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## **Humor in advertising : applications of a hierarchy of effects paradigm.**

Thomas J. Madden  
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HUMOR IN ADVERTISING: APPLICATIONS OF  
A HIERARCHY OF EFFECTS PARADIGM

A Dissertation Presented

By

THOMAS JUSTIN MADDEN

Submitted to the Graduate School of the  
University of Massachusetts in partial fulfillment  
of the requirements for the degree of

DOCTOR OF PHILOSOPHY

May 1982

Business Administration



Thomas Justin Madden 1982

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HUMOR IN ADVERTISING: APPLICATIONS OF  
A HIERARCHY OF EFFECT PARADIGM

A Dissertation Presented

By

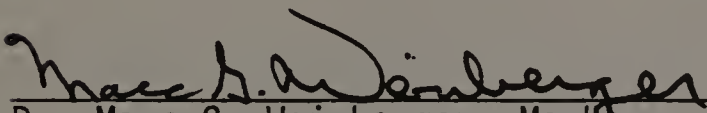
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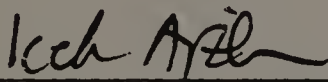
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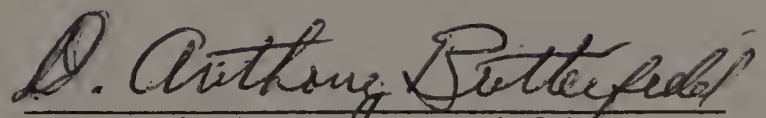
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To Priscilla, Michael and Amy

## ACKNOWLEDGMENTS

First, and foremost, I wish to express my love and gratitude to my wife, Priscilla, and my children, Michael and Amy, who unselfishly gave their love and devotion throughout my graduate education but especially during the dissertation process. I thank you.

I am grateful to Judith Rose and Dianne Peterson for their patience and typing skills.

A special vote of thanks is due: Bill Sheldon, California Milk Advisory Board; Annette Disano, Knudsen Corporation; Ann Johnson, ASI Market Research, Inc.; William Green, Gallup and Robinson, Inc.; The Radio Advertising Bureau; Scott and Jamisohn, Scott-Free Enterprise. They graciously supplied advice and materials which were invaluable to the completion of this dissertation.

This dissertation would not have been possible without the constant help and guidance of my dissertation committee. For their patience, comments and discerning reading I am sincerely grateful. Professor Icek Ajzen's methodological comments were invaluable and greatly appreciated. Professor Marc Weinberger contributed at all stages of the dissertation; however, his unending support, comments and suggestions at the beginning of the process will not soon be forgotten. To Professor William Dillon a very special gratitude is felt. It was a privilege to have him serve as my dissertation chairman and to have had the opportunity to work with him as a doctoral student. His efforts will not be forgotten; I owe him much.

Last, but certainly not least, I wish to express my appreciation to my parents, Thomas and Winifred, for their unending support and affection.



## ABSTRACT

### Humor in Advertising: Applications of a Hierarchy of Effects Paradigm

May 1982

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Directed by: Dr. William R. Dillon

The goal of this dissertation was to examine the impact of humorous commercials upon cognitive actions inherent to information processing within the context of a hierarchy of effects model. The model tested in this research is in the spirit of the information-processing model recommended by McGuire for testing the effectiveness of advertisements.

The research was experimental and was conducted in the context of a laboratory situation. The experimental design was a 2x2x3 factorial design: Two products (mature, new), two program contexts (humorous, nonhumorous) and three commercials (product related humor, product unrelated humor and nonhumor). The endogenous factors examined were: attention, comprehension, retention, product attitude, reaction to the commercial and behavioral intention. The subjects were undergraduate business and communication students at a large Northeastern university. Each subject was exposed to one of the twelve experimental treatments.

The effectiveness of the humorous commercials relative to non-humorous commercials was analyzed first by assessing the effects of

humor on individual cognitive actions and secondly by analyzing these cognitive actions as a causal system.

The method proposed in this research views the persuasion process to be succinctly characterized by two latent factors; namely, arousal and yielding. The manifest variables are: treatment, attention, message reaction, message evoked thought, attitudes and increased interest.

The results of this dissertation are supportive for the use of humor in advertising. The effectiveness of humor was vividly demonstrated when the cognitive actions were analyzed jointly. However, analysis of the effects of humor on the separate cognitive actions indicated that humor was effective at capturing attention, but no severe differential effects existed for subsequent cognitive action. Hence, as McGuire advocates, advertising messages should be compared in terms of persuasion not the separate cognitive actions comprising persuasion.

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## C H A P T E R I

### INTRODUCTION

#### Humor in Advertising

The topic of humor in advertising presents an anomalous situation to the marketing strategist. Recent research estimates the percentage of humor in broadcast media alone to range from a low of 15% to a high of 42% (Markiewicz 1974; Kelly and Solomon 1975). Considering this circumstance, one would expect a corresponding representation in the literature. But, our knowledge regarding the use of humor in advertising is as equivocal today as it was in the 1950s and 1970s, when some noted advertising executives (Ogilvy 1963; Reeves 1961) cautioned against the use of humor in advertising.

The vast majority of research investigating potential effects of humor has been in a nonadvertising context. Markiewicz (1974) and Sternthal and Craig (1973) provide the most comprehensive reviews of this literature. Both of the reviews attest to the incertitude of humor in persuasive communications. The few empirical studies conducted within an advertising context, similar to other past research, have investigated the effects of humor on only a portion of the cognitive actions typifying the persuasion process. Though the scholarly contributions do provide some insight, there is still very little empirical or conceptual evidence upon which to base further investigations.

### Purpose of the Study

The principal problem discussed in this dissertation concerns the possible differential effects of humorous commercials upon subjects' information processing. The research is experimental and was conducted in the context of a laboratory setting.

The major objective of the research is to examine the effects of humor on the persuasion process, where the persuasion process is considered as a causal system. This causal system is designed to trace the effects of humor from presentation of the commercial through a behavioral intention. The causal system tested is posited to consist of two latent factors and is tested utilizing Latent Structure Analysis.

The minor objectives are to assess some common notions concerning the potential effects of humor in advertising. Nine propositions concerning the potential effects of humor are offered and tested using various statistical procedures.

### Organization

Chapter II contains a literature review. The chapter closes with nine propositions based on the literature reviewed.

Chapter III presents the research design and methodology of the study. Included in this chapter are: (i) a detailed discussion of the procedure used to collect the data; (ii) an explanation of the commercials tested; (iii) a presentation of the research model with an explanation and discussion on the method of measurement of each factor; (iv) a discussion of the methodology used to test the model.

Chapters IV and V consist of a presentation of the results from the experiment. Included in these chapters is a restatement of each proposition, and a test and presentation of the results of each proposition.

Chapter VI concludes the dissertation with a discussion on the results found in Chapters IV and V. In addition, this chapter presents the overall conclusions of the research along with the study's limitations and suggestions for future research.

## CHAPTER II

### REVIEW OF LITERATURE

#### Early Studies

A comprehensive review of the early work on humor's effects in persuasive communication is provided by Markiewicz (1974). Her findings suggest a dim view of the use of humor as a vehicle for effecting persuasion, but as she points out, the early research has a number of shortcomings, for example, "inadequate control messages, questionable humor manipulations, inappropriate settings for receipt of humor, limited subject populations and blatant demand characteristics" (Markiewicz 1974, p. 407). Hence the lack of a clear link between humor and persuasion may be a function of poor research methodology. Her summary, which considered studies published between 1940 and 1972, can be segmented into two groups: (1) studies which utilized humorous messages only; (2) studies that employed a serious message control. For each study, where applicable, she indicates the extent of effectiveness of the humorous messages along four dimensions. Her summary is presented in Table 1. Clearly, the number of studies indicating positive effects for humor in persuasive communications are in the minority, with the most promising area being "Ratings of Source" (i.e., source credibility). "The humorous source appeared to be more positively evaluated than the serious source, on one or more of the following dimensions: 'character,' qualification (expertise), safety (evaluative, trustworthiness), and dynamism" (Markiewicz 1974, p. 412).

TABLE 1  
STUDIES CONSIDERING THE EFFECTS OF HUMOROUS MESSAGES<sup>+</sup>

	Comprehension	Retention	Attitude	Ratings of Source
I. Humorous Message Only				
*Berlo & Kumata (1956)	+		+	-
*Gruner (1965)	-		0	
*Gruner (1966)	-		0	
*Gruner (1967a)	-		+	
Gruner (1971a)			+	
*Windes (1961)			+?	
Zeman (1967)			0	
II. Serious Message Control				
Gibb (1964)		+		
*Gruner (1967b)		0		+
*Gruner (1970)		0		+
Gruner (1971b)			+?	
Gruner (1972)	-		0	
Kennedy (1970)		0		
*Kennedy (1972a)		0	0	+
Kennedy (1972b)				+
*Kilpela (1961)		0	0	
Lampton (1971)				0
*Lull (1940)			0	
Markiewicz (1972a)		0	+?	+
Experiment 1, Chapter 2				
Markiewicz (1972b)		-	0	0
Experiment 2, Chapter 2				
Markiewicz (1973)	-	-	-	-
Experiment 3				
McGown (1967)			0	0
Pokorny (1965)			0	
*Pokorny and Gruner (1969)			0	
*Taylor (1964)		0		
Taylor (1972)		-		-
Youngman (1966)			0	

NOTE: For Humorous Message Only experiments, (in I) "+" indicates a positive effect relative to control condition. "+" indicates a significant difference between humorous and serious messages in II with the more favorable effect following the humorous message (e.g., more persuasion, retention, positive source evaluations due to humorous message).

"-" indicates that the more negative effects occurred following humorous than control conditions in I, or than serious messages in II (e.g., poor comprehension, less retention, less attitude change, lower source evaluations).

"0" indicates that no significant differences occurred on the measure comparing humorous message and control conditions (in I) or humorous and serious message conditions (in II).

<sup>+</sup>Extracted from Markiewicz (1974, p. 409).

\*Asterisks are added and explained later.

In addition to assessing humor's effect on comprehension, retention, attitude, and ratings of source, Markiewicz provides a link between humorous stimuli and attention levels. This inference is based on more favorable interest ratings for humorous messages. Two studies (Gruner 1967; Lull 1940) reported no significant differences in interest, while two others (Markiewicz 1972, 1973) suggested humorous messages were perceived as more interesting. In a recapitulation she states, "There appears to be no significant difference due to humor at the acceptance and retention (and possibly comprehension) stages. Humor does appear to increase interest, which implies a possible increase in attention" (Markiewicz 1974, p. 413).

An empirical evaluation of the posited humor-attention linkage was conducted by Madden and Weinberger (1982). Their study utilized Starch readership scores for humorous liquor advertisements. The purpose was to determine whether humor heightens attention levels and whether these attention effects were moderated by audience confounds. The sample of advertisements used in the study was drawn from ad files at Starch/INRA/Hooper, Inc.

Their results provide support for the proposed linkage. The humorous advertisements consistently out-performed the industry Ad Norms. In addition, audience characteristics were seen to moderate the relationship. The most notable difference was between predominantly black audiences and predominantly white audiences.

The most frequently cited reference from the marketing literature is the work of Sternthal and Craig (1973). These authors organized

their review of humor around five topic headings: (i) message comprehension, (ii) persuasion, (iii) communication source, (iv) audience characteristics, and (v) vehicle selection. Many of the empirical studies reviewed by these authors were also reviewed by Markiewicz. Those articles reviewed by both studies are indicated by an asterisk in Table 1. Sternthal and Craig present eight conclusions based on previous studies that should guide the practitioner and serve as a basis for future research. In concordance with Markiewicz they note the nature of the conclusions is necessarily tentative. The conclusions are:

1. Humorous messages attract attention.
2. Humorous messages may detrimentally affect comprehension.
3. Humor may distract the audience, yielding a reduction in counterargumentation and an increase in persuasion.
4. Humorous appeals appear to be persuasive, but the persuasive effect is at best no greater than that of serious appeals.
5. Humor tends to enhance source credibility.
6. Audience characteristics may confound the effect of humor.
7. A humorous context may increase liking for the source and create a positive mood. This may increase the persuasive effect of the message.
8. To the extent that a humorous context functions as a positive reinforcer, a persuasive communication placed in such a context may be more effective (Sternthal and Craig 1973, p. 17).

These conclusions, for the most part, represent extrapolations from the speech literature and, in a strict sense, do not reflect the



effects of humor in an advertising context. Sternthal and Craig specifically suggest future research be directed at the following issues:

1. Do humorous introductions of an otherwise straightforward appeal enhance its persuasibility?
2. Do humorous conclusions increase influence?
3. Is humor more effective for particular types of products than others?

Audience characteristics. Recently, Shama and Coughlin (1979) addressed the notion that audience characteristics explain the variance in respondents' reactions to humorous commercials. The goal of their research was to "investigate the persuasive effect of humorous commercials as related to audience characteristics such as sex, subculture (Black vs. White) and social class" (Shama and Coughlin 1979, p. 5). Three commercials, two radio and one television, representing a food item, a drug, and a specialty item were used in the study. The majority of respondents classified the three commercials as using a slapstick type humor. The dependent variable was the persuasiveness of humor. The authors conclude that cultural background and social class have an impact on the persuasibility of humorous commercials, whereas gender does not.

One factor not incorporated in the Shama and Coughlin study, or for that matter in previous studies, is humor preference. Research in other disciplines has presented strong evidence to suggest that appreciation for various types of humor is a function of many factors, e.g., sex, age, personality, etc. In particular, Terry and Ertel (1974,

p. 1031) report that "a relatively consistent body of research suggests that humor appreciation, in general, varies directly with the personality dimensions of extroversion (Eysenck 1942, 1967; Verinis 1970; Williams 1946) and introversion (Adelson 1947; Middleton 1959)." In addition, an exploratory study conducted by these authors provided evidence that: (1) males who tended to be tough or group-dependent preferred sexual cartoons; (2) females preferred nonsexual cartoons more than males, especially for those females with lower general intelligence (Terry and Ertel 1974, p. 1035).

A January 19th issue of Psychology Today (Hassett and Houlihan 1979) reported the results of a study investigating the humor preference of 14,500 respondents. The results indicated that:

1. In general, men liked the jokes better than women. (There were fascinating differences in the kinds of jokes men and women preferred.)
2. Men substantially liked sexual jokes more than women.
3. Men also preferred ethnic and word play jokes.
4. The only type of humor that women clearly preferred was the Silly Joke (although the difference was not statistically significant).

In another recent study by Sheppard and Madden (1978) predictable results based on sex were obtained; males preferred sexual humor, whereas females preferred absurd and psychological humor. However, further investigation of the data showed that not all females preferred absurd humor. In this study subjects were also asked to indicate their preference for twenty-five popular magazines. The results suggested that

females who preferred *Cosmopolitan* and *People* magazines also rated sex and aggression cartoons highly.

Other studies have explored the possibility of group-based preference for humor. In one study (Wilson, Rust and Kasriel 1977), 101 pairs of twins (49 MZ and 52 DZ) were asked to rate 48 cartoons representing 4 types of humor: nonsense, satire, aggression, and sex. They concluded that for nonsense, satire, and sexual humor, the family environment appeared to be a more important determinant of individual preference than a genetic effect.

Another study (Weller, Amitsour and Pazzi 1976) hypothesized a difference in reaction to absurd humor by Israelis of Eastern and Western origin. They hypothesized this relationship based on the fact that Israelis of Eastern origin come from cultures where rational logic is emphasized less. They therefore have less need for a release which could be provided by absurd humor. The results supported this contention; Israelis of Eastern descent found absurd humor less funny than Israelis of European origin. These two studies lend support to the contention that past learning experiences have an impact on the type of humor an individual prefers.

Other research (Middleton 1959) has investigated the use of humor as a social function. For the most part, studies look into the use of humor, or why humor is appreciated by group members, with respect to who takes the brunt of the humor. Humor tends to be appreciated by the group if it heightens the esteem of the in-group while lowering the

esteem of some out-groups. In such cases, the out-group is the subject of the humor.

Granfield and Giles (1975) hypothesized that the way in which an individual organizes his social milieu reflects both the type of humor he prefers and the type of humor he repeats. They sampled twenty males of lower middle class backgrounds who were members of a sports center in the South Wales area. They concluded that

humor is not simply 'entertainment' but is an important way in which we learn and teach others about our social environment . . . and . . . humor is our opinions of what we find funny . . . our 'sense of humor' is not a critical judgment of the material presented but is a reflection, a symbol of our attitudes about the world.  
(Granfield and Giles 1975, p. 21)

Paraphrasing from an earlier work by Giles and Oxford (1970), they conclude that the humor we repeat and appreciate the most often tends to reflect the norms and values of the social group to which we belong. Consistent with this evidence, Shama and Coughlin, based on their investigation, advocate the recognition of varying preferences for various types of humor. They state, "it may well be that different subcultures and social classes within the same target group will require different types of humor as well as different levels of humor (if any)" (Shama and Coughlin 1979, p. 13). Whipple and Courtney (1980) suggest that future research should be directed at distinguishing the types of advertising humor which can be expected to elicit differential responses from males and females. They conducted an empirical investigation to test the hypothesis of no gender differences in response to humorous advertisements. Three magazine advertisements were used in their study; two of the ads were for the same brand of cigarettes and the third was an

insurance advertisement. Two samples (undergraduate and graduate students) viewed a projected color slide of each ad. Subsequent to the viewing, each ad was rated on each of thirteen dimensions, four of which specifically measured communication effectiveness. The criteria specific to communication effectiveness were: informative, easy to remember, easy to understand, and persuasive. The only significant differences ( $p < .05$ ) between male and female ratings existed in the undergraduate sample for a cigarette ad where a female was the butt of the humor. Differences were found for the informative, easy to remember, and persuasive dimensions.

The ads utilized in their study portrayed either a male or a female as the butt of the humor. They utilized a panel of judges consisting of advertising executives to categorize the ads. The judges unanimously agreed "that the selected ads were typical of the use of nonsensical humor in advertising" (Whipple and Courtney 1980, p. 4). They conclude from their results that advertising researchers and practitioners should be less concerned about males not liking nonsensical humor, but this conclusion may be fallacious. The panel of judges rated the ads as nonsensical. However, the humor portrayed either a male or a female as the butt of the joke, which might be perceived as hostile. In fact, their subjects rated the ads as being hostile as well as absurd. In addition, the ads were also rated as sexy. Consequently, the humorous stimuli may have been perceived as some combination of nonsensical, sexual, or hostile, which renders their results equivocal at best.

Naturalistic setting. Cantor and Venus (1980) measured the effects of humor on memorability and persuasiveness of a radio advertisement in a quasi-naturalistic setting. Recall of message content was used to measure memorability. To measure message persuasiveness, subjects were asked for their product impressions using a scale ranging from -10 to +10 which was anchored by the adjectives "extremely unfavorable" and "extremely favorable."

The quasi-naturalistic setting was created by exposing subjects to either a humorous or nonhumorous commercial for a fictitious magazine while the subjects were seated in a waiting room. In addition, to be able to test for an interaction between humorous commercials and the program context in which they were heard, each commercial was inserted within a humorous or nonhumorous program context.

The situation was set up such that subjects would think they were listening to a normal radio program from a local station while waiting for the experiment they volunteered for to begin. Hence, the waiting period was actually the experiment itself.

Recall of the content of the nonhumorous advertisement was statistically significantly greater than recall of the content of the humorous advertisement. No statistical significance existed for the interaction of message by context. That is, recall of message content for either the humorous or nonhumorous message was statistically equivalent whether the advertisement was heard in a serious or humorous context. Also, no statistical difference in product impressions was detected.

### Theory of the Effectiveness of Humor

There exists a wealth of material on the subject of advertising effectiveness, and there is a plethora of theories of humor, but the efficacy of humor for message effectiveness, although the target of much debate, has been until recently a theoretical orphan.

Markiewicz (1974) offered two approaches potentially applicable as theoretical bases for the effects of humor, namely learning theory and distraction effects. With regard to learning theory Markiewicz states, "A number of studies have found that associating an irrelevant reinforcer with a persuasive message affected its persuasiveness. If humor functions as a positive reinforcer, humor placed in temporal proximity to persuasive communications should enhance their persuasiveness" (Markiewicz 1974, p. 418).

With regard to distraction effects, she argues that the placement of humor within a message can act as a distraction because of the laughter elicited, consequently leading to a greater impact of the message's arguments. Haaland and Venkatesan (1968, p. 167) note opposing effects of distraction on the persuasive impact of a communication. Festinger and Maccoby (1964) posit that distraction interferes with the active process of counterargumentation, and consequently increases persuasion when an individual is exposed to a message attacking his/her beliefs. Conversely, McGuire (1966) states that distraction presented during a persuasive communication should interfere with the learning of the persuasive argument, therefore decreasing the likelihood of attitude

change. In their study, Haaland and Venkatesan (1968, p. 170) found significantly greater recall from the no-distraction groups, hence supporting McGuire's position.

Markiewicz (1974, p. 419) acknowledges that two conditions must be in place for any distraction effects to have a positive impact on persuasion: (1) the audience must be opposed to the message position; (2) the issue must be significant to the audience.

Duncan (1979) has developed a model which offers an evaluative framework to review past literature and base hypotheses for future empirical studies. His model consists of a simple relationship: stimulus-response with mediating factors potentially affecting the response. The mediating variables influence the intensity and the level of the audience's response to humorous stimuli. He divides these mediating variables into "situational variables" and "communication variables." The "situational variables" include promotional objectives, product characteristics, and audience characteristics, while the "communication variables" are the source of the humor, the content and structure of the message, and the media selected. The response variables are: attention, comprehension, retention, attitude change and sales. These two sets of variables, mediating and response, interact to form what Duncan calls the planning matrix.

#### Development of an Information Processing Approach

The response variables proposed by Duncan are similar to the well-known hierarchy of effects model and its many offspring. Briefly, as



the model is well documented, the hierarchy of effects model developed by Lavidge and Steiner (1961) consists of a series of seven hierarchical steps. Lavidge and Steiner conceptualized advertising as a force which moves people from awareness to purchase. The links in the process in ascending order consist of: unawareness, awareness, knowledge, liking, preference, conviction, and purchase.

Similar to this model is the communications spectrum developed by Colley (1962). Colley's model rests on the assumption that advertising is a communication force, which does not physically impel the consumer toward purchase, but creates a state of mind which is conducive to purchase. The stages in the communications spectrum are: unawareness, awareness, comprehension, conviction, and action.

McGuire (1978) has proposed an information-processing approach for the analysis of an advertisement's effectiveness. This approach requires the analysis of six steps which are logically consistent with the hierarchy of effects model.

The gist of the approach is to view the individual exposed to a persuasive communication as an information-processing machine which must proceed through a chain of behavioral steps, each probabilistically linked to the preceding one, leading finally to the criterion behavior (for example, purchase of the advertised product), only if it is not interrupted at any point. (McGuire 1978, p. 156)

Figure 1 presents McGuire's model containing the six steps along with McGuire's recommended tests of effectiveness. McGuire defines the probability of payoff behavior (e.g., purchase) as the scalar product of a probabilistic chain. Hence, the efficacy of humor is directly proportional to the degree to which a humorous advertisement increases this

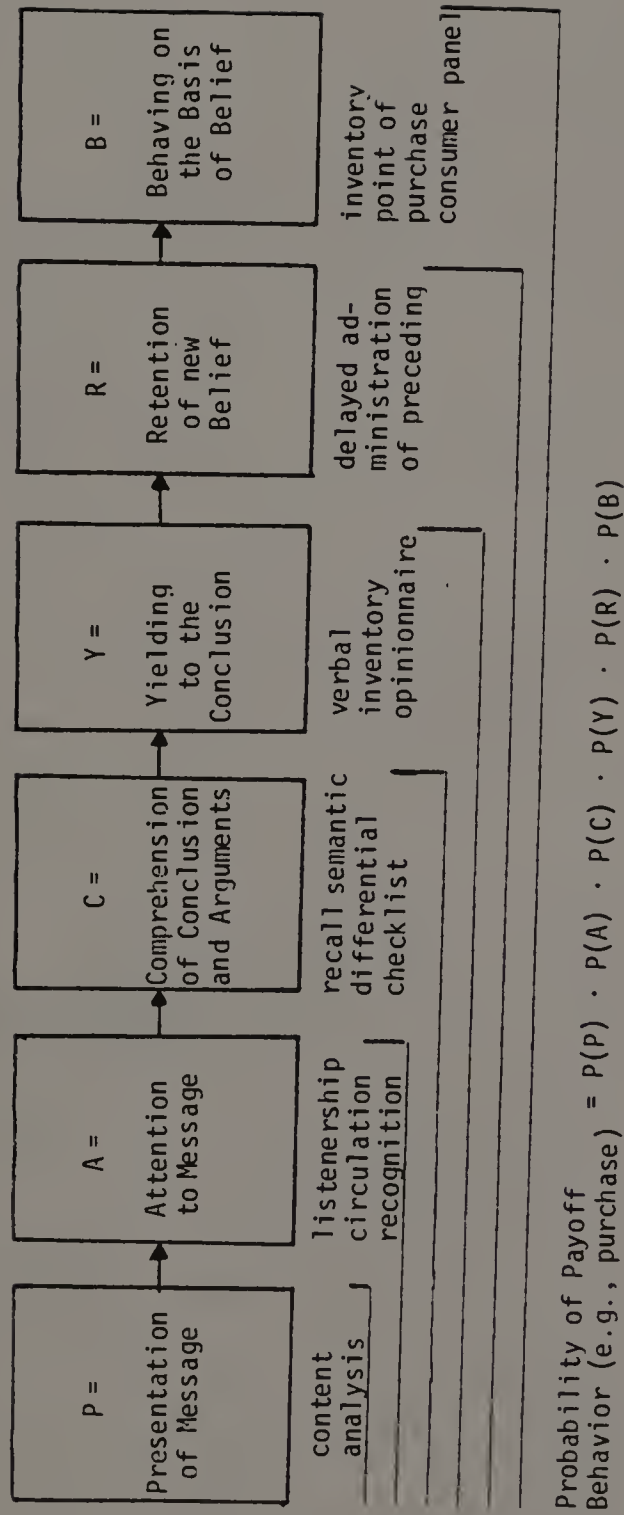


Fig. 1. Maguire's model for testing the effects of advertisements.

likelihood relative to alternative types of advertisements. Symbolically, the probability of payoff behavior is:

$$(1) \quad P\{\text{Behavior}\} = P\{P\} * P\{A\} * P\{C\} * P\{Y\} * P\{R\} * P\{B\}$$

It is useful to conceptualize these probabilities as conditional probabilities (e.g.,  $P(C|A)$ ). Attempting to evaluate the use of humor on one or any segment of the chain may yield misleading information. For example, humor may prove to be very effective at capturing attention but as a result of its attention-capturing abilities, the comprehension element is hindered. Consequently, with humorous stimuli the probability of comprehension would be low given attention, and because of the multiplicative relationship, the resulting scalar product would also be low. To assess the effectiveness of humor in advertising we must determine the degree to which humor hinders or facilitates the probability of payoff. Concordant with Duncan, this stipulates that humor is a mediating factor, and in addition ties humor directly to the theory of information processing. Consequently, we must look at the effect(s) of humor on the cognitive factors inherent in an information processing paradigm, namely: attention, comprehension, retention, and attitude as a result of the message.

Attention. Utilizing an information processing approach for the measurement of humor's effectiveness in advertising places the behavioral response of attention in an important position. Attention is the initial response to a stimulus by the receiver. Consequently, to maximize the payoff (e.g., purchase) the probability of attention should be maximized. This is essentially a constrained maximization problem, as

the payoff is contingent upon behavior which is contingent upon attention. Therefore, attention should be maximized only to the point where the resulting product of the entire chain is maximized.

It does not matter whether we view attention in terms of a structural model in which cognitive activity is limited or in terms of a capacity model where the sheer human limitations determine which activities are possible. The notion of limitation predominates; it is simply not possible to attend to all available stimuli. Hence, as the paradigm of the cocktail party dictates, a selection process is evoked allowing certain stimuli to enter for further processing while neutralizing other stimuli.

Broadbent (1961) purported a filtering of stimuli whereby the filtering was an all-or-nothing type process; only one stimulus at a time could be perceived. His theory had intuitive appeal but empirical evidence produced contrary conclusions. Moray (1959) discovered that subjects were able to respond to their name spoken on one ear while shadowing a message on the other ear. A modification of the original filter theory was proposed by Treisman in an attempt to accommodate the evidence which is contrary to the filter theory (Kahneman 1973, p. 122). Basically, Treisman was advocating the potential of divided attention; "unlike filter theory, Treisman's analyzer theory permits parallel processing, e.g., of information presented to different modalities" (Kahneman 1973, p. 123).

Deutsch and Deutsch (1963) advocated a more radical alternative to filter theory than Treisman. Treisman's notion was that a sensory

message activated hypothetical dictionary units. Each of these dictionary units has a threshold and for one to be activated, i.e., for the stimuli to be perceived, the threshold must be exceeded. Similar to Treisman's dictionary units, Deutsch and Deutsch postulated central structures. Instead of Treisman's thresholds, Deutsch and Deutsch proposed importance weights for stimuli. These importance weights are a function of learning and all stimuli are assigned a weight. Attention is given to the most important weight. "Thus the most important signal both captures the system and in a sense sets the criterion for any other signal to surpass" (Moray 1969, p. 35).

Kahneman (1973) proposes a capacity model of attention. His capacity model complements rather than supercedes models of the structure of information processing. According to Kahneman, "in a structural model interference occurs when the same mechanism is required to carry out two incompatible operations at the same time. In a capacity model, interference occurs when the demands of two activities exceed available capacity" (Kahneman 1973, p. 11).

Before leaving this brief review of attention theory, it is important to highlight a rather special process of attention, namely the Orientation Reaction. Novel stimuli elicit specific patterns of physiological responses which are called the orientation reaction (OR). The OR and states of high arousal, such as pain or fear, share several components: EEG desynchronization (alpha blocking) and manifestations of sympathetic dominance, including the galvanic skin response (GSR) and the dilation of the pupil.

The OR pattern is unique and can be distinguished from defensive reactions to pain and fear. "The most important difference between orientation and defense is that the OR is characterized by vasoconstriction in the limbs and vasodilation in the head, while the defensive reaction includes generalized vasoconstriction" (Kahneman 1973, p. 43). This difference has, for some, provided an empirical definition of the OR and therefore attention. These findings are almost exclusively the results of Russian scientists and are not unequivocally confirmed by Western scientists since "Western investigators tend to use the GSR or a transient desynchronization of the EEG as measures of the OR" (Kahneman 1973, p. 43).

