AN INVESTIGATION OF THE INDIRECT EFFECTS OF
ADVERTISEMENTS INTENDED TO CHANGE PRODUCT
ATTRIBUTE BELIEFS ON ATTITUDINAL ELEMENTS

Working Paper #573

Youjae Yi
The University of Michigan

AN INVESTIGATION OF THE INDIRECT EFFECTS OF ADVERTISEMENTS INTENDED TO CHANGE PRODUCT ATTRIBUTE BELIEFS ON ATTITUDIANL ELEMENTS

Abstract

This study investigated the dynamics of attitude change by examining indirect effects of an ad desinged to change a belief on other attitudinal elements and moderating conditions for these indirect effects. Results showed that an ad had indirect effects on unmentioned beliefs, which were a function of 1) the manner beliefs are organized internally in ad recipients' cognitive structure and 2) retrieval cues provided externally in the ad. Also, an ad intended to change a belief (B_i) had indirect effects on evaluations (a_i) of the intended attribute, which had not been examined in previous research; these effects were observed especially when the belief was attacked directly by the ad and the belief was held with high confidence by ad recipients. Implications of these indirect effects were discussed as well.

INTRODUCTION

Advertisements frequently emphasize salient attributes of products so that people's beliefs about these attributes will change. It is commonly accepted that changes in beliefs lead to changes in attitude (e.g., Lutz 1975a; Mitchell and Olson 1981). A theoretical basis for this approach is the expectancy-value (EV) model of attitude (e.g., Ajzen and Fishbein 1980; Fishbein and Ajzen 1975), which holds that brand attitude is a function of $\Sigma B_i a_i$: where B_i is an individual's belief that the brand will possess attribute i; a_i is one's evaluation of how good or bad it is for the brand to possess attribute i. Much research has therefore focused on changes in attacked beliefs (i.e, beliefs mentioned in the ad) and related these changes to attitude change. But what are the effects of advertisements on unattacked attitudinal elements?

Substantial evidence suggests that advertising can affect unattacked elements as well. An audience may infer beliefs about aspects of a product not mentioned in the ad, which is the process of inferential belief formation (Ford and Smith 1987; Huber and McCann 1982; Olson 1978). Thus, communication messages about one attribute can influence beliefs about other attributes (Lutz 1975a; Johnson and Levin 1985). Belief change attempts can also produce negative affect, since information discrepant with beliefs may induce defensive reactions (Oliver 1976; Wright 1980). The negative affect arising from discrepant ad information may influence other affective elements such as attribute evaluations (a_j). As a consequence, we need to understand indirect as well as direct effects in order to fully understand advertising effects.

The first purpose of this study is therefore to investigate the dynamics of attitude change by examining direct and indirect effects of advertising. In particular, the present study examines what indirect effects an ad designed to change a belief (B_i) can have on other attitudinal elements. As is illustrated in Figure 1, an ad designed to change a belief (B_i)

may have "direct effects" on the target belief (B_i). Equally important, however, effects of such an ad might extend vertically to other beliefs (B_k) and horizontally to evaluations (a_i) of attributes. Ad effects on other beliefs (B_k) may be called "indirect cognitive effects," whereas effects on attribute evaluations (a_i) are "indirect affective effects."

Insert Figure 1 about here

The second purpose of this study is to examine the conditions under which these indirect effects are likely to occur. What are the mechanisms underlying these indirect effects? What factors will facilitate the indirect effects? We need to answer these questions in order to understand the second-order effects better. We will look at the variables that moderate the indirect cognitive effects on unmentioned beliefs: attribute interdependence and visual cues. Also, belief confidence and directness of persuasive attempts will be examined as moderators of the indirect affective effects on a_i.

Although the present study is similar to previous studies of indirect effects, a few characteristics of this study should be noted. First, this study investigates indirect effects of advertisements in more depth by delineating ad impact on *individual* attitudinal elements. In this regard, this study differs from some studies that examined global indirect effects of advertising. Lutz (1975b), for example, found indirect effects of advertisements. The anticipated changes for the target attributes ($\Delta\Sigma_i B_i a_i$) are labeled "first-order cognitive effects," whereas the changes in unattacked elements ($\Delta\Sigma_k B_k a_k$) are "second-order cognitive effects." Second-order cognitive effects, however, do not reveal what are the effects for individual attributes (i.e., which attributes are affected, and which attributes are not) , and do not distinguish effects on beliefs (B_i) from effects on attribute evaluations (a_i). More importantly, the underlying mechanisms are not fully investigated, and it is difficult to predict *a priori* indirect effects of a specific ad. In contrast, the present study

addresses questions as to which attributes are indirectly affected, and distinguish indirect effects on belief strengths from indirect effects on evaluations.

Second, this study examines the unintended, indirect effects of belief change attempts on attribute evaluations (ai). Though many studies were conducted as to indirect effects of belief change attempts on other beliefs (e.g., Huber and McCann 1982; Johnson and Levin 1985), few researchers have examined indirect effects on attribute evaluations. This study also differs from those studies that have examined the persuasive communication intended to change attribute evaluations (e.g., Lutz 1975a; Mackenzie 1986). Such studies have usually examined the effects of advertisements that explicitly emphasize the importance or value of certain attributes, whereas this study looks at the ads intended to change certain beliefs, and examines the conditions under which such ads may have unintended effects on attribute evaluations (a_i).

HYPOTHESES

This study addresses the following questions as to how an ad designed to change a target belief indirectly influence other attitudinal elements.[1] What are the indirect effects of such an ad on other cognitive elements (i.e., other beliefs)? What are the indirect effects on affective elements (i.e., attribute evaluations (a_i))? What factors will determine these indirect effects? Specific hypotheses concerning these questions are presented in this section.

Indirect Cognitive Effects on Nontarget Beliefs

Theories of human inference suggest that people not only process given information, but also actively make inferences about unmentioned aspects of a stimulus (e.g., Huber and McCann 1982; Johnson and Levin 1985; Olson 1978). Suppose, for instance, an ad emphasizes the size of a car. The audience's beliefs about the target attribute, size, will be

affected by the ad. But they might also infer beliefs about other attributes, such as comfort, from the given information of size. Therefore, an ad designed to change a target belief may indirectly affect nontarget beliefs not mentioned in the ad. But what are the processes underlying the indirect belief change?

In this regard, the following questions arise: 1) Which nontarget beliefs will be affected? 2) Under what conditions will the indirect belief change facilitated? In order for an inference to be made for a nontarget attribute so that the belief is indirectly changed, that nontarget attribute should be accessible to the person while processing ad information. We will examine two factors that are likely to affect accessibility of attributes to ad recipients and are likely to address the above questions: attribute interdependence and visual cues.

Attribute Interdependence

Several developments suggest interrelationships or interdependence among attributes (Bagozzi 1982; Shimp and Kavas 1984). Interdependent attribute here refer to the attributes perceived to be associated with each other by people. One type of interdependent attributes are causally related attributes. For example, if consumers believe that the reliability of a car will reduce maintenance costs, the two attributes will be negatively associated in a causal sense. Attributes can be also interdependent as a result of measuring the same concept or by sharing the common antecedent.

What are the implications of such interdependence for predicting indirect effects of ads? For an indirect effect to occur for a nontarget belief, the nontarget attribute should be accessible to the ad recipient. When a target attribute is activated by the ad exposure, the activation is likely to spread to other attributes connected with the attribute, and these attributes may become accessible to ad recipients (Collins and Loftus 1975). As result, they are likely to make inferences about these interdependent attributes (made accessible

internally from one's knowledge structure), and change beliefs about these attributes accordingly.

Some theoretical support comes from the probabilogical model, based on the rules of probability and logic (" probabi-logical"), which was demonstrated by many studies (Wyer and Hartwick 1980; Danes and Hunter 1980; McGuire 1981). The probabilogical model uses syllogistic reasoning to explain how people make inferences based on information about an object. A syllogism is a set of three statements, two of which serve as premises that lead psycho-logically to a conclusion. A conclusion is an inferential belief that is derived from the two premises. An example of a syllogism might be as follows:

* First premise (B/A):   A reliable car has low maintenance costs.

