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THE EFFECT OF METHODOLOGICAL AND PERSONAL FACTORS ON
ATTITUDE-BEHAVIOR CONSISTENCY

City University of New York

PH.D. 1982

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THE EFFECT OF METHODOLOGICAL AND PERSONAL
FACTORS ON ATTITUDE-BEHAVIOR
CONSISTENCY

by

Neil H. Firtle

A dissertation submitted in partial fulfillment of the
requirements for the degree of Doctor of Philosophy in
Business

The City University of New York

September 1981

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This manuscript has been read and accepted for the Graduate Faculty in Business in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

Sept. 21, 1981

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Abstract

THE EFFECT OF METHODOLOGICAL AND PERSONAL
FACTORS ON ATTITUDE-BEHAVIOR CONSISTENCY

by

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Adviser: Professor Conrad Berenson

The theoretical conceptualization of attitude presented in this dissertation assumed that attitude serves as a precursor of behavior. In order to validate the attitudinal construct, empirical research must provide evidence that a consistent relationship exists between attitude measured at a given point in time, and behavior measured at a later point in time than the professed attitude. Previous research has generally failed to support the consistency of the attitude-behavior relationship. The inconsistency in this relationship has been attributed to the contamination of several types of factors (i.e., methodological, personal and situational).

In this dissertation it was argued that the relationship between brand attitudes and purchase behavior was affected by two methodological factors and one personal factor. More specifically, this researcher postulated that attitude measurement (i.e., via magnitude estimation or category scaling), the conceptualization of attitude (i.e., by form of multi-attribute model used) and a personal

factor (i.e., internal-external locus of control) were in large part responsible for this weak predictive relationship.

An "after only with control group" experimental design was utilized in order to examine the effects of these factors. A total sample of 375 females aged 18-49 who currently used toothpaste (residing in the New York Metropolitan area) were included in the data base, with approximately one-half of the total falling into each experimental group. Each of the groups completed a typical attitude and usage questionnaire concerning toothpaste. The questionnaires were identical in layout of questions, while the scaling technique used to complete the attitude questions differed within experimental group. Group I utilized magnitude estimation to answer the product specific attitude questions, and Group II used a traditional category scaling method (i.e., a seven-point bi-polar scale) to answer these same questions. This design allowed for the testing of all hypotheses in the study, because the variations of the multi-attribute model tested were only mathematical manipulations of data which were collected in both cells. The data on internal-external locus of control were also gathered in both groups. Respondents were recontacted by telephone approximately four weeks after the initial interview in order to obtain additional behavioral information needed for the testing of hypotheses.

The hypotheses set forth concerning the impact of certain methodological and personal factors on attitude-behavior consistency were tested via discriminant analysis. One of the methodological factors, type of attitude measurement device, did not significantly effect the predictive ability of the attitude-behavior relationship (although magnitude estimation consistently exhibited greater prediction on an absolute basis). After analyzing the impact of the other methodological factor, form of multi-attribute model utilized, it was found that greater attitude-behavior consistency existed when the model was presented in disaggregated, rather than aggregated form; while the inclusion of importance weights had no significant positive impact on prediction. Locus of control, the personal factor studied, was generally shown to have a moderating effect on the attitude-behavior relationship. In a more specific sense, externals were found to be more likely to show brand differences on product attributes which were related to social approval.

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CHAPTER I

INTRODUCTION

The concept of attitude is a necessary component in the study of consumer behavior. Its significance can be substantiated by its role as an intervening variable in each of the three consumer behavior models (Engel, Blackwell and Kollat, 1978; Howard and Sheth, 1969; Nicosia, 1966). More specifically, attitudes are thought to affect behavior.

The purpose of this dissertation is to investigate several areas of the literature on attitudes: the nature of the relationship between attitude and behavior, and factors affecting the validity of the relationship. By integrating these areas, theoretical causes of attitude-behavior inconsistency are suggested. In addition, an experiment designed to isolate several of these confounding factors is presented. After a brief introduction to the concept of attitude, the remaining sections of this chapter include: a discussion of the problem to be investigated; significance of the study; the scope and limitations of the study; and the organization of the paper.

The Nature of Attitudes

In searching the literature, a multitude of definitions for the concept of attitude were found. It is important to note that almost all of these definitions are theory specific: that is, they are defined in terms of the theoretical framework in which they are employed. Therefore, the conceptual definitions presented here are of a general nature and, thereby, assumed acceptable to most attitude researchers.

The first of these definitions is formulated by Fishbein and Ajzen (1975, p. 6): ". . . [attitude can be described as] a learned predisposition to respond in a consistently favorable or unfavorable manner with respect to a given object." Although general, and thus allowing many possible interpretations, it does establish three basic characteristics of attitudes: 1) attitudes are a form of learned behavior; 2) they predispose action; 3) these actions are consistently favorable or unfavorable toward any particular object.