Comprehension. Comprehension refers to the process by which we attach meaning to the various stimuli we attend to. Individual judgments are tempered by reference points and adaptation levels (Olson 1977, p. 51). Consequently, the sum total of experiences peculiar to the individual is a mediating factor in the comprehension process. Therefore, as individuals' experiences vary with reference to stimuli so may their comprehension of stimuli. For example, assume that one individual has reached the stage of routinized response behavior, while another individual is just entering the extensive problem solving stage for a hypothetical product, Brand X. Based upon their individual cognitive structures concerning Brand X, their comprehension of the message may be quite different, because of their varied experience with Brand X. In such cases, each individual will likely encode the information differently, depending on familiarity or prior experience.

Olson (1977, p. 51) describes three broad possibilities that an encoded cognition can take. These possibilities are:

1. The encoded information may be essentially isomorphic with the external stimulus.
2. The code may be similar to the external stimulus or somewhat modified.
3. The code may be quite different from the stimulus such as a visual image code for a printed word, or vice versa.

Tinkham and Leckenby (1977) report evidence presented by Jaccard and Fishbein (1975) which supports the contention that stronger correlations between recall and attitude are likely if inferential beliefs are incorporated in the model than with just recalled content. Certainly these inferential beliefs are mediated by one's experience with the product (i.e., they are based on other inferential beliefs, descriptive beliefs, and/or information beliefs). Appraisal of comprehension may be onerous even with a more isomorphic encoding of the message. The evidence that a message has been comprehended may be so transient that only measurement at a specific point in time will validly capture the process. For example, using the short-term/long-term notion of memory, the message may be comprehended in short-term memory but not translated to long-term memory; no evidence of message comprehension may exist thirty seconds after attending to it. This problem can also be considered using an alternative theory, namely, the theory of Knowledge-assembly. Knowledge-assembly theory assumes "the information about the complete structure should be more accessible than any part of that

information" (Hayes-Roth 1977, p. 264). This assumption is based upon the more global assumption

that learning involves the establishment and strengthening of memory representations of elemental components of an information structure, the establishment and strengthening of connections among representations and the recursive integration of connected representations into unitary higher order representations. (Hayes-Roth 1977, p. 263).

It is quite possible that the comprehension of some stimulus may serve only to strengthen or shape this "complete structure" and may only be measurable at the time the shaping takes place, i.e., once the structure is shaped, the mechanism by which it was shaped is lost from memory and therefore is unmeasurable.

These problems would appear to be more the concern of the cognitive psychologist rather than the advertising researcher. However, the advertiser is also interested in comprehension, particularly to the extent that the comprehension affects the individual's belief structure and its relation to one's attitude toward the brand.

Retention. Information which is internally retained (as opposed to external retention, such as notes, lists, etc.) is a function of the memory process. There is a tradition of empirical research on memory. However, investigation into the process of memory must be tempered by Bettman's caveat. "Much of the experimental research studies situations where individuals are trying to memorize . . . but in many situations what consumers remember may be incidental rather than deliberate" (Bettman 1979, p. 38). This caveat is especially important for the present investigation because it involves involuntary information



processing (i.e., motivated search). Hence it is of fundamental importance how information enters, remains and is retrieved from memory when the receiver is not actively seeking such information.

After reviewing three models of the memory process, multiple-store levels of processing, and activation, Bettman states: "All three models of memory cited above are consistent with the idea of a limited processing capacity and a single memory store with allocations of that capacity to the processing of incoming information" (Bettman 1979, pp. 142-3). This is the view of memory adopted for this investigation. As with the concept of attention, capacity is a limiting factor regulating which information is processed further (i.e., retained) and which information is lost.

Figure 2 depicts a flow chart of the memory system as hypothesized by Shiffrin and Atkinson (1969). This system is a suitable representation of the capacity or multistore theory of memory. The long-term store is the permanent repository of information. Information in the short-term store can be maintained indefinitely as long as it is rehearsed, otherwise it is lost in about thirty seconds (Shiffrin and Atkinson 1969, p. 180). Storage is assumed to consist of three primary mechanisms: transfer, placement, and image-production. The transfer mechanism is a control process ruling over what, when, and how to store information in the long-term store. The particular location in which a given ensemble of information currently under consideration will be stored is controlled by the placement mechanism. The proportion of information within the ensemble currently under consideration in the

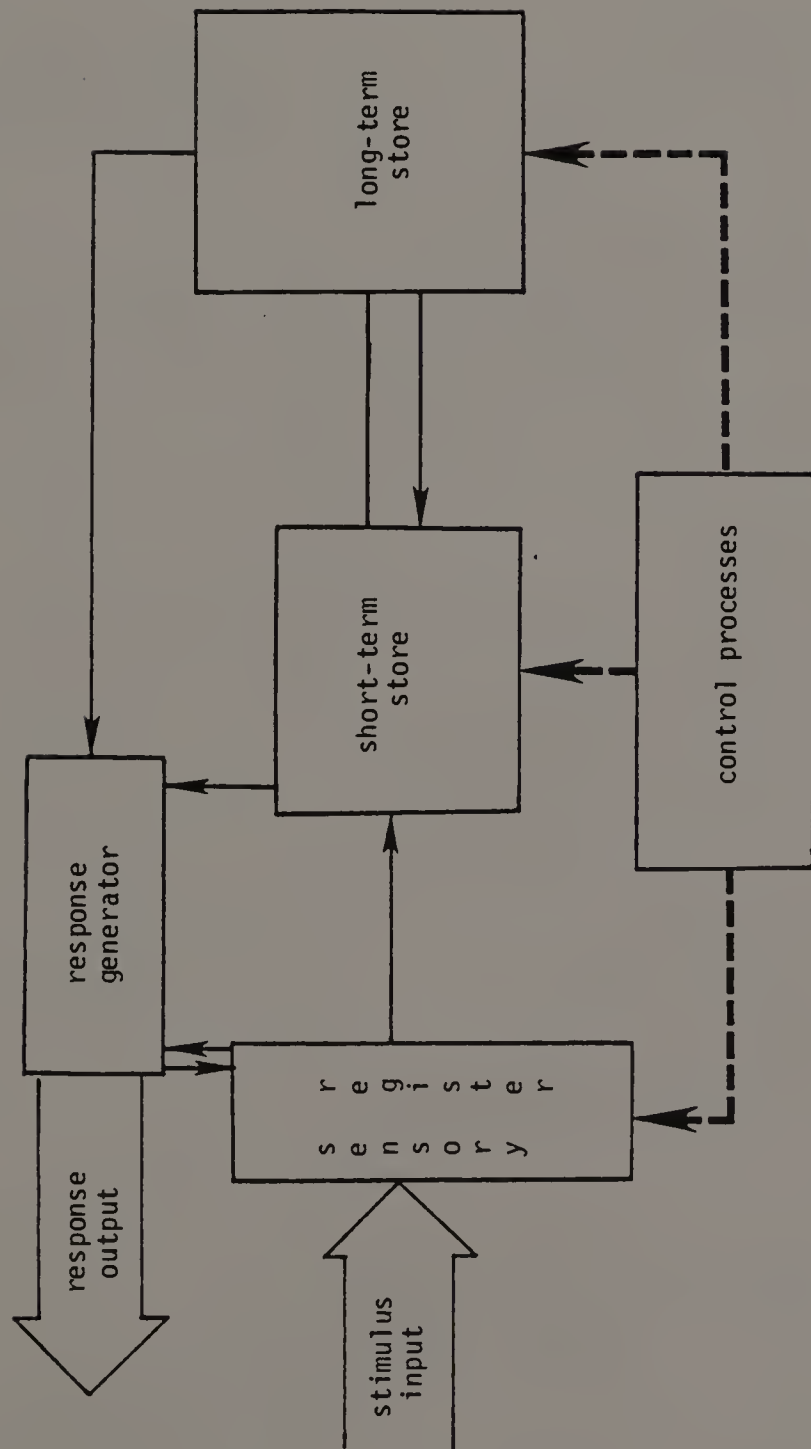


Fig. 2. Flow chart depicting the memory system hypothesized by Sheffrin and Atkinson

short-term store that will be transferred to the long-term store in a designated location is governed by the image-production mechanism. The specific amount of information which will be stored is dependent on the period for which the ensemble is maintained in the short-term store.

Retrieval, similar to storage, is assumed by Shriffrin and Atkinson to consist of three primary mechanisms: search, recovery, and response generation. The search process is a recursive loop. The loop consists of successive examinations of locations or images. The recovery process controls the amount of information that will be recovered from the image and deposited in the short-term store. Once the information has been recovered, the response generation process examines the information and decides whether to emit a response or to continue the search.

Table 2, taken from Craik and Lockhart (1972, p. 672) presents the commonly accepted differences among the three stages of verbal memory. This table is compiled from the sources they reviewed and provides an appropriate summary of the capacity theories of memory.

Following a review of the literature for the multistore approach to memory, Craik and Lockhart concluded that the published evidence did not provide enough support for distinguishing between separate stores. As an alternative to multistore theory Craik and Lockhart provide a conceptual framework, "the levels of processing approach." This orientation is provided with a view toward suggesting how further research might proceed. In their theory there are levels or stages of processing. The initial stages analyze physical or sensory features of the

TABLE 2  
DIFFERENCES AMONG THREE STAGES OF VERBAL MEMORY

<u>Feature</u>	<u>Sensory Register</u>	<u>Short Term Store</u>	<u>Long Term Store</u>
Entry of Information	Pre-Attentive	Requires Attention	Rehearsal
Maintenance of information	not possible	continual attention rehearsal phonemics probably visual possibly semantic	repetition organization
Forward of information	literal copy of input	small displacement possibly decay	largely semantic some auditory and visual
Capacity	large	-	no known limit
Information loss	decay	-	possibly no loss
Trace duration	1/4 - 2 seconds	up to 30 seconds probably automatic items in consciousness	loss of accessibility or discriminability
Retrieval	readout	temporal/phonemic cues	minutes to years retrieval cues possibly search process

stimulus, while the latter stages are concerned with pattern recognition and the extraction of meaning from stimuli. They designate these stages as the "depth of processing," and in this context, depth "implies a greater degree of semantic or cognitive analysis" (Craik and Lockhart 1972, p. 675). Also, in opposition to the notion that rehearsal maintains information in primary memory and transfers it to secondary memory, Craik and Lockhart (1972, p. 611) state: "Only deeper processing will lead to an improvement in memory."

Whereas the multistore theory supports that retention or transfer to long-term store is a function of rehearsal time (i.e., length of stay in the short-term store), the levels of processing approach posits that long-term memory is related to deeper levels of processing. Hence, in a very simplistic manner, one may contrast the two notions as a difference in specification of the memory function. The multistore theory specifies retention =  $f$  (rehearsal) while the levels of processing specifies retention =  $f$  (depth), and that depth does not equal rehearsal. Both theories are concerned with the same end (retention) but each postulates a different means to this end (rehearsal vs. depth).

Chestnut and Jacoby (1977, p. 123) have characterized the debate by stating: "Moreover, while consumer theorists had been adding memory stores, experimental psychologists had been taking them away." Postman (1975, p. 307) very appropriately adds: "The moral one may well draw from the history of dual-process theory is that there are important risks in the rush to modeling."

Cognizant of Postman's suggestion, Chestnut and Jacoby (1977, p. 124) proposed the use of Venn diagrams to conceptualize the memory process. The diagram consists of three sets: (1) encoding, (2) conscious decision making, and (3) long-term memory, and the intersection of the three sets, namely (1, 2) conscious encoding, (1, 3) trace activation, (2, 3) operational memory and (1, 2, 3) spectator behavior.

Attitude. Any attitude formation or change is a function of the impact of the message upon belief structures. Kaplan (1972) posits an interesting notion of this impact. Kaplan appropriately differentiates between attitude formation and attitude change. Attitude change involves the interaction between beliefs resulting from information already processed and beliefs formed from the current processing of information. Kaplan's proposition provides a foundation to analyze possible source effects.

Kaplan's notion of attitude change is represented by

$$(2) \quad \Delta A_o = \sum_{i=J+1}^{J+K} B_i E_i + \Delta \sum_{i=1}^J B_i E_i$$

where  $A_o$  is the change in attitude,  $B_i$  is the belief, and  $E_i$  is the  $i^{\text{th}}$  evaluation. The already formed attitude toward the object  $o$  (i.e.,  $A_o$ ) is represented as

$$(3) \quad A_o = \sum_{i=1}^k B_i E_i$$

which explains the summation of  $i=J+1$  over all  $J+K$  beliefs. That is, the  $J+1$  evaluations constitute the new information. Kaplan's model can also represent attitude formation. The second term on the right of

equation (2) must be zero and the summation is only for the information presented. It may be more instructive to view equation (2) as:

$$(4) \quad A_o = A_{o,T} + (A_{o,T-1} * A_{o,T})$$

Here the change in attitude is equal to the linear combination of two components:

1.  $A_{o,T}$  is the attitude formed from the new information, and
2.  $(A_{o,T-1} * A_{o,T})$  is the attitude formed as a result of the interaction between the new information and existing cognitive structure.

The attitudinal paradigm adopted for this research is consistent with the theoretical work of Ajzen and Fishbein (1980). As this model is well established (cf. Fishbein 1967; Fishbein and Ajzen 1975; Mazis, Ahtola and Klippel 1975; Ajzen and Fishbein 1980) the model is only briefly described here.

Attitude is considered to be a function of the perceived consequences of performing the behavior and of the person's evaluation of these consequences. This is represented as:

$$(5) \quad A_B = \sum_{i=1}^n b_i e_i$$

where  $b_i$  is the individual's subjective probability that performing the behavior of B will lead to consequence or outcome i;  $e_i$  is the person's evaluation of outcome i (e.g., favorable-unfavorable); and n represents the set of beliefs the person holds about performing behavior B.

Insight into an individual's motivation for choosing one alternative in lieu of another may be gained by examining the beliefs related to each alternative.

Behavioral intention. As previously noted, the final stage of McGuire's model is behaving on the basis of beliefs (i.e., overt behavior). Because of the difficulties inherent in the recording of postexposure behavior, intentions, a direct antecedent of behavior, are utilized in this research as a surrogate for behavior.

The most widely used and recognized model for the prediction of intentions was proposed by Fishbein (1967) and reformulated by Fishbein and Ajzen (1975). The most recent formulation is:

$$(6) \quad B \sim BI = W_1 A_B + W_2 (SN)$$

This specification states that behavioral intention is a result of two major factors: a personal or "attitudinal" factor and a social or "normative" factor. The attitudinal component ( $A_B$ ) was explained in the previous section. The social or normative factor (SN) captures the perception by the individual of referent others' actions towards the behavior B. Symbolically this factor is represented as:

$$(7) \quad SN = \sum_{i=1}^n b_i m_i$$

where  $b_i$  is the normative belief formed by the perception of what referent others think I should do concerning behavior B;  $m_i$  is the motivation of the respondent to comply with referent  $i$ ; and  $n$  is the total number of referent others for behavior B. It should be noted that as the behavioral act B changes, so may  $n$  change. That is, in some situations



n may refer to family whereas in other situations it may refer to a particular person or other reference group.

Each of the two components (A and SN) is weighted for its relative importance by the empirically derived weights  $W_1$  and  $W_2$ . Fishbein and Ajzen (1975) postulate that these weights will vary according to the situation. In some situations the normative or social component may be the primary determinant of intention ( $W_1 < W_2$ ), whereas in other situations the normative or social component may be relatively weak and have little effect on intentions ( $W_2 < W_1$ ). In their most recent book, Ajzen and Fishbein diagrammatically portray the theoretical relations which link behavior to beliefs (Ajzen and Fishbein 1980, p. 84). These relationships are presented in Figure 3.

Recently, Warshaw (1980) has argued that further specifications of the Fishbein and Ajzen model is necessary because of the often high degree of multicollinearity between the A and SN components. In our everyday interaction with others we are continually bombarded by others' values, which typically are indicative of the normative structure of the groups to which we belong and interact. As this interaction is further developed, the likelihood of one adopting these values (internalizing them) is enhanced, especially if membership in this group is salient. Thus, using Fishbein and Ajzen's model to account for these societal norms can result in a double counting. The influence is measured by SN but because the norms have been internalized, they become part of the individual's cognitive structure concerning this behavior and therefore are also measured by  $A_g$ . The two components are not independent and

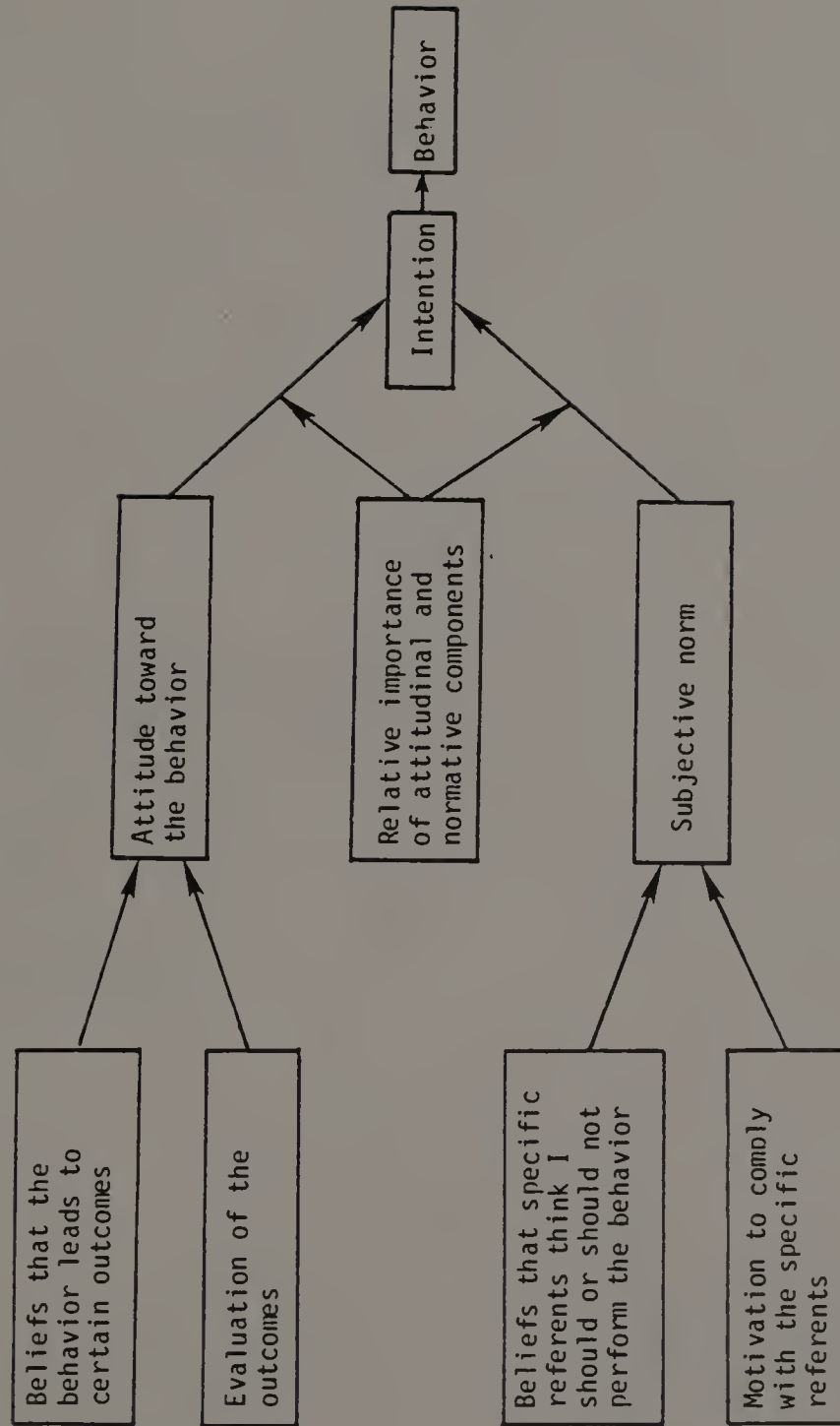


Fig. 3. Fishbein and Ajzen's Behavioral Intention Model

multicollinearity results, which affects the estimation of the individual weights.

### Propositions

The literature reviewed thus far provides little base upon which to proceed; except for Duncan's article, no theoretical notions of humor's role in the advertising process are proposed. Studies such as those by Shama and Coughlin (1979), Courtney and Whipple (1980), and Madden and Weinberger (1982) are contributions, but if we are ever to understand the phenomenon, we must seek to establish causal links.

In a well-established discipline, research hypotheses are typically deduced from some set of empirically tested generalized conditionals. However, considering the scarcity of empirical work testing the relationships of humor in advertising, this deductive approach is encumbering, and may well hinder the establishment of causal statements. Consequently, this research follows a more inductive approach. Inherent in an inductive approach is the possibility of testing spurious relationships (i.e., accidental generalizations). To diminish the likelihood of testing these spurious relationships, the propositions are, where appropriate, linked to the existing theoretical and empirical work.

The propositions set forth are primarily constructed from the conclusions of Sternthal and Craig (1973) which closely parallel the findings of Markiewicz (1974). Because of the information processing approach adopted here, the propositions are primarily oriented towards the cognitive factors of attention, comprehension, and retention, and

specifically how these factors are potentially affected by a humorous stimulus in an advertising context.

Proposition one. Humorous commercials will affect greater attention levels from respondents than nonhumorous commercials.

This proposition is based on the empirical work of Madden and Weinberger (1982) and the humor-attention link posited by Markiewicz (1974). Markiewicz attributes this link to heightened interest because of the humor. Because the commercial is perceived as interesting, the individual allocates processing capacity to this stimulus.

Treisman (1973) posited a filtering of stimuli, whereas Deutsch and Deutsch (1963) advocated a type of weighting system for incoming stimuli. Both approaches attest to the notion that a stimulus must secure a portion of an individual's processing capacity. Humor can act as a vehicle to increase interest to the stimuli, hence, capturing attention.

Proposition two. Humorous commercials within a serious program context evoke greater levels of attention than humorous commercials within a non-serious program context.

Humorous commercials within a serious program should be perceived as more novel (i.e., unexpected, unusual) than if the commercial was placed within a humorous program. Unexpected and/or unusual stimuli create arousal (Howard 1977, p. 150), and arousal gives rise to attention and search (Howard 1977, p. 136). Howard reports three effects of arousal:

1. It increases the consumer's sensitivity to information.
2. It not only encourages the receipt of relevant information, but actually inhibits the effect of irrelevant information, and
3. General muscle tone increases, so that the person is prepared for sudden actions. (Howard 1977, p. 143)

In proposition one, it is posited that humorous commercials are more likely to be attended to than nonhumorous commercials because of the heightened interest levels, whereas proposition two proposes an interaction between the humorous stimuli and the program. Attention levels will be dampened when the humorous commercial is placed within a humorous background and augmented when the humorous commercial is placed within a serious background.

Proposition three. Humorous commercials create an obstacle to the comprehension of the commercial's arguments.

For this research, comprehension is defined as the meaning we attach to stimuli. Humor may interfere with this process in one of two ways:

1. The humor within a message is simply an additional stimulus to which the individual must attend and subsequently attach meaning. Consequently, in a humorous commercial the individual must divide his/her processing capacity to both the commercial's arguments and the humor. At the extreme the individual may be highly attentive to the commercial but only process the humorous portion because the humor drowns out the commercial's arguments.

2. By incorporating humor into the message, the advertiser runs the risk of a potential interaction between the type of humor employed

and individual humor preferences. In the Whipple and Courtney study (1980), the only significant differences found were for the advertisement where the female was the butt of the humor. Both male and female subjects rated this ad as more hostile towards women than men and as more demeaning to women than to men. For all the communication effectiveness dimensions having significant differences between male and female ratings, female ratings were lower than male ratings. It is quite possible that an interaction between humor preference and the type of humor used might account for the difference in effectiveness between males and females.

Proposition four. Humorous commercials facilitate the retention of the message's arguments.

Retention can be viewed as a function of rehearsal time or depth of processing of a stimulus. Because humor should increase the interest level of the stimulus (proposition one), the increased processing provides a longer-lasting memory trace for the message's arguments.

Proposition five. The contiguity of the humor to the product affects the processing of the commercial's arguments.

Markiewicz (1974, p. 414) has provided results which suggest that humor external to the message has no significant effects on persuasion from humor internal to the message.

However, in an advertising context the message is rarely greater than 60 seconds. External humor must be allocated to some portion of these 60 seconds, thus reducing the amount of time available for

transmission of the commercial's arguments. Also, because the humor is external to the message, a true dual processing situation results (i.e., the subject must process both the humor and the arguments simultaneously). Processing of the humor may hinder processing of the commercial's arguments.

Proposition six. Humorous commercials increase perceived source trustability.

The work of Gruner (1967, p. 108) indicates that the use of humor does increase the trustability of the source, particularly when the humor is placed in an otherwise dull communication. Sternthal and Craig (1973, p. 16) argue that if most commercials are perceived to be dull, then the use of humor may enhance the audience's perception of the message's source.

Proposition seven. Gender differences have no effect on the response to humorous stimuli.

Shama and Coughlin (1979) found the audience characteristics of gender to have no effects, but Madden and Weinberger (1982) found significant differences in Starch scores of humorous print advertisements between males and females. Past studies have indicated rather consistent but varying humor preferences for males versus females. Any gender differences should result from the interaction of these preferences with the type of humor used.

Proposition eight. The likelihood of persuasion will be greater for humorous commercials than nonhumorous commercials.

McGuire (1978) argues that this likelihood is the scalar product of five preceding constructs congruent with an information processing model of advertising effectiveness. That is, to answer the question of how effective an advertisement is at inducing a person to buy a certain product, each of these constructs must be considered. This proposition tests the causal linkages of a particular conceptualization of a hierarchy of effects model. The model to be tested along with the model's factors are discussed in the methodology chapter and Chapter V.

Proposition nine. Product familiarity will moderate subjects' attention levels to humorous stimuli.

When an individual begins processing a message about a product he/she is unfamiliar with, the individual is said to be in the Extensive Problem Solving (EPS) stage of learning to buy (Howard 1977, p. 9). This cognitive state (EPS) requires a great deal of information and causes cognitive strain in information processing. The humor in the message must also be processed which simply increases the cognitive strain, potentially to the point where the entire message is tuned out. Also, the novelty of the humor plus the novelty of a new brand may interact to cause a state of excessive arousal which may be detrimental to the processing of the information; "excessive arousal can inhibit the effort to pay attention and to search, as it can for any form of behavior" (Howard 1977, p. 136).



## C H A P T E R   I I I

### METHODOLOGY

This chapter introduces the model to be empirically tested and provides a discussion of the statistical technique, Latent Structure Analysis, chosen to test the data's structure. The chapter opens with a brief discussion on measurement and statistical technique. Next, the research model and an exegesis of the model's factors are presented. The chapter closes with a discussion on the experimental procedure utilized to collect the data.

#### The Use of Qualitative and/or Categorical Data

Scales can be classified as: (1) nominal, (2) ordinal, (3) interval, or (4) ratio. A complete discussion on the various scales is presented in Green and Tull (1975) and Boyd and Westfall (1972). Each of these scales possesses its own characteristics or underlying assumptions, and consequently, the meaningfulness of performing mathematical operations on these elements (Dillon, 1976).

Martilla and Carvey (1975) state that the use of interval scale statistics (e.g., mean, standard deviation, F and Z tests, etc.) for ordinal data is one of the four subtle sins of marketing research. Interval scales require that the distance between 1 and 2 be equal to the distance between 3 and 4. Brown and Beik (1969) posit that the psychological distance between positions 2 and 3 on an attitude scale is probably greater than the distance between positions 3 and 4. Myers and

Warner (1968) present empirical support for Brown and Beik's notion; they found that the intervals of adjective rating scales were in fact not subjectively equal. When this is the case, the data must be considered to be ordinally scaled rather than intervally scaled.

Stevens (1951, 1968) takes the position that the most common and most powerful statistical procedures (i.e., those of a parametric nature) are meaningless unless the data have at least interval scale properties. Conversely, Harris (1975) has argued that the validity of statistical conclusions depends only on whether the numbers to which they are applied conform to the distributional assumptions, most notably, normality, used to derive them. The assumptions of equal intervals should not be considered as a rhetorical question but rather should be questioned both theoretically and empirically. Dillon (1976) states that normality cannot be known when only order is ascertained and, in fact, it is contradictory to assume a variable is normally distributed when the variable is only amenable to ordinal measurement.

### Categorical Causal Models

Estimation of the parameters of a causal system is no longer new to marketers. The vast majority of applications to causal modeling with unobservable constructs is directly due to the advancements of Jöreskog and his colleagues (cf. Jöreskog 1973; Werts, Linn and Jöreskog, 1971, 1973) who established the general method for the analysis of covariance structures. However, there are a number of restrictive assumptions underlying the proper use of these methods; specifically, these model

testing methods are only appropriate when: (1) the manifest variables are quantitative and continuous; (2) the latent variables are also continuous; and (3) the manifest variables are distributed as multivariate normal. Based on these assumptions, structural equation models are restricted to a limited number of problems. For example, when the marketing analyst is faced with a problem composed of dichotomous or polytomous variables, which is frequently the case, these structural equation models are less appealing, and in fact may be quite inappropriate.

Without question, these techniques (structural equation models) are clearly inappropriate for the current research project. The manifest variables are dichotomous or polytomous. Only the attitudinal construct could potentially be viewed as continuous.

Based on the scaling of the model's constructs and the nature of the latent variables, the model is tested using a class of models commonly referred to as latent structure models.

These methods originally proposed over thirty years ago by Lazarsfeld (1950) yield a general mathematical model which relates the probability of responding in each level of each variable (and all joint probabilities) to an unobserved latent variable. The resurgence of these techniques is mostly due to the innovative work of Goodman (1972, 1973a, 1974a, 1974b, 1974c, 1975, 1978), who indicated how latent structure models could be incorporated into the general framework of log-linear models. In addition, Clogg (1979, 1980, 1981) has recently put forth several novel extensions and has made available a very flexible

computer program (MLLSA) for maximum likelihood latent structure analysis (Clogg 1977).

For completeness, a brief overview of log-linear modeling techniques and the logit model is offered before introducing latent variables and latent structure analysis.