* Second premise (A):   Ford is a reliable car.

* Conclusion (B):   Ford has low maintenance costs.

If we designate the first premise as B/A, the second premise as A, and the conclusion as B, we obtain the following *static* equation for a belief in the conclusion, P(B).

$$(1) \qquad P(B) = P(A) \, P(B/A) + P(\tilde{A}) \, P(B/\tilde{A})$$

Here B/A indicates the event B, given the event A, and $\tilde{A}$ is not A. In the given example, A is reliability, whereas B is low maintenance costs. P(B) is the belief in B, where as P(A) and $P(\tilde{A})$ (1-P(A)) are beliefs that A is and is not true, respectively. Assuming that A and B/A are independent, we get the *dynamic* equation for belief change (Wyer and Hartwick 1980):

$$(2) \qquad \Delta P(B) = [\, P(B/A) - P(B/\tilde{A}) \,] \, \Delta \, P(A)$$

This equation has an important implication for advertising effects. If a belief in A (e.g., Ford is a reliable car) is altered by an ad, there may be a change in other, unmentioned but logically related, beliefs in B (e.g., Ford has low maintenance costs). Furthermore, Equation 2 shows that the indirect belief change (Δ P(B)) is a function of beliefs in the first

premise (P(B/A)). Since the first premise, "A reliable car has low maintenance costs," relates two attributes (i.e., reliability and maintenance costs), beliefs in the first premise reflect the degree of the interdependence or association between the attributes. Thus, we hypothesize:

> **H1**: An ad designed to change a target belief will affect nontarget beliefs that are interdependent with the target belief.

Visual Elements as External Retrieval Cues

It has been argued that a nontarget attribute must be accessible to the person for an indirect belief change to occur. It is also hypothesized that a nontarget attribute interdependent with a target attribute is likely to be accessed. That is, accessibility of certain attributes is determined by an internal factor (i.e., one's knowledge structure about the product, especially linkages among attributes). Then, what environmental factors might influence the accessibility of a nontarget attribute?

Lynch and Srull (1982) note that self-generated or externally generated cues can facilitate information accessibility. In the advertising context, visual cues suggesting a nontarget attribute may work as retrieval cues that directly activate and enhance the awareness of that nontarget attribute by directing one's attention toward that attribute. Since these cues remind ad recipients of the attribute, they are more likely to recognize the relationship between the attributes, make inferences, and consequently change the belief than those not so reminded. That is, people make inferences about Attribute B (triggered and made accessible externally by visual elements) based on information about Attribute A from the ad claims. Based on the above arguments, we hypothesize:

> **H2**: An indirect effects of an ad on a nontarget belief will increase with the existence of visual cues that suggest the nontarget attribute.

Indirect Affective Effects on Attribute Evaluations (a_i)

When one receives information about products, one may compare the information with one's own beliefs or expectations about products (Bettman 1986). That is, a basis exists for a confirmation or disconfirmation of prior beliefs. An ad designed to change beliefs conveys information that does not fit with one's existing beliefs. In such a case, one is not likely to accept all the new information from the message and completely discard one's own beliefs . Rather one's existing beliefs will persist to a certain extent, and one may resist persuasive attempts by generating unfavorable cognitive responses such as counterarguments (CA) (Greenwald 1968; Wright 1975, 1980), and these negative counterarguments will generate negative affect. This negative feeling may generalize to attribute evaluations (a_i), which are attitudes toward attributes (Fishbein and Ajzen 1975) or affective reactions to attributes that are learned through classical conditioning or operant conditioning (Bagozzi 1985).

The generalized negativity theory provides further support for the above predictions. According to this theory, information disconfirming expectations will produce negative affect (Carlsmith and Aronson 1963; Oliver 1976). When a person is exposed to belief-discrepant information and process the content associated with it, he or she might develop negative feelings or emotions toward the information. These negative feelings will be generalized to its referent (i.e., attribute), lowering evaluation of its referent (a_i). Thus, it is hypothesized that an ad designed to change a person's belief (B_i) may have a negative indirect effect on one's attribute evaluation (a_i), which are called "indirect affective effects."

We have claimed that an ad not fitting with one's existing belief may induce defensive reactions from the audience and consequently indirect consequences on a_i. But this may not happen in some cases (for example, if the ad leads to acceptance rather than resistance). We need to understand the conditions under which the indirect affective effects are likely to

occur. In H3 and H4, we examine two moderator variables designed to address this issue: belief confidence and directness of persuasive attempts.

Belief Confidence as a Moderator

Belief confidence is the degree of subjective certainty that one can judge product attributes or that one's belief is accurate (Bennett and Harrell 1975; Fishbein and Ajzen 1975; Smith and Swinyard 1983). If a consumer has high confidence in his belief, he will allow only a narrow range of acceptable belief change (Eagly 1981). As a result, he is less likely to accept new discrepant information about the attribute and to make more cognitive responses to resist persuasion . In contrast, if a consumer has low confidence in his belief, he will be more receptive to the ad information and make fewer unfavorable cognitive responses (Wright 1975).

Belief confidence is also similar to commitment to one's belief. Counterarguing is more intense when one is strongly committed than when one is uncommitted to one's position (Hass 1981). When uncommitted, one produces counterarguments or source derogations when the veracity of the message is in doubt. But when committed, one counterargues to resist persuasion, whether the recommended claims are perceived as valid or not. People are thought to be motivated to defend their beliefs and attitudes from the implications of information that might disturb existing cognitions to which they were highly committed (Eagly and Chaiken 1984).

This is also predicted by the "basic antinomy" hypothesis (Jones and Gerard 1967). According to this theory, there are two paradoxical tendencies in human behavior. On the one hand, it is useful to receive new information and improve our view. On the other hand, it is also healthy to reject new information and maintain our view. Jones and Gerard suggest that these two tendencies are related to one's commitment. When an individual is minimally committed to a position, openness or flexibility dominates. But when an

individual is strongly committed, closedness or self-protection prevails, resulting in more negative cognitive responses.

The above theories suggest that the more confidence one has in a belief, the more likely one is to show defensive reactions and experience a negative feeling when one's belief is contradicted. This negative feeling will be generalized to affective elements such as attribute evaluations (a_j). Since the defensive reactions are more likely for those with high confidence in the attacked belief, the indirect affective effects are more likely for them, compared with those with low confidence. Based on this argument, we hypothesize:

> H3: The indirect effects an ad with belief-discrepant information has on attribute evaluation (a_j) are more likely to occur for persons with high confidence in the belief being changed through the ad than for those with low confidence.

Directness of Belief Change Attempts as a Moderator

Indirect cognitive effects on nontarget beliefs suggest that advertisers may be able to change certain beliefs without mentioning them directly. Hence, there are two ways to affect a particular belief intended to be changed: (1) a direct attempt by attacking the intended belief explicitly and (2) an indirect attempt by attacking beliefs other than the intended belief. An intended belief here refers to a particular belief that an advertiser intends to change ultimately, regardless of what attributes are mentioned in the ad.

Let us first compare direct and indirect attempts to change an intended belief. Suppose an advertiser intends to change consumers' beliefs about Attribute B. In a direct attempt, an ad makes verbal claims about Attribute B explicitly; that is, the mentioned attribute (B) is the same as the intended attribute (B). In an indirect attempt, an ad may verbally attack Attribute A, hoping that beliefs about Attribute A will induce beliefs about Attribute B; that is, the mentioned attribute (A) is different from the intended attribute (B). Given these two attempts at belief change, the following questions arise. What are the differences between direct and indirect attempts? Which approach should be used to change a certain belief? In

order to answer these questions, the present study examines the difference of the two attempts in their effects on attribute evaluations (a_j).