A second definition provided by Allport (1935), which is most widely cited in the literature, has at least five attributes: "(1) it is a mental and neural state (2) of readiness to respond, (3) organized (4) through experience, (5) exerting a directive and/or dynamic influence on behavior." The term "mental and neural state"

implies that attitude is composed of both phenomenological (i.e., verbally reported) and physiological aspects. However, both aspects seem to put forth both theoretical and practical problems for researchers. The theoretical problems stem from the fact that when viewed in a strict behavioral sense, attitude serves as an intervening variable to behavior, and therefore, verbal reports to a hypothetical abstraction may prove to be an invalid extension of this theory (McGuire, 1969). The practical problems involve the measurement of this "neural state." Existing physiological measures, at best, provide a measure of intensity of attitude without any indication of direction. Therefore, it is difficult to measure a person's response to a given stimulus because the magnitude of the reaction can be measured by pupil dilation or skin perspiration, but the direction (e.g., love, hate, fear, etc.) cannot be assessed.

Problem Statement

The theoretical conceptualization of attitude proposed earlier (Allport, 1935) assumes that attitude serves as a precursor of behavior. In order to validate the attitudinal construct, empirical research must show consistency between attitude and behavior. Researchers in marketing specifically (Day, 1970), and the social sciences

in general (Wicker, 1969; Gross and Niman, 1975), have concluded that a strong relationship does not exist between these two variables due to the contamination of several types of factors (methodological, personal and situational).

It will be suggested that inaccurate attitude measurement techniques are largely responsible for the weakness of this relationship. Further, the use of alternative multiattribute attitude models may also be a cause of inconsistency. In addition to these methodological shortcomings, several personal and situational factors have been postulated as having an effect on the relationship between attitude and behavior. Consequently, this dissertation is devoted to an investigation of the attitude-behavior relationship and factors thought to influence the consistency of the relationship.

Significance of the Study

This study can be shown to be valuable for both the marketing scholar and practitioner. The concepts of attitude and attitude measurement have comprised a significant area of study among social psychologists and marketing academicians for the last fifty years. Within the scholarly literature, researchers have debated the merits of various attitude scaling devices, and the relationship of attitude and behavior. By investigating these areas, the

knowledge already acquired may be solidified, and thereby generate topics for future research which may improve our understanding of consumer behavior.

Market researchers within the corporate world may also benefit from this study. Strategies for the marketing of new products and the repositioning of mature products are highly dependent on the accuracy of attitude measurement techniques. Thus, the precision of these techniques may affect the outcome of the simplistic concept test, or a highly sophisticated market segmentation study. With the high costs of product failure, it is essential for market researchers to assemble a set of measurement tools which can effectively predict purchase behavior. By acquiring a higher quality of information, the marketer may reduce the uncertainty in decision making.

Scope and Limitations of the Study

This dissertation examines the relationship between attitude and behavior, and several methodological and personal factors thought to affect the relationship. Its scope is confined to the investigation of the basic linear compensatory attitude model (to be discussed in the next chapter), two attitude measurement techniques (i.e., magnitude estimation and category scaling), and one personality factor (i.e., internal-external locus of control).

An analysis of the findings of this study should lead to the resolution of the following questions: Which form of the multi-attribute attitude model tested here elicits the strongest attitude-behavior relationship? Which attitude measurement technique predicts best? Does internal-external locus of control contribute to attitude-behavior inconsistency?

The major limitation of the study centers around the generalizability of the results. The results of this study are only applicable to the sample from which it came (toothpaste users), and the particular attitude-behavior relationship posed in this study. In addition, the results may not be indicative of other experimental situations (e.g., concept testing), or other product categories, or category scales constructed in a manner which are different from the type that is to be tested here.

Organization of the Study

Within the second chapter, the literature reviewed provides the theoretical framework for the study of the attitude-behavior relationship. It is specifically focussed on studies which have examined attitude-behavior consistency, and factors thought to promote inconsistency (i.e., attitude measurement, conceptualization of attitude, personal and situational factors).

The research methodology employed in this investigation is presented in Chapter III. A statement of the hypotheses to be tested and the experimental design utilized are discussed in this chapter. The sampling design and method of data collection is given intensive study in this section.

Chapter four provides a discussion of the data analyses performed and the resultant research findings. The results are presented in two subsections: methodological factors and personal factors.

A summary of findings and conclusions, along with marketing implications, is provided in the final chapter. Directions for future research are also provided within the chapter.

Summary

In this chapter, a brief introduction to the attitudinal construct, and its validation via the relationship between attitude and behavior, was provided. Attitude-behavior inconsistency was cited as a roadblock in the establishment of the validity of the attitudinal construct. Specific factors postulated as being responsible for this inconsistency are reviewed and tested in the following chapters.

CHAPTER II

LITERATURE ON THE ATTITUDE- BEHAVIOR RELATIONSHIP

Before reviewing the many studies on attitude-behavior consistency, several evaluative criteria must be established. A review of the philosophy of science indicates that the highest level of understanding provided by any given concept is found in its ability to predict future events (Zaltman, Pinson and Angelmar, 1973). As mentioned previously, attitude is thought to be the precursor of behavior. Thus, the level of understanding that can be achieved for the concept of attitude can be assessed by evaluating the power of verbally reported attitudes in predicting overt behavior at a later point in time. In addition to this restriction, the unit of analysis for this relationship should be the individual (not the group), since attitudes involve individual processes. The establishment of the relationship between attitude and behavior at the group level may not indicate validity because there is no direct link between an individual's attitude and his/her actual behavior. With these criteria in mind, research concerning attitude-behavior consistency in both the social sciences and consumer behavior are reviewed in the following sections.