Loglinear models. Models for the analysis of contingency tables are well described in the works of Birch (1963), Bishop (1969) and Fienberg (1978). The recent text by Haberman (1978) and the collection of papers by Goodman in the text edited by Magidson (1978) are also excellent references. However, Bishop, Fienberg, and Holland (1975) still remains the most comprehensive and standard reference.

For expository purposes, consider the case of a three dimensional table. Let A, B, and C denote the variables having  $i$ ,  $j$ , and  $k$  levels respectively. Also, let  $f_{ijk}$  and  $F_{ijk}$  denote the respected observed and expected frequency in the  $(i,j,k)$  cell.

The expected count ( $F_{ijk}$ ) is the estimated count induced by fitting a specified model to the table. For the model of independence, the estimate of the expected count ( $F_{ijk}$ ) for the  $(i,j,k)$  cell is:

$$(8) \quad F_{ijk} = \left( \frac{f_{i++}}{N} \right) \left( \frac{f_{+j+}}{N} \right) \left( \frac{f_{++k}}{N} \right) N.$$

Once the estimated values for a specified model have been calculated, a test of the model's goodness-of-fit can be accomplished using either the Pearson chi-square statistic (PR) or the likelihood ratio statistic (LR), where:

$$(9) \quad PR = \sum (f_{ijk} - F_{ijk})^2 / F_{ijk}, \text{ and}$$

$$(10) \quad LR = 2 \sum f_{ijk} \ln(f_{ijk} / F_{ijk}).$$

With large sample sizes, both PR and LR have approximate chi-square distributions with degrees of freedom equal to the number of cells minus the number of parameters estimated.

Typically, the researcher is more interested in testing models which contain causal links rather than the model of complete independence. However, the model of complete independence is the first model to be fit to the data because if this model fits, no causal links can be present, as the causal links specify some association between and/or among the factors.

Testing causal links. Letting  $n$  denote the total sample size, it follows that:

$$(11) \quad \sum_{i=1}^I \sum_{j=1}^J \sum_{k=1}^K f_{ijk} = n,$$

and

$$(12) \quad \sum_{i=1}^I \sum_{j=1}^J \sum_{k=1}^K F_{ijk} = n.$$

The full parametrization of  $F_{ijk}$  in multiplicative form is:

$$(13) \quad F_{ijk} = \eta^{\tau_i^A \tau_j^B \tau_k^C \tau_{ij}^{AB} \tau_{ik}^{AC} \tau_{jk}^{BC} \tau_{ijk}^{ABC}}$$

where  $\eta$  is a constant added to insure condition (12) is satisfied.

Taking the natural logarithm of  $F_{ijk}$ , we can decompose (13) in a fashion analogous to analysis of variance as:

$$(14) \quad \ln F_{ijk} = \theta + \lambda_i^A + \lambda_j^B + \lambda_k^C + \lambda_{ij}^{AB} + \lambda_{ik}^{AC} + \lambda_{jk}^{BC} + \lambda_{ijk}^{ABC}$$

with the customary constraints on the  $\lambda$ 's:

$$\sum_i \lambda_i = \sum_j \lambda_j = \sum_k \lambda_k = 0$$

$$\sum_{ij} \lambda_{ij}^{AB} = \sum_{ik} \lambda_{ik}^{AC} = \sum_{jk} \lambda_{jk}^{BC} = 0$$

$$\sum_{ijk} \lambda_{ijk}^{ABC} = 0.$$

These  $\lambda$ 's represent possible "effects" of the three variables on the  $\ln F_{ijk}$ . Equation (14) describes the saturated or full rank model where all possible effects are included, that is, there are as many parameters to estimate as there are cells in the table establishing the equality  $F_{ijk} = f_{ijk}$ .

Typically in experimental settings we wish to find reduced log-linear models, whereby fewer parameters are necessary for estimates which adequately summarize the underlying structure of the I by J by K table.

Typically in experimental settings one or more of the variables in the multidimensional contingency table is singled out as the response or dependent variable. Where C is the response variable, let  $\psi_{ij}^C$  denote the K-1 dimensional vector

$$(15) \quad \psi_{ij}^C = [(\ln F_{ij1} - \ln F_{ij2})/2 \text{ for } k = 2, 3, \dots, K].$$

Hence,  $\psi_{ij}^C$  denotes the K-1 logits (log odds) for  $k=2, 3, \dots, K$  at the (i,j) levels of variables A and C. From (15) we obtain:

$$(16) \quad \psi_{ij}^C = \Lambda^C + \Lambda_i^{A\bar{C}} + \Lambda_j^{B\bar{C}} + \Lambda_{ij}^{ABC\bar{C}}$$

where the  $\Lambda$ 's are the  $K-1$  dimensional vectors;

$$\Lambda^C = [(\lambda_1^C - \lambda_k^C)/2 \text{ for } k = 2, 3, \dots, K],$$

$$\Lambda_i^{A\bar{C}} = [(\lambda_{i1}^{A\bar{D}} - \lambda_{ik}^{A\bar{D}})/2 \text{ for } k = 2, 3, \dots, K],$$

$$\Lambda_j^{B\bar{C}} = [(\lambda_{j1}^{B\bar{D}} - \lambda_{jk}^{B\bar{D}})/2 \text{ for } k = 2, 3, \dots, K], \text{ and}$$

$$\Lambda_{ij}^{AB\bar{C}} = [(\lambda_{ij1}^{AB\bar{C}} - \lambda_{ijk}^{AB\bar{C}})/2 \text{ for } k = 2, 3, \dots, K].$$

Similar to the  $\lambda$ 's effect on  $F_{ijk}$ , the  $\Lambda$ 's represent the possible effects on  $\psi_{ij}^C$ .

Notice that similar to (13), equation (14) is a saturated model. Next, a method is presented for selecting unsaturated models (i.e., some of the parameters are set to zero) that fit the data.

This class of loglinear models falls under the title of "hierarchical models." The hierarchical principle states that if a higher-order effect is included in the model, then all lower-order relatives are also included in the model, that is, if the  $\lambda^{AB}$  effect is included in the model the  $\lambda^A$  and  $\lambda^B$  main effects are also included. The partitioning properties of the likelihood ratio statistic and the hierarchical principle allow tests of hypotheses of the  $H_0: \lambda^{AB} = 0$  variety possible, which in turn allows the selection of unsaturated models.

Consider, for example, the following nested hierarchy of loglinear models:

$$\text{Model 1} \quad \mu + \mu_i^A + \mu_j^B + \mu_k^C + \mu_{ij}^{AB} + \mu_{ik}^{AC} + \mu_{jk}^{BC},$$

$$\text{Model 2} \quad \mu + \mu_i^A + \mu_j^B + \mu_k^C + \mu_{ij}^{AB} + \mu_{ik}^{AC},$$

$$\text{Model 3} \quad \mu + \mu_i^A + \mu_j^B + \mu_k^C + \mu_{ij}^{AB}, \text{ and}$$

$$\text{Model 4} \quad \mu + \mu_i^A + \mu_j^B + \mu_k^C.$$

Notice that each model differs from the subsequent model by only one term. For example, models 1 and 2 differ by  $\mu_{jk}^{BC}$ .

A test for determining whether  $\mu_{jk}^{BC} = 0$  is accomplished by utilizing the partitioning properties of the likelihood-ratio chi-square statistic for the conditional test of absence of  $\mu_{jk}^{BC}$ ; namely,  $LR(\text{model 2}) - LR(\text{model 1})$  with corresponding  $V_2 - V_1$  degrees of freedom. Similar tests can be used in a forward or backward selection procedure (Goodman 1973a) to find the "best" model.

Latent structure analysis. The loglinear models thus far presented are useful when the observed interactions are of direct interest to the researcher. This section presents a class of models where the importance of the observed interactions is that they are considered as imperfect indicators of a variable which is unobservable. The subsequent discussion of latent structure analysis is by design a terse review of the methodology as it is provided solely as an introduction; the interested reader is referred to Lazarsfeld and Henry (1968), Goodman (1974a) and Clogg (1979).

For this discussion consider the three-way cross-classification of manifest variables A, B and C where



$$i = 1, 2, \dots, I;$$

$$j = 1, 2, \dots, J; \text{ and}$$

$$k = 1, 2, \dots, K.$$

If we assume that these three variables are indicators of an underlying dimension, then there is a latent variable  $X$  consisting of  $T$  classes which can explain the relationships among these manifest variables (Clogg 1979, p. 290). This latent variable is considered to exist if when the level  $t$  of the latent variable  $X$  is held constant the relationships among the manifest variables vanish. In other words variables  $A$ ,  $B$  and  $C$  are independent given the latent factor  $X$ .

Let  $\pi_{ijk}$  denote the expected proportion of observations in the  $(i, j, k)$  cell of the  $A \times B \times C$  multiway table and consider the hypothesis that there is a latent variable which accounts for the associations among the manifest variables  $A$ ,  $B$ , and  $C$ , then  $\pi_{ijk}$  can be expressed as:

$$(17) \quad \pi_{ijk} = \sum_{t=1}^I \pi_{ijk}^{ABCX}$$

where

$$(18) \quad \pi_{ijk}^{ABCX} = \pi_t^X \pi_{it}^{\bar{A}X} \pi_{jt}^{\bar{B}X} \pi_{kt}^{\bar{C}X}$$

In equation (18)  $\pi_t^X$  is the probability that an observation will be in the  $t$  class of  $X$ ;  $\pi_{it}^{\bar{A}X}$  denotes the conditional probability that an observation will be at the  $i^{\text{th}}$  level with respect to variable  $A$  given the observation is at the  $t^{\text{th}}$  level of  $X$ ;  $\pi_{jt}^{\bar{B}X}$  and  $\pi_{kt}^{\bar{C}X}$  refer to similar conditional probabilities as  $\pi_{it}^{\bar{A}X}$ . Note that equation (18) reflects the "axiom of local independence" (Lazarsfeld and Henry 1968), that is, within the  $t^{\text{th}}$  latent class the manifest variables are mutually

independent. Moreover, the  $\pi_t^X$  parameters indicate the distribution of the original observations among the  $t$  levels of  $X$  and the conditional probabilities ( $\pi_{it}^{\bar{A}X}$ ,  $\pi_{jt}^{\bar{B}X}$ , and  $\pi_{kt}^{\bar{C}X}$ ) are analogous to factor loadings derived from the common factor model in that they measure the strength of association between the class of variable  $X$  and the class of the manifest variables (Clogg 1979).

To test whether the hypothesis of a latent variable is congruent with the data, the  $\pi_t^X$ ,  $\pi_{it}^{\bar{A}X}$ ,  $\pi_{jt}^{\bar{B}X}$ ,  $\pi_{kt}^{\bar{C}X}$  parameters must be estimated. For some time this process was tedious. Fortunately Goodman (1974a) solved the estimation problem and Clogg (1977), who in addition to presenting some novel extensions of LSA, has made available a very flexible computer program (MLLSA), which provides maximum likelihood estimates of the parameters.

Restricted models. Imposing restrictions, other than the usual restrictions which pertain to probabilities and conditional probabilities, permits tests of hypotheses in the spirit of those developed by Jöreskog and his colleagues for structural equation models. As an example of the use of these restrictions, consider the case of a restricted model with an ordered latent variable, originally presented by Clogg (1980). Suppose we assume three trichotomous variables are indicators of a single (latent) trait consisting of three ordered classes. For each of the manifest variables, level one pertains to high, level two is medium and level three denotes low with a respective ordering of the latent variable. The hypothesis of an ordered latent with respect to the three manifest variables assumes the following conditions

(restrictions) are congruent with the data: (1) in latent class 1 a manifest response of 3 is prohibited, but a response of 2 is allowed and considered as response error; (2) in latent class 2 responses of 1, 2, or 3 on the manifest variable are allowed; (3) in latent class 3 a manifest response of 1 is prohibited and as before a response of 2 is allowed as error. Given this hypothesis the following set of restrictions on the conditional probabilities imposes the structure of the ordered latent.

$$\pi_{31}^A = \pi_{31}^B = \pi_{31}^C = 0$$

$$\pi_{13}^A = \pi_{13}^B = \pi_{13}^C = 0$$

In other words the restriction  $\pi_{31}^A = 0$  states that no observation with a response of low on manifest variable A can be in the high class of latent variable X.

#### Research Model

Utilizing McGuire's model as a foundation, this author's conceptualization of the potential impact of a humorous stimulus upon information processing is presented in Figure 4. In general, this model depicts a process whereby a stimulus (e.g., an advertisement) must penetrate an idiosyncratic barrier. The barrier reflects noise present in an individual's environment. That is, any given stimulus is but one of an infinite number of internal and external stimuli to which an individual may attend. The intensity of this barrier, at any given time, is conditional upon personal factors, situational factors, and their

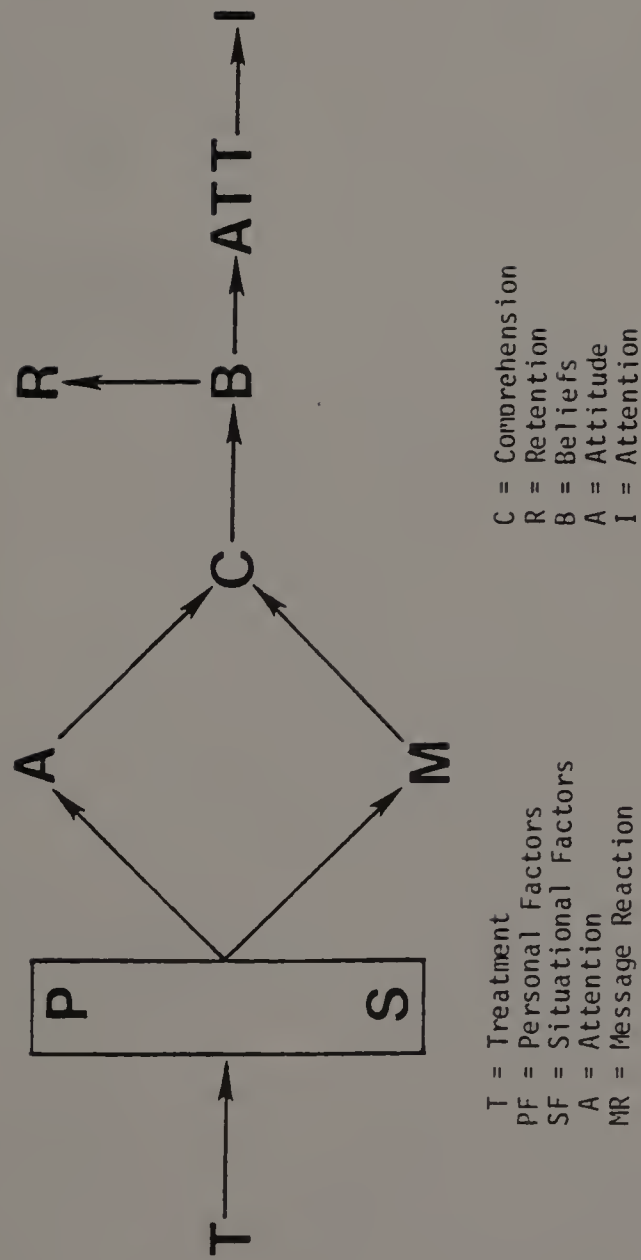


Fig. 4. Research model for testing the effectiveness of advertising stimuli

interaction. If the message impregnates the barrier (i.e., it is attended to), the next stage in the model depicts the genesis of information processing, the attention-comprehension-retention linkage. This process then impacts upon the subject's belief structures, which results in the formation or change of an attitude and an intention.

Endogenous factors. Standard measurement techniques have been used wherever possible. Scales expressly developed for this research are explicated in detail. Cronbach's alpha is used to establish the reliability of all multi-item scales.

Figure 5 presents both the exogenous and endogenous factors of the research. An exegesis in terms of operational definition and empirical measurement of the endogenous factors immediately follows.

Attention. Definition: Attention is the allocation of processing capacity to a specific stimulus.

Of all the measurements, this factor presents the most difficult problems. As noted in the brief review of attention, one way to measure attention is through the use of physiological measurements. Although the collection of an involuntary measure would be ideal, the potential intrusion upon other measurements, due to the obtrusiveness of physiological measuring devices, is unacceptable.

In some cases, recall (e.g., Starch scores (cf. Madden and Weinberger 1982)) has been used as a surrogate for attention, that is, the more the person recalls, the more attentive he or she was. This does not always have to be the case; for example, the person may have been

<u>Exogenous</u>	<u>Endogenous</u>
Stimuli	Attention
Product type	Comprehension
Program context	Retention
	Message reaction
	Attitude toward product
	Behavioral intention

Fig. 5. Endogenous and exogenous factors

quite attentive but did not store the information, or stored it in such a manner that typical recall questions are not able to elicit the information.

In an attempt to measure attention levels, a retrospective self-report (paper and pencil) measure of attention to the experimental stimulus was administered to the subjects. This measurement was placed in one of the final sections of the instrument so as not to contaminate other measures.

Comprehension. Definition: Comprehension is the cognitive encoding of a specific stimulus, that is, the meaning attached to the stimulus.

Comprehension is truly a process, but it is not the process that is of concern here; it is the output of the process. As shown in the model presented in Figure 4, comprehension affects two other factors, namely belief structure and retention. The first of these two factors, belief structure, was measured using elicited postexposure salient beliefs.

The measurement of retention was accomplished utilizing standard recall measures. These measures were developed with the aid of materials donated by various copytesting services (Audience Studies Incorporated, McCollum-Spielman and Gallup and Robinson). These measures simply require the subject to list the information they can remember after presentation of the commercial. As each set of commercials (milk vs. sweet acidophilus) communicates a finite set of product

arguments, the number of product arguments listed will indicate the degree of retention.

Message reaction. Definition: Message reaction is defined as the affect toward the stimulus.

One element included in this model not present in McGuire's model is Message Reaction. Shimp (1981, p. 17) proposes that "an attitude toward the ad ( $ATT_A$ ) is an important mediator of consumers' choice behavior."

Bartos (1980) has stated that copytesting should include an overall measure of like/dislike for the message itself. This notion of like/dislike for the message itself is particularly important when contemplating the use of humor in advertising. As previously demonstrated, there is substantial evidence indicating varying preferences of humor by individuals. The use of humor, therefore, can affect the liking/disliking of the message, simply because of the type of humor employed.

The importance of this factor in copytesting is that liking or disliking of the message can act as a mediating factor between comprehension and attitude toward the product. It is quite possible that an individual can have strong beliefs and evaluations about a number of attributes of a product resulting in a high positive "expected value," yet exhibit a very low intention to purchase because the individual has a negative feeling toward the brand as a result of the advertising.

Attitude. Definition: This is the individual's subjective evaluation of consuming the product within a specific time period.



This factor was measured using a variation of the scales provided in Ajzen and Fishbein (1980). The measurement is accomplished using an additive linear model. This model is represented symbolically as:

$$(19) \quad A_B = \sum_{i=1}^n b_i e_i$$

where  $b_i$  is the individual's subjective probability that A performing the behavior B will lead to consequence or outcome  $i$ ;  $e_i$  is the person's evaluation of outcome  $i$ ; and  $n$  represents the set of beliefs the person holds about performing behavior B.

Of critical importance is  $n$ , the set of beliefs. This set was established in a twofold manner: (1) statements of outcomes specifically reflecting arguments made in the commercial to ascertain the impact of beliefs across commercial and (2) outcomes commonly associated with consumption of the product, even if not specifically addressed in the stimulus. These potential outcomes were determined using the methodology posited by Ajzen and Fishbein (1980) for the elicitation of modal beliefs.

Behavioral intention. Definition: This is the individual's subjective probability of consuming the product. This factor is more-or-less a global measure of message effectiveness. That is, the effective commercial should increase a person's intention of purchasing or consuming the product either directly or indirectly through one of the preceding constructs forming intention. Behavioral intention was measured by three direct questions.

### Exogenous factors.

Stimulus. There are three types of commercials: a product related humorous commercial, a product unrelated humorous commercial, and a nonhumorous commercial. See Appendix A for scripts of each commercial. The nonhumorous commercial simply communicates the message content in dialogue form. The product unrelated humorous commercial communicates the message content with periodically injected humor; the humor is extraneous to both the commercial and the product. The product related humorous commercial communicates the message content in a humorous fashion. That is, the humor is integral to the communication.

The types of humor were selected after listening to a sample of humorous radio commercials supplied to the author by the Radio Advertising Bureau. The product-related humor copies the format of a well-known radio advertising team (Dick and Bert) graciously supplied by the California Milk Advisory Board. The product-unrelated humor copies a one-liner style of humor from a Henny Youngman commercial for a northeastern manufacturer.

All commercials were professionally created such that the product characteristics (i.e., message arguments) are equivalent and the delivery of the message is of the highest production quality. The only factor varying among the stimuli was the use and type of humor.

Product types. To vary the complexity and subsequent cognitive strain, two types of products were used; a well established product and a new product. The products are standard milk and Sweet Acidophilus milk (a type of milk marketed in some areas of the country but not marketed in

the Northeast). The specific characteristics to be communicated for the two products are shown in Figure 6.

Program context. To test whether a humorous commercial is more effective within a serious program, each of the six commercials was inserted into one of two program contexts: humorous or nonhumorous. During recruitment of the subjects they were told that they would be listening to radio tapes containing programs originally aired in the 1940s to determine the feasibility of airing these types of programs for a college-aged audience. To support this cover story the nonhumorous program was a tape of "The Shadow" and the humorous program was a tape of "The Abbott and Costello Show." Each tape was fifteen minutes in length. The sequence of each tape is illustrated in Figure 7.

Path diagram of research model. Figure 1 presented McGuire's model, which incorporates an information processing approach to the testing of advertising effectiveness. The model contains six steps, but McGuire (1978) has in the past combined some of these steps, which reduces the model considerably. The heart of the model, i.e., cognitive activity, flows directly from the Yale group's (Hovland, Janis, and Kelly 1953) traditional three step process of opinion (attitude) change: (1) Attention, (2) Comprehension, and (3) Yielding.

Prior to this traditional three step process, McGuire incorporates presentation (i.e., the probability that an individual was exposed to the message). Subsequent to the process, he adds retention and behaving on the basis of beliefs.

Sweet Acidophilus Milk

- All the goodness of milk
- Has natural ingredients for digestion
- Made like yogurt
- Vitamin A
- Vitamin D
- Low fat
- 3-4 cents more than regular milk

Milk

- Not just for kids anymore
- Calcium for bones
- Vitamin A
- Source of nutrition  
regardless of age, sex,  
social class
- Good for active adults
- Good at social occasions

Fig. 6. Product specific measurements communicated in each treatment

<u>Sequence</u>	<u>Time in Minutes</u>
Program	1
Control Commercial	1
Program	3
Experimental Commercial	1
Program	3
Experimental Commercial	1
Program	3
Control Commercial	1
Program	1

Fig. 7. Sequence of experimental treatments

McGuire had advocated combining the first two stages of the cognitive process (Attention and Comprehension) into one construct, reception, which is operationally defined and measured directly by recall.

McGuire (1968, p. 1143) has utilized the two middle stages to explicate his combinatorial principle, which posits that an independent variable (i.e., a personality variable) can have opposite effects on the two mediators (Reception and Yielding) rendering a nonmonotonic relationship between the independent variable and probability of the behavior.

Although frequently demonstrated utilizing a personality factor as the independent variable, McGuire has proposed the functional relationship via the compensation postulate (1978, p. 171) to hold for advertising variables (e.g., theme) as well. In fact, he states: "Variables with respect to which the compensation postulate is applicable are extremely widespread in communication-persuasion situations."

The model has intuitive appeal, but empirical testing is less appealing resulting from the operationalization of the yielding construct. McGuire derives a measure of yielding with the aid of two other measurements, reception and opinion change. He states:

We could, for example, compute the within-condition correlation between reception and opinion change, and on the basis of this correlation and of each person's reception score, calculate his predicted opinion-change score. His yielding score would be the algebraic difference. (1968, p. 1174)

However, this difference is analogous to the random error component in the standard ordinary least squares regression model. The assumptions of the normal equations dictate that the regressors are independent of

the error term. This independence constitutes an inconsistency between the model's specification and operational definitions of its constructs, namely the proposed relationship between reception and yielding.

In the current research, yielding is conceptualized as a latent construct, which is characterized by two formative indicators and two reflective indicators. The formative indicators are message-evoked thoughts and the estimated latent factor arousal. Message-evoked thoughts were elicited from subjects by asking them to state their "reactions, thoughts, emotions, etc.," to the milk (Sweet Acidophilus milk) commercial they had just heard. These thoughts were then coded, by independent judges, as either positive or negative. The message-evoked thoughts factor was then operationalized by subtracting negative thoughts from positive thoughts. A complete discussion of the model described here is presented in Chapter V, where the results of the model testing are presented. The two reflective indicators are attitudes and increased interest in consumption of the product.

Figure 8 presents the causal model to be tested, which is a construal representation of the research model presented previously.

The effectiveness of an advertisement is gauged by the advertisement's association with the two latent dimensions, i.e., the extent to which the advertisement arouses the subject, and given arousal the increase in the likelihood of the subject's yielding to the message's arguments. This association of an advertisement with the two latent constructs can be assessed utilizing the estimated conditional probabilities from the Latent Structure Analysis.

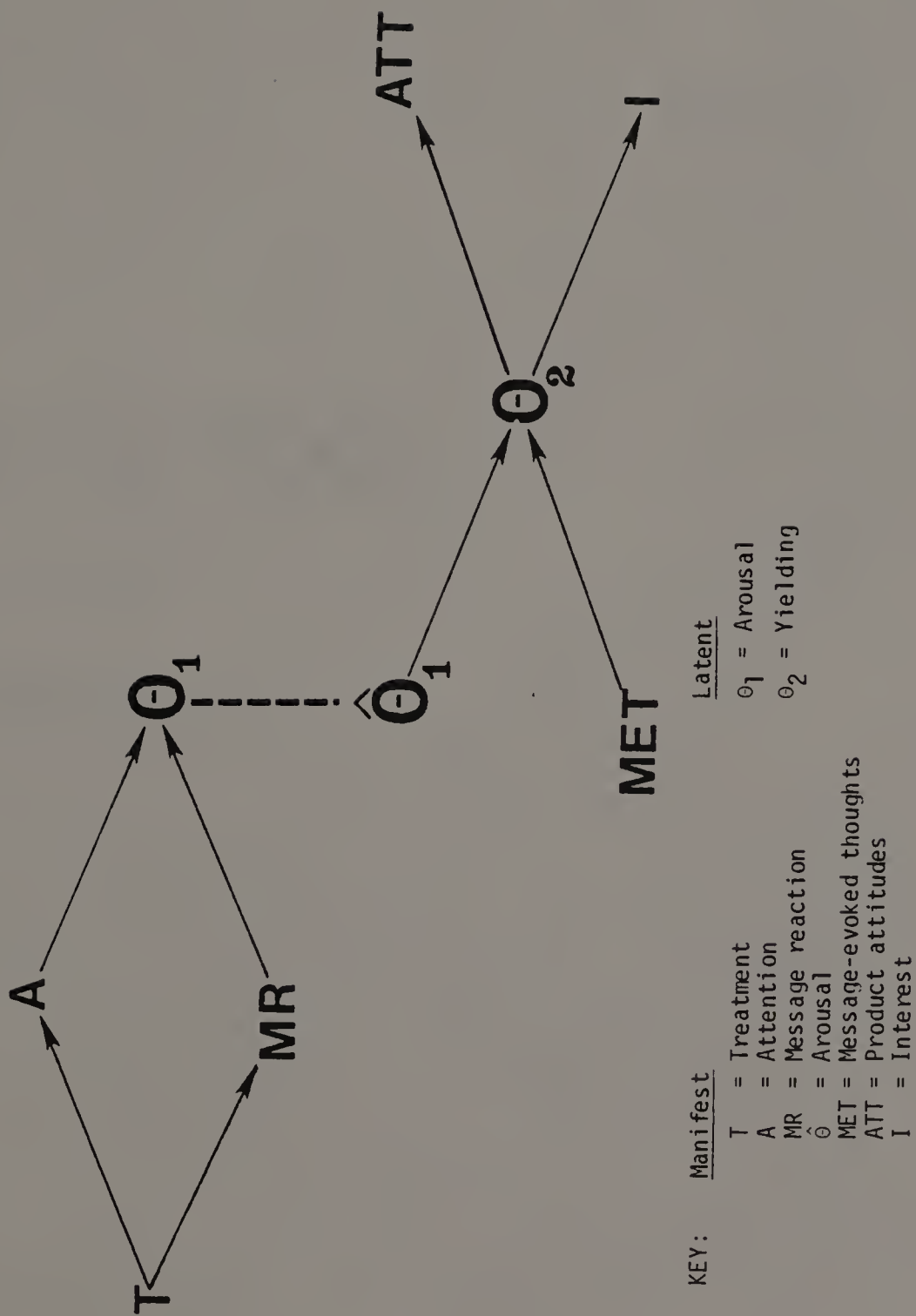


Fig. 8. Construed representation of proposed research model



Although the means of assessing the effectiveness of an advertisement on the persuasion process is divergent from McGuire's method, the overall evaluation is similar, i.e., to what extent does one advertisement induce a person to purchase a product relative to other advertisements for the same product.

### Experimental Procedure

Modal beliefs. The operational definition of both the attitude toward the consumption of the product and the attitude toward the product itself follows a Fishbein-Ajzen type methodology, consequently the elicitation of modal beliefs is necessary. To ascertain modal salient beliefs, a representative sample of approximately seventy students was selected. Each student received one of two questionnaires (see Appendix B for a copy of each questionnaire). The questionnaires required the students to list the advantages and disadvantages of:

1. whole milk
2. consuming whole milk

The elicited advantages and disadvantages were categorized to form the salient modal beliefs, which were used for the measurement of subjects' attitudes in conjunction with statements directly communicated in the experimental stimuli.

Pretests. Three pretests were conducted. Two pretested the experimental stimuli and one pretested the questionnaire. The experimental stimuli were created to be homogeneous in terms of the information communicated for each product group, with the only factor varying being

method of communication (humor versus nonhumor). To ensure the homogeneity of information content a very conservative test of the stimuli was conducted. For each of the six commercials, five students independently were asked to listen to the commercial as many times as they would like and to record any information in the commercial concerning milk or Sweet Acidophilus depending on which treatment they listened to. Based on these pretests the phrase "active adult" was edited to "adult" in scripts B and C to conform to script A. Also, during this editing, the last joke in scripts B and C was removed and the phrase "This commercial was brought to you by the California Milk Association" was added to each of the six stimuli. This phrase was added to measure recall and trustability of source.