People want to feel free to adopt their own positions, and they regard persuasive attempts to influence their positions as threats to their attitudinal freedom (Brehm 1966). To the extent that an ad is seen as intending to persuade, there should be reactance arousal and accompanying decreased influence (Clee and Wickland 1980). In a direct attempt, the advertiser's persuasive intent is overt and explicit, and the ad recipient may build defenses against persuasion. Petty and Cacioppo (1979) found that forewarning of persuasive intent instills reactance in subjects and motivates them to counterargue in order to maintain or restore their freedom to hold their attitudes. These unfavorable cognitive responses will induce negative affect toward the attribute, lowering attribute evaluation (a_j).

On the other hand, in an indirect attempt, the process of belief change is not overt or explicit, and it is based relatively more on recipients' own thoughts. People will build fewer defenses against persuasion and make fewer counterarguments in reaction to the belief change attempt. As a consequence, we hypothesize:

H4: The indirect effects an ad with belief-discrepant information has on attribute evaluation (a_j) are more likely to occur under a direct attempt than under an indirect attempt.

Scope Conditions

Prior to describing the study designed to test the model, it is necessary to identify the scope for which it applies. First, the model applies to highly involving product classes. Since the proposed model presumes that people will give much thought to product attributes, it applies to high involvement product classes where perceived risk in brand choice and brand differentiation are high. Also, the proposed model applies to situations where ad recipients have high message response involvement (Batra and Ray 1985). A

premise of the model is that, in responding to an ad, consumers will actively generate idiosyncratic responses or inferences.

METHOD

Selection of Subjects, Product, Attributes, and Ad Medium

Subjects. The subjects for this study were 120 MBA students and business school staff at a major western university. Each subject who participated in the experiment was paid $ 5.00 and was given a chance to win $ 100.00.

Test Product. An automobile was selected as the test product class based on the following considerations. First, the product class should include relatively interdependent attributes so as to induce an interdependent cognitive structure. The automobile seemed appropriate in this regard, since it has many salient attributes and probable associations among attributes. Also, the product class should be highly involving. Since MBA students and staff were likely to consider automobiles important and have considerable knowledge about this product class, subjects would readily process product information in an ad and respond deeply to it.

The test brand was the Hyundai Excel, an imported car from South Korea. There were some requirements in selecting the test brand. On the one hand, subjects should be familiar with the test brand so that they can engage in at least a minimal processing of the ad information. On the other hand, there should be substantial variations in subjects' confidence in beliefs about the test product, because belief confidence is one of the independent variables in this study. The Hyundai Excel seemed to satisfy these requirements. It had been on the U.S. market for about a year when this study was done, and it had been sold in Canada for two or three years prior to its entry into the U.S. market. Numerous articles and publicity preceded its introduction. In fact, most subjects (80 %)

indicated that they had heard of the Hyundai Excel. Nevertheless, since the brand was new in the U.S., variation in experience and knowledge about the brand was highly likely so that we would expect differences in belief confidence across subjects.

Salient Attributes. After the test product was chosen, a focus group of 20 MBA students (who were not included in the main experiment) was interviewed to identify salient attributes of the product. Eight attributes that were mentioned by at least 30 % of the individuals were selected as modally salient attributes. They are durability, dependability, ease of maintenance, repair costs, roominess, style, riding comfort, and sportiness. These attributes are similar to those employed in previous studies of automobiles (cf. Farley, Katz, and Lehmann 1978).

Ad Medium. Print ads were selected, since they generally provide a high opportunity to respond deeply and facilitate message-evoked thoughts (Wright 1975, 1981).[2] Also, it is easy to manipulate the message content of print ads, a feature which is critical to the experimental treatment.

Experimental Design

This study used a 2 x 2 x 2 factorial between-subject design with directness of belief change attempts (direct or indirect), visual cues (present or absent), and belief confidence (high or low) as the factors. Since a pilot study revealed that "repair costs" were considered as a relatively weak attribute of the test brand, repair costs were selected as an intended attribute to be changed by the ad. "Dependability " and "repair costs" were found to be highly associated in the focus group interview, and these attributes were the foci of the ad stimuli.

Directness of belief change attempts was manipulated by varying verbal claims in the ads. In the direct attempt, the ads made verbal claims about low repair costs; that is, the target attribute was the same as the intended attribute (repair costs). In the indirect attempt,

the ads made verbal claims about high dependability; that is, the target attribute (dependability) was different from the intended attribute (repair costs). The format and the number of message claims were approximately the same between direct and indirect attempts, except for the content.

Visual cues were manipulated by either including or not including pictures that suggest or hint at the intended attribute, repair costs. The visual cues used were pictures of a person with repair bills in his hand in front of an auto mechanic. It was ascertained that the visual cues did indeed suggest the intended attribute, repair costs. In a pilot study, doctoral students examined a set of potential visual cues and wrote what they suggested. For the visual cues chosen for this study, all mentioned the repair costs, and no one mentioned other attributes.

Finally, belief confidence was measured on the basis of subjects' responses to the questionnaire. A median split was then used to divide the subjects into high and low belief confidence groups for purposes of analysis.

Procedure

Subjects performed the experimental tasks in small groups of five to seven in a research room. Each subject was told a disguised purpose of the study consisting of the evaluation of advertisements in pre-production form. This instruction was also intended to induce high elaboration of product information in the ads. After reading and signing a consent form, each subject was given an envelope with four booklets. Each subject was told to complete the booklets in the order presented. Once the subject finished a booklet, he or she was asked to put the finished booklet in the envelope, to move on to the next, and not to refer back to it later. It was emphasized that all the questions concerned subjects' own thoughts and feelings, and that there were no right or wrong answers.

In the first booklet, subjects were asked for general background information such as their experience and familiarity with cars. Following this, they were asked about pre-exposure attitudinal responses, including beliefs (B_i), belief confidence (BC_i) and evaluations (a_i). To separate the measurement of preexposure attitudes from the postexposure attitudes, this booklet contained several scales of personality.

In the third booklet, each subject saw an ad designed to change his or her belief about the target attribute. The ads varied in two aspects: 1) target attributes and 2) visual cues. The target attribute of ad messages was either dependability or repair costs, depending on whether the subject was assigned to the indirect or direct attempt condition. The ads varied as to the presence or absence of visual cues suggesting the intended attribute (repair costs).

Cognitive responses were collected after ad exposure by asking them to write down all of the things that came to mind as they read the ad. Subjects were given three minutes to write down all of their thoughts to reduce the possibility of subjects generating thoughts in response to the protocol task itself (Wright 1980).

In the final booklet, subjects filled out a post-exposure questionnaire on expectancy-value measures (B_i and a_i) on the salient attributes of the test brand. Subjects were then asked to guess the purpose of the study and to write down their thoughts about the purpose. This step completed the experiment. The experimental sessions lasted, on average, between 30 and 40 minutes.

Data Collection Instruments

To assess beliefs (B_i) about the test brand, subjects were asked, "Assuming you bought the Hyundai Excel, how likely or unlikely would the following consequences be?" Subjects were asked to estimate the probability that the Hyundai Excel possessed each attribute on 11-point scales, ranging from "very unlikely" to "very likely" Belief confidence (BC_i) was measured for each belief by the question "How confident are you

that your belief estimate is accurate?" Each subject was asked to respond to this question

on a 7-point scale ranging from "very confident" to "not at all confident." This scale is

similar to that used by Smith and Swinyard (1983).

Attribute evaluations (a_i) were measured by using semantic differential scales. Subjects

read the following instructions: "We want you to rate the following ideas connected with

buying a car. From your point of view, how good or bad are they relative to each other? "

Then, for each attribute i, subjects were asked to indicate on an 11-point scale (-5 to +5,

with end points labeled "very bad" and "very good," respectively) to what degree it is

good or bad that a car has attribute i.

Subjects' handwritten cognitive responses were independently coded by two judges

who were blind to experimental treatments. Coding of each response involved two

judgments on the part of judges: direction and valence of the thought (c.f. Mackenzie

1986). First, it was decided whether or not the thought was directed toward the intended

attribute (repair costs). Second, the valence of the thought was decided; favorable (in favor

of the advocated position), unfavorable (contrary to the advocated position), or neutral. As

a result, there were six categories of thoughts; favorable thoughts toward the intended

attribute (FTI), unfavorable thoughts toward the intended attribute (UTI), neutral thoughts

toward the intended attribute (NTI), other favorable thoughts (FTO), other unfavorable

thoughts (UTO), and other neutral thoughts (NTO).