Studies in the Social Sciences

A number of review articles have concluded that there is a lack of attitude-behavior consistency in the social sciences (Wicker, 1969; Gross and Niman, 1975; Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1980). The most extensive of these articles reviewed 46 studies in a wide variety of areas including: attitudes and behaviors toward work, minority group members, and a group of miscellaneous topics (Wicker, 1969). In this review, both the subjects' attitudinal and behavioral responses were measured on separate occasions. Having reviewed a wide range of subject populations, verbal attitude measures and overt behavioral responses, Wicker suggests that measured attitudes were often unrelated to or only slightly related to overt behavior based on the fact that attitudinal data was rarely able to account for greater than 10% of the variance in overt behavior.

The conclusions cited in the review articles mentioned here show great similarity with those expressed by Corey more than forty years ago:

It is impossible to say in advance of investigation whether the lack of relationship reported here between attitude questionnaire scores and overt behavior is generally true for measures of verbal opinion. Were that the case, the value of attitude scales and questionnaires would for most practical purposes be extremely slight. . . . It is difficult to devise techniques whereby certain types of overt behavior can

be rather objectively estimated for the purpose of comparison with verbal opinions. Such studies, despite their difficulty, would seem to be very much worthwhile. It is conceivable that our attitude testing program has gone far in the wrong direction. The available scales and techniques are almost too neat. The ease with which so-called attitudinal studies can be conducted is attractive, but the implications are equivocal (Corey, 1937, p. 279).

In contrast to this wholesale discounting of traditional attitude measurement methods, other researchers (see for example, Green, 1968; Warner and DeFleur, 1969; Weissberg, 1975) have suggested a host of personal and environmental factors that contribute to variation in overt behavior, other than measurement imprecision. A complete discussion of these factors is provided later in this chapter.

Studies in Consumer Behavior

Unfortunately, a review of the consumer behavior literature has failed to increase explanation of the attitude-behavior relationship beyond the level achieved by social science researchers. Most studies concerning the relationship of attitude and behavior in marketing seek to establish a less meaningful level of validity than that which is sought here. In these studies, attitude measures are obtained in the same survey with concurrent or subsequent brand purchases (Abrams, 1966; Axelrod, 1968; Bird and Ehrenberg, 1970; Gormley, 1974; Haley and Case, 1979). The results of these studies have established the concurrent validity of the attitude-

behavior relationship.

Although other measures of validity are important in establishing the explanatory power of the theoretical construct, predictive validity provides the scholar with the highest level of understanding. In this dissertation, the prediction of overt behavior from a given attitude represents the highest level of explanation for the concept of attitude. In reviewing studies on multi-attribute attitude models through 1979, Oshikawa states that almost all researchers have failed to establish the predictive validity of these models with any kind of criterion variable (i.e., overall affect, preference, choice behavior):

. . . predictive validity is the ability to foretell the future behavior of respondents on the basis of their scores on the scale. In almost all studies of multi-attribute models, the criterion variable has been measured immediately before or soon after the predictor variables have been measured. This procedure not only fails to test the predictive validity but also causes the respondents to become aware of the relationships between the criterion and predictor variables and produces artifactually high correlation coefficients (1979, p. 257).

More specifically, in reviewing the literature for this dissertation, this researcher was unable to locate any studies which showed a significant relationship between brand attitudes measured at one point in time with brand choice behavior measured on the individual level at a later point in time. Predictive validity at the group level has been established by studies which show high correlations

between aggregate measures of brand attitude and objective measures of market share (Maloney, 1966; Assael and Day, 1969); and between aggregate measures of attitude toward Presidential Candidates and election results (Crespi, 1971). Thus, there is a need for research which establishes predictive validity of attitude at the individual level.

Factors Thought to Affect the Relationship

Several factors have been postulated as influencing the relationship between attitude and behavior. The significance of each variable is unknown due to the absence of systematic research in this area. The variables generally fall into one of the following three groups: methodological, personal or situational. Each of these types of confounding elements is given a thorough, although not exhaustive, discussion in one of the following sections.

Methodological Factors

The methodological factors discussed below generally are limited to the inhibiting effects of attitudinal and behavioral measures. More specifically, the inadequacies inherent in traditional attitude scaling techniques, and the use of single- versus multi-attribute models, are reviewed in an attempt to shed light on the inconsistent relationship between attitude and behavior.

Attitude Measurement

Despite its theoretical problems, the measurement of attitudes through verbal report is the most widely used method in attitude research. Using this method, respondents are presented with statements associated with a particular attitude and asked to indicate their degree of agreement on some type of category scale. These category scales may be unipolar or bipolar, ranging from 2 to 9 categories. In a similar fashion, these scales have been adapted for use in consumer research to assess the relative acceptability and positioning of competitive brands within a given product category. Possible reasons for the widespread acceptance and use of the category scaling approach include: 1) the scale appears to have the validity and reliability as an attitude measurement device; 2) it is easy to administer; 3) scores obtained through the administration of these scales are amenable to the analytical tools of parametric statistics (e.g., ANOVA, Regression, Factor Analysis).