The questionnaire was pretested using a marketing research class at a large northeastern university. In conjunction with this pretest, another pretest of two of the stimuli (A and B) was conducted. The research class was split into two groups in separate classrooms and instructed to listen to the tapes and then fill out the questionnaire. The students were asked to indicate any complexity in understanding the instructions or wording of any of the questions. Minor revisions to the questionnaire were executed to relieve problems encountered during the pretest. Also, tallies of advantages and disadvantages of milk were recorded to see if the phrase "active adult" versus "adult" was noticeable. Based on the more conservative approach, it was thought that two cognitive patterns might result from listening to one of the two stimuli, confounding the results of the final experiments. The difference

was much less noticeable in the second pretest, but still 13 percent of the sample indicated the encoding of the phrase "active adult." Therefore, with the evidence from both pretests, the tapes were edited as previously mentioned.

A copy of the questionnaire used is contained in Appendix C. This questionnaire was used with the six tapes containing a Sweet Acidophilus commercial. The milk questionnaires were identical except for changing the phrase Sweet Acidophilus to whole milk throughout and deletion of the last four evaluative and belief statements, which pertained solely to Sweet Acidophilus.

Sample. The sample of subjects was a convenience sample of undergraduate students recruited from Business Administration and Communication Studies classes.

A lottery with four monetary prizes (\$50.00, \$10.00, \$10.00, \$5.00) was used as an incentive. Only classes not included in one of the pretests were used. Introductory classes were selected such that the students would be either sophomores or juniors.

The experiment. All testing took place in one of the language laboratories at the university. Each subject had his/her own booth and headset for processing of the stimuli. This was considered necessary in lieu of processing subjects in a group because humor was being tested. The individual processing negated the potential confound of group pressure on enjoyment of humorous stimuli. Also the booths, via communication devices, were separated for the processing of more than one

stimulus at each lab session, consequently dampening potential treatment by session interaction.

Traditional experimental design literature dictates that we randomize wherever possible and as much as possible. True randomization will ensure that any factor potentially considered as a rival hypothesis will be equal across treatments, and any effects will wash out. Here, randomization was carried out as much as possible, but total randomization could have resulted in bias due to the nature of recruitment of students.

In addition to the lottery, some professors offered course-specific incentives for participating in experiments. To avoid having one treatment composed mostly of students from one class, all treatments were layered. At first the specific tapes to be played at a session were randomly assigned, but as the sessions progressed, specific treatments were selected to be equally layered with students. Also, to avoid having any treatment with less than twenty subjects, as soon as a treatment received a sample size of twenty, this treatment was not used until the remaining treatments had twenty subjects. At all times students were randomly assigned to one of two treatments at each session using a systematic type process, i.e., the first person to one treatment, the second person to the other treatment, etc. This process was also conditioned to balance the male-female composition of all treatments. Attempts made to equalize the individual cells were reasonably successful as regards both size and male/female ratios.

All subjects were processed between April and May 1981. Sessions were run five times a day from Monday through Thursday and once on Fridays. The control group was also recruited during this same time period. Members of the control group were subjects that showed up to receive one of the treatments but were allocated to the control group in one of the other language labs. These students simply completed a shorter version of the questionnaire; questions pertaining to the tapes were eliminated.

As the subjects entered the lab they were handed a color-coded (coded by treatment) name sheet and instructed where to sit. The coded name sheet was used to separate transmissions as any booth could be programmed to any treatment. Typically, the lab was divided in half with each treatment being transmitted to one half.

During the recruitment of students they were told that the purpose of the research was to determine the feasibility of airing old radio programs. Supporting this cover story, once in the lab, the students were told they would listen to one of many potential radio programs (actually, only two were used). Also, they were told that following the transmission they would be handed a questionnaire asking their opinions about something they had heard, but it was not necessary to take notes or intentionally try to remember any part of the transmission.

After these instructions, the tape was begun. A console at the front of the room was used by this researcher to verify that those people who should be hearing one treatment in fact were. This protected from possibly misclassifying one of the questionnaires.

Following the transmission the students, still in their own booths, were handed the appropriate questionnaire. They were told to fill out the questionnaire in its entirety, being sure to only take three minutes for the first question and proceed at their own pace thereafter.

Upon completion of the questionnaire, subjects were debriefed. They were told that the programs were constructed for experimental purposes only. Prior to the debriefing, a sample of subjects from each treatment were asked: If someone were to ask you what the purpose of this experiment was, what would you answer? This question was utilized to assess potential demand artifacts.

## C H A P T E R I V

### RESULTS

The purpose of this research was to test the effects of incorporating humor into an advertising message. The experimental design was a 2x2x3 factorial design: two products, two program contexts and three commercials. The analyses to be discussed explore the impact of humor on the persuasion process. In addition, the disparity of effects, if any, for the different products is also examined. In this research, two dairy products were used, differing in position in the product life cycle. The first, milk, is well established (mature), while the second, Sweet Acidophilus milk, is new.

To analyze the consistency of effects across products two approaches are possible: (1) both product samples could be pooled creating a product factor at two levels; or (2) each product sample could be analyzed separately.

In this research, the latter approach was chosen. The commercials were created such that content was controlled within product samples, while message content varied substantially between product samples. If the samples were pooled, interpretation of the results would be confounded as a result of the different message content between the two product samples.

The analysis is organized in two parts. The first part examines individual components of the research model and related constructs

(e.g., attention, retention, gender, etc.), whereas in the second part, the overall model is tested with latent structure modeling techniques.

The results are reported in two chapters. In Chapter IV some general results of the experiment are presented and the results of testing propositions one through seven and nine are offered. Chapter V presents results of proposition eight, which tests the overall model.

In Chapter IV a number of multivariate and univariate statistical techniques are utilized. In cases where the null hypothesis can be safely rejected (i.e., something other than chance has caused the difference), the question of just how the treatments are different is considered. For univariate analysis, the comparisons are rather straightforward, the only question being the establishment of proper confidence levels. However, with multivariate analysis, the comparisons are not so straightforward.

Cramer and Bock (1966) suggest an approach combining overall multivariate tests followed by univariate inference procedures, i.e., if the multivariate null hypothesis is rejected, univariate F tests are used to identify those variables causing the rejection. Goldstein and Dillon (1982) generally do not recommend this procedure, as it tends to be less conservative than the simultaneous confidence region approach. The type of research conducted here, however, is of the inductive variety, consequently a more liberal approach in the analysis is acceptable. Thus I will follow Cramer and Bock's approach, which relies on the univariate F-test procedure.



### General Results

Table 3 presents a tabulation of the treatment by sex cell counts. As previously mentioned, the design attempted to match the proportion of males and females in each treatment. Although not identical, the proportions are quite similar.

As individual consumption patterns could moderate any postexposure measurements, these consumption levels should be randomly distributed across treatments or, if not, incorporated into the analysis. Subjects were asked to indicate their average consumption, so as to assess patterns of consumption across treatments. If by chance usage levels were not random, any pattern between consumption levels and treatment can be controlled by using this variate to adjust postexposure measurements. Table 4 displays the results of a crosstabulation between usage level and the milk treatments. The chi square test supports the randomization of consumption level across treatments ( $p=.76$ ). Therefore, no adjustment of postexposure measurements was necessary. Similar results were found for the Sweet Acidophilus milk treatments ( $p=.42$ ). Moreover, prior usage is less of a concern for the Sweet Acidophilus milk treatments since the product was not marketed in the Northeast at the time of the experiment.

Cronbach's alpha was employed to assess the reliability of four multi-item measurement scales: attitude toward the consumption of the product, attitude toward the product, reaction to the commercial, and attention to the stimulus. Attitude toward consumption is derived from

TABLE 3  
CELL COUNTS BY TREATMENT AND SEX

Program Environment	Stimuli	Product			
		Milk		Sweet Acidophilus Milk	
		Male	Female	Male	Female
"The Shadow" (Serious)	C <sub>1</sub>	13	15	20	13
	C <sub>2</sub>	13	14	13	10
	C <sub>3</sub>	11	11	7	13
"Abbott and Costello" (Humorous)	C <sub>1</sub>	17	16	12	15
	C <sub>2</sub>	14	17	13	14
	C <sub>3</sub>	<u>9</u>	<u>12</u>	<u>16</u>	<u>18</u>
Total		77	85	81	83

C<sub>1</sub> = Product Unrelated Humor

C<sub>2</sub> = Product Related Humor

C<sub>3</sub> = Non-Humor

TABLE 4  
MILK USAGE LEVEL BY TREATMENT

Glasses/Day	Treatment					
	1	2	3	4	5	6
0	12	9	9	13	10	13
1	5	6	3	7	6	0
2	5	7	6	4	7	4
3	1	1	2	1	3	2
4	5	4	2	8	5	2

the first sixteen evaluative and belief statements, while attitude toward the product is derived from the remaining evaluative and belief statements.

The attention scale represents the sum of the five scales from the semantic differential in the attention section of the questionnaire. The commercial scale is the sum of the semantic differential measuring reaction to the commercial.

Table 5 shows Cronbach's reliability coefficients ( $\alpha$ ) for the multi-item additive scales.

The results reported in Table 5 represent the reliability coefficients without the statements pertaining to: "foods with a good image," "a product that causes acne," and "a product that causes an upset stomach" which were dropped from subsequent analyses of the milk sample based on the results of an item scale analysis. As a rough guideline, exploratory work of this sort requires alphas in the neighborhood of 0.50 or better (Nunnally 1967). Thus the results in Table 5 indicate the scales used here can be judged to be reliable.

As a final exercise, the subjects were asked to rank order six cartoons to establish a measure of humor preference. Varying preferences of humor are well documented (cf. Groch, A. S. 1974; Malpass, L. and E. Fitzpatrick 1959; and Terry, R. L. and S. L. Ertel 1974). Although this construct has been shown to be a possible confounding variable, it has been virtually ignored by marketers investigating the effect of humor in an advertising context.

TABLE 5  
 RELIABILITY COEFFICIENTS FOR MULTI-ITEM ADDITIVE SCALES\*

Scale	Product	
	Milk	Sweet Acidophilus Milk
Attitude toward Behavior	.70	.75
Attitude toward Product	.86	.84
Attention	.85	.82
Commercial	.87	.83

\*The elements reported are Cronback's reliability coefficients ( $\alpha$ ).

In this research chi-square tests of independence were calculated to determine if humor preferences were neutralized across treatments. Table 6 reports the significance levels of the chi-square statistic calculated under the model of complete independence for the ranking of the six cartoons crosstabulated with the two humorous treatments. Cartoons one and three represent aggressive humor, cartoons two and five represent sexual humor, and cartoons four and six represent absurd humor.

Based on the significance levels, the model of independence fits the data well in all cases. Hence, humor preferences do not confound the results.

The direct effect of the commercials on two intention type measures are reported in Table 7. The table reports the significance levels of the chi-square statistic calculated under the model of complete independence. In both product samples the effects of the treatments are stronger for the "increased interest" measure.

The remainder of this chapter is devoted to the testing of the first through seventh and the ninth propositions. As previously mentioned, a discussion of proposition eight is withheld until the next chapter.

### Analysis of Propositions

Proposition one. Humorous commercials generate greater attention levels than nonhumorous commercials.

TABLE 6

P VALUES OF CHI-SQUARE STATISTIC FOR MODEL OF COMPLETE  
INDEPENDENCE: CARTOON RANK BY TREATMENT

Cartoon	Product	
	Milk	Sweet Acidophilus Milk
1	.14	.83
2	.71	.54
3	.76	.95
4	.94	.70
5	.35	.22
6	.88	.42

TABLE 7

P VALUES OF CHI-SQUARE STATISTIC FOR MODEL OF COMPLETE  
INDEPENDENCE: INTENTION MEASURES BY TREATMENT

	Product	
	Sweet Acidophilus Milk	Milk
Intention	.66	.77
Increased Interest	.03	.06

Proposition two. Humorous commercials within a serious program context evoke greater levels of attention than humorous commercials within a non-serious program context.

Both of these propositions were analyzed using multivariate analyses of variance (MANOVA). The criterion variables are: effectiveness of the commercial at gaining attention (A1), effectiveness of the commercial at holding attention (A2), and the sum of the attention semantic differential (A3). The factors are the three stimuli (C1, C2, C3) and the program context (P1 and P2). For this and subsequent analyses:

1. C1 = extraenous humorous message,
2. C2 = related humorous message,
3. C3 = nonhumorous message,
4. P1 = the Shadow program, and
5. P2 = the Abbott and Costello program.

Table 8 presents the tests for homogeneity of dispersion matrices.

The reported p levels suggest no deviation from the assumption of homogeneity of variance for either product sample. Hence, no transformation or corrections for unequal variances are invoked here.

Table 9 presents the multivariate tests of significance for the hypothesis of no difference between treatments. The multivariate test chosen is Wilks Lambda.

The MANOVA indicates that the mean attention levels are statistically different among commercials, but the mean levels of attention are not statistically different between program contexts. For both samples,



TABLE 8  
BOX'S M TEST OF HOMOGENEITY OF VARIANCE

Test	Product	
	Milk	Sweet Acidophilus Milk
P value	0.107	0.056
Calculated F	1.340	1.450

TABLE 9  
WILK'S MULTIVARIATE TEST OF SIGNIFICANCE (P VALUES)  
FOR ATTENTION BY COMMERCIAL AND PROGRAM TYPE

Effect	Product	
	Milk	Sweet Acidophilus Milk
Commercial x Program	.025	.670
Commercial	.012	.008
Program	.230	.150

the commercial main effect is statistically significant but the program main effect is statistically nonsignificant.

A multiple comparisons technique can be utilized to detect the direction of the significant effects; that is, which commercials evoke greater levels of attention. However, the commercial by program interaction is statistically significant ( $p=.025$ ) in the milk sample. Consequently for this sample the multiple comparisons are not straightforward, as significant interactions render the main effects tenuous.

A significant interaction means that one treatment behaves differently under different levels of the other treatment. Tables 10 to 12 present plots of cell means for the three criterion variables by humor and program for the milk sample.

Departures from parallelism are not too severe for A1 and A2 but become more pronounced for A3. For all measures, the related-humor commercial produced greater attention than did the other two commercials.

Kirk (1968, p. 263) recommends the experimenter proceed to tests of simple main effects, when the interaction is significant. These tests are designed to answer the following kind of question: Is there a difference between factor X at the  $i^{\text{th}}$  level of factor Y, etc. The experimenter then returns to a posteriori comparisons between means for those simple main effects which are statistically significant.

Table 13 reports the significance levels for the two way analysis of variance for each of the three criterion measures for the milk sample. The significance levels of the interactive effect are in agreement with the previously presented plots of cell means; the interaction

TABLE 10  
 CELL MEANS FOR GAINING ATTENTION BY  
 COMMERCIAL AND PROGRAM TYPE

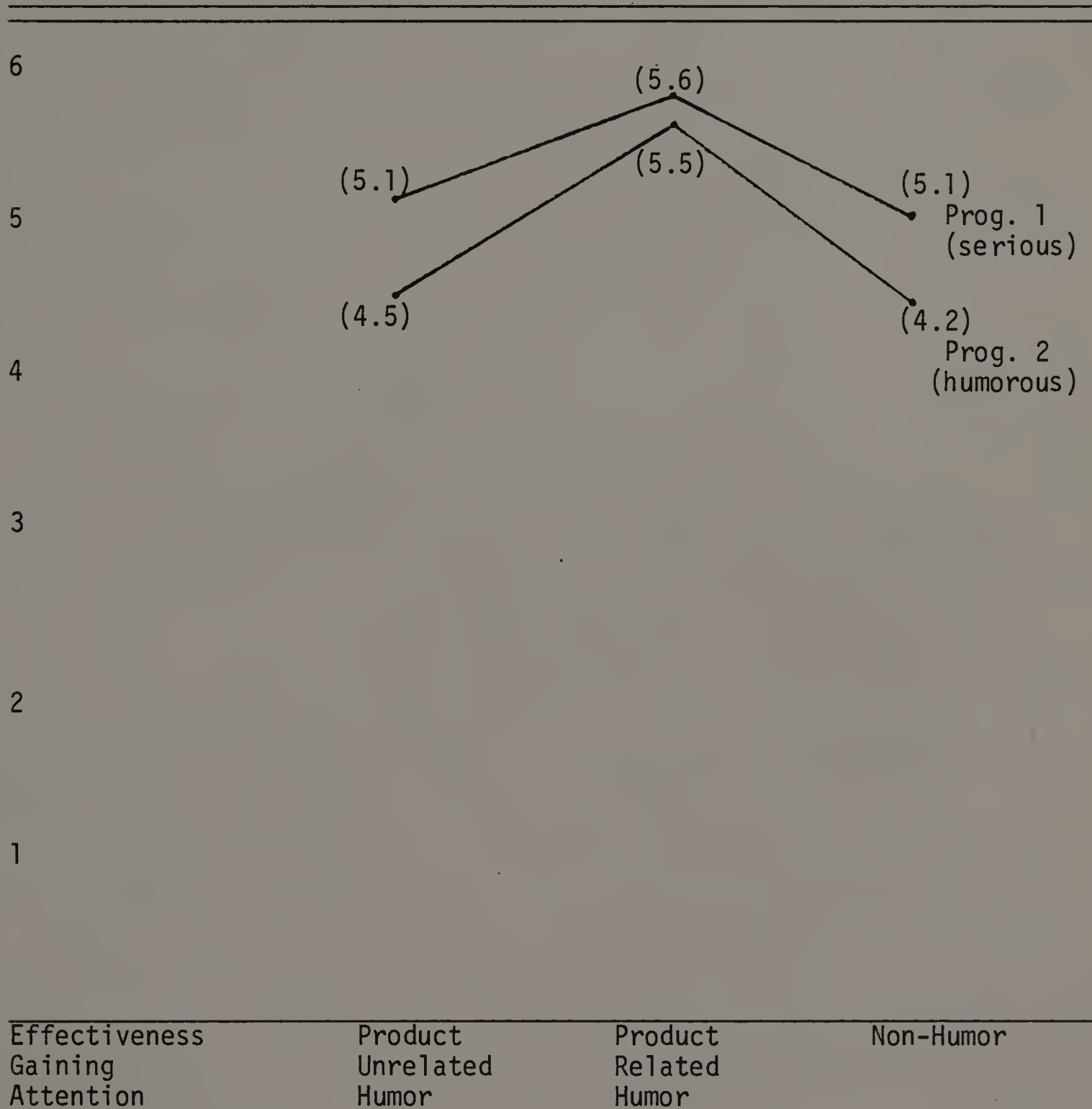


TABLE 11  
 CELL MEANS FOR HOLDING ATTENTION BY  
 COMMERCIAL AND PROGRAM TYPE

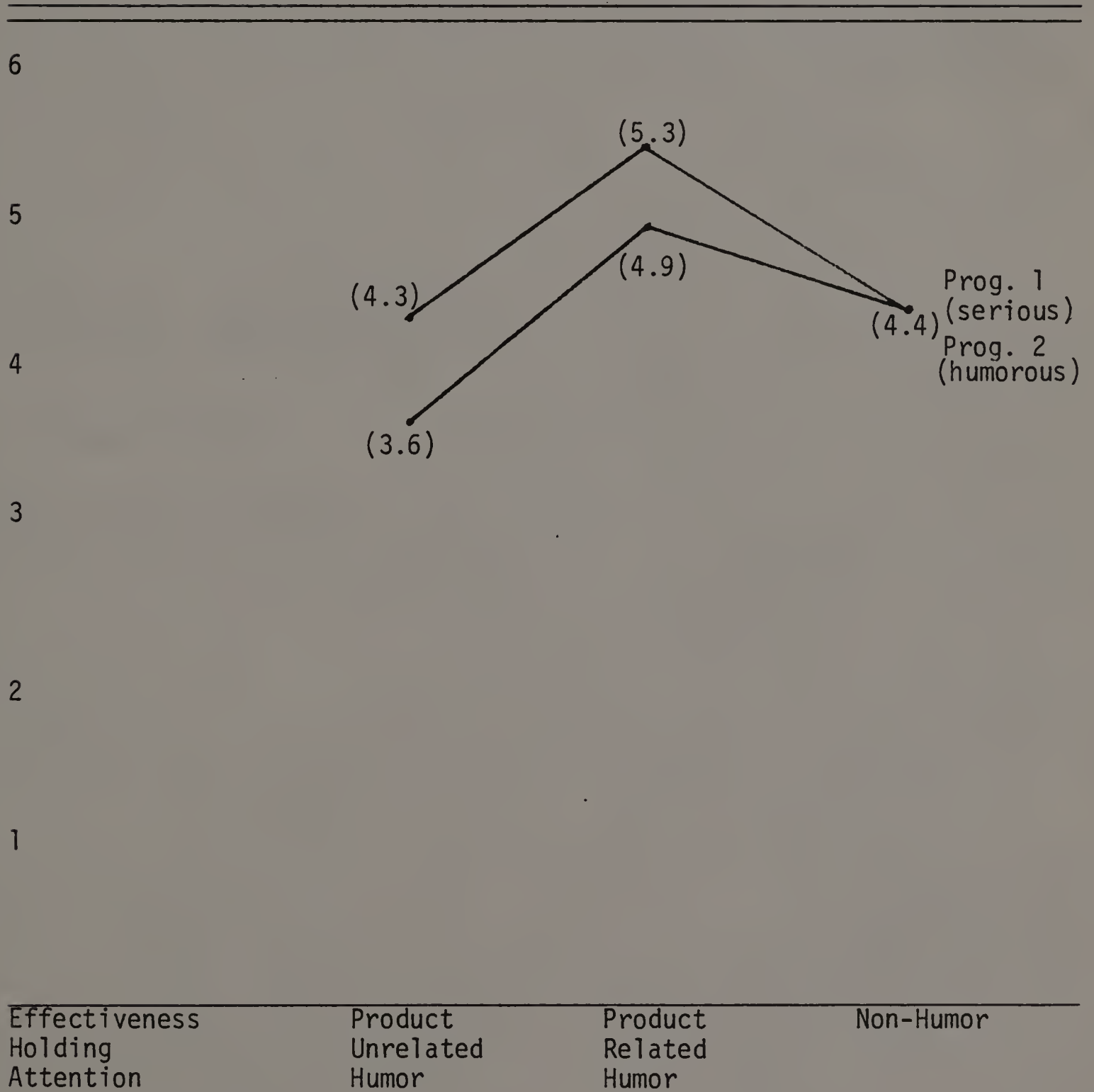


TABLE 12

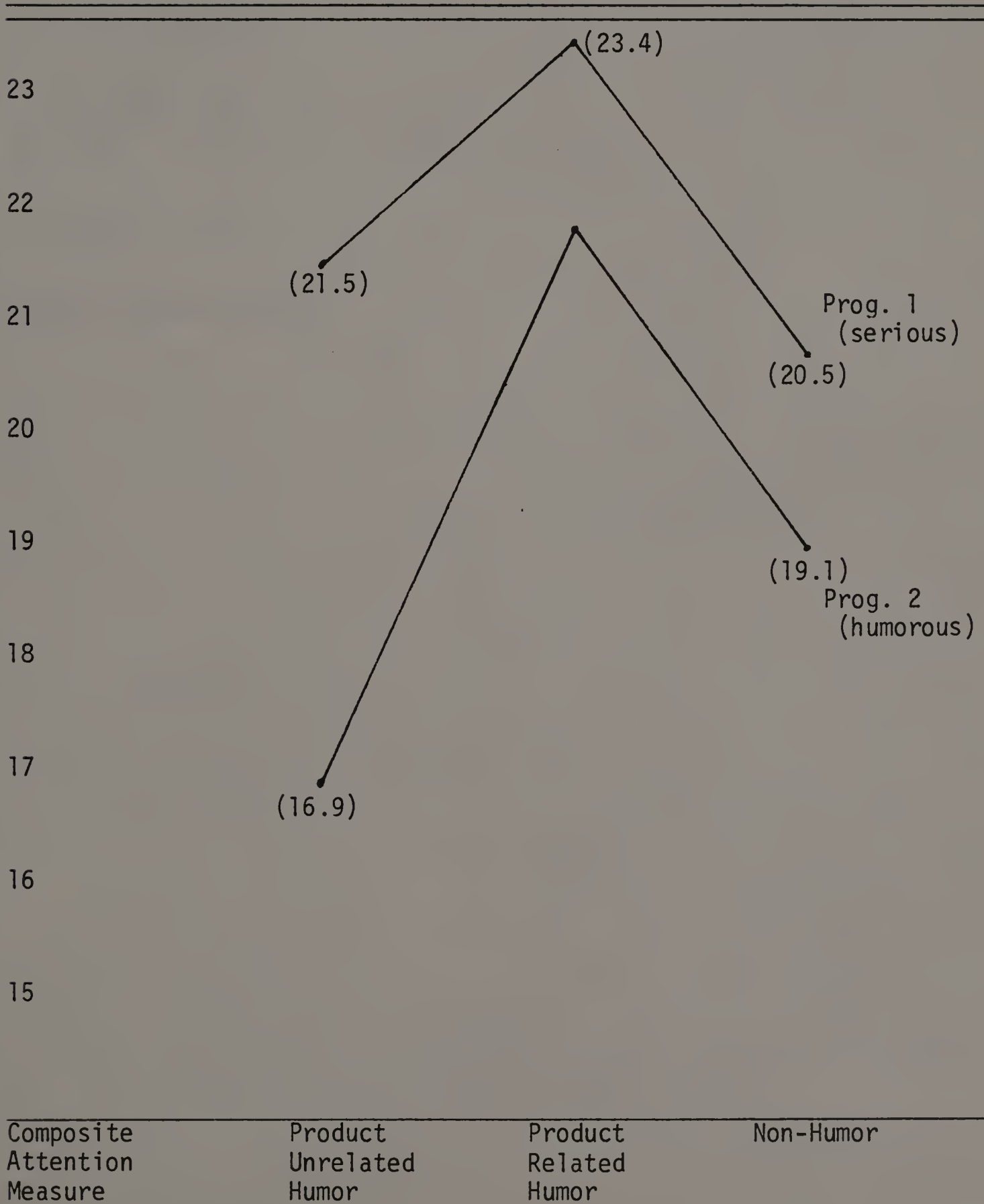
CELL MEANS FOR COMPOSITE ATTENTION MEASURE  
BY COMMERCIAL AND PROGRAM TYPE

TABLE 13

SIGNIFICANCE LEVELS OBTAINED FROM THE ANALYSIS OF VARIANCE  
FOR ATTENTION MEASURES (MILK SAMPLE)

Effect	Criterion Measure		
	Gaining Attention	Holding Attention	Composite
Commercial x Program	.499	.644	.036
Commercial	.015	.002	.001
Program	.062	.177	.036

effect achieves statistical significance only for the composite attention measure (A3). As the commercial by program interaction is only significant for A3, tests of simple main effects will only be conducted for this variate.

Table 14 presents the significance levels for the tests of simple main effects. To maintain the same error rate as the overall F, the overall F for a main-effects test is evenly divided among the collection of simple main effects tests. For example, if the overall F was set at .05 and a factor had 4 levels, the actual value of F for each test would be set at  $.05/4 = .0125$  with appropriate degrees of freedom. Consequently, in this research the appropriate F-critical value for each test for the treatment factor is set at  $(.05/3)0.0167$ .

From Table 14 we see that the commercial variable, the factor of interest, is significant for P2 (humorous program content) but is nonsignificant for P1 (serious program content). Although F-values were not available at the .983 confidence level, if the statistic is significant at the .99 confidence level it will be significant at the .983 confidence level, and if the statistic is nonsignificant at the .975 confidence level it will be nonsignificant at the .983 confidence level. The confidence levels of .99 and .975 are reported in Table 14. Hence, only a posteriori comparisons for treatments at P2 are presented.

Table 15 presents the results of the LSD comparisons for the milk sample. The a posteriori multiple comparison technique employed here is Fisher's least significant difference (LSD) test (Nei et al. 1975). This method was chosen because it provides an exact test for designs

TABLE 14  
 TESTS OF SIMPLE MAIN EFFECTS FOR COMPOSITE MEASURE

Source	F	d. f.	$\alpha=.01$	$\alpha=.05$
Program at Product Unrelated Humor	9.58	$[\frac{1}{154}]$	6.81	3.91
Program at Product Related Humor	1.09	$[\frac{1}{154}]$	6.81	3.91
Program at Non-Humor	<1	$[\frac{1}{154}]$	6.81	3.91
Humor at Serious Program	3.29	$[\frac{2}{154}]$	4.75	3.06
Humor at Humorous Program	6.12	$[\frac{2}{154}]$	4.75	3.06



TABLE 15  
LSD COMPARISONS FOR MILK SAMPLE AT THE ALPHA=.05 LEVEL

Variate	Comparison	Significant	Highest Mean Value
Gaining Attention	C <sub>1</sub> vs. C <sub>2</sub>	Yes	C <sub>2</sub>
	C <sub>1</sub> vs. C <sub>3</sub>	No	
	C <sub>2</sub> vs. C <sub>3</sub>	Yes	C <sub>2</sub>
Holding Attention	C <sub>1</sub> vs. C <sub>2</sub>	Yes	C <sub>2</sub>
	C <sub>1</sub> vs. C <sub>3</sub>	No	
	C <sub>2</sub> vs. C <sub>3</sub>	Yes	C <sub>2</sub>
Composite*	C <sub>1</sub> vs. C <sub>2</sub>	Yes	C <sub>2</sub>
	C <sub>1</sub> vs. C <sub>3</sub>	Yes	C <sub>3</sub>
	C <sub>2</sub> vs. C <sub>3</sub>	No	

C<sub>1</sub> = Product Unrelated Humor

C<sub>2</sub> = Product Related Humor

C<sub>3</sub> = Non-Humor

\*Note: Only for P=2 (humorous program context)

with unequal cell sizes, whereas other methods (e.g., Newman-Keuls) provide only approximate tests in such cases.

For the vast majority of statistically significant comparisons of the "C1 vs. C2" variety, the related humorous treatment (C2) exhibits a higher mean value than either of the other two commercial treatments. This evidence indicates that the related humorous treatment outperforms the other two treatments for the three attention dimensions.