Estimates of reliability for cognitive response measures were obtained for each of the six

categories. The interjudge reliability estimates ranged from .77 to .89, averaging .83

across the six thought categories. Overall, these estimates suggest that the level of

reliability in coding the thought protocols was comparable to that obtained in previous

cognitive response research (e.g., Wright 1980).

Reducing Threats to Internal Validity

Several precautions were taken to reduce potential threats to the validity of the results. First, the purpose of the study was disguised to reduce any demand characteristics. Furthermore, subjects were asked about their perceived purpose of the study after the experiment. The results showed that no subjects guessed the real purpose of the study. This gives a rough indication that little demand characteristics operated. Second, data were collected in stages, and subjects were not allowed to refer back to their earlier responses. This step was taken to eliminate any contamination due to response set consistency. Since this study required a pretest and posttest, this was critical.

Third, filler tasks, which took about 10 minutes, were inserted between the pretest and posttest to reduce memory bias. Finally, to ensure that ad messages did contain information discrepant with the subjects' prior beliefs about the test brand, a 7-point disconfirmation scale was measured after ad exposure. The result was significantly more negative than zero (M=-.69, t=5.3, p< .01), suggesting that the ad messages did contradict subjects' preexposure beliefs about the test brand.

RESULTS

The results for the experiment are discussed below. For ease of exposition, they are reported in the order of research issues.

EV Representation

The cognitive structure EV was investigated using a structural equation modeling framework with LISREL (Joreskog and Sorbom 1984). Figure 2 represents this cognitive structure, exposing the nature of interdependence among the EV elements. The model consists of four dimensions, EV1-EV4; these reflect (1) reliability (durability and dependability), (2) maintenance costs (ease of maintenance and repair costs), (3)

convenience (riding comfort and roominess), and (4) appearance (style and sportiness).

Also according to the pilot study, EV2 (maintenance costs) is hypothesized to be causally

dependent on EV1 (reliability).

The EV representation in Figure 2, which will be called "an interdependence EV

model," was estimated with LISREL by employing a modified version of higher-order

confirmatory factor analysis (Bagozzi 1985; Gerbing and Anderson 1984). The

interdependence EV was represented as a second-order factor, whereas the dimensions of

interdependence EV (i.e., EV1 to EV4) were represented as first-order factors.[3] It was

also ascertained that the model is identified.

The set of EV attitudinal measures was analyzed, and the fit of the model was assessed

with maximum likelihood ratio chi-square test. The interdependence EV model achieved

convergent validity; the chi-square statistic was satisfactory in terms of the usual .05 cut-off

level (X^2=22.84, d.f.=15, p=.09). Other measures of the overall fit of the model also

suggested that the model was satisfactory; the adjusted goodness-of-fit index (AGFI) =

.89, the root mean square residual (RMR) = .05.

Insert Figure 2 about here

Statistical significance of the causal path from EV1 (reliability) to EV2 (maintenance

costs) was tested by using the chi-square difference (X_d^2) test. Specifically, we compared

the model having the path from EV1 to EV2 free and the model having the path fixed to

zero. Results suggested that the fit of the model without the path is not acceptable;

X^2=40.7, d.f.=16, p<.00. Thus, the difference in fits of the two models is significant

(X_d^2=17.9, d.f.=1, p<.001), suggesting that EV1 and EV2 dimensions are causally

related. The standardized value for this path is .54 (t=4.73, p<.001), suggesting that

reliability is causally associated with low maintenance costs. As a result, the four attributes

(i.e., durability, dependability, ease of maintenance, and low repair costs) measuring these

two dimensions were found to be interdependent, the expected interdependence between dependability and low repair costs was confirmed.

We also computed reliabilities of individual EV items, composite reliabilities of the EV scales, and average variance extracted (AVE) (Werts, Linn, and Joreskog 1974; Fornell and Larcker 1981). Table 1 presents the individual and composite reliabilities and AVE for the EV measures used in this study. Although some individual reliabilities were low, all composite reliabilities were higher than .60, the usual cut-off level, and the average composite reliability was .70. All AVE measures were greater than .5, which is considerate adequate, and average AVE was .65. Overall, the EV measures achieved internal consistency.

Insert Table 1 about here

Indirect Cognitive Effects on Beliefs

Attribute Interdependence as a Moderator. H1 was tested by examining whether the ad changed the nontarget beliefs that are interdependent with the target belief for the subjects in the indirect change conditions . It can be noted that dependability was the mentioned target attribute for the ads in indirect attempt conditions. Recall that three attributes were found interdependent with the mentioned attribute (dependability); that is, durability, ease of maintenance, and low repair costs.

Pre- minus postexposure belief scores were tested for statistical significance both for ads with the visual cues and for those without the visual cues. As Table 2 indicates, the indirect belief change was significant for all of the three interdependent attributes. For example, for ads without visual cues, the belief change scores for them are 1.23, .83, and 1.00, respectively, all of which are significant. Similarly, for ads with visual cues, the indirect belief change was significant at the .01 level for two of the three interdependent

attribute. For the attribute "ease of maintenance," the indirect belief change approached significance (p=.06). In contrast, the belief change was not significant for any of the non-interdependent attributes. Overall, there is strong support for H1; that is, an ad attempting to change a belief affected other interdependent beliefs as well.

Visual Cues as a Moderator. H2 predicts that visual cues will facilitate indirect belief change for an attribute suggested by the visual cues. In this study, visual cues were about repair costs, which is one of the interdependent nontarget attributes. Thus, the effect of visual cues was tested by comparing the indirect belief change scores between ads with visual cues and those without visual cues. An inspection of belief change scores given in Table 2 reveals that the visual cues had the predicted effects; inclusion of visual cues increased the indirect belief change by .70, which was significant at the .05 level. That is, an indirect effect on an unmentioned belief increased with the visual cues suggesting that belief. Overall, there is strong support for H2.

Insert Table 2 about here

Indirect Affective Effects on Attribute Evaluations (a_i)

Since this study used a pretest and posttest design, analysis of variance (ANOVA) was run on change scores of attribute evaluation (Δa_i) to test hypotheses regarding indirect affective effects. The results are illustrated in Table 3.

Belief Confidence as a Moderator. H3 examines the moderating role of belief confidence in indirect affective effects. A three-way ANOVA was run with attribute evaluation change scores (Δai) as a dependent variable. As Table 3 shows, the predicted main effect of belief confidence was significant ($F(1,112)=8.27$; $p=.01$). An inspection of cell means reveals that the effect of belief confidence is in the predicted direction; the

magnitude of attribute evaluation change (Δa_i) is larger in the high confidence group than in

the low confidence group (-.59 vs -.05 ; p < .01). In sum, there is support for H3.

Insert Table 3 about here

Directness of Belief Change Attempts as a Moderator. H4 states that a direct change

attempt will produce more change in attribute evaluation than an indirect attempt. Attribute

evaluation change scores (Δa_i) were compared between direct and indirect attempts by

examining the main effects of directness of persuasive attempts on Δa_i. The directness of

belief change attempt had the main effect in the predicted direction, but its effect did not

reach the statistical significance ($F(1,112)=1.67$; $p=.20$).

However, directness of persuasion attempt had a significant interaction effect with

belief confidence ($F(1,112)=6.71$; $p < .01$). For the high belief confidence group, attribute

evaluation change (Δa_i) was larger in the direct attempt than in the indirect attempt (-.24 vs.

-.97, $p<.05$). In contrast, for the low confidence group, Δa_i was not different between the

direct and indirect attempts (-.19 vs .07 $p>.10$).