As noted in the previous paragraph, one of the possible reasons for the adaptation of the category scaling method is its apparent validity. In many studies, researchers use this measurement approach without assessing its validity because they assume that it has been demonstrated previously. The strength of the relationship between

attitude and behavior is the most critical question in establishing the validity of an attitude scale (Haley and Case, 1979). Unfortunately, however, researchers have repeatedly failed to demonstrate a strong consistency between attitude and behavior (Wicker, 1969; Gross and Niman, 1975).

Earlier in this dissertation, it was suggested that the inadequacies inherent in traditional attitude scaling are largely responsible for attitude-behavior inconsistency. This measurement imprecision may be the result of arbitrary construction procedures, the use of different measures in different types of studies, and the susceptibility of these measures to a number of response biases. Each of these aspects of attitude measurement is reviewed below.

Construction of attitude measures

Several problems in constructing attitude scales have been noted in the scholarly literature, among them: the number of categories, the degree and kind of verbal description and forced versus non-forced response (Guest, 1962; Jacoby and Matell, 1971; Lehman and Hulbert, 1972; Green and Rao, 1979; Cox, 1980).

The most prevalent problem in the construction of category scales is the decision as to the number of response categories to use (Guest, 1962). Jacoby and Matell (1971) suggested that three-point scales were adequate for providing

discrimination when averaging across people or aggregating individual scales to form a new scale for each individual; while other research (Lehman and Hulbert, 1972; Green and Rao, 1979; Cox, 1980) contend that five to seven categories may be necessary when the focus is on individual behavior. Related to this problem is the choice of an odd or even number of categories. When there are an odd number of categories, the central point is usually designated as the neutral point. Some researchers believe that respondents should be forced to indicate direction of feeling and, thereby, support the use of an even number of categories. In sum, research has failed to provide conclusive results as to the optimal number of categories (Cox, 1980).

Another problem faced by the researcher when using this type of scale relates to the degree and kind of verbal description to be employed. When using these scales most researchers use brief phrases to describe each category. Some researchers believe that the reliability of response is a function of the degree to which the categories have been defined (Selltiz, Wrightsman and Cook, 1976, p. 406). Mittelstaedt (1973) contends that the exact wording of each category has a major impact on responses obtained. In addition to the effect of specific wording on response, the ratio of favorably-worded to unfavorably-worded categories may also confound ratings. When the ratio is 1:1, the scale

is considered to be balanced; any other ratio would mean that it is unbalanced. Browne, Copeland and Millward (1973) cite the failure of an unbalanced product evaluation scale as a method of predicting new product success.

A final aspect of scale construction to be discussed here is the decision of whether to use a forced- or nonforced-choice scale. In using a forced scale, the researcher requires the respondent to express an attitude toward the stimulus being examined. However, the respondent may not have a salient attitude, and as a result, he/she is forced to choose the category that is close to the "neutral" point. In this way, respondents who hold a "neutral" attitude are indistinguishable from respondents who do not actually have an attitude toward the stimulus in question. Further, when the use of the neutral point as a measure of "no opinion" accounts for a substantial portion of the total response, measures of central tendency and variance will become distorted (Hughes, 1969). As a result, the researcher should provide a "don't know" or "no opinion" category in scales concerning subjects on which respondents are not likely to have opinions. In the next section, it is suggested that the problem of constructing the appropriate measurement device is further confounded by the type of consumer research study it is to be used in.

Use of category scales in consumer research

As noted above, category scales are considered the most widely used attitude measurement devices in consumer research. They may be constructed differently for use in various types of studies. For example, category scales may be employed to measure overall opinion or purchase intention within a simplistic concept test, or ratings of brands on specific characteristics in a highly sophisticated segmentation study. Category scales are most commonly used in product/concept testing, and what are referred to here as strategic studies (i.e., attitude and usage studies whose objectives may be the assessment of brand positioning and/or market segmentation) [Tull and Hawkins, 1976; Boyd, Westfall and Stasch, 1977; Green and Tull, 1978; Churchill, 1979; Lehman, 1979; Marcus and Tauber, 1979]. As a result, the discussion in the following paragraphs pertaining to the use of category scales in consumer research is focussed on these two types of studies (i.e., product/concept testing and strategic studies).

Product/concept testing. Product testing and concept testing are devices used by marketing researchers to screen new product opportunities using consumers' responses to a physical product, a written description of the product or both (Marcus and Tauber, 1979). Different types of quantitative designs may be employed to provide consumer reaction

to alternative products/concepts. Among these quantitative designs are monadic and paired comparison testing, the two most commonly used in marketing research practice (Greenberg, 1963; Golden, 1972). While monadic tests employ category scales in the questioning of respondents (i.e., because respondents are only presented with one stimulus), paired comparison tests use ranking measures and, as a result, are beyond the scope of this dissertation. Therefore, the discussion of product/concept testing below will be confined to monadic research designs only.