The results of the a posteriori comparisons for the Sweet Acidophilus milk sample are presented in Table 16. The results of the comparisons in the Sweet Acidophilus milk sample are very similar to the comparisons in the milk sample. However, in the Sweet Acidophilus milk sample the efficacy of the product related humorous treatment at capturing attention vis-a-vis the other treatments is even more strongly demonstrated. In all comparisons between commercials, the mean level of attention in the product related humorous treatment is statistically significantly greater than the mean level of attention in the other two treatments.

Because the three measures of attention analyzed here can be viewed as being causally related (i.e., A1 is causally prior to A2 and A2 is causally prior to A3), the results of Roy's step-down F tests are also reported. This test is a succession of analyses of covariance taking each criterion variable as the dependent, while all previous criterion variables are utilized as covariates (Goldstein and Dillon forthcoming). Table 17 presents the results for the significant effects.

TABLE 16  
LSD COMPARISONS FOR SWEET ACIDOPHILUS MILK SAMPLE  
AT THE ALPHA=.05 LEVEL

Variate	Comparison	Significant	Highest Mean Value
Gaining Attention	C <sub>1</sub> vs. C <sub>2</sub>	Yes	C <sub>2</sub>
	C <sub>1</sub> vs. C <sub>3</sub>	No	
	C <sub>2</sub> vs. C <sub>3</sub>	Yes	C <sub>2</sub>
Holding Attention	C <sub>1</sub> vs. C <sub>2</sub>	Yes	C <sub>2</sub>
	C <sub>1</sub> vs. C <sub>3</sub>	No	
	C <sub>2</sub> vs. C <sub>3</sub>	Yes	C <sub>2</sub>
Composite	C <sub>1</sub> vs. C <sub>2</sub>	Yes	C <sub>2</sub>
	C <sub>1</sub> vs. C <sub>3</sub>	No	
	C <sub>2</sub> vs. C <sub>3</sub>	Yes	C <sub>2</sub>

C<sub>1</sub> = Product Unrelated Humor

C<sub>2</sub> = Product Related Humor

C<sub>3</sub> = Non-Humor

TABLE 17  
SIGNIFICANCE LEVELS FOR ROY'S STEP-DOWN F-TEST

Effect	Variate	Product	
		Milk	Sweet Acidophilus Milk
Commercial x Program	Gaining Attention	.530	NA
	Holding Attention	.150	NA
	Composite Attention Measure	.010	NA
Commercial	Gaining Attention	.018	.005
	Holding Attention	.030	.120
	Composite Attention Measure	.535	.253

Notice that the significance levels for the commercial main effect steadily decline in both product samples.

The results of the step-down F-tests indicate that the among treatment effects for "holding attention" (A2) and the "composite attention measure" (A3) are statistically nonsignificant among treatments once the "gaining attention" (A1) measure has been accounted for in the Sweet Acidophilus milk sample. In the milk sample, the "composite attention" (A3) measure is statistically nonsignificant among treatments once the other two attention measures are accounted for. Also, the "holding attention" (A2) measure exhibited a sharp decline in significance once "gaining attention" was accounted for. Therefore, most of the information relevant to subjects' attention levels is captured by the scale measuring the effectiveness of the commercial at gaining attention.

Recapitulation: Propositions one and two. These propositions tested (1) the effects of humorous commercials vis-à-vis a serious commercial on subjects' attention levels, and (2) whether there existed an interaction between the program context and humorous commercials on attention levels.

Three self-reported measures of attention were employed as criterion variables for a MANOVA design with the factors being the treatments and the program context. The MANOVAS were calculated for both products. The program main effect was statistically nonsignificant for both products; however, the treatment main effect was statistically significant in both product samples. Subsequent multiple comparisons clearly

indicated that the group mean for the product related humorous commercial was greater than the group means for both of the other commercials. Hence, the humorous commercial did receive more attention than the non-humorous commercial. In the milk sample, the commercial by program interaction was statistically significant; univariate F tests revealed the interaction was significant only for the composite variable derived from the semantic differential. Tests of simple main effects indicated the treatment main effect was statistically significant only within the humorous program context. The Least Significant Differences (LSD) multiple comparisons technique disclosed that the product related humorous commercial (C2) was more effective on all three measures of attention for both products.

Proposition one is supported: A humorous commercial generated greater levels of attention than the nonhumorous commercial. The product related humorous commercial was more effective at capturing attention than the nonhumorous commercial in both product samples, but the product unrelated humorous commercial was not more effective at capturing attention than the nonhumorous commercial in either product sample.

Proposition two is not supported. The commercial by program interaction is only significant for one measure of attention and only in the milk sample.

Proposition three. Humorous commercials create an obstacle to the comprehension of the commercial's arguments.

Previously, comprehension was defined as the meaning attached to stimuli. For this research, differential effects on the comprehension process among the treatments is analyzed using (1) salient beliefs and (2) recall.

As proposition four deals directly with retention and is analyzed using recall measures, this proposition will be analyzed with subjects' postexposure salient beliefs.

Subjects were asked to list the advantages and disadvantages of consuming milk (Sweet Acidophilus milk). Assuming beliefs are equivalent across treatments prior to exposure, any post exposure differences of salient beliefs can be attributed to the processing of the message's content.

For analysis purposes only those belief categories containing more than ten responses from the experimental subjects are used. Twelve advantages of consuming Sweet Acidophilus milk received ten or more responses. The samples had only six advantages in common which is to be expected as the messages were quite dissimilar in terms of informational content for the two different products.

Table 18 presents the percentages of respondents in the experimental groups and the control group reporting one of the categories as an advantage and/or disadvantage of consuming milk or Sweet Acidophilus milk. The advantages elicited from both samples reflect the information communicated in the different messages. Figure 9 contains the specific arguments communicated in the messages in the two product samples.

TABLE 18

ELICITED ADVANTAGES AND DISADVANTAGES OF CONSUMING MILK (SWEET ACIDOPHILUS MILK) IN PERCENTAGES FOR MILK, SWEET ACIDOPHILUS MILK AND THE CONTROL GROUP

	Group		
	Milk	Sweet Acidophilus Milk	Control
<u>Advantages</u>			
1. Healthy	24	31	29
2. Tastes good	14	14	29
3. Good for bones	51	--	54
4. Good for teeth	26	--	36
5. Protein	11	--	10
6. Vitamin D	25	17	36
7. Calcium	56	--	52
8. Vitamins	28	9	23
9. Nutritious	26	20	36
10. Vitamin A	36	19	6
11. Replaces bacteria	--	17	--
12. Low fat; Low calorie	--	9	--
13. Helps lower tract	--	10	--
14. Helps digestive system	--	35	--
15. Counteracts processed fats	--	19	--
16. Has all the goodness of whole milk	--	10	--
<u>Disadvantages</u>			
1. Too much calcium	12	--	25
2. Too much fat	24	--	32
3. High in cholesterol	7	--	10
4. Fattening	25	--	23
5. Expensive	6	36	6
6. No disadvantages	25	15	13
7. Tastes bad	--	20	--
8. Bacteria/Cultures	--	9	--



Sweet Acidophilus Milk

- All the goodness of milk
- Has natural ingredients for digestion
- Made like yogurt
- Vitamin A
- Vitamin D
- Low fat
- 3-4 more cents than regular milk

Milk

- Not just for kids anymore
- Calcium for bones
- Vitamin A for skin
- Source of nutrition regardless of age, sex, social class
- Good for active adults
- Good at social occasions

Fig. 9. Information communicated by product sample.

Comparing Table 18 and Figure 9 demonstrates the basic similarity between the information communicated and the elicited advantages.

It would be inappropriate to compare the Sweet Acidophilus milk sample to the control as the arguments proffered in the Sweet Acidophilus milk commercials were for a new product. However, comparisons between the control group and the milk commercials can provide evidence as to whether the messages, or any particular message, created beliefs different from the control group. Of particular interest is any differences in those arguments which were expressly communicated in the commercials, and whether the difference exists for any specific commercial in relation to the control group. For example, if the humorous commercial(s) is (are) statistically different from the control group with respect to a message related belief and if the nonhumorous commercial is not statistically different from the control group, for the same belief, then one may conclude that the humorous commercial(s) were more effective at communicating this belief.

Table 19 reports, in percentages, the cross-classification of the elicited advantages and disadvantages for the three milk commercials and the control group. For example, 18 percent of subjects in the product unrelated commercial indicated that milk was healthy; whereas, 33 percent of subjects in the product related commercial indicated milk was healthy, etc.

Table 20 presents the calculated z-values for the statistical tests of differences between these proportions. For each of the humorous commercials five of the proportions were statistically different

TABLE 19

ELICITED ADVANTAGES AND DISADVANTAGES FOR CONSUMING MILK IN  
PERCENTAGES FOR MILK TREATMENTS AND THE CONTROL GROUP

	Treatment			
	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	Control
<u>Advantages</u>				
Healthy	18	33	12	29
Tastes Good	16	16	7	29
Good for Bones	54	55	42	54
Good for Teeth	25	28	26	36
Protein	13	7	14	10
Vitamin D	28	19	30	36
Calcium	59	47	63	52
Vitamins	26	33	23	23
Nutritious	25	19	40	36
Vitamin D	36	38	33	6
<u>Disadvantages</u>				
Too Much Calcium	10	14	14	25
Too Much Fat	26	22	23	32
High in Cholesterol	6	5	9	10
Fattening	20	22	35	23
Expensive	3	9	7	6
No Disadvantages	31	21	21	13

C<sub>1</sub> = Product Unrelated Humor

C<sub>2</sub> = Product Related Humor

C<sub>3</sub> = Non-Humor

TABLE 20

CALCULATED Z-VALUES FOR TESTS OF DIFFERENCES IN STATED ADVANTAGES:  
MILK TREATMENTS VERSUS CONTROL GROUP

Advantage	Comparison		
	C <sub>1</sub> vs. Control	C <sub>2</sub> vs. Control	C <sub>3</sub> vs. Control
Healthy	2.56*	.81	3.72*
Tastes Good	3.10*	3.04*	6.00*
Good for Bones	0.00	.19	2.07*
Good for Teeth	2.33*	1.63	1.87
Protein	.88	1.04	1.05
Vitamin D	1.66	3.71*	1.10
Calcium	1.35	.94	1.92
Vitamins	.66	2.07*	0.00
Nutritious	2.33*	3.71*	.71
Vitamin A	6.57*	6.81*	5.64*

\*Represents significance at  $p < .05$

C<sub>1</sub> = Product Unrelated Humor  
 C<sub>2</sub> = Product Related Humor  
 C<sub>3</sub> = Non-Humor

from the control; whereas, four proportions were statistically different from the control group for the nonhumorous commercial. Although the number of statistically different proportions is similar among treatments, the specific advantages which exhibit differences do vary across treatments.

Table 21 presents the z-values for tests of differences in proportions for the elicited disadvantages. Here the significantly different proportions indicate that a greater proportion of subjects in the control group reported a particular disadvantage of consuming milk than the proportion of subjects in any of the treatments. For example, in relation to the disadvantage "too much calcium" the proportion of subjects in the control group was greater than the proportion of subjects in all three treatments.

Comparing the differences between the proportions of subjects in the treatment groups and the control group for the elicited advantages and disadvantages reveals that the messages did have an effect, especially in terms of reducing the elicitation of disadvantages of consuming milk.

Attention now centers on the differences between treatments in terms of elicited salient beliefs for both product samples. Table 22 presents the significance level of the chi-square statistic for the crosstabulation of treatment groups for each of the advantages and disadvantages. Statistical significance among the treatments for the milk sample was found for the advantages "healthy and nutritious." In the Sweet Acidophilus Milk sample statistical significance existed for the

TABLE 21

CALCULATED Z-VALUES FOR TEST OF DIFFERENCES IN STATED  
DISADVANTAGES: MILK TREATMENT VERSUS CONTROL GROUP

Disadvantage	Comparison		
	C <sub>1</sub> vs. Control	C <sub>2</sub> vs. Control	C <sub>3</sub> vs. Control
Too Much Calcium	4.02*	2.71*	2.43*
Too Much Fat	1.28	2.03*	1.75
High in Cholesterol	1.47	1.88	0.29
Fattening	0.71	0.23	2.76
Expensive	1.47	1.04	0.35
No Disadvantages	3.99*	1.96*	1.80

\*Represents significance at  $p < .05$

C<sub>1</sub> = Product Unrelated Humor

C<sub>2</sub> = Product Related Humor

C<sub>3</sub> = Non-Humor

TABLE 22

SIGNIFICANCE LEVELS FOR CHI-SQUARE STATISTIC CALCULATED FOR THE  
 MODEL OF COMPLETE INDEPENDENCE FROM THE CROSS TABULATION  
 OF ADVANTAGES AND DISADVANTAGES BY TREATMENTS FOR  
 BOTH PRODUCT SAMPLES

Milk		Sweet Acidophilus Milk	
<u>Advantage</u>			
1. Healthy	.027	1. Healthy	.075
2. Tastes good	.334	2. Tastes good	.545
3. Good for bones	.335	6. Vitamin D	.009
4. Good for teeth	.931	8. Vitamins	.116
5. Protein	.440	9. Nutritious	.184
6. Vitamin D	.368	10. Vitamin A	.026
7. Calcium	.211	11. Replaces bacteria	.367
8. Vitamins	.541	12. Low fat; Low calorie	.215
9. Nutritious	.062	13. Helps lower tract	.394
10. Vitamin A	.855	14. Helps digestive system	.031
		15. Counteracts processed fats	.126
		16. Has all the goodness of whole milk	.111
<u>Disadvantage</u>			
1. Too much calcium	.752	5. Expensive	.300
2. Too much fat	.879	6. No disadvantages	.695
3. High in cholesterol	.714	7. Tastes bad	.484
4. Fattening	.184	8. Bacteria/Cultures	.050
5. Expensive	.465		
6. No disadvantages	.339		

advantages "vitamin D," "vitamin A," and "helps digestive tract."

There was no statistical significance between the proportions of elicited disadvantages for the milk sample; however, the disadvantage of "bacteria/cultures" was statistically significant in the Sweet Acidophilus milk sample. The proportion of subjects responding positively to these significant proportions are reported in Table 23. The z-values from the test of differences between proportions are presented in Table 24.

In the milk sample a greater proportion of subjects from the non-humorous commercial reported "nutritious" as an advantage of consuming milk than did the subjects exposed to the humorous commercials. However, the proportion of subjects in the humorous commercials reporting "healthy" as an advantage of consuming milk was statistically greater than the proportion of subjects in the nonhumorous commercial. These two beliefs are quite similar; therefore, for all practical purposes there are no differences in the elicitation of salient beliefs among treatments for the milk sample.

The differences among salient beliefs in the Sweet Acidophilus milk sample is similar to the milk sample except that there is less difference between the product unrelated humorous treatment and the non-humorous treatment. These two treatments differ statistically on only one of the three advantages, "vitamin A," and for the disadvantage of "bacteria/cultures." The product related humorous commercial and the nonhumorous commercial are statistically different from each other for all three of the elicited advantages and the elicited disadvantages.



TABLE 23

PROPORTION OF RESPONDENTS ANSWERING YES TO ADVANTAGES OR  
DISADVANTAGES NOT INDEPENDENT OF TREATMENTS

Product	Advantage	Disadvantage	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>
Milk	Healthy	-	18	33	12
	Nutritious	-	25	19	40
Sweet Acidophilus Milk	Good for bones	-	8	33	13
	Vitamin D	-	14	31	13
	Vitamin A	-	24	35	47
	-	Fattening	3	8	16

C<sub>1</sub> = Product Unrelated Humor

C<sub>2</sub> = Product Related Humor

C<sub>3</sub> = Non-Humor

TABLE 24

CALCULATED Z-VALUES FOR TESTS OF DIFFERENCES BETWEEN TREATMENTS  
FOR ADVANTAGES OR DISADVANTAGES NOT INDEPENDENT OF TREATMENTS

Product	Advantage/Disadvantage	C <sub>1</sub> vs. C <sub>2</sub>	C <sub>1</sub> vs. C <sub>3</sub>	C <sub>2</sub> vs. C <sub>3</sub>
Milk	Healthy	3.76*	1.69	4.94*
	Nutritious	1.58	3.30*	4.77*
Sweet Acidophilus Milk	Good for bones	6.32*	1.75	4.94*
	Vitamin D	4.38*	.31	4.51*
	Vitamin A	2.55*	5.14*	2.52*
	Fattening	2.34*	4.78*	2.54*

\*Represents significance at  $p < .05$

C<sub>1</sub> = Product Unrelated Humor

C<sub>2</sub> = Product Related Humor

C<sub>3</sub> = Non-Humor

Also, the two humorous treatments are statistically different for all of the elicited beliefs. Hence, in this sample the product unrelated humorous commercial is more similar to the nonhumorous commercial than to the product related humorous commercial.

Recapitulation: Proposition three. First, the elicited advantages and disadvantages from the milk treatments were compared to a no exposure control group. The analyses provided evidence that the messages had an overall effect. All three treatments were statistically different from the control group for the advantage vitamin A, which was expressly communicated in the message. In addition, the control group reported more disadvantages than the treatment groups. Hence, the treatments seem to be more effective at mitigating perceived disadvantages associated with the consumption of milk. This is not really surprising as the messages do not really communicate any new beliefs about milk except perhaps "vitamin A." "Vitamin A" is considered as potentially a new belief because this advantage was not mentioned in a pretest conducted prior to the experiment to assess the modal beliefs of consuming milk, and only two subjects in the control group mentioned this advantage. Consequently, the messages are considered as effective in that the treatment groups perceived less disadvantages from consuming milk and expressly mentioned a message related belief, vitamin A, which can be considered as a new belief.

Next, differences among treatments for both product samples in relation to elicited advantages and disadvantages were analyzed. If one treatment was consistently different from the other treatment(s), then

possibly the comprehension of that group was different. Specifically, the question considered is whether humor creates an obstacle to comprehension. If so, then the reported advantages and/or disadvantages should be noticeably different from the nonhumorous commercial.

In the milk sample there is virtually no difference between the humorous and nonhumorous treatments. However, in the Sweet Acidophilus milk sample minor differences were detected.

Proposition four. Humorous commercials facilitate the retention of the message's arguments.

The specific arguments communicated in each commercial were presented in Figure 9. These arguments can be used to measure the degree of recall; that is, how many of the arguments could the subject remember. In addition a question asking the subject to identify the commercial source was also employed as a recall measure. Each message concluded with the statement, "This message was brought to you by the California Dairy Association."

Table 25 presents the results of the crosstabulation of source recall by treatment for both products. The chi-square values and significance levels calculated under the complete independence model are 1.23, 1.31 and .54, .52 for the milk and Sweet Acidophilus milk samples, respectively. The model of independence fits the data well. That is, the percentages of subjects being able to recall the source of the message are not associated with the treatment conditions.

For the milk sample a total of six arguments could have been recalled, whereas a total of seven arguments could have been recalled for

TABLE 25  
 CROSS-CLASSIFICATION OF ACTUAL COUNTS OF SOURCE  
 RECALL BY TREATMENTS

Product	Treatment	Recall Source	
		Yes	No
Milk	Product Unrelated Humor	30	31
	Product Related Humor	33	25
	Non-Humor	20	23
SAM	Product Unrelated Humor	28	32
	Product Related Humor	18	32
	Non-Humor	23	30

the Sweet Acidophilus milk sample (see figure 9). The crosstabulations of recall by treatment for each sample are presented in tables 26 and 27. The chi square values under the model of complete independence are 18.35 and 13.90 for the milk and Sweet Acidophilus milk samples, respectively, with corresponding significance values of .05 and .31.

The significance levels of the two crosstabulations indicate that the model of independence fits the Sweet Acidophilus milk sample well, but not the milk sample. In the milk sample the model of independence can be rejected at the 5% significance level.

In a fashion analogous to a posteriori comparisons, the goodness-of-fit in each cell is examined when the overall chi-square value indicated that a particular model did not fit the data. Examination of the fit in each cell is useful for partitioning segments of the array and/or for indicating alternative models which might provide a better fit. For the case of an r by c contingency table, the cell fits provide additional information as to whether the non-independence is spread throughout or confined to a specific partition of the table. Here we use the Freeman/Tukey deviates (z) to examine the goodness-of-fit in each cell. Symbolically the deviates are represented as:

$$(20) \quad z_i = \sqrt{x_i} + \sqrt{x_{i+1}} - \sqrt{4\hat{\mu}_i + 1}$$

As the z are normally and independently distributed (NID) one can compare the values with the value of a standard normal deviate at the selected significance level to detect large deviates. Cells with large deviates are indicative of the absence of independence. The values of z for the recall by commercial crosstabulation in the milk sample are

TABLE 26

CROSS-CLASSIFICATION OF ACTUAL COUNTS OF MESSAGE RECALL  
BY TREATMENTS FOR THE MILK SAMPLE

Treatment	Recall						
	Number of Arguments						
	0	1	2	3	4	5	6
C <sub>1</sub>	6	22	20	9	4	0	0
C <sub>2</sub>	7	9	22	14	6	0	0
C <sub>3</sub>	4	9	15	11	1	3	0

C<sub>1</sub> = Product Unrelated Humor  
 C<sub>2</sub> = Product Related Humor  
 C<sub>3</sub> = Non-Humor

TABLE 27

CROSS-CLASSIFICATION OF ACTUAL COUNTS OF MESSAGE RECALL BY  
BY TREATMENTS FOR THE SWEET ACIDOPHILUS MILK SAMPLE

Treatment	Recall							
	Number of Arguments							
	0	1	2	3	4	5	6	7
C <sub>1</sub>	12	10	16	10	7	5	0	0
C <sub>2</sub>	3	15	11	10	7	3	1	0
C <sub>3</sub>	8	11	17	11	7	0	0	0

C<sub>1</sub> = Product Unrelated Humor  
 C<sub>2</sub> = Product Related Humor  
 C<sub>3</sub> = Non-Humor

reported in Table 28. The pattern of the Freeman/Tukey deviates suggests no one commercial was superior in terms of recall. Although no deviate is significant at the .05 significance level (i.e.,  $z$  greater than 1.96, the algebraic sign and magnitude of the  $z$ 's suggest the serious commercial (C3) was more effective in terms of recall than the humorous commercials, especially compared to the product unrelated commercial (C1). For example, notice the largest deviate occurs at the 5/6 level of recall for the serious commercial and at this level both C1 and C2 are large and negative. The observed cell counts reflect that only C3 was nonzero at this level. However at the 4/6 level of recall C2 has the largest positive value of  $z$  with C1 close to zero and C3 large and negative. The actual cell counts at this level are 4, 6, and 1 for C1, C2, and C3, respectively.

Recapitulation: Proposition four. This proposition tested differences in levels of recall for both products. Two measures of unaided recall were employed: source of the message and percentage of message related product arguments noted. For both of the products, the recall of message source was independent of the treatments. The level of recall for message arguments was independent of the treatments in the Sweet Acidophilus milk sample; however, this was not true in the milk sample.

Analysis of individual cell fits using Freeman/Tukey deviates indicated the product unrelated humorous commercial (C1) was associated with lower levels of recall, especially in comparison to the serious commercial.



TABLE 28

FREEMAN/TUKEY DEVIATES FOR CROSS-CLASSIFICATION OF MESSAGE  
 RECALL BY TREATMENT FOR THE MILK SAMPLE CALCULATED  
 FROM RESIDUALS OF COMPLETE INDEPENDENCE MODEL

Treatment	Recall						
	0	1	2	3	4	5	6
C <sub>1</sub>	-.06	1.66	.26	-1.06	.04	-1.35	0
C <sub>2</sub>	.44	-1.47	.40	.57	1.00	-1.30	0
C <sub>3</sub>	-.13	-.43	.03	.69	-1.15	1.69	0

C<sub>1</sub> = Product Unrelated Humor  
 C<sub>2</sub> = Product Related Humor  
 C<sub>3</sub> = Non-Humor

Proposition five. The contiguity of the humor to the product affects the processing of the commercial's arguments.

The analyses presented here parallel the analyses of propositions three and four; however, in this case only differences between the two humorous treatments are examined.

Table 29 presents the significance levels of the chi-square statistic based on the model of complete independence between recall of message source and message arguments. In all cases the model of independence fits the data well, indicating no association between recall and humor type. That is, whether the humor is related to or unrelated to the product does not affect recall of the message.

Proposition three analyzed the salient beliefs across all treatments. The same beliefs are analyzed here but only for two humorous treatments. Tables 30 and 31 present the significance level for the chi-square statistic calculated for the model of complete independence for milk and Sweet Acidophilus milk, respectively. In all cases the model of independence fits well for the milk sample as indicated by the large p values; however, for two of the beliefs, "vitamin D" and "vitamin A," which also were significant in Proposition three, the model does not fit in the Sweet Acidophilus milk sample as indicated by the p values of 0.0 and 0.06, respectively.

Tables 32 and 33 cross-classify the actual counts for the advantages "vitamin A" and "vitamin D" where the model of independence could not be accepted in the Sweet Acidophilus milk sample. For both of these beliefs the odds of a subject reporting "vitamin A" (3.2:1) or "vitamin

TABLE 29

SIGNIFICANCE LEVELS OF CHI-SQUARE STATISTIC BASED ON  
THE MODEL OF COMPLETE INDEPENDENCE FOR RECALL  
MEASURES BY HUMOR TYPE

Product	Recall	
	Source	Message Arguments
Sweet Acidopholous Milk	.5098	.2394
Milk	.3497	.1338

TABLE 30

SIGNIFICANCE LEVELS OF CHI-SQUARE STATISTIC BASED ON  
THE MODEL OF COMPLETE INDEPENDENCE FOR ELICITED  
ADVANTAGES BY HUMOR TYPE IN THE MILK SAMPLE

Belief	Significance Level
Healthy	.70
Tastes good	.90
Good for bones	.91
Good for teeth	.71
Protein	.26
Vitamin D	.25
Calcium	.17
Vitamins	.43
Nutritious	.46
Vitamin A for skin	.83

\*Corrected chi-square values are reported.

TABLE 31

SIGNIFICANCE LEVELS OF CHI-SQUARE STATISTIC BASED ON THE MODEL  
OF COMPLETE INDEPENDENCE FOR ELICITED ADVANTAGES BY HUMOR  
TYPE IN THE SWEET ACIDOPHILUS MILK SAMPLE

Belief	Significance Level
Good for health	.18
Tastes good	.70
Vitamin D	.00
Vitamins	.23
Nutritious	.50
Vitamin A	.06
Replaces bacteria	.85
Low-fat/Less calories	1.00
Helps lower tract	.17
Helps digestive system	.30
Counteracts processed foods	.16
All the goodness of whole milk	.22

\*Corrected chi-square

TABLE 32

CROSS-CLASSIFICATION OF ACTUAL COUNTS FOR ELICITED  
ADVANTAGE "VITAMIN A" BY HUMOR TYPE IN THE  
SWEET ACIDOPHILUS MILK SAMPLE

	Extraneous ( $C_1$ )	Related ( $C_2$ )	
Yes	5	16	21
No	<u>55</u>	<u>34</u>	<u>89</u>
	60	50	110

$C_1$  = Product Unrelated Humor  
 $C_2$  = Product Related Humor

TABLE 33

CROSS-CLASSIFICATION OF ACTUAL COUNTS FOR ELICITED  
ADVANTAGE "VITAMIN D" BY HUMOR TYPE IN THE  
SWEET ACIDOPHILUS MILK SAMPLE

	Extraneous ( $C_1$ )	Related ( $C_2$ )	
Yes	8	15	23
No	<u>52</u>	<u>35</u>	<u>87</u>
	60	50	110

$C_1$  = Product Unrelated Humor  
 $C_2$  = Product Related Humor

D" (1.9:1) as an advantage of consuming Sweet Acidophilus milk are in favor of the related humorous commercial (C2). The contiguity of the humor did have an effect, but the effect was conditioned by the product being advertised. The only statistical significance between the proportion of elicited advantages existed in the Sweet Acidophilus milk sample for the advantages "Vitamin A" and "Vitamin D," both of which were expressly communicated in the commercial. For both cases the proportion was greater for the product related treatment than for the product unrelated treatment.

Recapitulation: Proposition five. The analyses for this proposition paralleled the analyses of propositions three and four but only for the two humorous commercials; that is, tests of differences in terms of recall and salient beliefs.

The only differences were for two beliefs, Vitamin A and Vitamin D, in the Sweet Acidophilus milk sample. It should be noted that for Vitamin A the model of independence was rejected at the .06 significance level. The odds of indicating the belief as being salient were greater for the product related humorous commercial (C2) for both products.

Proposition six. Humorous commercials increase trust of source.

To investigate this relationship three scales relating to source credibility were chosen from the commercial reaction semantic differentials. The scales are: "believable-unbelievable," "candid-deceitful," and "honest-dishonest." The analyses reported here follow the format of

propositions one and two with multivariate analysis of variance followed by F tests and a posteriori comparisons where appropriate.

Homogeneity of variance was examined for the response measures. The results clearly indicated a violation of the equality assumption in the milk sample. The multivariate test (Box's M) yielded a p value of .019, while the p value for the univariate test (Bartlett-Box) was .004 for the believable-unbelievable scale. The other variates had statistically nonsignificant values of .497 and .499, respectively. The univariate tests are seriously affected by the distributional form of the data; that is, they are not robust to violations of normality. O'Brien (1981) presents two transformations which he states are more robust than conventional transformations to departures from normality. These transformations are:

$$(21) \quad Z_{ik} = |Y_{ik} - \bar{Y}_i|,$$

and

$$(22) \quad Z'_{ik} = |Y_{ik} - Md_i|.$$

where  $Z_{ik}$  and  $Z'_{ik}$  are the transformed variables,  $Y_{ik}$  is the original variable,  $\bar{Y}_i$  is the mean for the  $I^{\text{th}}$  group and  $Md_i$  is the median for the  $I^{\text{th}}$  group.

Table 34 compares the three transformations in terms of the correction of the heterogeneity of variance. Notice that the hypothesis of homogeneity of variance is supported with both transformations recommended by O'Brien, but not for the conventional transformation.

Analyses of the milk sample in proposition six will utilize the  $Z'_{ik}$  transformation.

TABLE 34

HOMOGENEITY OF VARIANCE TESTS FOR TRANSFORMATIONS  
OF "BELIEVABLE-UNBELIEVABLE" FACTOR

Transformation	Significance Level	
	Multivariate	Univariate
$Z_{ik}$	.528	.379
$Z'_{ik}$	.462	.106
$\sqrt{y_i}$	.005	.001



The values for tests of homogeneity of variance following the transformation are presented in Table 35.