Cognitive Responses as Causal Mediators The above analyses have shown that

directness of belief change attempts and belief confidence influenced the attribute evaluation

change (Δa_i), as hypothesized. However, the proposed mediating roles of cognitive

responses have not been examined. If the two factors do not produce parallel effects on

cognitive responses and on attribute evaluation change (Δa_i), it is unlikely that the effects

on Δa_i are mediated by the cognitive responses. A convincing test of the mediating effects

of cognitive responses requires that the two factors produce statistically significant parallel

effects on Δa_i and cognitive responses (Wright 1980).

We have already seen that directness and belief confidence had significant effects on

Δa_i. To test whether the two factors also affected subjects' unfavorable cognitive

responses, an analysis of variance was conducted for the number of unfavorable thoughts

toward the intended attribute (UTI). Table 3 presents the results from this ANOVA test.

Both directness of persuasion attempt and belief confidence had significant main effects on

UTI ($F(1,112)=19.7$, $p<.00$; $F(1,112)=8.38$, $p<.01$, respectively). Their interaction effect

was also significant ($F(1,112)=8.06$, $p<.01$). Similar analyses were conducted for other

thought categories, but none of the effects were significant for other thought categories

(e.g., FTI).

The analyses provided results consistent with the hypothesized processes, that is,

attribute evaluation change mediated mainly by the unfavorable cognitive responses toward

the intended attribute. Additional evidence for the degree to which cognitive responses

mediate the effects of advertisements on evaluation change can be provided a series of

covariance analysis. This procedure has been thoroughly discussed in previous studies

(e.g., Olson, Toy, and Dover 1982; Wright 1980).

If cognitive responses do mediate the effects of persuasive communications, then

including measures of cognitive responses as covariates in an analysis of variance of the ad

effects on evaluation change should eliminate the effects of the two factors. That is, the

effects of directness and confidence should become small and statistically nonsignificant.

Analysis of covariance (ANCOVA) was therefore run on Δa_i with UTI as a covariate, and

the results are presented in Table 4.

Insert Table 4 about here

As we have seen in Table 3, directness and confidence had significant effects on Δa_i.

But when UTI was included as a covariate, their effects, which were originally significant

($F(1,112)=8.27$, $p<.01$; $F(1,112)=6.71$, $p<.01$), became insignificant ($F(1,111)=3.52$,

$p>.06$; $F(1,111)=2.99$, $p>.09$), while the effect of the covariate UTI was statistically

significant (F(1,111)=7.84, p<.01).[4] These results suggest that unfavorable thoughts

about the intended attribute mediated the effects of the two factors (directness of persuasion

and belief confidence) on evaluation of the intended attribute (a_j). Overall, results are

consistent with the causal hypothesis that directness and belief confidence affected

cognitive responses (i.e., UTI), which in turn changed attribute evaluation (Δa_i).

DISCUSSION

In this section, the findings of the study are interpreted in light of the proposed

theoretical framework, compared with those of other researchers, and their implications are

discussed. After the limitations of this study are noted, future research directions are

discussed as well.

EV Representation

Investigation of people's EV reactions to an automobile showed that one could model

EV as a network of interdependent elements. Ths finding is consistent with the associative

network model of memory (Anderson, 1983; Anderson and Bower 1973). The associative

network model states that memory is a network consisting of nodes (concepts) and links

(associations) among them. Analogously, the interdependence EV model describes

explicitly the associative linkages among the EV elements. The interdependence EV model

is also compatible with the recent finding that EV has a hierarchical structure with

subdimensions (Oliver and Bearden 1984, Shimp and Kavas 1984). It represents various

EV elements as superordinate or subordinate attributes by using a hierarchy of factors; for

example, room and style are treated as subordinate attributes of convenience (see Figure 2).

Indirect Effects of Advertising

In this study, we have examined the indirect effects of an ad designed to change a belief.
This study has addressed the following questions. What indirect effects can an ad have on
unattacked elements: e.g., 1) indirect cognitive effects on nontarget beliefs and 2) indirect
affective effects on attribute evaluations (a_i)? What factors facilitate these indirect effects?
By investigating underlying mechanisms and moderating conditions, this study has
attempted to extend research on indirect cognitive effects, which have often been found in
several studies. This study has also explored indirect affective effects, which have not
been examined by researchers of indirect effects.

Indirect Cognitive Effects

An ad indirectly influenced other beliefs not mentioned in the ad. Two facilitators of
these indirect cognitive effects were tested: interdependence of attributes and visual cues in
an ad. The facilitating role of interdependence was found; indirect effects on nontarget
beliefs were significant for interdependent attributes, but not for non-interdependent
attributes. The facilitating role of the visual cues was also found. When an ad contained
visual cues suggesting an attribute, the indirect belief change for that attribute increased,
compared with the condition where visual cues were absent.

The above findings fit with our representation of EV. Since EV is a cognitive network
of interdependent beliefs, an ad effect on one belief is expected to bring about changes in
other related beliefs. This is consistent with the spreading-activation theory predicting that
when one node is activated, the activation will spread to other nodes through the associative
network via the linkages (Collins and Loftus 1975). That is, when one is exposed to an
ad, clusters of interdependent beliefs, not just a target belief, change together.

By using the EV structure as a basis for understanding the processes of advertising
effects, this study links attitude formation with attitude change within a single framework.

Previous studies of advertising effects have scrutinized attitude change in a global sense (e.g., Fishbein and Ajzen 1975; Lutz 1975a, 1977), whereas recent studies of attitude formation have focused on the existence of substructures (Bagozzi 1981, 1982; Oliver and Bearden 1985; Shimp and Kavas 1984). The two streams of research have been disjoint to date, and there is a need to link them. This study is an effort toward that goal.

Indirect effects on nontarget beliefs appear to be similar to the so-called "halo effect." According to this effect, the valence of perceptions of an object on one attribute generalizes to other attributes (e.g., Holbrook 1983). However, this study differs from the halo effect studies in that it specifies the conditions under which indirect effects will occur. This study predicts that indirect effects are likely to be observed when focal attributes are interdependent with the mentioned attributes and especially when they are suggested by visual cues. Results support the predictions of this study in that the indirect effects did occur only for certain related, not all, nontarget beliefs.

The proposed research procedures have several managerial implications. First, they can be used to help advertisers identify target attributes for copy design. If several attributes are interdependent, advertisers can choose the attribute(s) that is relatively easy to influence as a target attribute in the copy. The results are also consistent with wisdom of marketers for copy testing. It is not sufficient to examine a post-exposure change in the target attribute, since there might be second-order effects on other attributes which could have consistent or inconsistent effects on overall attitudes.

This study suggests another strategic application as well; even if ads do not address the product's possession of attributes, they can effectively enhance consumers' perceptions of the brand. For example, if consumers perceive a product to be strong in one attribute (e.g., the size of a car), ads can either emphasize or merely suggest other related attributes (e.g., safety) and/or their interdependence with that attribute. They may still change the overall

attitude by inducing consumers' inferences about other attributes. Thus, a firm can exploit the strengths of its product position by employing the interdependence information. This might be especially fruitful when the direct attribute achieves wearout.

Indirect Affective Effects

An ad designed to change a belief influenced attribute evaluation (a_j) as well. The evaluation associated with the intended attribute was lowered as a result of exposure to ad messages discrepant with existing beliefs. Evaluation of the intended attribute (a_i) was changed significantly when a belief is directly attacked and the belief is held with high confidence by ad recipients. Thus, the individual factor (one's confidence in the belief) and the ad stimulus factor (directness of belief change attempt) interacted in producing indirect affective effects.

The hypothesized mediating effects of counterarguments were demonstrated. It was found that removing the variance in Δai that was associated with negative thoughts toward the intended attribute eliminated or dramatically reduced the significant effects of belief confidence of the subjects and directness of ad messages. It has been usually argued that counterarguments with an advertising claim that a product possess a particular attribute may resist persuasion by reducing or blocking the formation of one's belief about that attribute (Olson, Toy, and Dover 1982). This finding suggests still another process by which cognitive responses resist persuasion. That is, counterarguments can work against persuasion by lowering the attribute evaluation (a_j) independently of their effects on beliefs (B_i).