In monadic testing, the consumer is presented with one product (concept) and asked to evaluate it by itself based on experience with the product category. Respondents are asked to express their overall opinion or purchase intent, and reasons for this judgement. In addition, diagnostic information such as likes and dislikes of the product as described (or sampled), and directional ratings on several product attributes are obtained. In order to compare the evaluations of different products (concepts), matched samples of consumers are utilized (i.e., the different samples of respondents are similar in terms of age, brand usage, geographic region, etc.).

The attitude measures used in monadic product/concept testing (i.e., overall opinion, purchase intent and directional ratings) are subject to the same arbitrary

construction procedures described in the previous section. Overall opinion and purchase intent can be measured in a variety of ways (e.g., bi-polar labelled five-point scale, uni-dimensional six-point scale, etc.), while directional ratings are usually measured with three-point scales (i.e., "too much," "just right," and "not enough"). The reader should also note the unique positioning of these measures within this type of survey as compared with that utilized in strategic studies, discussed in the following section.

Strategic studies. The term "strategic studies" is used in this dissertation to collectively describe attitude and usage studies whose objectives may be the assessment of brand positioning and/or market segmentation. Green and Tull (1978, p. 527) provide the following descriptions of brand positioning and market segmentation:

Brand (or service) positioning deals with measuring the perceptions that buyers hold about alternative marketplace offerings. Market segmentation deals with those situations in which perceptions, preferences, or other aspects of consumer choice differ across buyer groups.

In either case, the objective is to assist management in designing strategies that will enhance the company's offerings in terms of sales and profits.

Strategic studies may be seen as generally answering two types of basic questions: 1) What do consumers perceive our brand position to be in relation to competing brands?

and 2) How are our consumers defined in terms of brand perceptions and preferences, benefits sought, lifestyle and demographics? (Smith, 1956; Haley, 1968; Frank, Massy and Wind, 1972; Wells, 1975; Wind, 1978). In order to achieve the answers to these problems, both evaluative and diagnostic questions must be asked of respondents in a quantitative survey research study. The evaluative questions, asked at the beginning of the survey, help to define the structure of the marketplace in terms of brand awareness, usage and purchase. After answers to the evaluative questions have been obtained, the diagnostic questions are asked in order to help explain why the market is structured the way it is. Respondents may be asked what benefits they feel are important in the particular product, and how one or more brands perform on these benefits. In addition, they may be questioned about their lifestyle via reaction to psychographic statements, and demographic questions.

The attitude measures generally used in strategic studies (i.e., importance of specific characteristics, ratings of brands on specific characteristics and psychographic reactions) may be obtained using a variety of construction procedures. For example, importance of attributes may be measured using an uni-polar scale that ranges from "extremely important" to "not at all important," while respondents may be asked to rate brands on these specific

characteristics using a "1-10" scale. At this point in time, no one way of asking these particular questions has been shown to exhibit a higher level of predictive validity than others. Further, it is possible that a particular construction procedure be shown to be valid in a product/concept test and invalid in a strategic study (and vice-versa) for the following two reasons: 1) product/concept tests often gain reaction to stimuli about which the respondent may not have well-formed opinions (i.e., it is a spontaneous reaction), while strategic studies involve measurement of brand attitudes and lifestyles which probably have greater definition since they have been cultivated over time, and 2) strategic studies are generally more time-consuming than product/concept tests and as a result, the respondent may just say anything to complete the interview quickly. Consequently, it is quite possible that the type of research study may also affect the validity of various attitude measures.

The review of category scales presented thus far has illuminated some of the difficulties in the construction of these measurement devices in addition to the confounding of this problem with a situational variable, the type of consumer research study the attitude measurement device is to be used in. These problems are further enlarged by the fact that category scales may be susceptible to particular response styles and biases; a matter which is discussed in the following section.

Response biases

However constructed, category scales have specific kinds of response biases attributed to them. These biases may be a function of the respondent's psychological characteristics, or the nature of category scaling itself (e.g., acquiescence, extremity, ceiling and floor effects). Each of these extraneous determinants of response is discussed separately in the following sections.

Social desirability. Social desirability refers to a psychological tendency to be agreeable in a rather passive and submissive way. In this type of response set, the respondent tries to give the most socially acceptable answer, or "fake" his/her response in order to avoid the unpleasant consequences of an "honest" reply (Rorer, 1965).

Several methods have been suggested as remedies for social desirability. One of these techniques is to detect and discard respondents who possess this trait. A review of the literature has shown that there are two methods which have been used to detect respondents who possess this response set. The first of these instruments consists of dichotomous answer categories, one which is usually not characteristic of the subject and socially desirable, and one which is characteristic and socially undesirable (Crown and Marlowe, 1960). An individual who selects more socially desirable responses than the norm, is said to possess the

trait. Another procedure is to select statements whose scores vary significantly when respondents are instructed to present themselves in a favorable light (Norman, 1963). People who score high on these select statements will be chosen as rendering socially desirable responses.