Table 36 presents the MANOVA tests of significance. The effect of humor is significant for both products. The significance levels for milk and Sweet Acidophilus milk are .002 and .001, respectively. Therefore, in both samples, the perceived source trustability is not the same among the three treatments. Subsequent univariate analyses are employed to detect differences between the group means.

In the milk sample, the only statistically significant effect occurs for the semantic differential scale "believable-unbelievable." Table 37 reports the significance levels of the F-statistic from the analysis of variance for all three of the trustability scales. The direction of the effects, as seen in Table 38, indicates that the non-humorous message was perceived as more believable than both of the humorous messages. In the Sweet Acidophilus milk sample statistically significant effects occur for the semantic differential scales "believable-unbelievable" and "honest-dishonest." The direction of the effects indicates that both the nonhumorous message and the product unrelated treatment were perceived as more believable and honest than the product related humorous message. Recall, the nonhumorous message and the product unrelated humorous message were also found to be similar in propositions one and two.

Recapitulation: Proposition six. This proposition tested for differences in perceived source trustability among the treatments. The analyses indicated the product unrelated humorous commercial (C1) and

TABLE 35  
HOMOGENEITY OF VARIANCE TEST FOLLOWING TRANSFORMATIONS

Test	Product	
	Milk	Sweet Acidophilus Milk
Multivariate	.462	.175
Univariate:		
Non-Humor	.106	.781
Product Related Humor	.506	.852
Product Unrelated Humor	.501	.444

TABLE 36  
WILK'S MULTIVARIATE TEST OF SIGNIFICANCE (P VALUES)  
FOR TRUSTABILITY BY COMMERCIAL

Effect	Product	
	Milk	Sweet Acidophilus Milk
Humor	.002	.001

TABLE 37

SIGNIFICANCE LEVELS FOR THE ANALYSIS OF VARIANCE OF THE  
TRUSTABILITY SCALES BY COMMERCIAL

Criterion Variable	Product	
	Milk	Sweet Acidophilus Milk
"believable-unbelievable"	.0002	.0002
"candid-deceitful"	.2876	.0816
"honest-dishonest"	.1883	.0208

TABLE 38

LSD COMPARISONS AT THE ALPHA EQUALS .05  
LEVEL FOR BOTH PRODUCT SAMPLES

	Milk		Sweet Acidophilus Milk	
	Comparison Significant	Mean with Highest Score	Comparison Significant	Mean with Highest Score
Believable- Unbelievable	C <sub>1</sub> vs. C <sub>2</sub>	No	Yes	C <sub>1</sub>
	C <sub>1</sub> vs. C <sub>3</sub>	Yes	No	-
	C <sub>2</sub> vs. C <sub>3</sub>	Yes	C <sub>3</sub>	C <sub>3</sub>
Honest- Dishonest	C <sub>1</sub> vs. C <sub>2</sub>		Yes	C <sub>1</sub>
	C <sub>1</sub> vs. C <sub>3</sub>		No	-
	C <sub>2</sub> vs. C <sub>3</sub>		Yes	C <sub>3</sub>

C<sub>1</sub> = product unrelated  
C<sub>2</sub> = product related  
C<sub>3</sub> = nonhumor

the serious commercial (C3) were not perceived differently in terms of trust, but both were perceived as more trustworthy than the product related humorous commercial (C2) in the Sweet Acidophilus milk sample. In the milk sample, both humorous commercials were perceived as less trustworthy than the non-humorous message.

Proposition seven. Gender differences have no effect on the response to humorous stimuli.

This proposition is analyzed by (i) a two-way, treatment by gender, MANOVA with twelve criterion measures comprising the commercial reaction semantic differential, and (ii) a loglinear analysis for the cross-classification of treatments (H), gender (S), and whether or not the subject's interest (I) in consuming the product was increased.

The results of the MANOVA are shown in Table 39. Neither the main effect of sex nor the commercial by sex interaction is statistically significant. Hence, there is no difference in reaction to the message due to gender of the subject.

The loglinear analysis supported the results of the MANOVA. A restriction on the fitting process, for the loglinear analysis, is that the margin [HS] must be fitted since this was fixed by the sampling design. For both samples, the model described by the margins [HS] [IH] fits the data well ( $p=.97$  and  $p=.46$  for Sweet Acidophilus and milk, respectively). This means that gender and increased interest are independent (absence of the [IS] margin). Moreover, the main effect for gender was statistically nonsignificant at the  $p=.05$  level.

TABLE 39

WILK'S MULTIVARIATE TEST OF SIGNIFICANCE (P VALUES)  
FOR ATTENTION BY COMMERCIAL AND SEX

Effect	Product	
	Milk	Sweet Acidophilus Milk
Commercial x Sex	.150	.490
Commercial	.000	.000
Sex	.525	.100

Recapitulation: Proposition seven. This proposition examined whether the gender of the subjects had an effect on the response to the humorous stimuli. The main effect of sex and the sex by treatment interaction were statistically nonsignificant with reaction to the commercial as the criterion variables. In addition, treating increased interest in consumption of the advertised product as the criterion measure, the fitted loglinear model failed to include the sex by increased interest interactive effect and the main effect of sex was statistically nonsignificant.

Proposition nine. Product familiarity will moderate subjects' attention levels to the experimental stimuli.

The novelty of the humor and the novelty of the product should each heighten attention levels; however, if these effects interact a state of excess arousal may result which could lower attention levels. Howard (1977) states that excess arousal can inhibit an individual's attention levels.

The cognitive strain of processing the message for an unfamiliar product is analyzed by investigating subjects' perceived complexity of the message for the unfamiliar product vis-à-vis subjects' perceived complexity of the message for the familiar product. To determine if the messages were perceived as more complex in the Sweet Acidophilus milk sample, tests of mean differences were calculated for each of the commercial types (e.g., perceived complexity in the Sweet Acidophilus milk sample versus perceived complexity in the milk sample for the extraneous humorous commercial). The criterion measure was a semantic differential

scale characterized by the bi-polar adjectives "complex-simple" (complex=7, simple=1). The significance levels of the t-tests are reported in Table 40.

Statistically significant differences between the perceived complexity of commercial messages existed for the product unrelated humorous treatment and the serious treatment. However, no statistically significant differences were found for the product related treatment.

Table 41 profiles the means for the three treatments along this complexity dimension. Although the group means for the product related humorous treatment were statistically nonsignificant ( $p > .05$ ), the means were in the same direction as the other two commercials.

Previous analyses (i.e., propositions one and two) have demonstrated that humor does heighten attention levels. Here it has been shown that the commercial messages for a new product were perceived as more complex than the commercial messages for an established product. A MANOVA procedure was utilized to test for the possible interaction between humorous messages and messages for a new product. The criterion measures were the same attention measures analyzed in proposition one. Table 42 reports the significance levels of Wilk's Lambda for the three effects. Box's M, which is not shown, revealed no serious departure from the homogeneity of variance assumption ( $F=1.4$ ,  $p=.07$ ). Only the commercial main effect is significant. Hence, for these data, product unfamiliarity does not moderate the effects of humor on attention.

Recapitulation: Proposition nine. This proposition examined differences between the unfamiliar product sample (Sweet Acidophilus

TABLE 40

SIGNIFICANCE LEVELS (P VALUES) FOR ANALYSES OF VARIANCE  
FOR COMPLEXITY BY PRODUCT TYPE FOR EACH  
OF THE THREE COMMERCIALS

Treatment	Significance
Product unrelated humor	.017
Product related humor	.135
Non-Humor	.000

TABLE 41

MEAN VALUES OF COMPLEXITY BY TREATMENT  
FOR BOTH SAMPLES

Treatment	Complex (7)	Simple (1)
Product unrelated humor	_____ S _____	_____ M _____
Product related humor	_____ _____	_____ S M _____
Non-Humor	_____ _____	_____ S M _____

S = Sweet Acidophalus Milk

M = Milk



TABLE 42

WILK'S LAMBDA TEST OF SIGNIFICANCE (P VALUES) FOR ATTENTION  
BY TREATMENT AND PRODUCT WITH POOLED SAMPLE

Effect	Significance
Commercial x Product	.487
Commercial	.000
Product	.768

milk) and the established product sample (milk) on levels of attention and perceived message complexity. The results of a MANOVA indicated the commercial by product interaction was statistically nonsignificant for the attention criterion measures.

## C H A P T E R V

### RESULTS

#### Model Testing

Proposition eight. The likelihood of persuasion will be greater for humorous commercials than nonhumorous commercials.

In this research the elements of the persuasion process to be analyzed are: attention, reaction to the persuasive message, message-evoked thoughts, attitudes and interest in consumption of the advertised product. Table 43 presents the simple correlation between the model's constructs. Because the data are categorical the correlations were calculated by

$$(23) \quad r = \left[ \frac{\phi^2}{\min[(I-1), (J-1)]} \right]^{1/2}$$

with  $\chi^2/n$  being a maximum likelihood estimate of  $\phi^2$  (Bishop, Fienberg, and Holland 1975).

Of particular importance is the association between the intention measure and the psychological constructs. Inspection of Table 43 reveals that there is a statistically significant correlation between intention and each of the psychological factors.

The variables were selected to reflect a particular conceptualization of the hierarchy of effects model which is similar to but not isomorphic with McGuire's formulation (see Figure 1). Moreover, here it is hypothesized that the hierarchy can be succinctly characterized by two

TABLE 43  
CORRELATION MATRIX OF THE MODEL'S FACTORS

	Attention	Message Reaction	Attitude	Message- Evoked Thoughts	Interest
Attention	1				
Message Reaction	.14	1			
Attitude	.25 <sup>a</sup>	.17 <sup>b</sup>	1		
Message- Evoked Thoughts	.29 <sup>a</sup>	.29 <sup>a</sup>	.23 <sup>a</sup>	1	
Interest	.27 <sup>a</sup>	.33 <sup>a</sup>	.29 <sup>a</sup>	.40 <sup>a</sup>	1

<sup>a</sup>( $p < .01$ )

<sup>b</sup>( $p < .05$ )

latent factors: Arousal ( $\theta_1$ ) and Yielding ( $\theta_2$ ). Figure 10 presents the model to be tested. An explanation of each variable and its levels is provided in Figure 11.

The path diagram of Figure 10 indicates that the arousal dimension has three causes: the treatment (T), attention (A), and message reaction (MR). The arousal latent factor  $\theta_1$  in conjunction with message-evoked thoughts (MET) are formative indicators of the yielding dimension  $\theta_2$  which is reflected by attitudes (ATT) and increased product interest (I).

This two factor model would typically be analyzed by forming the multiway table resulting from the cross-classification of the six manifest variables. Relationships between manifest variables and latent factors would be specified by imposing certain restrictions on the conditional probabilities. For example, assume we have a causal system containing four manifest variables (A, B, C, and D) and two latent factors (X,Y) each having two levels as shown in Figure 12. The hypothesis is that variables A and B are associated with X but independent of Y and variables C and D are associated with Y but independent of X. Goodman (1974a) has shown that this model can actually be represented by one latent variable with four classes. In this example, latent classes 1 and 2 refer to X and classes 3 and 4 refer to Y.

As before let  $\pi_{it}^{\bar{A}X}$  denote the conditional probability that an observation will be at level i with respect to variable A given the observation is in the t class of X. Table 44 presents the conditional probabilities associated with the model shown in Figure 12.

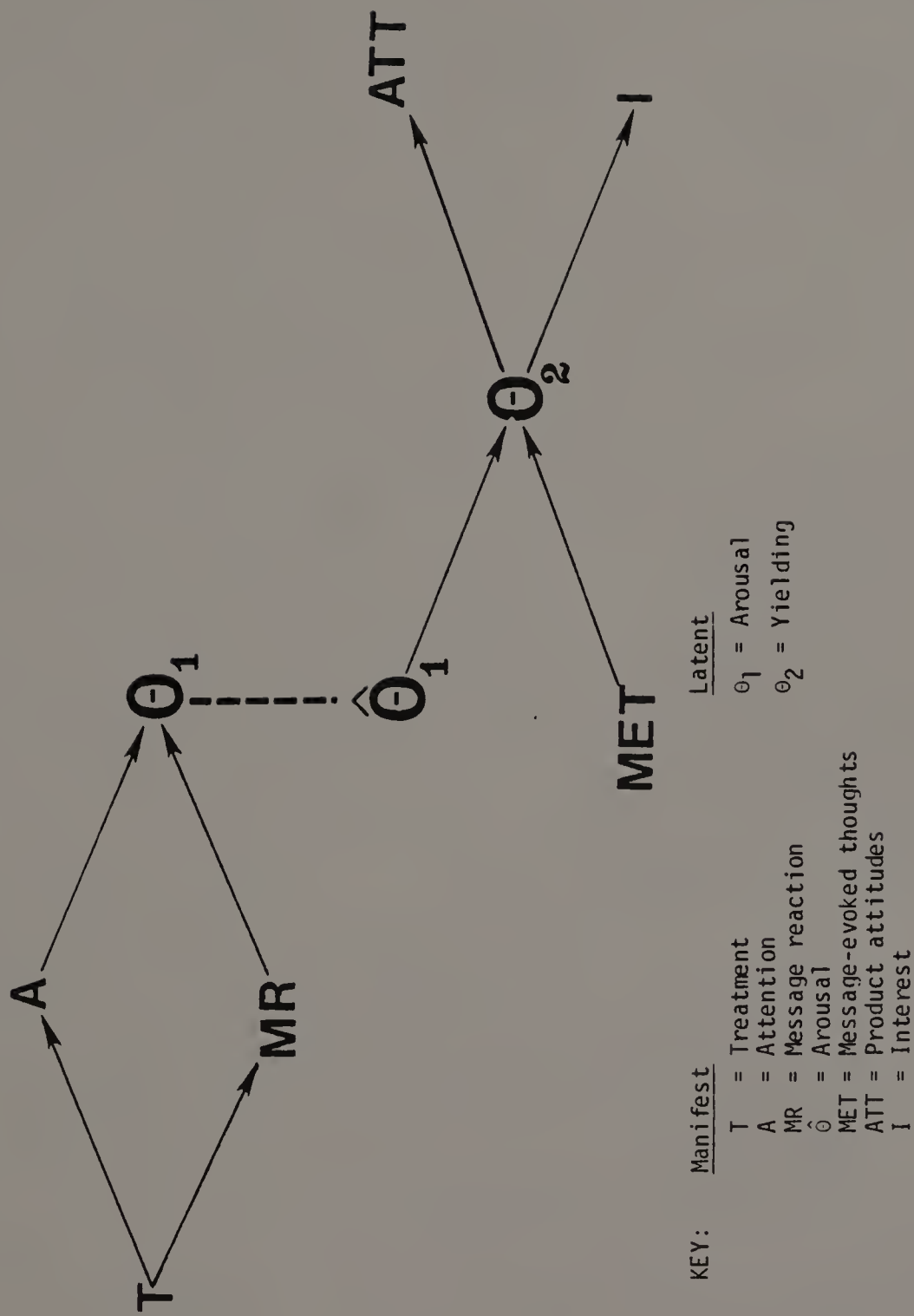


Fig. 10. Construed representation of proposed research model

<u>Symbol</u>	<u>Name</u>	<u>Variable Description</u>	<u>Number of Levels</u>	<u>Level Description</u>
T	Treatment	<u>Treatment Groups.</u> The treatment groups consisted of three commercials for a new dairy product. The treatments differed with respect to method of delivery: two were humorous, the other serious.	3	T <sub>e</sub> : extraneous humor T <sub>p</sub> : product related humor T <sub>s</sub> : serious
A	Attention	<u>Attention Level.</u> Three self-rating dimensions relating to gaining attention, holding attention and overall attention to the entire message were used to categorize subjects into two attention level groups.	2	A <sub>L</sub> : low attention level A <sub>H</sub> : high attention level
MR	Message Reaction	<u>Reaction to the Message.</u> Two self-rating dimensions relating to the "goodness-badness" and the "insulting-uninsulting" nature of the commercial were used to categorize subjects as having one of three types of reactions to the message.	3	(MR) <sub>U</sub> : favorable message reaction (MR) <sub>N</sub> : neutral/mixed message reaction (MR) <sub>F</sub> : favorable message reaction
MET	Message Evoked Thoughts	<u>Thoughts Concerning the Message.</u> Subjects were asked to list their emotions, feelings, thoughts, etc. they had while listening to the commercial. Elicited thoughts were recorded into positive and negative categories. The categories of message evoked thoughts were defined according to the difference between positive and negative thoughts.	3	(MET) <sub>U</sub> : favorable thoughts concerning the message (MET) <sub>N</sub> : neutral thoughts concerning the message (MET) <sub>F</sub> : favorable thoughts concerning the message
ATT	Attitudes	<u>Attitudes Toward Both the Product and Consumption of the Product.</u> Sixteen scales measuring subjects' attitudes toward consumption of the product and fourteen scales measuring attitudes toward the product itself were used to calculate an overall attitude score, according to the Fishbein and Ajzen (1975) formulation. Subjects were then placed into one of three attitude groups.	3	(ATT) <sub>U</sub> : unfavorable attitudes toward consumption and/or the product (ATT) <sub>N</sub> : neutral attitudes toward consumption and/or the product (ATT) <sub>F</sub> : favorable attitudes toward consumption and/or the product
I	Interest	<u>Product Interest.</u> The subjects reported whether the commercial increased their interest in consuming the product.	2	I <sub>N</sub> : No--advertisement did not increase interest I <sub>Y</sub> : Yes--advertisement did increase interest

Fig. 11. Definitions of Variables Used in Analyses

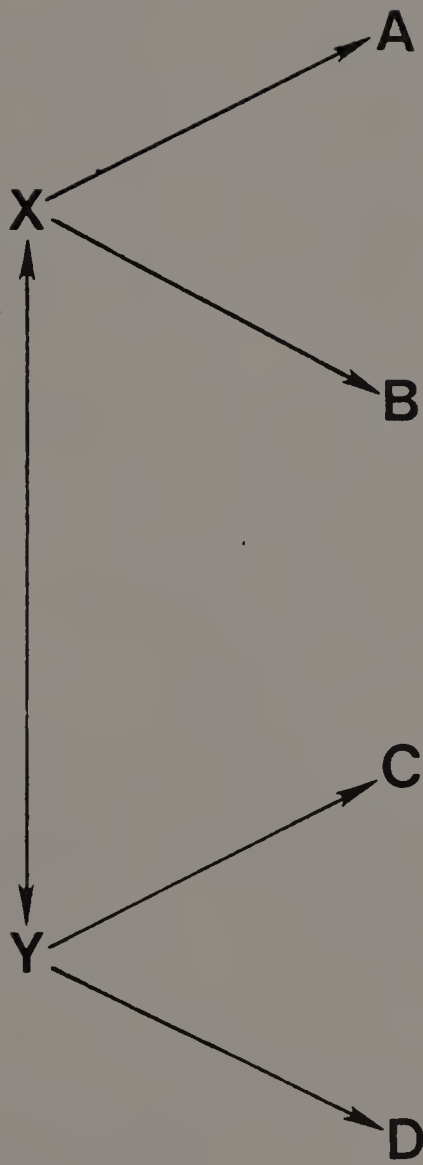


Fig. 12. Path diagram for model with two latent factors



TABLE 44  
LATENT CLASS PARAMETERS FOR TWO LATENTS  
AT TWO LEVELS

Manifest	Latent Class*			
	1	2	3	4
A <sub>1</sub>	$\pi_{11}^{\bar{A}X}$	$\pi_{12}^{\bar{A}X}$	$\pi_{13}^{\bar{A}X}$	$\pi_{14}^{\bar{A}X}$
A <sub>2</sub>	$\pi_{21}^{\bar{A}X}$	$\pi_{22}^{\bar{A}X}$	$\pi_{23}^{\bar{A}X}$	$\pi_{24}^{\bar{A}X}$
B <sub>1</sub>	$\pi_{11}^{\bar{B}X}$	$\pi_{12}^{\bar{B}X}$	$\pi_{13}^{\bar{B}X}$	$\pi_{14}^{\bar{B}X}$
B <sub>2</sub>	$\pi_{21}^{\bar{B}X}$	$\pi_{22}^{\bar{B}X}$	$\pi_{23}^{\bar{B}X}$	$\pi_{24}^{\bar{B}X}$
C <sub>1</sub>	$\pi_{11}^{\bar{C}X}$	$\pi_{12}^{\bar{C}X}$	$\pi_{13}^{\bar{C}X}$	$\pi_{14}^{\bar{C}X}$
C <sub>2</sub>	$\pi_{21}^{\bar{C}X}$	$\pi_{22}^{\bar{C}X}$	$\pi_{23}^{\bar{C}X}$	$\pi_{24}^{\bar{C}X}$
D <sub>1</sub>	$\pi_{11}^{\bar{D}X}$	$\pi_{12}^{\bar{D}X}$	$\pi_{13}^{\bar{D}X}$	$\pi_{14}^{\bar{D}X}$
D <sub>2</sub>	$\pi_{21}^{\bar{D}X}$	$\pi_{22}^{\bar{D}X}$	$\pi_{23}^{\bar{D}X}$	$\pi_{24}^{\bar{D}X}$

\*Note: Classes 1 and 2 pertain to latent factor X; whereas, classes 3 and 4 pertain to latent factor Y.

These conditional probabilities can be used to derive an overall measure of the association between the latent factors and the manifest variables. Let  $\psi_{\cdot T}^{\bar{A}X}$  represent the odds that an observation will be at level 1 rather than level 2 on manifest variable A given that the observation is in class T of latent factor X, where

$$(24) \quad \psi_{\cdot T}^{\bar{A}X} = \pi_{1T}^{\bar{A}X} / \pi_{2T}^{\bar{A}X}$$

Alternatively, these odds ratios can be parameterized and expressed in additive form by taking logarithms. That is,

$$(25) \quad \ln \psi_{\cdot T}^{\bar{A}X} = \beta^{\bar{A}} + \beta_{\cdot T}^{\bar{A}X}.$$

Goodman (1974a) demonstrates how the  $\beta$ -parameter effects can be expressed in terms of the expected cross-product ratio. For example in the case of manifest variable A and latent factor X we have:

$$(26) \quad \beta_{\cdot T}^{\bar{A}X} = 1/2 [ (\ln \pi_{11}^{\bar{A}X_1} + \ln \pi_{22}^{\bar{A}X_1}) - (\ln \pi_{12}^{\bar{A}X_1} + \ln \pi_{21}^{\bar{A}X_1}) ]$$

These  $\beta$ -parameters indicate the association between the latent factor and the manifest variable. By imposing certain restrictions on the conditional probabilities we can insure that specific manifest variables are independent of specific latent factors.

The lower case alphabets in Table 45 are used to denote parameter effects from Table 44 which are set equal to each other. For instance we see that  $\pi_{13}^{\bar{A}X} = \pi_{14}^{\bar{A}X}$ . The matrix of the  $\beta$ -parameter effects, which are analogous to factor loadings in the common factor model, are reported in Table 46.

TABLE 45

RESTRICTION IMPOSED ON ONE FACTOR AT FOUR LEVELS  
TO FIT TWO FACTORS AT TWO LEVELS

Manifest	Latent Class			
	1	2	3	4
A <sub>1</sub>	a	c	i	i
A <sub>2</sub>	b	d	j	j
B <sub>1</sub>	e	g	k	k
B <sub>2</sub>	f	h	l	l
C <sub>1</sub>	m	m	o	p
C <sub>2</sub>	n	n	q	r
D <sub>1</sub>	s	s	u	v
D <sub>2</sub>	t	t	w	x

TABLE 46

STRUCTURE MATRIX (FACTOR LOADINGS) OF LATENT  
FACTORS AND MANIFEST VARIABLES

Manifest	Latent Factor	
	1	2
A	$1/2[\ln(a+d) - \ln(b+c)]$	0
B	$1/2[\ln(e+h) - \ln(g+f)]$	0
C	0	$1/2[\ln(o+r) - \ln(p+q)]$
D	0	$1/2[\ln(u+x) - \ln(v+w)]$

Hence, we see that the loadings are congruent with the path diagram shown in Figure 13. Variables A and B are independent of Y, and variables C and D are independent of X.

The cross-classification of the six manifest variables, characterizing the hierarchy shown in Figure 12, creates a multiway table consisting of 324 cells ( $3 \times 3 \times 3 \times 3 \times 2 \times 2$ ). Table 47 presents the cross-classification of the six manifest variables. What is most striking about the multiway table is the number of sparse cell values. Estimates of parameter effects based upon such sparse cell values would be of questionable validity. This problem of cell sparseness is common in categorical data analysis in general and specifically in experimental settings. Therefore, it becomes necessary to develop some strategy to deal with the sparseness problem (c.f. Dillon, Goldstein and Lement 1981).

Here the problem was handled by analyzing the model in two stages. Essentially, the procedure first fits the arousal latent factor from the cross-classification of treatment (T), attention (A) and message reactions (MR). Upon finding a good fitting model, the original observations are recategorized into the classes of the latent dimensions based on modal probabilities. The new variable is then treated as a manifest variable for fitting the second latent factor.

Fitting the arousal dimension. Arousal is hypothesized to consist of three levels. One level corresponds to subjects having high attention levels to the stimulus and favorable message reactions. However, because it is entirely possible for a subject to also have high

TABLE 47  
CROSS-CLASSIFICATION OF MODEL'S FACTORS

Interest	Attention	Message- Evoked Thought	Message Reaction	Attitude	Treatment			
					1.0	2.0	3.0	
0.0	1.0	1.0	1.0	1.0	3	2	3	
			2.0	2	2	0		
			3.0	2	1	0		
		2.0	1.0	7	3	10		
		2.0	2.0	3	3	6		
		3.0	3.0	2	1	5		
		3.0	1.0	0	0	0		
		2.0	2.0	0	0	2		
		3.0	3.0	0	0	1		
	-----							
			2.0	1.0	1.0	0	0	0
					2.0	0	0	0
					3.0	0	0	0
				2.0	1.0	1	0	1
				2.0	2.0	0	0	1
		3.0		3.0	0	0	1	
		3.0		1.0	0	0	0	
		2.0		2.0	0	0	0	
		3.0		3.0	0	0	0	
-----								
		3.0	1.0	1.0	0	0	0	
				2.0	0	0	0	
				3.0	0	0	0	
			2.0	1.0	1	0	1	
			2.0	2.0	0	0	0	
			3.0	3.0	0	1	0	
			3.0	1.0	0	0	0	
			2.0	2.0	1	0	1	
			3.0	3.0	1	0	1	
-----								
		2.0	1.0	1.0	1	1	0	
				2.0	2	2	1	
				3.0	1	1	0	
			2.0	1.0	1	3	4	
			2.0	2.0	2	2	2	
			3.0	3.0	3	2	1	
			3.0	1.0	1	0	0	
			2.0	2.0	0	0		
			3.0	3.0	0	1		

TABLE 47--Continued

Interest	Attention	Message- Evoked Thought	Message Reaction	Attitude	Treatment		
					1.0	2.0	3.0
		2.0	1.0	1.0	0	0	0
				2.0	0	0	0
				3.0	0	0	0
			2.0	1.0	0	0	0
				2.0	1	0	0
				3.0	0	1	0
			3.0	1.0	0	0	0
				2.0	0	0	0
				3.0	0	0	0
		3.0	1.0	1.0	0	0	0
				2.0	1	0	0
				3.0	0	0	0
			2.0	1.0	0	3	1
				2.0	0	1	1
				3.0	2	0	1
			3.0	1.0	0	0	0
				2.0	0	2	1
				3.0	1	1	0
1.0	1.0	1.0	1.0	1.0	0	0	0
				2.0	0	0	0
				3.0	0	0	0
			2.0	1.0	0	0	0
				2.0	2	2	0
				3.0	0	0	0
			3.0	1.0	1	0	1
				2.0	0	0	0
				3.0	0	0	0
		2.0	1.0	1.0	0	0	0
				2.0	0	0	0
				3.0	0	0	0
			2.0	1.0	0	0	0
				2.0	0	1	0
				3.0	0	0	1
			3.0	1.0	0	0	0
				2.0	0	0	0
				3.0	1	0	0

TABLE 47--Continued

Interest	Attention	Message- Evoked Thought	Message Reaction	Attitude	Treatment			
					1.0	2.0	3.0	
		3.0	1.0	1.0	0	0	0	
				2.0	0	0	0	
				3.0	0	0	0	
			2.0	1.0	0	0	0	
				2.0	2	0	0	
				3.0	0	0	0	
			3.0	1.0	0	0	1	
				2.0	0	0	0	
				3.0	1	0	0	
		-----						
2.0	1.0	1.0	1.0	1.0	0	0	0	
				2.0	0	0	0	
				3.0	1	0	0	
			2.0	1.0	1	1	0	
				2.0	1	1	0	
				3.0	1	1	1	
			3.0	1.0	0	0	0	
				2.0	0	0	1	
				3.0	0	1	0	
		-----						
		2.0	1.0	1.0	0	0	0	
				2.0	0	0	0	
				3.0	1	0	0	
			2.0	1.0	0	0	0	
				2.0	0	0	0	
				3.0	2	1	0	
			3.0	1.0	0	0	0	
				2.0	0	0	0	
				3.0	0	2	0	
		-----						
		3.0	1.0	1.0	0	0	0	
				2.0	0	0	0	
				3.0	0	0	0	
			2.0	1.0	0	1	0	
				2.0	1	2	0	
				3.0	2	2	0	
			3.0	1.0	1	0	0	
				2.0	1	0	0	
				3.0	2	2	1	

The total frequency is 164.

attention levels and negative reactions to the message, a second high arousal class is hypothesized. The third latent class is posited to consist of neutral/mixed message reactions and low attention levels which corresponds to a low arousal class. Therefore, the arousal latent factor is posited to be characterized by three classes:

- class 1 = high positive arousal ( $\theta_H^+$ ),
- class 2 = high negative arousal ( $\theta_H^-$ ), and
- class 3 = low arousal ( $\theta_L$ ).

Prior to fitting the three class model, a two class model was fit. Table 48 presents the parameter estimates for the unrestricted two class model.

The fit of the model was good (likelihood ratio chi-square of 13.4 with seven degrees of freedom), but the parameter estimates for the attention factor contain zeros and ones. To check if these estimates were terminal values, the initial estimates of the conditional probabilities were reversed. Table 49 presents the new parameter estimates.

Again, the fit is acceptable ( $\chi^2=13.3$ ), but now two of the parameter estimates for the treatment variable are zeros. This pattern suggests that the two class model is bouncing between local maximums. Consequently, the posited three class model is now fit.