These findings suggest a need to investigate the relationship between the expectancy (belief) and value (evaluation). The traditional research assumed that expectancy and value are independent in that each does not affect the other. But the findings of this study suggest that such an assumption may not be valid, since belief changes produced evaluation

changes. By examining the effects of changing beliefs on evaluations, this study links cognitive change and affective change.

Researchers have traditionally treated evaluations or importance weights attached to product attributes as predetermined, exogenous factors in their research (e.g., Fishbein and Ajzen 1975). This practice seems to be based on the assumption that attribute evaluations or values cannot be easily influenced (Mackenzie 1986). The findings, however, suggest that values or evaluations of attributes are not as stable as have been posited. This study has demonstrated that attribute evaluations can be affected by belief change attempts, identified underlying mechanisms, and found the moderator variables of the effects. This is consistent with the empirical evidence that attribute evaluations or weights are affected by persuasive messages (Gardner 1983; Mackenzie 1986) and contextual factors (Currim, Weinberg, and Wittink 1981).

The findings suggest an implication for selecting target attributes. When consumers' confidence in a belief is high, a firm had better not attack the belief directly. Attacking the belief might induce negative effects on attribute evaluations (a_i), which might ultimately offset any effects on beliefs (B_i). In other words, indirect affective effects might lead to unexpected negative effects on overall attitudes. One effective way might be to change the belief indirectly by making verbal claims about other related beliefs and making the intended belief accessible (e.g., via certain retrieval cues). If consumers have less confidence in these related beliefs, this approach should minimize the negative secondary effects.

Limitations and Further Directions

This study used a pretest-posttest design to evaluate advertising effects. A limitation of such a design is the potential for demand to operate (Sawyer 1975). This study attempted to assess any demand by post-experimental inquiry and found none. Yet, there is another

problem with this approach. Demand might still have operated at the time when subjects wrote paragraphs describing their guesses about the the purpose of the experiment. As a result, finding no evidence for demand might not be so informative, since the lack of evidence itself might be an artifact of demand. To minimize the demand, we can replicate the study using a posttest only with control design.

The present study used pre-production form advertisements as experimental stimuli. Furthermore, subjects saw only the test ads in the experiment. Since this procedure was perhaps foreign to the subjects, it might have reduced the realism of the study. In future work, the test ads could be embedded in a magazine, together with other filler ads.

There are several directions in which the proposed study can be extended. First, we can further explore the moderators of indirect effects. The critical questions are the following. What factors will facilitate retrieval of belief linkages and consequently indirect belief change?; for example, does consumer expertise increase the perception and utilization of interdependence between product attributes (cf. Alba and Hutchinson 1987)? What type of persons will show more affective reactions to belief disconfirmation?; for example, does consumer sophistication or brand loyalty increase affective effects? Which beliefs are easy to change by external persuasive attempts?; for example, are beliefs about subjective experience attributes easy to influence, as opposed to search attributes? Answers to these questions will be of much relevance to persuasion researchers as well as advertisers.

We can also extend this study to evaluation of partially described multiattribute options. If the value for a particular attribute is missing, he may infer that attribute value. According to this study, the inferred value for a missing attribute will depend on perceived interdependence between the missing attribute and available attributes as well as the values of the available attributes.

This study has investigated the effect of consumers' indirect experience (ad exposure) on attitudes, but future research can examine the effect of direct experience (product trial or use). We expect that the indirect effects will be stronger with direct experience, because it involves more commitment. One emotional reaction from direct experience is consumer satisfaction or dissatisfaction, and future research can link consumer satisfaction and the processes investigated in the attitude literature.

[1] *Target attributes* are attributes that are explicitly mentioned in verbal claims of the ad, and beliefs about target attributes are called *target beliefs*. Nontarget attributes are attributes that are not explicitly mentioned in an ad, and corresponding beliefs are *nontarget beliefs*.

[2] The ad should give the subjects enough opportunity to respond deeply to the ad messages in order to satisfy the scope conditions for the study. Two approaches that would provide adequate message response opportunity were considered: repetition of ad exposure and choice of ad medium (cf. Wright 1980). Repetition, however, may have unintended effects (e.g., tedium) in addition to increasing message response opportunity. Hence this study used choice of ad medium as a means for stimulating response opportunity.

[3] This is similar to the second-order factor analysis model (Joreskog and Sorbom 1984; I. 10-11), but different in that first-order factors are allowed to be interdependent.

[4] Similar analyses were conducted with other categories of cognitive responses. When other thoughts (e.g., FTI) were used as covariates, however, the original effects were not reduced.

REFERENCES

Ajzen, Icek and Martin Fishbein (1980), Understanding Attitudes and Predicting Social Behavior, Englewood Cliffs, NJ: Prentice-Hall

Alba, Joseph W. and J. Wesley Hutchinson (1987), "Dimensions of Consumer Expertise," Journal of Consumer Research, 13 (March), 411-54.

Anderson, John R. (1983), The Architecture of Cognition, Cambridge, MA: Harvard University Press.

_____ and Gordon H. Bower (1973), Human Associative Memory, Washington, D.C., Winston & Sons.

Bagozzi, Richard P. (1982), "A Field Investigation of Causal Relationships Among Cognitions, Affect, Intentions, and Behavior," Journal of Marketing Research, 19 (November), 562-84.

_____ (1985), "Expectancy-Value Attitude Models: An Analysis of Critical Theoretical Issues," International Journal of Research in Marketing, 2, 43-60.

Batra, Rajeev and Michael Ray (1985), "How Advertising Works at Contact," in Psychological Processes and Advertising Effects, Linda F. Alwitt and Andrew A. Mitchell, eds. Hillsdale, NJ: Erlbaum.

Bennett, Peter D. and Gilbert D. Harrell (1975), "The Role of Confidence in Understanding and Predicting Buyers' Attitudes and Purchase Intentions," Journal of Consumer Research, 2 (September), 110-7.

Bettman, James R. (1986), "Consumer Psychology," Annual Review of Psychology, 37, 257-89.

Brehm, J. W. (1966), A Theory of Psychological Reactance, New York: Academic Press.

Carlsmith, J. Merrill and Elliot Aronson (1963), "Some Hedonic Consequences of the Confirmation and Disconfirmation of Expectations," Journal of Abnormal and Social Psychology, 66 (2), 151-6.

Collins, Allan A. and E.F. Loftus (1975), "A Spreading Activation Theory of Semantic Memory," Psychological Review, 82 (6), 407-28.

Currim, Imran S., Charles B. Weinberg, and D. R. Wittink (1981), "Design of Subscription Programs for a Performing Arts Series," Journal of Consumer Research, 8 (June), 67-75.

Danes, Jeffrey E. and John E. Hunter (1980), "Designing Persuasive Communication Campaigns: A Multimessage Communication Model," Journal of Consumer Research, 7 (June), 67-77.

Eagly, Alice H. (1981), "Recipient Characteristics as Determinants of Responses to Persuasion," in Cognitive Responses in Persuasion, R.E. Petty, T.M. Ostrom, and T.C. Brock, eds. Hillsdale, NJ: Erlbaum.

_____ and S. Chaiken (1984), "Cognitive Theories of Persuasion," in Advances in Experimental Social Psychology, L. Berkowitz ed.New York: Academic Press.

Farley, John V., Jerrold Katz, and Donald R. Lehmann (1978), "Impact of Differential Comparison Sets on Evaluations of a New Subcompact Car Brand," Journal of Consumer Research, 5 (September), 138-142.

Fishbein, Martin and Icek Ajzen (1975), Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research, Reading, MA: Addison-Wesley.

Ford, Gary and Ruth A. Smith (1987), "Inferential Beliefs in Consumer Evaluations: An Assessment of Alternative Processing Strategies," Journal of Consumer Research, 14 (December), 363-71.

Fornell, Claes and D.F. Larcker (1981), "Evaluating Structural Equation Models With Unobservable Variables and Measurement Errors," Journal of Marketing Research, 18 (February), 39-50.