Scott (1968) makes two important criticisms regarding these detection procedures. The first of which is that the classification of respondents who possess the trait is imprecise due to the establishment of arbitrary cutoff points. It is certainly inaccurate to assume that the person with a score that falls just below the cutoff point does not possess the trait. A second criticism deals with the procedures used for validating these types of scales. In general, the validity of both of the scales previously described (i.e., the scales developed by Crowne and Marlowe, and Norman) is usually established in an experimental situation where those respondents being instructed to fake responses scored higher than those given the standard instructions (i.e., truthful self report). This role playing situation may not generate the same response set as the one present in respondents who possess the trait naturally. Thus, although there appears to be a valid relationship in the experimental situation between the induced attribute (i.e., the instruction to fake response) and higher scores on the detection scales, the researcher is not able to

conclude that all subjects having higher scores in the actual test situation possess the "social desirability" trait.

The previous discussion has suggested the difficulties in eliminating social desirability through sample selection. Alternatively, the researcher may try to minimize the effects of this bias by modifying the conditions of administration, or the attitude measurement instrument itself (Scott, 1968). In administering the questionnaire, a considerable amount of effort should be expended in creating a good rapport between interviewer and respondent. Some sort of "preamble" should be read to the respondent prior to the administration of attitude scales, which: a) guarantees anonymity of response; b) stresses that there are no right or wrong answers; and c) urges respondents to reply honestly. It should be noted that rapport building is dependent on the ability of the interviewer to relate to the respondent and, as a result, will not be equally effective in all situations.

A third method for controlling social desirability response patterns suggests changing the nature of the measurement instrument (Edwards, 1957). In this forced choice technique, respondents are presented with two items (statements) of equal social desirability and asked to select the one which is most indicative of his/her opinion. The equating of items is usually done on the basis of group

mean ratings. Saltz, Reece and Ager (1962) have suggested that this procedure does not guarantee that items with equal ratings are necessarily equal in terms of social desirability. In general, research has failed to show the efficacy of this technique in eliminating social desirability response set.

In sum, social desirability is a subject characteristic which seems to manifest itself as a specific response pattern in traditional attitude scales. In recognizing this type of bias, the researcher assumes that the respondent is somehow motivated to give false responses (possibly as a result of external control or other-direction), and that he/she is aware of socially desirable responses. Proof of these assumptions alone is not enough to substantiate the existence of this response set. In the following sections, response biases (i.e., acquiescence and extremity, ceiling and floor effects) directly attributable to traditional attitude scaling, itself, will be discussed.

Acquiescence. Acquiescence, or "yea-saying," is the tendency of respondents to agree with attitude statements regardless of item content (Wells, 1960; Rorer, 1965; Becker and Myers, 1970). This response style may be exhibited in a test consisting of closed questions with two answer categories (e.g., true-false), or within attitude scales having "agree" and "disagree" as alternative

responses. Originally, acquiescence was thought to be a trait of the individual (Couch and Keniston, 1960; Jackson and Messick, 1958, 1961). However, an extensive review of research on response styles by Rorer (1965) has concluded that this is not so because it (acquiescence) is only exhibited in certain test situations (particularly true-false tests). More specifically, acquiescence has been given considerable attention as an extraneous determinant of response in the F scale measure of authoritarianism.

This situation can be remedied to some degree by taking additional pains in scale construction. The acquiescence response effect is generally minimized by using a balanced scale -- a scale where there are an equal number of positively-worded and negatively-worded statements. Equality of statements (pro and con) is usually judged by a comparison of variation in response, and the degree to which the sets of items are correlated. If the sets of items are positively correlated and have relatively equal variances, the effect of the acquiescence response set should be counterbalanced (Oskamp, 1977).

Extremity. The extremity response set, sometimes referred to as "halo effect," is common to closed-end questions with more than two alternative response categories, where respondents exhibit a tendency to check the

extreme choices (i.e., high or low). This response style may be common in Likert-type scales where respondents may opt for the "agree strongly," or "disagree strongly" categories, or in a seven-point numerical scale where there is a tendency to choose the numbers 1 or 7.

Very little research has been done to assess the impact of this response set on questionnaire validity, no less the magnitude of its existence (Beckwith, et. al., 1978). Oskamp (1977) has proposed two remedies to reduce the effects of extreme response bias. One solution is the development of a balanced scale (mentioned in the previous section) in order to counterbalance the effects. The other remedy eliminates the extreme response tendency altogether by using a two-point scale (e.g., agree-disagree). Neither algorithm appears to be adequate because they both fail to provide for the elimination of the extreme response bias without the loss of discrimination capabilities in scaling. After all, the purpose of using more than two categories in attitude measurement is to provide an indication of the intensity of attitude and, thereby, encourage discrimination among attitude statements. The first solution mentioned above (i.e., the reverse-scoring procedure) does not in any way induce respondents to use all response categories, it just gets them to select the opposite extreme point (e.g., from "agree strongly" to

"disagree strongly"); while the second solution makes discrimination impossible by eliminating the "excess" categories which were designed to measure intensity.