Table 50 presents the restrictions imposed on the conditional probabilities to test the hypothesized arousal latent factor. The conditional probabilities for the treatment variable were left free because subjects' reactions to humor type, or lack of humor, were not known or easily estimated. Moreover, since the effects of humor are the variable



TABLE 48  
 PARAMETER ESTIMATES FOR THE UNRESTRICTED  
 TWO CLASS MODEL

	Latent Class	
	1	2
$T_e$	0.3659	0.3659
$T_p$	0.1951	0.4147
$T_s$	0.4390	0.2195
$(MR)_U$	0.1829	0.1463
$(MR)_N$	0.6707	0.5976
$(MR)_F$	0.1463	0.2561
$A_L$	0.9999	0.0000
$A_H$	0.0001	1.0000

TABLE 49  
 PARAMETER ESTIMATES FOR THE UNRESTRICTED TWO CLASS MODEL  
 SUBSEQUENT TO CHANGES IN THE STARTING VALUES

	Latent Class	
	1	2
$T_e$	0.4512	0.2591
$T_p$	0.5488	0.0000
$T_s$	0.0000	0.7409
$(MR)_U$	0.2271	0.0865
$(MR)_N$	0.5986	0.6786
$(MR)_F$	0.1743	0.2349
$A_L$	0.3581	0.6773
$A_H$	0.6419	0.3227

TABLE 50  
 RESTRICTIONS IMPOSED ON THREE CLASS MODEL  
 TO FIT AROUSAL DIMENSION

Manifest	Latent Class		
	1	2	3
$T_e$	0*	0	0
$T_p$	0	0	0
$T_s$	0	0	0
$(MR)_U$	.2	0	0
$(MR)_N$	0	0	.7
$(MR)_F$	0	.2	0
$A_L$	.2	.2	0
$A_H$	0	0	0

\*Note: 0 implies free parameter.

of interest here, the unrestricted estimates of the conditional probabilities of the  $i^{\text{th}}$  treatment for the  $t^{\text{th}}$  restricted latent class in relation to the other two variables provides information about the individual effects of humor type. That is, since the three classes of the hypothesized arousal dimension have been restricted in terms of attention and message reaction, all that remains in terms of understanding humor's effects is whether or not a specific class of the arousal factor is associated with a particular treatment level.

Table 51 reports the parameter estimates. The fit of the model, especially in light of its restrictive nature, is acceptable. The unrestricted three class model is not identified since  $(IJK-1) = (I+J+K-2)3-1$  (the necessary condition is  $(IJK-1) > (I+J+K-2)3-1$ ). However, there were five restrictions imposed and three conditional probabilities which had terminal values equal to zero ( $\theta_{22}^{\bar{1}X}$ ,  $\theta_{31}^{\bar{1}X}$ ,  $\theta_{32}^{\bar{1}X}$ ), which provides eight degrees of freedom for the model. The likelihood ratio chi-square and the Pearsonian chi-square were 14.32 and 12.29, respectively, thus the restricted model appears congruent with the data. As before with resulting zero estimates the initial starting values for the treatment variable were reversed. The resulting parameter estimates indicated these zero estimates appeared to represent terminal values. In addition, the pattern of conditional probabilities provides a rather clear interpretation of the three latent classes. The two high arousal classes (1 and 3) are associated with humorous treatments, whereas the low arousal class is associated with the serious treatment. Consequently, there appears to be a relationship between humor and arousal. Now

TABLE 51  
PARAMETER ESTIMATES FOR THREE CLASS RESTRICTED MODEL

Manifest	Latent Class		
	1	2	3
$T_e$	.1046	1.0000	.3595
$T_p$	.8954	.0000	.1149
$T_s$	.0000	.0000	.5256
$(MR)_U$	.2000	.4110	.1074
$(MR)_N$	.5452	.3890	.7000
$(MR)_F$	.2048	.2000	.1926
$A_L$	.2000	.2000	.6655
$A_H$	.8000	.8000	.3345

the effects of humor on yielding will be assessed through the arousal factor.

Fitting the yielding dimension. In stage one a 3 class latent model was fit to the cross-classification of Treatment (T), Message reaction (MR), and Attention (A). The fit of the model was good: 82 percent of the subjects were correctly allocated into the latent classes. It is therefore possible to assign, i.e., predict, latent membership on the basis of the estimated modal probabilities. The assignment of subjects among the three arousal classes is shown in Table 52.

These predicted class memberships are now used to create a new variable  $\hat{\theta}_1$ , which is used to test the second phase of the model.  $\hat{\theta}_1$  is now cross-classified with the remaining manifest variables, message-evoked thoughts (MET), attitudes (ATT) and interest (I) in order to fit the yielding latent factor.

The yielding factor is hypothesized to consist of two classes: yes or no. Table 53 reports the restrictions imposed on the conditional probabilities. In words, these restrictions (i.e., hypothesis tested) state:

1. There exist two latent yielding classes which correspond to yes or no.
2. The "no" class is characterized by unfavorable or neutral message-evoked thoughts, unfavorable or neutral attitudes, low or negative arousal and no increase in product interest.
3. The yes class is characterized by neutral or favorable message-evoked thoughts, neutral or favorable attitudes, high positive arousal and increased interest in the product. Notice that the neutral level of the trichotomous variable is free for both latent

TABLE 52

ASSIGNMENT OF SUBJECTS INTO CLASSES OF  
THE AROUSAL LATENT DIMENSION

Treatment	Message Reaction	Attention	Latent Class	Modal Probability
E	U	L	2	.6072
P	U	L	3	.6442
S	U	L	2	1.0000
E	N	L	2	.8969
P	N	L	2	.5475
S	N	L	2	1.0000
E	F	L	2	.8363
P	F	L	3	.5082
S	F	L	2	1.0000
E	U	H	1	.7498
P	U	H	3	.9351
S	U	H	2	1.0000
E	N	H	2	.5223
P	N	H	3	.8680
S	N	H	2	1.0000
E	F	H	1	.4889
P	F	H	3	.8916
S	F	H	2	1.0000

Total observations: 164  
 Percent correctly classified: 82.24  
 Lambda: .5245

E = Product unrelated humor  
 P = Product related humor  
 S = Nonhumor  
 U = Unfavorable  
 N = Neutral  
 F = Favorable  
 L = Low  
 H = High

TABLE 53  
 RESTRICTIONS IMPOSED ON TWO CLASS MODEL  
 TO FIT YIELDING DIMENSION

Manifest	Latent Class	
	1	2
$\hat{\theta}_H^+$	0.00	0.00
$\hat{\theta}_H^-$	0.10	0.10
$\hat{\theta}_L$	0.00	0.00
(ATT) <sub>U</sub>	0.00	0.10
(ATT) <sub>N</sub>	0.00	0.00
(ATT) <sub>F</sub>	0.10	0.00
(MET) <sub>U</sub>	0.00	0.10
(MET) <sub>N</sub>	0.00	0.00
(MET) <sub>F</sub>	0.10	0.00
$I_N$	0.00	0.20
$I_Y$	0.20	0.00

classes. This conforms to the specifications for describing an ordered latent set forth by Clogg (1981).

Table 54 presents the parameter estimates for the two class yielding model. The fit of the model is acceptable; there are 46 degrees of freedom and the likelihood ratio chi-square and the Pearsonian chi-square are 55.3 and 66.17, respectively.

Further insight into the effects of the manifest variables on the yielding dimension are provided by examining the log-odds of being in the class of the latent factor given the subject is at a particular level of a manifest variable. Table 55 presents the log-odd estimates.

The interpretation is quite clear: an individual characterized by high arousal, favorable attitudes, neutral or favorable message-evoked thoughts and increased product interest displays greater odds at yielding. Also, the effects of humor on the latent yielding dimension are traceable through the arousal factor. The first three rows of Table 51 report the estimated parameters. The conditional probabilities of being at level  $i$  of the treatment given the individual is in the  $T^{\text{th}}$  class of the arousal factor. Clearly, the two high arousal classes are associated with the two humorous treatments ( $\Pi_{12}^{\bar{T}01}=1.0$  and  $\Pi_{31}^{\bar{T}01}=.90$ ).

Although the two class model was posited, a three class model was also fit. Similar to the three class model for the arousal dimension, some of the resulting parameter estimates were either zero or one. The same evaluation as described for the two class arousal model was utilized to determine if the zero or one estimates were terminal values. Again the procedure indicated that the three class model was bouncing between local maxima.



TABLE 54  
PARAMETER ESTIMATES FOR TWO CLASS RESTRICTED MODEL

Manifest	Latent Class	
	1	2
$\hat{\theta}_H^+$	.1000	.4056
$\hat{\theta}_H^-$	.0591	.1000
$\hat{\theta}_L$	.8409	.4944
$(ATT)_V$	.4757	.1000
$(ATT)_N$	.4243	.1993
$(ATT)_F$	.1000	.7007
$(MET)_V$	.8647	.1000
$(MET)_N$	.0353	.2932
$(MET)_F$	.1000	.6068
$I_N$	.8000	.2000
$I_Y$	.2000	.8000

TABLE 55

LOG-ODDS OF BEING IN "YES" CLASS FOR LEVELS OF ATTITUDE,  
MESSAGE EVOKED THOUGHTS AND INCREASED INTEREST

Manifest	Log-Odds
$\hat{\theta}_H^+$	1.400
$\hat{\theta}_H^-$	.525
$\hat{\theta}_L$	- .531
(ATT) <sub>U</sub>	-1.517
(ATT) <sub>N</sub>	- .756
(ATT) <sub>F</sub>	1.947
(MET) <sub>U</sub>	-2.157
(MET) <sub>N</sub>	2.117
(MET) <sub>F</sub>	1.80
I <sub>N</sub>	-1.386
I <sub>Y</sub>	1.386

Recapitulation: Proposition eight. Here the effects of humor were traced through a hierarchy of effects paradigm characterized by six manifest variables and two latent factors. Because of extreme cell sparseness in the original multiway table (70 percent of the cells were empty), the model was analyzed in two stages.

It was shown that humor was associated with both high arousal and yielding, which suggests that humor is an effective medium in persuasive communications.

## C H A P T E R V I

### CONCLUDING REMARKS

#### Discussion

The goal of this research was to empirically test the effects of humor on cognitive actions inherent to a hierarchy of effects or information processing paradigm of the communication process. These cognitive actions (e.g., attention, comprehension, retention, yielding, etc.) are believed to be sequential in nature. Persuasion can be viewed as the completion of all stages. Past research has examined the impact of humorous messages on each of these cognitive actions. To this researcher's knowledge, no studies have examined the overall impact of humorous stimuli on the sequential process, especially not in an advertising context.

Markiewicz (1974), based on her review of the relevant literature, noted that there appeared to be no apparent significant differences due to humor for acceptance, retention, and message comprehension. However, Markiewicz did note that humor appeared to be more interesting, which possibly implied an increase in attention. Unfortunately, the statements that Markiewicz was able to make were severely limited by the lack of experimental controls in the prior humor research. With respect to the advertising community her statements have been further limited by the non-marketing messages employed in prior research. Based upon a similar literature review, Sternthal and Craig (1973) posit that humorous appeals appear to be more more persuasive and may actually

detrimentally affect comprehension, but humorous messages appear to heighten attention. As in the case of the Markiewicz review, the conclusions drawn by Sternthal and Craig (1973) were based upon a very limited and flawed group of studies. This study attempted to compensate for some of the limitations of prior studies by adhering to stringent experimental controls while using advertising as the focus of the humorous message appeal. Thus a more rigorous examination of the effects of humor in an advertising context is possible. Interestingly enough, for the most part the results presented in Chapter IV, for the tests of Propositions one through four, which analyzed the effects of humor on attention, comprehension, and retention, were consistent with the tentative statements of Markiewicz (1974) and Sternthal and Craig (1973).

Attention. The product related humorous commercial captured greater levels of attention than did the nonhumorous commercial. However, the product related humorous commercial also generated greater levels of attention than the product unrelated humorous commercial, and there was no appreciable difference in attention levels between the product unrelated humorous commercial and the nonhumorous commercial. Hence, type of humor, i.e., format or style, moderates the relationship between humor per se and attention.

Markiewicz (1974) posited that the greater attention levels generated by humorous stimuli was because these stimuli were perceived as more interesting than the nonhumorous stimuli. The product related humorous commercial was perceived, along a seven point semantic differential scale, as more interesting than the other commercials.

This research supports the commonly accepted notion that "humor attracts attention" in an advertising context. However, this effect is moderated by how interesting the humor is perceived to be. Hence if humorous stimuli are perceived as interesting, a greater weight, as compared to other stimuli, may be assigned. In such cases, the individual's information processing system may be activated which creates a barrier for other stimuli to surpass.

Cantor and Venus (1980) tested whether humorous commercials were more effective when placed within a serious program context vis-à-vis a humorous program context. Novel stimuli elicit specific patterns of physiological responses (i.e., the orientation reaction) which are characterized by heightened attention and information processing. Hence if a humorous message is perceived as more novel when placed within a humorous context, the commercial should be more effective in the serious context.

Cantor and Venus found that mean recall scores did not differ significantly between the serious and humorous context. This lack of effect due to the program context in which the commercial was placed was also supported in this research. The attention levels of the humorous commercials were not greater when the humorous commercial was placed within a serious program context than when inserted within a humorous program context.

Comprehension. The comprehension process was analyzed using two outputs of the process itself, namely salient beliefs and recall.

Cantor and Venus found recall levels to be greater for a serious message than a humorous message. In this research, however, this finding is, if at all, only slightly supported. There was no difference in recall among treatments for the new product sample. In the established product sample a mild statistically significant effect was found. Subsequent analyses indicated that no clear decision as to the effectiveness of the nonhumorous commercial was possible. The highest level of recall was for the nonhumorous commercial. Three subjects recalled five of the six product specific arguments communicated. However, the humorous commercials were also effective in that ten subjects recalled four of the six arguments.

Sternthal and Craig (1973) advocated that humor would detrimentally affect comprehension of message content. In a similar fashion, Cantor and Venus (1980) purported that humor may attract attention but the subjects would selectively attend only to the humor and not attend to the nonhumorous elements of the commercial. This notion of humor detrimentally affecting comprehension was not supported in this research.

Analyzing the different elicited salient beliefs showed some difference among treatments primarily in the new product sample, but the differences were not great enough to warrant a conclusion that the comprehension process was hindered due to the use of humor.

For the new product, in many instances, the nonhumorous message and the product unrelated humorous commercial were similar to each other and both were dissimilar to the product related humorous commercial,

especially with respect to salient beliefs. Hence although the humor does not appear to affect the processing of the message's content, subjects exposed to the product related humorous commercial did report, to a minor degree, different advantages of consuming Sweet Acidophilus Milk than subjects exposed to the other two commercials. It should be noted that the different beliefs elicited were not negative for any of the commercials, just different. Therefore when the message's content (i.e., product specific arguments) was communicated in a humorous manner, different salient beliefs were formed than when the message's content was communicated in a nonhumorous fashion. This similarity among treatments was also present for the attention measures. The slight differences among salient beliefs may be due to a direct effect of the humorous commercials or operate indirectly through attention levels.

Source. Markiewicz (1974) reports that the effects of humor on perceptions of the source are inconclusive, while Sternthal and Craig (1973) advocated that humor tends to enhance source credibility and/or liking of the source. In this research, the perceived trust of the source was evaluated for humorous commercials. Overall the product-related humorous treatment was perceived as less trustworthy than the other two commercials. This effect was slightly more pronounced for the new product. Hence, the use of humor apparently can detract from the trustability of the source.



Overall analysis. The effects of humorous commercials on the cognitive actions of attention, comprehension, retention, and ratings of source in this research are for the most part consistent with statements about the effects of humor made by the authors of the two most comprehensive reviews. However, analyses conducted individually at each step of the communication hierarchy ignore the fact that evaluation of one commercial in relation to another relevant to persuasion must analyze all of these effects simultaneously, because persuasion is viewed as the completion of all actions and not any potential subset. McGuire emphasizes this notion when he states that persuasion (i.e., the probability of behavior) is the scalar product of the probabilities of all the preceding stages.

The results presented in Chapter V analyze the effects of humorous stimuli on the persuasion process, where the persuasion process is typified by a hierarchy of effects model. The results in this chapter suggest that humor was effective at increasing the likelihood of behaving on the basis of formed beliefs. Moreover, the effectiveness of humor was more strongly supported when the analysis captured the entire persuasion process rather than individual steps within the process.

The model presented in Chapter V examined the causal linkages between humorous commercials and the persuasion process. Three intention-type measures were collected from respondents. The measure chosen as the overall criterion variable in the model was the response to the question: "The advertiser tried to increase your interest in drinking Sweet Acidophilus Milk. Did she/he succeed?" Responses were coded as

simple yeses or noes. This measure was selected because (1) the response is more related to intention as a function of the message and (2) initial analysis on the more standard intention measures exhibited little variance among treatments.

The causal linkages in Chapter V were tested for only the Sweet Acidophilus milk sample. The milk sample was not included in this stage of the analysis because of the potential strength of prior beliefs. That is, with only two exposures to one of the commercials for milk the subjects' experiences with such a well-known product could vastly overshadow any effects of the message on intention. The crosstabulation of treatments with both intention measures indicated no statistically significant differences among treatments for the milk sample. The Sweet Acidophilus milk sample did achieve statistical significance for the increased interest measure.

Essentially, the causal linkages proposed are that arousal leads to yielding and humor leads to arousal. Yielding, a latent factor, is reflected by measurements on both attitudes and the intention measure. Hence if humor is associated with arousal and arousal is associated with yielding, one may conclude that for the commercials tested in this research, humor was effective. The data supported these relationships.

It is important to note that the "yes" class of yielding was associated with (1) favorable attitudes, (2) favorable message-evoked thoughts, (3) high arousal and (4) increased interest. These associations indicate that those subjects with an overall favorable response to the commercial were persuaded. Arousal was hypothesized to consist of

three classes, two high classes and one low class. The two high classes were associated with high attention but one of the high arousal classes was associated with a favorable message reaction, whereas the other class was associated with a negative message reaction.

Recently (cf. Bartos 1979; Shimp 1980; Mitchell and Olson 1981) interest has centered on subjects' attitude or beliefs about the advertisement as a potential covariate with intention moderating the effects of product attitudes. The high negative arousal class represented this possible situation. Subjects reported high attention to the commercials, but they also reported unfavorable reactions to the commercial, that is, they considered the commercial to be bad and insulting. The latent structure analysis rendered a clear interpretation of this arousal dimension. The product related humorous commercial was associated with the high positive arousal class, the product unrelated humorous commercial was associated with the high negative arousal class, and the nonhumorous commercial was associated with the low arousal class. Subsequent analysis of the association of the arousal latent dimension with yielding produced interesting and surprising results. Both of the high arousal classes were associated with yielding. The high positive class was clearly the dominant commercial, in terms of log-odds, for the "yes" yielding class. The high negative arousal class, however, was also associated more with the "yes" class than with the "no" class. Hence in this research a negative reaction to the message did not hinder persuasion; in fact, it was a facilitator. The product unrelated humorous commercial injected Henny Youngman type "one liners" into an otherwise

nonhumorous commercial. Perhaps the subjects reacted negatively to humor but the humor heightened their attention and this (heightened attention) facilitated the processing of the commercial's product specific arguments, which aided the persuasiveness of the message.

Audience characteristics. Sternthal and Craig (1973) posited that audience characteristics may confound the effects of humor. One audience characteristic that has been empirically addressed in the marketing literature is the effect of subjects' gender. Shama and Coughlin (1979) found that subculture (black versus white) and social class were related to subjects' reactions to humorous commercials but gender was not. Whipple and Courtney (1980) found only one of four sets of humorous advertisement evaluations to be statistically different for communication effectiveness scores between males and females. Madden and Weinberger (1982), utilizing Starch recall scores, found statistically significant differences for both black versus white audiences and male versus female audiences.

In this research, no effects of sex were detected. However, it must be remembered that the subjects for this research were college students and it can well be argued that college students, even of different sex, do not constitute different audience profiles for the processing of humorous versus nonhumorous commercials. Also, before more substantive conclusions about this potential confound can be made, divergent types of humor must be tested. Differential effects for audiences of different profiles (e.g., male versus female audiences) should

result because members of one profile perceive the humor as more interesting than members of another profile.

Product effects. All of the analyses presented in Chapter IV were conducted for two products, namely one new and one mature. However, both products were convenience items and the new product is more similar to an adaptive replacement rather than a real innovation. In this research, only moderate differences were detected for different products. Hence the effects of humor were as effective for the new product as for the established product. It was posited in proposition nine that humor would be less effective for a new product because the subject has to process new message related beliefs about a product in addition to the humor. Because both the humor and a new product are novel, their interaction could create excess arousal lowering attention which would hinder subsequent information processing. Although the messages for Sweet Acidophilus Milk were perceived as more complex than the messages for milk, both product messages were perceived as more simple than complex. Perhaps the message arguments for the new product were not complex enough and the subjects encountered no problem in processing both the humor and the product arguments.

Cognitive response. Markiewicz (1974) noted that in general researchers have ignored theories relevant to the effects of humor on persuasion. She posits that learning theory may be capable of explaining the effects of humor on persuasion. She states, "Humor may operate as an unconditioned stimulus in a classical conditioning sense. That is, if humor

elicits a positive affective response, a message paired with the humor might eventually elicit a positive (agreeing) response" (Markiewicz 1974, p. 418). The product related humorous commercial was most effective at persuasion and also received the most favorable cognitive responses. Potentially the humor does act as a reward in the spirit of a standard learning paradigm which increases the likelihood of persuasion. This notion is consonant with the conclusion of Sternthal and Craig (1978, p. 17) that the more a humorous context functions as a positive reinforcer, the more effective the humorous persuasion.

It should be noted that proposition two tested for differences in attention due to different program contexts (humorous versus nonhumorous). No statistically significant differences were found for the program main effect. To the extent that program context also acts as a reward, this notion is not supported. It is, however, possible that the humor within the commercial is more directly paired with the message content.

### Conclusions

The effectiveness of humorous commercials was assessed by (1) analyzing the effects of humorous versus nonhumorous commercials on separate cognitive actions inherent to the persuasion process and (2) by comparing the humorous versus nonhumorous commercials in terms of the entire persuasion process.

Analyzing the cognitive actions separately led to the conclusion that the humorous commercials did attract greater attention levels and

did increase the subject's interest in consuming the product, but no severe differential effects existed for the other cognitive actions tested. When the humorous versus nonhumorous commercials were tested in terms of the entire persuasion process, however, the effectiveness of the humorous commercials was more strongly supported. Hence it is concluded that humor does facilitate the persuasion process and this facilitation is primarily due to heightened attention levels. These conclusions are severely limited to the types of humor used and the products tested. Also, comparing commercials in terms of the entire persuasion process exposed the effectiveness of one commercial relative to another in a more informative way than when the commercials were analyzed for each of the stages of the persuasion process separately.

#### Limitations

As with most all laboratory research using college students as subjects, the generalizability of results is seriously limited. The major limitation of the laboratory in this research is the reactive arrangements. For example, we know that attention levels are artificially heightened. This does not affect the internal validity of the research because this is equivalent across treatments. Still, whether the results found in this research will persist in a more natural setting is not known. If the results do not persist, then the conclusions concerning the use of humor found in this research provide no useful information to the marketing strategist who must use humor in a natural setting.

The typical limitations of this type of research are varying message content and commercials which are not representative of conventional advertising. Common limitations of this variety were controlled in this research by extensive pretesting and professional development of the commercials. Although all commercials were professional developed, the product related humorous commercial may be more representative of conventional advertising than the other commercials. The product related humorous commercial copied an existing commercial, while the other two commercials were created to be as homogeneous, in terms of information communicated, as possible to the product related humorous commercial.

A potential limitation is the measure of attention. In this research three self-report measures of attention were employed. The content validity of the measure was ascertained, but, more sophisticated measures of validity were not possible. The measures demonstrated good reliability using Cronbach's alpha, and the upper limit of validity of the attention measures is healthy but still unknown.

The results are also limited to radio commercials as this was the only medium used to present the commercials. Because other media (e.g., print, television, etc.) require different types of information processing, at least in terms of modalities, the effects discovered in this research may or may not exist for humorous commercials communicated by a different medium.



### Quo Vadis

The role of humor in advertising presents a propitious topic area for both the theoretician and the empiricist. The issues presented here are by no means exhaustive of potential research; they merely represent what this researcher considers as salient future issues.

1. Do the effects of humorous commercials persist in naturalistic settings?
2. Can humor be utilized to communicate complicated message arguments?
3. Are different types of humor more effective for different audience profiles?
4. Is humor less effective for one source than another (e.g., a liked source versus a disliked source)?
5. What are the effects of humor for different types of product classes?
6. Can the effects or lack of effects of humor be theoretically explained?
7. What are the effects of humorous commercials for media other than radio?
8. Do humorous commercials wear out at a faster rate than nonhumorous commercials?

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APPENDIX A  
SCRIPTS

Humor Related - Milk

AMB: "CHARMING PARTY MRS. UPTIGHT!"

MRS: "THANK YOU AMBASSADOR . . . OH CHARLES . . ."

CHAS: "YES?"

MRS: "BRING THE AMBASSADOR A DRINKY."

CHAS: "HERE YOU ARE, SIR."

AMB: "THIS ISN'T A DRINKY . . . THIS IS MILK DISGUISED AS A DRINKY!"

CHAS: "THAT'S RIGHT! AND I AM NOT CHARLES, I AM THE MILKMAN DISGUISED AS CHARLES!"

BOTH "OH NO!"

MRS: "GOOD HEAVENS, AND WITHOUT AN INVITATION."

CHAS: "THAT'S THE PROBLEM DEAR LADY, ONE FORGETS TO INVITE MILK TO SOCIAL OCCASIONS."

MRS. "BUT MILK IS FOR WITTLE CHILDREN!"

CHAS: "WRONG!"

AMB: "MILK IS NOT FOR GROWN-UP PEOPLE WHO GO TO DRINKY PARTIES."

CHAS: "WRONG AGAIN! ADULTS NEED HELP IN BUILDING STRONG, HEALTHY BODIES!"

MRS: "AHH-H"

CHAS: "WHAT'D I SAY?"

AMB: "YOU SAID 'BODIES' IN FRONT OF MRS. UPTIGHT."

CHAS: "DOESN'T SHE HAVE ONE?"

AMB: "NO!"

CHAS: "OH . . . WELL AS MILKMAN IT IS MY DUTY TO REMIND ALL OF YOU THAT MILK HAS CALCIUM FOR BUILDING BONES, AND VITAMIN A FOR MAKING HEALTHY SKIN."

MRS &  
AMB: (OUTRAGED SOUNDS) "GOOD GRIEF!"

CHAS: "KNOCK IT OFF!"

MRS: "WHAT DO YOU WANT FROM US?"

CHAS: "A SIMPLE PLEDGE TO REMEMBER THAT MILK IS AN EXCELLENT SOURCE  
OF NUTRITION REGARDLESS OF AGE ("YES") . . . SOCIAL STATUS  
("YES") . . . OR SEX!"

AMB: "MRS UPTIGHT FAINTED INTO THE SALMON LOAF!"

CHAS: "OF ALL THE THINGS YOU DO TO YOUR BODY, MAKE SURE ONE OF THEM  
IS MILK."

This message brought to you by The California Milk Association.

Humor Unrelated - Milk

- TOM: "O.K., MILK FOR ADULTS TAKE 12. NOW RALPH, PLEASE TRY TO BE QUIET THIS TIME."
- RALPH: "BUT WOW, I NEVER GOT TO PRACTICE IN FRONT OF A REAL MICROPHONE BEFORE!" (JOKE #1)
- TOM: "WE'RE ON - HI - WHEN'S THE LAST TIME YOU ENJOYED A FRESH, TALL GLASS OF MILK? YOU KNOW, MILK'S NOT JUST FOR KIDS ANYMORE."
- RALPH: "I GOT IT!" (JOKE #2)
- TOM: "UH . . . IF YOU ARE AN ACTIVE ADULT YOU MAY BE UNAWARE THAT YOU STILL NEED CALCIUM FOR YOUR BONES AND THAT THE VITAMIN A IN MILK HELPS KEEP SKIN HEALTHY AND YOUNG LOOKING!"
- RALPH: (EXCITED) (JOKE #3)
- TOM: (EMBARRASSED) "YES, MILK IS AN EXCELLENT SOURCE OF NUTRITION REGARDLESS OF AGE, SEX, OR SOCIAL STATUS. SO NEXT TIME YOU HAVE A PARTY . . ."
- RALPH: "PARTY!" (JOKE #4)
- TOM: ". . . OR JUST HAVE FRIENDS OVER, DON'T BE AFRAID TO SERVE MILK, THE DRINK THAT IS FOR ADULTS ON THE GO, AND DO EVERYBODY A FAVOR!"
- RALPH: "HEY, EVERYBODY!" (JOKE #5)
- TOM: (DISGUSTED) "MILK'S NOT JUST FOR KIDS ANYMORE. TAKE RALPH . . . PLEASE!"

This message brought to you by the California Milk Association.

Non-Humor - Milk

"WHEN'S THE LAST TIME YOU ENJOYED A REFRESHING, TALL GLASS OF MILK? YOU KNOW, [MILK'S] NOT JUST FOR KIDS ANYMORE. IF YOU ARE AN ACTIVE ADULT, YOU MAY BE UNAWARE THAT MILK CAN PROVIDE YOU WITH MANY ESSENTIAL NUTRIENTS THAT CAN HELP YOU FEEL BETTER AND LOOK BETTER TOO. THOSE STRONG BONES YOU BUILT WITH THE HELP OF MILK WHEN YOU WERE A CHILD STILL NEED CALCIUM NOW TO MAINTAIN THAT STRENGTH. MILK'S ABUNDANT VITAMIN A HELPS KEEP SKIN HEALTHY AND YOUNG-LOOKING. IN FACT, MILK IS AN EXCELLENT SOURCE OF NUTRITION REGARDLESS OF AGE, SEX, OR SOCIAL STATUS. SO NEXT TIME YOU HAVE A PARTY OR JUST HAVE FRIENDS OVER, DON'T BE SHY; SERVE THEM MILK, THE DRINK THAT IS FOR ACTIVE ADULTS, AND DO EVERYONE A FAVOR!"

This message brought to you by the California Milk Association.

Humor Related - Sweet Acidophilus Milk

AMB: "CHARMING PARTY MRS. UPTIGHT."