Gardner, M.P. (1983), "Advertising Effects on Attributes Recalled and Criteria Used for Brand Evaluations," Journal of Consumer Research, 10 (December), 310-8.

Gerbing, D.W. and James C. Anderson (1984), "On the Meaning of Within-Construct Correlated Errors," Journal of Consumer Research, 11 (), 572-80.

Greenwald, Anthony G. (1968), "Cognitive Learning, Cognitive Responses to Persuasion, and Attitude Change," in Psychological Foundations of Attitudes, A.G. Greenwlad, T.M. Brock, and T.C. Ostrom, eds. New York: Academic Press.

Hass, R. Glen (1981), "Effects of Source Characteristics on Cognitive Responses and Persuasion," in Cognitive Responses in Persuasion, R.E. Petty, T.M. Ostrom, and T.C. Brock, eds. Hillsdale, NJ: Erlbaum.

Holbrook, Morris B (1983), "Using a Structural Model of Halo Effect to Assess Perceptual Distortion due to Affective Overtones," Journal of Consumer Research, 10 (September), 247-52.

Huber, Joel and John McCann (1982), "The Impact of Inferential Beliefs on Product Evaluations," Journal of Marketing Research, 19 (August), 324-33.

Johnson, Richard D. and Irwin P. Levin (1985), "More Than Meets the Eyes: The Effects of Missing Information on Purchase Evaluations," Journal of Consumer Research, 12 (September), 169-77.

Jones, E.E. and H.B. Gerard (1967), Foundations of Social Psychology, New York: Wiley.

Joreskog, Karl G. and D. Sorbom (1984), LISREL VI: User's Guide, Mooresville, IN: Scientific Software, Inc.

Lutz, Richard J. (1975a), "Changing Brand Attitudes through Modification of Cognitive Structures," Journal of Consumer Research, 1 (March), 49-9.

_____ (1975b), "First-Order and Second-Order Cognitive Effects in Attitude Change," Communication Research, 2 (July), 288-99.

_____ (1977), "An Experimental Investigation of Causal Relationships among Cognitions, Affect, and Behavioral Intentions," Journal of Consumer Research, 3 (March), 197-208.

Lynch, John G. and Thomas Srull (1982), "Memory and Attentional Factors in Consumer

    Choice: Concepts and Research Methods," Journal of Consumer Research, 9

    (June), 18-37.

McGuire, William (1981), "The Probabilogical Model of Cognitive Structure and Attitude

    Change," in Cognitive Responses in Persuasion, R.E. Petty, T.M. Ostrom, and

    T.C. Brock, eds. Hillsdale, NJ: Erlbaum.

Mitchell, Andrew A. and Jerry C. Olson (1981), "Are Product Attribute Beliefs the Only

    Mediator of Advertising Effects on Brand Attitude?" Journal of Marketing

    Research, 18 (August), 318-22.

Oliver, Richard L (1976), "Hedonic Reactions to the Disconfirmation of Prior

    Expectations: Some Moderating Conditions," Journal of Applied Psychology, 61

    (2), 246-50.

_____ and William O. Bearden (1985), "Crossover Effects in the Theory of

    Reasoned Action: A Moderating Influence Attempt," Journal of Consumer

    Research, 12 (December), 324-40.

Olson, Jerry C. (1978), "Inferential Belief Formation in the Cue Utilization Process," in

    Advances in Consumer Research, H. Keith Hunt, ed. Ann Arbor, MI: Association

    for Consumer Research, 706-13.

_____, Daniel R. Toy, and Philip A. Dover (1982), "Do Cognitive Responses

    Mediate the Effects of Advertising Content on Cognitive Structure?" Journal of

    Consumer Research, 9 (December), 245-62.

Petty, Richard P. and John T. Caccioppo (1979), "Effects of Forewarning of Persuasive

    Intent and Involvement on Cognitive Responses and Persuasion," Personality and

    Social Psychology Bulletin, 5 (2), 175-6.

Werts, C.E., R.L. Linn, and K.G. Joreskog (1974), "Interclass Reliability Estimates:

    Testing Structural Assumptions," Educational and Psychological Measurement, 34,

    25-33.

Sawyer, Alan G. (1975), "Demand Artifacts in Laboratory Experiments in Consumer Research," Journal of Consumer Research, 1 (March), 218-28.

Shimp, Terence A. and Alican Kavas (1984), "The Theory of Reasoned Action Applied to Coupon Usage," Journal of Consumer Research, 11 (December), 795-809.

Smith, Robert E. and William R. Swinyard (1983), "Attitude-Behavior Consistency: The Impact of Product Trial Versus Advertising," Journal of Marketing Research, 20 (August), 257-67.

Wright, Peter (1975), "Factors Affecting Cognitive Resistance to Advertising," Journal of Consumer Research, 2 (June), 1-9.

_____ (1980), "Message-Evoked Thoughts: Persuasion Research Using Thought Verbalizations," Journal of Consumer Research, 7 (September), 151-75.

_____ (1981), "Cognitive Responses to Mass Media Advocacy," in Cognitive Responses in Persuasion, R.E. Petty, T.M. Ostrom, and T.C. Brock, eds. Hillsdale, NJ: Erlbaum.

Wyer, Robert S. and J. Hartwick (1980), "The Role of Information Retrieval and Conditional Inference Process in Belief Formation and Change," in Advances in Experimental Social Psychology, L. Berkowitz ed. New York: Academic Press.

Table 1
RELIABILITY OF THE EV MEASURES

EV Measure	Individual Item Reliability	Composite Reliability	Average Variance Extracted
Highly dependable	.59	.80	.77
Highly durable	.75		
Easy to Maintain	.61	.73	.57
Requires low repair costs	.53		
Provides riding comfort	.63	.60	.57
Provides enough room	.30		
Has an appealing style	.78	.68	.67
Has sporty appearance	.30		

Table 2
BELIEF CHANGE SCORES (ΔB_i) AFTER AD EXPOSURE

| | Belief Change Scores (ΔB_i's) | | Difference Scores [a] |
	Ads without visual cues	Ads with visual cues	Effects of visual cues
Highly dependable [b]	1.07**	1.43**	.36
Highly durable	1.23**	1.33**	.10
Easy to maintain	.83*	.53	-.30
Requires low repair costs [c]	1.00**	1.70**	·70*
Provides riding comfort	.13	.20	.07
Provides enough room	.67	.30	-.37
Has an appealing style	-.50	-.40	.10
Has a sporty appearance	.03	-.27	.30

NOTE: Visual cues are those suggesting an intended belief (i.e., repair costs).

[a] The difference in belief change score between ads with visual cues and ads without visual cues.

[b] This is a target belief explicitly mentioned in the ad messages.

[c] This is an intended belief to be changed ultimately by the ad.

*$p < .05$

**$p < .01$

Table 3

RESULTS OF ANOVA ON EVALUATION CHANGE SCORES (Δa_i) AND UNFAVORABLE THOUGHTS TOWARD THE INTENDED ATTRIBUTE (UTI)

| Sources	ANOVA on Δa_i			ANOVA on UTI		
	MS	F	p	MS	F	p
Main Effects						
Direct	1.79	1.67	.20	7.89	25.20	.00
BC	8.86	8.27	.01	3.59	11.48	.00
Visual	.05	.05	.83	.62	1.98	.16
Interaction Effects						
Direct*BC	7.19	6.71	.01	2.78	8.89	.00
Direct*Visual	.10	.09	.77	.03	.09	.77
BC*Visual	2.29	2.13	.15	1.00	3.18	.08
Visual*Direct*BC	2.44	2.28	.13	1.17	3.72	.06

NOTE: Δa_i, change in the evaluation or value of the intended attribute (a_i);

UTI, unfavorable thoughts toward the intended attribute.