Ceiling and floor effects. Ceiling and floor effects are present in experiments in which measurement variation is artificially controlled through the imposition of finite boundaries (upper and lower) on the response variable (e.g., 0-100%, 1-9 points, etc.). As a result of constrained response, the experimental effect (e.g., the amount of attitude change) is a function of the initial level of response in the dependent variable. If the initial level is high, the second response will be biased downward; if it is low, the response will be biased upward (Hovland, Lumsdaine and Sheffield, 1949).

Thus, category scales may be subject to ceiling and floor effects because their physical design allows for a finite number of response categories containing a pre-defined upper and lower bound. As a result, the respondent may "run out of categories" while completing an attitude scale. For example, the subject may answer "agree strongly" (i.e., the upper bound on the scale) to the first item to which he/she is exposed. Then he/she encounters a statement in which the intensity of agreement is much stronger. At this point, it is possible that the respondent has run

out of categories because there is no choice with which he/she can indicate this stronger intensity of feeling. Consequently, the researcher may be unable to find discrimination among highly positive or highly negative attitudes.

From the previous discussion, it seems apparent that a number of biases are inherent in the use of traditional attitude scales. However, it is often difficult to ascertain the degree to which these response sets or styles are present in category scales, and the efficacy of the remedies suggested to counter them. The method of magnitude estimation has been suggested as an alternative measurement technique which may minimize some of these biases. A discussion of this scaling device, and its attendant biases, are provided in the following section.

Magnitude estimation

Magnitude estimation is a scaling device developed in the area of psychophysics, and adapted for use in attitude research. Its aim is to assign numbers to stimuli (i.e., attitude statements) so that ratios between the assigned numbers reflect ratios among the stimuli on the attribute being scaled (i.e., degree of agreement). It can be used to scale either unipolar or bipolar dimensions. In operation, the procedure is similar to traditional scaling in that respondents must indicate agreement or disagreement with an attitude statement. Once the respondent has

indicated the direction of feeling (i.e., agree or disagree), he/she is instructed to freely assign numbers to indicate the intensity of feeling. In a similar fashion, magnitude estimation has been used to assess many different aspects of perception (Stevens, 1975), public opinions about the seriousness of crimes (Sellin and Wolfgang, 1964), attitudes concerning national conflict and cooperation (Corson, 1970), and in product testing (Moskowitz, Jacobs and Firtle, 1980).

In using this scaling technique, respondents are not limited to a fixed set of numbers, as they would be when using category scales. The set of numbers is continuous, so that in theory the respondent would be able to assign a number in between two others (e.g., 9.5) to reflect gradations in intensity. Thus, precision is built into the scale, even if respondents do not (or cannot) make use of that potential precision.

Magnitude estimation may reduce three of the response biases (i.e., social desirability, extremity, ceiling and floor effects) which have been thought to recur in attitude research. In the discussion of social desirability, it was noted that two assumptions must be met in order to consider the presence of this type of response tendency: 1) the respondent must be somehow motivated to reply in an untruthful manner; and 2) the

respondent must be aware of the socially desirable response. It is the latter assumption which is difficult to support when using magnitude estimation because it is highly unlikely that one socially desirable answer will exist when each person is using his/her own rating scale (i.e., there is no obvious choice such as "agree completely"). In contrast, when respondents use traditional devices every respondent is using the same scale (e.g., a Likert-type scale) in which the response categories are well-defined, and the socially desirable reaction may appear obvious.

It also appears that in using magnitude estimation the researcher may, to some extent, evade the extremity response style found to exist in category scales. A superficial comparison of the two types of attitude measurement devices (i.e., category scales and magnitude estimation) will show that magnitude estimation has no extreme categories; they must be created by respondents. Further, in using magnitude estimation respondents cannot run out of categories -- thus allowing for discrimination at the extremes of the response continuum, and possibly avoiding ceiling and floor effects.

The researcher must be aware that observations like those mentioned in the previous paragraphs have not been demonstrated empirically. Therefore, it cannot be concluded that magnitude estimation operates independent of these

biases in all situations, regardless of the logic used to demonstrate otherwise.

Biases in magnitude estimation. In the following paragraphs, biases thought to be characteristic of magnitude estimation are reviewed (Stevens, 1975). As with traditional scales, the existence and magnitude of these biases has yet to be proven empirically.

When respondents are instructed to create their own scales, they tend not to use the entire continuum of numbers, especially on the first stimulus. Instead, some respondents exhibit a tendency to use a few favorite numbers. More specifically, the numbers 1, 5, 10, 20, 50 and 100 come up more often than other numbers. Hence, the name for this response style became the round number tendency.

Stevens (1975) recommends the randomization of the first stimulus (i.e., attitude statement) in order to counterbalance the effects of this response style. This adjustment allows the round numbers to be distributed along the entire set of attitude statements in any particular scale. If this procedure is not used, the distribution for the first statement may appear with several modal points, and thereby create an artificial narrowing of the variability of the data.

Besides using round numbers for the first stimulus, the respondent may decide to arbitrarily limit the range of

numbers used within the experiment as a whole. Respondents may use a range of 1 to 5, 1 to 10, or possibly 0 to 100. In this way, the respondent may create a scale in which the numbers describe specific levels of the attribute being scaled. For example, ratings maybe confined to four categories (e.g., 25, 50, 75, 100 -- 0 would be the neutral point on a bipolar hedonic scale) in which the numbers are equated to varying levels (e.g., slightly, moderately, very much, extremely). In effect, the respondent creates a category scale with equal interval properties (not ratio) in order to make the magnitude estimation exercise easier.