MRS: "THANK YOU AMBASSADOR. OH CHARLES . . ."

CHAS: "YES?"

MRS: "BRING THE AMBASSADOR A DRINKY"

CHAS: "HERE YOU ARE, SIR."

AMB: "THIS ISN'T A DRINKY, THIS IS MIL DISGUISED AS A DRINKY!"

CHAS: "THAT'S RIGHT, AND I AM NOT CHARLES, I AM THE MILKMAN DIS-  
GUISED AS CHARLES!"

BOTH: "OH NO!"

CHAS: "BUT THIS IS NOT REGULAR MILK . . . NO MAM, THIS IS SWEET  
ACIDOPHILUS MILK."

BOTH: "WHAT?"

CHAS: "IT HAS ALL THE GOODNESS OF LOWFAT MILK AND, LIKE YOGURT, IT  
CONTAINS A SPECIAL CULTURE."

MRS: "CULTURE?"

CHAS: ". . . THAT HELPS MAINTAIN THE ESSENTIAL BACTERIA IN YOUR  
LOWER TRACT."

BOTH: (OUTRAGED SOUNDS)

CHAS: "WHAT'D I SAY?"

AMB: "YOU SAID LOWER TRACT IN FRONT OF MRS UPTIGHT."

CHAS: "SHE DOESN'T HAVE ONE?"

AMB: "NO!"

CHAS: "OH, WELL AS MILKMAN IT IS MY DUTY TO INTRODUCE YOU TO THIS  
WONDERFUL NEW PRODUCT. SWEET ACIDOPHILUS MILK PUTS BACK  
INTO YOUR DIGESTIVE . . . AH . . . THAT SYSTEM PROCESSED  
FOODS TAKE OUT."

MRS: "BUT SWEET ACIDOPHILUS - IT SOUNDS SO AWFUL!"

CHAS: "ON THE CONTRARY MADAM, IT TASTES JUST LIKE REGULAR MILK AND HAS ALL THE VITAMINS A & D OF MILK."

MRS: "BUT WHAT DO YOU WANT FROM US?"

CHAS: "A SIMPLE PLEDGE TO REMEMBER THAT NOW THERE'S A WAY TO COMBAT THE RAVAGES OF THE MODERN AMERICAN . . . AHH . . . CUISINE."  
"AHH . . . COULD I HAVE THAT TRAY OF MINIATURE PIZZA ROUNDS?"

MRS: "OH MY GOD!"

CHAS: "WHAT'S WRONG NOW?"

AMB: "THOSE ARE IMPORTED CAVIAR, MY DEAR SIR. MRS UPTIGHT HERE . . . OH NO SHE'S FAINTED INTO THE SALMON LOAF."

CHAS: "OF ALL THE THINGS YOU DO TO YOUR BODY MAKE SURE ONE OF THEM IS SWEET ACIDOPHILUS MILK. JUST 3-4 CENTS MORE THAN MILK."

This message brought to you by the California Milk Association.



Humor Unrelated - Sweet Acidophilus Milk

- TOM: "O.K. SWEET ACIDOPHILUS MILK TAKE 12. NOW RALPH, PLEASE TRY TO BE QUIET THIS TIME."
- RALPH: "BUT WOW, I NEVER GOT TO PRACTICE IN FRONT OF A REAL MICROPHONE BEFORE! DID YOU HEAR ABOUT THE GUY WHO WAS SO LAZY HE MARRIED A PREGNANT WOMAN?"
- TOM: "WE'RE ON. HI, I'M HERE TO INTRODUCE YOU TO AN IMPORTANT NEW PRODUCT. IT HAS ALL THE GOODNESS OF MILK AND CONTAINS A SPECIAL CULTURE LIKE YOGURT THAT PUTS BACK INTO YOUR DIGESTIVE TRACT WHAT PROCESSED FOODS TAKE OUT."
- RALPH: "I GOT IT! DID YOU HEAR ABOUT THE GUY WHO WOULDN'T TAKE OUT HIS OWN WIFE 'CUZ HE HEARD SHE WAS MARRIED!"
- TOM: "AHH, THIS LOWFAT MILK PRODUCT HAS ALL THE GOODNESS AND VITAMIN A & D OF REGULAR MILK AND TASTES THE SAME, FOR JUST 3-4 CENTS MORE!"
- RALPH: "DID YOU HEAR ABOUT THE GUY WHO STUDIES 5 DAYS FOR A URINE TEST?"
- TOM: "SWEET ACIDOPHILUS MILK'S BENEFICIAL CULTURE HELPS MAINTAIN THE NATIVE BACTERIA IN THE LOWER TRACT TO KEEP IT FUNCTIONING EFFICIENTLY AND REGULARLY."
- RALPH: "HEY, I KNEW A GUY WHO WAS SO STUPID HE THOUGHT PETER PAN WAS SOMETHING YOU PUT UNDER THE BED!"
- TOM: "SO DO YOURSELF A FAVOR, TRY SWEET ACIDOPHILUS MILK AND ENJOY MILK WITH A PLUS."
- TOM: "SWEET ACIDOPHILUS MILK - IT'S GOOD FOR EVERYBODY . . . TAKE RALPH, PLEASE!"

This message brought to you by the California Milk Association.

Non-Humor - Sweet Acidophilus Milk

ANNOUNCER: "HELLO, I'M HERE TO INTRODUCE YOU TO AN IMPORTANT NEW PRODUCT THAT HAS ALL THE GOODNESS OF MILK PLUS A NATURAL INGREDIENT THAT PUTS BACK INTO YOUR DIGESTIVE TRACT WHAT PROCESSED FOODS TAKE OUT. SWEET ACIDOPHILUS MILK TASTES JUST LIKE MILK, BUT IT IS MADE LIKE YOGURT, WITH A SPECIAL CULTURE. THIS HARMLESS BACTERIA HELPS TO MAINTAIN THE NORMAL LEVELS OF NATIVE BACTERIA IN THE TRACT THAT ARE ESSENTIAL TO DIGESTIVE FUNCTIONS. SWEET ACIDOPHILUS MILK HAS ALL THE WHOLESOMENESS, ALL THE VITAMINS A & D, THAT REGULAR MILK HAS. AND IT'S LOWFAT! SCIENTIFIC STUDIES HAVE SHOWN THAT OVER-PROCESSED FOODS CAN ADVERSELY AFFECT THE DELICATE BALANCE OF YOUR LOWER TRACT. NOW THERE'S A WAY TO SAFEGUARD YOURSELF AND YOUR FAMILY. SWEET ACIDOPHILUS MILK IS JUST 3-4 CENTS MORE EXPENSIVE THAN MILK. CAN YOU AFFORD NOT TO TRY IT?"

This message brought to you by the California Milk Association.

APPENDIX B  
QUESTIONNAIRE TO ELICIT MODAL BELIEFS

I would like to ask your opinion regarding whole milk.

- (1) In your opinion, what are the advantages of whole milk?

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- (2) In your opinion, what are the disadvantages of whole milk?

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- (3) Is there anything else you associate with whole milk?

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I would like to ask your opinion regarding the consumption of whole milk.

- (1) In your opinion, what are the advantages of the consumption of whole milk?

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- (2) In your opinion, what are the disadvantages of the consumption of whole milk?

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- (3) Is there anything else you associate with the consumption of whole milk?

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APPENDIX C  
RESPONDENT QUESTIONNAIRE







IN THIS SECTION I AM SPECIFICALLY INTERESTED IN WHAT YOU CAN RECALL ABOUT THE SWEET ACIDOPHILUS MILK COMMERCIAL.

- 1. WHAT SALES POINTS OR ARGUMENTS FOR DRINKING SWEET ACIDOPHILUS MILK DID THE COMMERCIAL TALK ABOUT?

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- 2. DID YOU LEARN ANYTHING FROM THE COMMERCIAL? IF YES, PLEASE LIST THE POINTS YOU LEARNED.

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- 3. WHAT WAS IT IN THE COMMERCIAL THAT INFLUENCED YOUR RESPONSE TO QUESTION 2?

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- 4. THE ADVERTISER TRIED TO INCREASE YOUR INTEREST IN DRINKING SWEET ACIDOPHILUS MILK. DID SHE/HE SUCCEED?

YES [ ]

NO [ ]

IN THIS SECTION I WOULD LIKE TO DETERMINE YOUR OPINIONS OF THE PROGRAM YOU JUST HEARD. PLEASE CHECK THE PHRASE THAT BEST REFLECTS YOUR OPINION.

- |  |  |                              |                                |                                 |   |
|--|--|------------------------------|--------------------------------|---------------------------------|---|
| 1. THE PROGRAM WAS INTERESTING                     | <u>          </u><br>STRONGLY<br>AGREE | : <u>          </u><br>AGREE | : <u>          </u><br>NEITHER | : <u>          </u><br>DISAGREE | : <u>          </u><br>STRONGLY<br>DISAGREE |
| 2. THE PROGRAM WAS ENTERTAINING                    | <u>          </u><br>STRONGLY<br>AGREE | : <u>          </u><br>AGREE | : <u>          </u><br>NEITHER | : <u>          </u><br>DISAGREE | : <u>          </u><br>STRONGLY<br>DISAGREE |
| 3. I WOULD LISTEN TO A PROGRAM LIKE THIS REGULARLY | <u>          </u><br>STRONGLY<br>AGREE | : <u>          </u><br>AGREE | : <u>          </u><br>NEITHER | : <u>          </u><br>DISAGREE | : <u>          </u><br>STRONGLY<br>DISAGREE |
| 4. THE PROGRAM IS TOO OLD FASHIONED                | <u>          </u><br>STRONGLY<br>AGREE | : <u>          </u><br>AGREE | : <u>          </u><br>NEITHER | : <u>          </u><br>DISAGREE | : <u>          </u><br>STRONGLY<br>DISAGREE |
| 5. THE PROGRAM WAS BORING                          | <u>          </u><br>STRONGLY<br>AGREE | : <u>          </u><br>AGREE | : <u>          </u><br>NEITHER | : <u>          </u><br>DISAGREE | : <u>          </u><br>STRONGLY<br>DISAGREE |
| 6. THE PROGRAM SHOULD ONLY BE AIRED ON FM RADIO    | <u>          </u><br>STRONGLY<br>AGREE | : <u>          </u><br>AGREE | : <u>          </u><br>NEITHER | : <u>          </u><br>DISAGREE | : <u>          </u><br>STRONGLY<br>DISAGREE |

IN THIS SECTION OF THE QUESTIONNAIRE I WOULD LIKE TO ASK YOU SOME QUESTIONS ABOUT YOUR OPINIONS OF CONSUMING SWEET ACIDOPHILUS MILK WITH ONE OF YOUR MEALS. THE QUESTIONS TO BE ASKED MAKE USE OF A SEVEN POINT RATING SCALE. THE FOLLOWING DESCRIBES HOW TO USE THE SCALE.

FOR EXAMPLE, IF YOU WERE ASKED TO RATE THE CONSUMPTION OF BEER WITH ONE OF YOUR MEALS ON SUCH A SCALE THE SEVEN PLACES SHOULD BE INTERPRETED AS FOLLOWS:

IF YOU THINK CONSUMING BEER WITH ONE OF YOUR MEALS IS EXTREMELY GOOD, THEN YOU WOULD PLACE YOUR MARK AS FOLLOWS:

GOOD <sup>X</sup> : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : BAD  
 EXTREMELY    QUITE    SLIGHTLY    NEITHER    SLIGHTLY    QUITE    EXTREMELY

IF YOU THINK CONSUMING BEER WITH ONE OF YOUR MEALS IS QUITE BAD, THEN YOU WOULD PLACE YOUR MARK AS FOLLOWS:

GOOD \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : <sup>X</sup> \_\_\_\_\_ : \_\_\_\_\_ : BAD  
 EXTREMELY    QUITE    SLIGHTLY    NEITHER    SLIGHTLY    QUITE    EXTREMELY

YOU WILL ALSO BE USING A RATING SCALE WITH LIKELY-UNLIKELY AS END POINTS. THIS SCALE IS TO BE INTERPRETED IN THE SAME WAY. FOR EXAMPLE, IF YOU WERE ASKED THE LIKELIHOOD THAT CONSUMING BEER WITH ONE OF YOUR MEALS WAS HEALTHY AND YOU THINK THIS IS EXTREMELY LIKELY THEN YOUR MARK WOULD APPEAR AS FOLLOWS:

CONSUMING BEER WITH ONE OF MY MEALS IS HEALTHY.

LIKELY <sup>X</sup> : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : UNLIKELY  
 EXTREMELY    QUITE    SLIGHTLY    NEITHER    SLIGHTLY    QUITE    EXTREMELY

IN MAKING YOUR RATINGS, PLEASE REMEMBER THE FOLLOWING POINTS.

(1) PLACE YOUR MARKS IN THE MIDDLE OF SPACES, NOT ON THE BOUNDARIES.

LIKE THIS \_\_\_\_\_ : <sup>X</sup> \_\_\_\_\_ : \_\_\_\_\_ :

(2) BE SURE YOU ANSWER ALL ITEMS---PLEASE DO NOT OMIT ANY.

(3) NEVER PUT MORE THAN ONE MARK ON A SINGLE SCALE.

1. HAVING SALT IN MY DIET IS

GOOD \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : BAD  
 EXTREMELY    QUITE    SLIGHTLY    NEITHER    SLIGHTLY    QUITE    EXTREMELY

2. HAVING SUGAR IN MY DIET IS

GOOD \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : BAD  
 EXTREMELY    QUITE    SLIGHTLY    NEITHER    SLIGHTLY    QUITE    EXTREMELY

3. HAVING CHEMICALS/ADDITIVES IN MY DIET IS:

GOOD \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : BAD  
 EXTREMELY    QUITE    SLIGHTLY    NEITHER    SLIGHTLY    QUITE    EXTREMELY

4. HAVING CARBOHYDRATES IN MY DIET IS

GOOD \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : BAD  
 EXTREMELY    QUITE    SLIGHTLY    NEITHER    SLIGHTLY    QUITE    EXTREMELY

5. HAVING VITAMIN A IN MY DIET IS

GOOD \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : BAD  
 EXTREMELY    QUITE    SLIGHTLY    NEITHER    SLIGHTLY    QUITE    EXTREMELY

6. HAVING VITAMIN D IN MY DIET IS

GOOD \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : BAD  
 EXTREMELY    QUITE    SLIGHTLY    NEITHER    SLIGHTLY    QUITE    EXTREMELY

7. HAVING CHOLESTEROL IN MY DIET IS

GOOD \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : BAD  
 EXTREMELY    QUITE    SLIGHTLY    NEITHER    SLIGHTLY    QUITE    EXTREMELY

8. HAVING CALCIUM IN MY DIET IS

GOOD \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : BAD  
 EXTREMELY    QUITE    SLIGHTLY    NEITHER    SLIGHTLY    QUITE    EXTREMELY

9. HAVING FOODS HARD TO DIGEST IN MY DIET IS

GOOD \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : BAD  
 EXTREMELY    QUITE    SLIGHTLY    NEITHER    SLIGHTLY    QUITE    EXTREMELY

10. HAVING EXCESS FAT CONTENT IN MY DIET IS

GOOD \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : BAD  
 EXTREMELY    QUITE    SLIGHTLY    NEITHER    SLIGHTLY    QUITE    EXTREMELY

11. HAVING EXCESS CALORIES IN MY DIET IS

GOOD \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : BAD  
 EXTREMELY    QUITE    SLIGHTLY    NEITHER    SLIGHTLY    QUITE    EXTREMELY

12. HAVING PROTEIN IN MY DIET IS

GOOD \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : BAD  
 EXTREMELY    QUITE    SLIGHTLY    NEITHER    SLIGHTLY    QUITE    EXTREMELY

13. HAVING ENERGY SUPPLYING FOODS IN MY DIET IS

GOOD \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : BAD  
 EXTREMELY    QUITE    SLIGHTLY    NEITHER    SLIGHTLY    QUITE    EXTREMELY

14. HAVING FOODS WITH A GOOD IMAGE IN MY DIET IS

GOOD \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : BAD  
 EXTREMELY    QUITE    SLIGHTLY    NEITHER    SLIGHTLY    QUITE    EXTREMELY

15. HAVING WHOLESOME FOODS IN MY DIET IS

GOOD \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : BAD  
 EXTREMELY    QUITE    SLIGHTLY    NEITHER    SLIGHTLY    QUITE    EXTREMELY

16. HAVING FILLING FOODS IN MY DIET IS

GOOD \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : BAD  
 EXTREMELY    QUITE    SLIGHTLY    NEITHER    SLIGHTLY    QUITE    EXTREMELY

17. A PRODUCT THAT PROVIDES NUTRITION FOR ADULTS IS

GOOD \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : BAD  
 EXTREMELY    QUITE    SLIGHTLY    NEITHER    SLIGHTLY    QUITE    EXTREMELY

18. A PRODUCT THAT HELPS TO SETTLE MY STOMACH IS

GOOD \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : BAD  
 EXTREMELY    QUITE    SLIGHTLY    NEITHER    SLIGHTLY    QUITE    EXTREMELY

19. A PRODUCT THAT IS BENEFICIAL FOR MY TEETH IS

GOOD \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : BAD  
 EXTREMELY    QUITE    SLIGHTLY    NEITHER    SLIGHTLY    QUITE    EXTREMELY

20. A PRODUCT THAT IS BENEFICIAL FOR MY BONES IS

GOOD \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : BAD  
 EXTREMELY    QUITE    SLIGHTLY    NEITHER    SLIGHTLY    QUITE    EXTREMELY

21. A PRODUCT THAT QUENCHES MY THIRST IS

GOOD \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : BAD  
 EXTREMELY    QUITE    SLIGHTLY    NEITHER    SLIGHTLY    QUITE    EXTREMELY

22. A PRODUCT THAT CAUSES ACNE IS

GOOD \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : BAD  
 EXTREMELY    QUITE    SLIGHTLY    NEITHER    SLIGHTLY    QUITE    EXTREMELY

THE FOLLOWING SCALES CONTAIN THE SAME SPACING, BUT THE ENDPOINTS HAVE CHANGED. HERE I AM INTERESTED IN HOW MUCH YOU BELIEVE THE FOLLOWING STATEMENTS.

1. MY DAILY CONSUMPTION OF A GLASS OF SWEET ACIDOPHILUS MILK PROVIDES SALT TO MY DIET

LIKELY \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : UNLIKELY  
EXTREMELY    QUITE    SLIGHTLY    NEITHER    SLIGHTLY    QUITE    EXTREMELY

2. MY DAILY CONSUMPTION OF A GLASS OF SWEET ACIDOPHILUS MILK PROVIDES SUGAR TO MY DIET

LIKELY \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : UNLIKELY  
EXTREMELY    QUITE    SLIGHTLY    NEITHER    SLIGHTLY    QUITE    EXTREMELY

3. MY DAILY CONSUMPTION OF A GLASS OF SWEET ACIDOPHILUS MILK PROVIDES CHEMICALS/ADDITIVES TO MY DIET

LIKELY \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : UNLIKELY  
EXTREMELY    QUITE    SLIGHTLY    NEITHER    SLIGHTLY    QUITE    EXTREMELY

4. MY DAILY CONSUMPTION OF A GLASS OF SWEET ACIDOPHILUS MILK PROVIDES CARBOHYDRATES TO MY DIET

LIKELY \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : UNLIKELY  
EXTREMELY    QUITE    SLIGHTLY    NEITHER    SLIGHTLY    QUITE    EXTREMELY

5. MY DAILY CONSUMPTION OF A GLASS OF SWEET ACIDOPHILUS MILK PROVIDES VITAMIN A TO MY DIET

LIKELY \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : UNLIKELY  
EXTREMELY    QUITE    SLIGHTLY    NEITHER    SLIGHTLY    QUITE    EXTREMELY

6. MY DAILY CONSUMPTION OF A GLASS OF SWEET ACIDOPHILUS MILK PROVIDES VITAMIN D TO MY DIET

LIKELY \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : UNLIKELY  
EXTREMELY    QUITE    SLIGHTLY    NEITHER    SLIGHTLY    QUITE    EXTREMELY

7. MY DAILY CONSUMPTION OF A GLASS OF SWEET ACIDOPHILUS MILK PROVIDES CHOLESTEROL TO MY DIET

LIKELY \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : UNLIKELY  
EXTREMELY    QUITE    SLIGHTLY    NEITHER    SLIGHTLY    QUITE    EXTREMELY

8. MY DAILY CONSUMPTION OF A GLASS OF SWEET ACIDOPHILUS MILK PROVIDES CALCIUM TO MY DIET

LIKELY \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : UNLIKELY  
EXTREMELY    QUITE    SLIGHTLY    NEITHER    SLIGHTLY    QUITE    EXTREMELY

9. MY DAILY CONSUMPTION OF A GLASS OF SWEET ACIDOPHILUS MILK IS EASY TO DIGEST

LIKELY \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : UNLIKELY  
EXTREMELY    QUITE    SLIGHTLY    NEITHER    SLIGHTLY    QUITE    EXTREMELY

10. MY DAILY CONSUMPTION OF A GLASS OF SWEET ACIDOPHILUS MILK PROVIDES EXCESS FAT TO MY DIET

LIKELY \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : UNLIKELY  
EXTREMELY QUITE SLIGHTLY NEITHER SLIGHTLY QUITE EXTREMELY

11. MY DAILY CONSUMPTION OF A GLASS OF SWEET ACIDOPHILUS MILK PROVIDES EXCESS CALORIES TO MY DIET

LIKELY \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : UNLIKELY  
EXTREMELY QUITE SLIGHTLY NEITHER SLIGHTLY QUITE EXTREMELY

12. MY DAILY CONSUMPTION OF A GLASS OF SWEET ACIDOPHILUS MILK PROVIDES PROTEIN TO MY DIET

LIKELY \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : UNLIKELY  
EXTREMELY QUITE SLIGHTLY NEITHER SLIGHTLY QUITE EXTREMELY

13. MY DAILY CONSUMPTION OF A GLASS OF SWEET ACIDOPHILUS MILK PROVIDES ENERGY TO MY DIET

LIKELY \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : UNLIKELY  
EXTREMELY QUITE SLIGHTLY NEITHER SLIGHTLY QUITE EXTREMELY

14. MY DAILY CONSUMPTION OF A GLASS OF SWEET ACIDOPHILUS MILK PROVIDES A GOOD IMAGE

LIKELY \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : UNLIKELY  
EXTREMELY QUITE SLIGHTLY NEITHER SLIGHTLY QUITE EXTREMELY

15. MY DAILY CONSUMPTION OF A GLASS OF SWEET ACIDOPHILUS MILK IS WHOLESOME

LIKELY \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : UNLIKELY  
EXTREMELY QUITE SLIGHTLY NEITHER SLIGHTLY QUITE EXTREMELY

16. MY DAILY CONSUMPTION OF A GLASS OF SWEET ACIDOPHILUS MILK IS FILLING

LIKELY \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : UNLIKELY  
EXTREMELY QUITE SLIGHTLY NEITHER SLIGHTLY QUITE EXTREMELY

17. MILK IS AN EXCELLENT SOURCE OF NUTRITION FOR ADULTS

LIKELY \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : UNLIKELY  
EXTREMELY QUITE SLIGHTLY NEITHER SLIGHTLY QUITE EXTREMELY

18. SWEET ACIDOPHILUS MILK HELPS TO SETTLE MY STOMACH

LIKELY \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : UNLIKELY  
EXTREMELY QUITE SLIGHTLY NEITHER SLIGHTLY QUITE EXTREMELY

19. SWEET ACIDOPHILUS MILK IS BENEFICIAL FOR MY TEETH

LIKELY \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : UNLIKELY  
EXTREMELY QUITE SLIGHTLY NEITHER SLIGHTLY QUITE EXTREMELY

20. SWEET ACIDOPHILUS MILK IS BENEFICIAL FOR MY BONES

LIKELY \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : UNLIKELY  
 EXTREMELY QUITE SLIGHTLY NEITHER SLIGHTLY QUITE EXTREMELY

21. SWEET ACIDOPHILUS MILK QUENCHES MY THIRST

LIKELY \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : UNLIKELY  
 EXTREMELY QUITE SLIGHTLY NEITHER SLIGHTLY QUITE EXTREMELY

22. SWEET ACIDOPHILUS MILK CAUSES ACNE

LIKELY \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : UNLIKELY  
 EXTREMELY QUITE SLIGHTLY NEITHER SLIGHTLY QUITE EXTREMELY

23. SWEET ACIDOPHILUS MILK GIVES ME AN UPSET STOMACH

LIKELY \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : UNLIKELY  
 EXTREMELY QUITE SLIGHTLY NEITHER SLIGHTLY QUITE EXTREMELY

24. SWEET ACIDOPHILUS MILK CAUSES HIGH BLOOD PRESSURE

LIKELY \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : UNLIKELY  
 EXTREMELY QUITE SLIGHTLY NEITHER SLIGHTLY QUITE EXTREMELY

25. SWEET ACIDOPHILUS MILK GOES WELL WITH OTHER FOODS

LIKELY \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : UNLIKELY  
 EXTREMELY QUITE SLIGHTLY NEITHER SLIGHTLY QUITE EXTREMELY

26. SWEET ACIDOPHILUS MILK IS BENEFICIAL TO MY HEALTH

LIKELY \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : UNLIKELY  
 EXTREMELY QUITE SLIGHTLY NEITHER SLIGHTLY QUITE EXTREMELY

27. SWEET ACIDOPHILUS MILK IS MADE LIKE YOGURT

LIKELY \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : UNLIKELY  
 EXTREMELY QUITE SLIGHTLY NEITHER SLIGHTLY QUITE EXTREMELY

28. SWEET ACIDOPHILUS MILK HAS NATURAL INGREDIENTS TO HELP DIGESTION

LIKELY \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : UNLIKELY  
 EXTREMELY QUITE SLIGHTLY NEITHER SLIGHTLY QUITE EXTREMELY

29. SWEET ACIDOPHILUS MILK TASTES LIKE WHOLE MILK

LIKELY \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : UNLIKELY  
 EXTREMELY QUITE SLIGHTLY NEITHER SLIGHTLY QUITE EXTREMELY

30. SWEET ACIDOPHILUS MILK HAS ALL THE GOODNESS OF WHOLE MILK

LIKELY \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : UNLIKELY  
 EXTREMELY QUITE SLIGHTLY NEITHER SLIGHTLY QUITE EXTREMELY



IN THIS SECTION I AM INTERESTED IN YOUR IMPRESSIONS OF SWEET ACIDOPHILUS MILK YOU JUST HEARD. YOU WILL BE ASKED TO PLACE A CHECK MARK INDICATING YOUR IMPRESSIONS ON A SEVEN POINT SCALE DIVIDING TWO BI-POLAR ADJECTIVES. THE DIRECTION WHICH YOU CHECK, OF COURSE, DEPENDS UPON WHICH OF THE TWO ENDS OF THE SCALE SEEM MOST CHARACTERISTIC OF THE COMMERCIAL. IF YOU CONSIDER THE CONCEPT TO BE NEUTRAL ON THE SCALE, OR IF THE SCALE IS COMPLETELY IRRELEVANT TO THE COMMERCIAL, THEN YOU SHOULD PLACE YOUR CHECK-MARK IN THE MIDDLE SPACE.

THE SWEET ACIDOPHILUS MILK COMMERCIAL IS:

GOOD \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : BAD

ARTFUL \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : ARTLESS

BELIEVABLE \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : UNBELIEVABLE

SERIOUS \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : HUMOROUS

COMPLEX \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : SIMPLE

INTERESTING \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : BORING

DULL \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : WITTY

CANDID \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : DECEITFUL

REFINED \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : VULGAR

HONEST \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : DISHONEST

INFORMATIVE \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : UNINFORMATIVE

INSULTING \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : UNINSULTING



IN THIS SECTION I WOULD LIKE YOU TO INDICATE YOUR INTENTIONS OF DAILY DRINKING A GLASS OF SWEET ACIDOPHILUS MILK.

1. I INTEND TO DRINK A GLASS OF SWEET ACIDOPHILUS MILK EVERY DAY

LIKELY \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : UNLIKELY  
EXTREMELY    QUITE    SLIGHTLY    NEITHER    SLIGHTLY    QUITE    EXTREMELY

2. THERE IS A \_\_\_\_\_ % CHANCE THAT I WILL DRINK A GLASS OF SWEET ACIDOPHILUS MILK EVERYDAY.

HERE, I WOULD LIKE TO DETERMINE HOW EFFECTIVE THE SWEET ACIDOPHILUS MILK COMMERCIAL WAS AT ATTRACTING AND HOLDING YOUR ATTENTION.

1. AT GAINING MY ATTENTION, THE SWEET ACIDOPHILUS MILK COMMERCIAL WAS

EFFECTIVE \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : NOT EFFECTIVE  
 EXTREMELY QUITE SLIGHTLY NEITHER SLIGHTLY QUITE EXTREMELY

2. AT HOLDING MY ATTENTION THE SWEET ACIDOPHILUS MILK COMMERCIAL WAS

EFFECTIVE \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : NOT EFFECTIVE  
 EXTREMELY QUITE SLIGHTLY NEITHER SLIGHTLY QUITE EXTREMELY

3. DURING THE SWEET ACIDOPHILUS MILK COMMERCIAL I WAS

ALERT \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : NOT ALERT

OBSERVANT \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : NOT OBSERVANT

OCCUPIED WITH \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : NOT OCCUPIED WITH

EMOTIONAL \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : UNEMOTIONAL

MOTIVATED \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : AIMLESS

IN THIS SECTION I WOULD LIKE TO ASK YOU SOME GENERAL QUESTIONS ABOUT THE PROGRAM YOU JUST HEARD.

1. HOW OFTEN BEFORE TODAY HAVE YOU HEARD THE RADIO PROGRAM?

TWO OR MORE TIMES [ ]

ONCE [ ]

NEVER [ ]

2. HOW OFTEN BEFORE TODAY HAVE YOU HEARD THE SWEET ACIDOPHILUS MILK COMMERCIAL?

TWO OR MORE TIMES [ ]

ONCE [ ]

NEVER [ ]

3. WHO WAS THE SOURCE OF THE SWEET ACIDOPHILUS MILK COMMERCIAL?

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4. THE INFORMATION IN THE SWEET ACIDOPHILUS MILK COMMERCIAL WAS BELIEVABLE.

LIKELY \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : UNLIKELY  
EXTREMELY    QUITE    SLIGHTLY    NEITHER    SLIGHTLY    QUITE    EXTREMELY