Table 4

RESULTS OF ANCOVA ON Δa_i

Sources	ANCOVA on Δa_i with UTI		
	MS	F	p
Main Effects			
Direct	1.00	.02	.88
BC	3.35	3.52	.06
Visual	.01	.04	.84
Interaction Effects			
Direct*BC	2.96	2.99	.09
Direct*Visual	.42	.16	.69
BC*Visual	1.31	.94	.34
Visual*Direct*BC	1.10	.95	.33
Covariate			
UTI	7.90	10.14	.00

NOTE: Δa_i, change in the evaluation or value of the intended attribute (a_i);

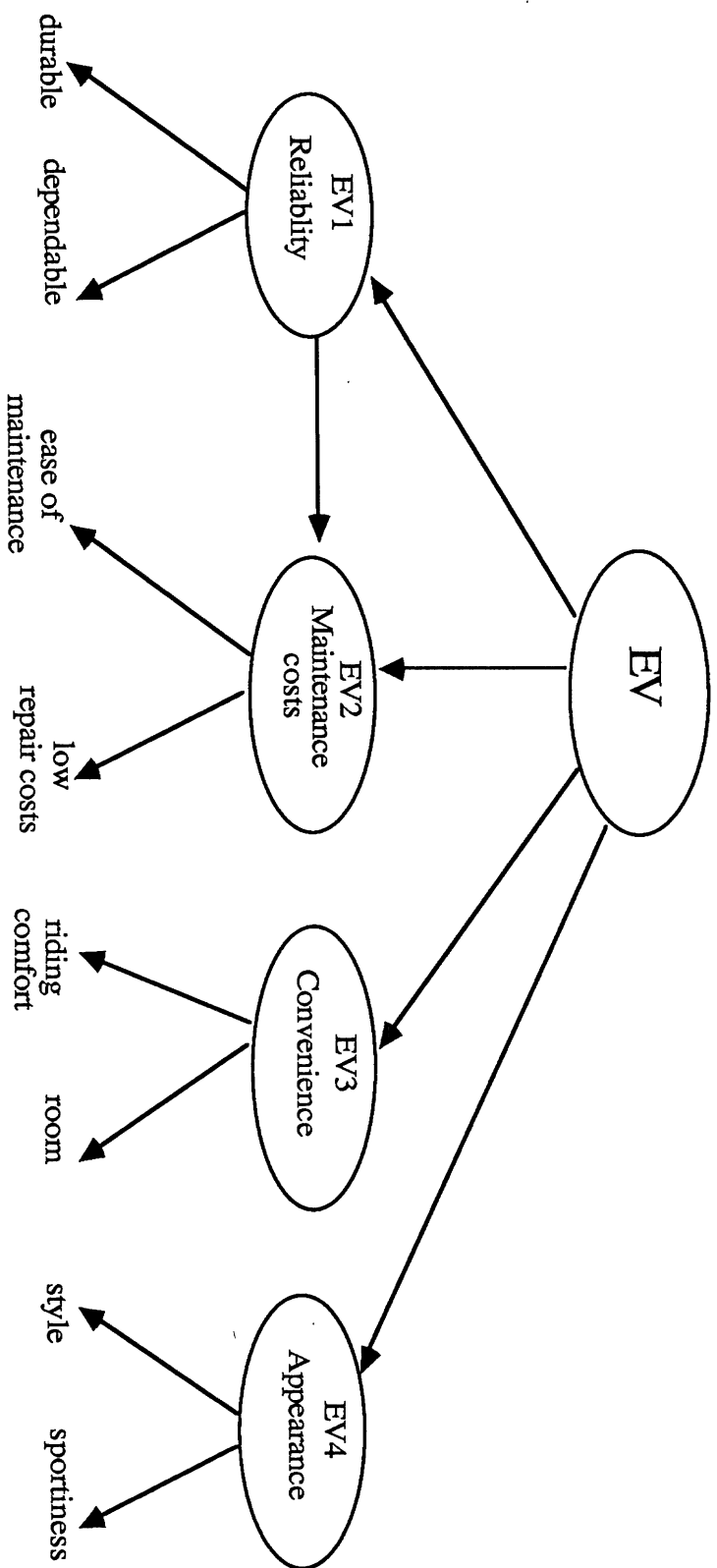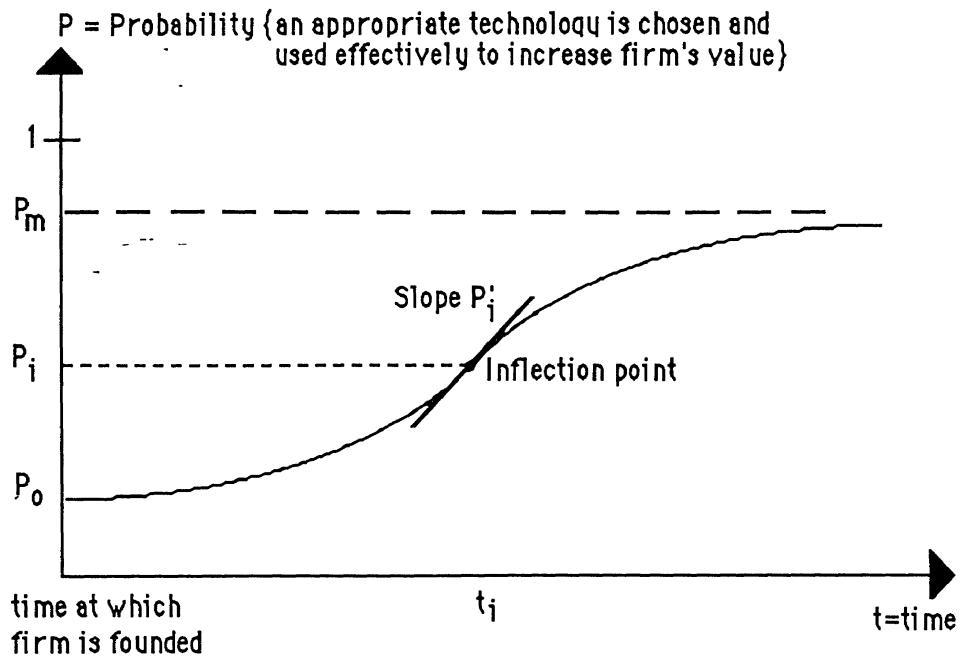UTI, unfavorable thoughts toward the intended attribute.

Figure 1

DIRECT AND INDIRECT EFFECTS OF AN AD DESIGNED TO CHANGE A BELIEF (Bi)

Ad claims
on attribute i

$$\Delta Bk^{b}$$

$$\Delta Bi^{a}$$

$$\Delta ai^{c}$$
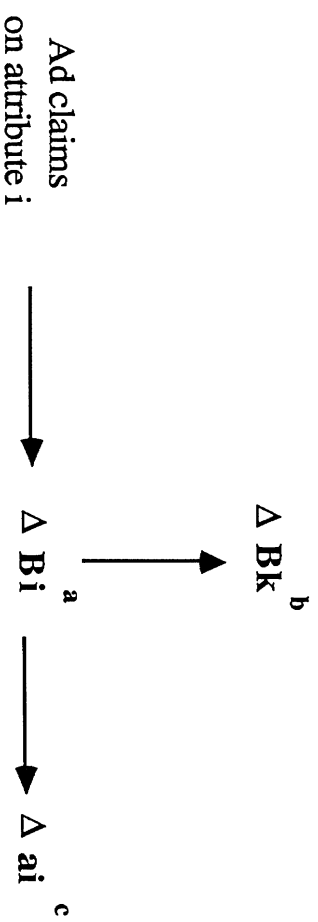
a Direct effects on a target belief

b Indirect cognitive effects on a nontarget belief

c Indirect affective effects on attribute evaluation (ai)

FIGURE 2
THE INTERDEPENDENCE EV MODEL

P = Probability {an appropriate technology is chosen and used effectively to increase firm's value}

$$P_i = \frac{P_m}{2} \qquad P_i' = k\frac{P_m}{4} \qquad t_i = \frac{1}{kP_m}\ln\frac{P_m - P_0}{P_0}$$

An organizational learning curve

Figure 1