In this case, there is no suggested remedy. The respondent has decided to use a learned method of scaling in order to facilitate response. The response pattern may have the effect of limiting response discrimination, and subjecting measurement to biases inherent in traditional scaling techniques.

Conceptualization of Attitude

In the previous section, traditional attitude measurement was postulated as one of the methodological factors contributing to attitude-behavior inconsistency. Another methodological factor, is the conceptualization of attitude. In investigating this area, two important research questions deserve attention: Should attitude be replaced by a unidimensional measure of affect or some form of multi-

dimensional model? If the multi-dimensional (attribute) model is superior, what are the dimensions and form of that model?

There is some research (although not conclusive) which supports the notion that the multi-dimensional model is superior. After reviewing fifteen studies in the social sciences, Tittle and Hill (1967) found that the strength of the relationship between attitude and behavior seemed to vary as a function of the combination of the following variables: 1) the attitude measure used (i.e., single attribute vs. multi-attribute); 2) the behavioral criteria; 3) the circumstances of the behavioral criterion (i.e., usual vs. unusual). The strongest relationships between attitude and behavior were achieved (i.e., .60 or above in 3 out of 4 studies) when the attitude measure was a multi-item instrument and the behavioral criterion consisted of patterned behavior occurring under usual circumstances. In contrast, attitude-behavior consistency tended to be low (i.e., below .35) when the attitude measure was a stereotyped single question and the behavioral criterion consisted of a single act or set of acts occurring under unusual circumstances. The results of this review are rather inconclusive -- although it seems that multi-attribute measures tend to be more predictive.

In addition to the research support, Wilkie and Pessemier (1973) describe the multi-attribute representation as being particularly valuable in the assessment of brand attitudes: "The potential advantage of multi-attribute models over the simple 'overall affect' approach is in gaining understanding of attitudinal structure. Diagnosis of brand strengths and weaknesses on relevant product attributes can then be used to suggest specific changes in a brand and its marketing support." (p. 428). As a result, multi-attribute attitude models serve as the focus of this dissertation.

Multi-attribute models

Over the last fifteen years, the area of multi-attribute attitude models has been given considerable attention in the marketing literature. Although several models have been discussed, the majority of research seems to have focused on summative attitude models as originally developed by Rosenberg (1956) and Fishbein (1963). These models, although developed within an "expectancy-value" framework, have been operationalized a bit differently in the consumer behavior context. More specifically, in order to measure the attitude toward a product or brand, the importance given to an attribute is multiplied by the belief that the particular brand possesses the attribute, and then these "products" are summed across all attributes. This model is also referred to as the basic linear compensatory model, and is described below:

$$A_{jk} = \sum_{i=1}^n I_{ik} B_{ijk}$$

where:

i = specific product characteristic (attribute)

j = brand

k = respondent

such that:

A_{jk} = respondent "k's" attitude score for brand "j"

I_{ik} = the importance weight given attribute "i" by consumer "k"

B_{ijk} = respondent "k's" belief as to the extent to which attribute "i" is offered by brand "j".

In reviewing the literature, it was found that a major portion of the research in this area has been conducted on the evaluation (in terms of predictive validity) of various forms of the multi-attribute attitude model. As Reibstein (1977) points out, in the majority of these tests (of alternative forms), the validation criterion has been a measure of the correlation between the model's attitude score and preference rankings, or uni-dimensional measures of affect. In either case, both measures are usually obtained from respondents in the same interview (Oshikawa, 1979). These facts about the research designs employed (i.e., the attitude model is generally validated with another attitude measure, rather than behavior, and

both the predictor and criterion variables are measured concurrently) lead to the conclusion that the predictive validity of the multi-attribute model has yet to be established -- because, as stated previously, the predictive validity of an attitude measure may be obtained through its relationship with an appropriate behavioral measure obtained at a later point in time. As a result, there is a need for research which confirms the predictive validity of the model.

More specifically, in an extensive review of this model, as it has been applied in the marketing literature, Wilkie and Pessemier (1973) raise a number of research issues with regard to the conceptualization and operationalization of the model. While most of the issues relating to the operationalization (i.e., measurement of importance weights and beliefs) have been researched extensively, little work has been done on certain conceptual issues, specifically those relating to model structure. The linear compensatory model, as previously described, assumes that the inclusion of importance weights and summation across all attributes add to the explanatory power of the model. According to Bonfield (1979), there is little knowledge of which structural form (i.e., with/without importance weights, disaggregation/summation of attributes) is a valid measure of attitude. In addition, there are no conclusive findings regarding the number and kind of attributes which result in the most parsimonious representation (Holbrook, 1978). Each of these issues relating to model structure is

presented in the following paragraphs.

The inclusion or deletion of importance weights in the basic model has been the most important issue in marketing studies (Wilkie and Pessemier, 1973). According to Bass and Wilkie (1973), the bulk of the evidence on the suppression effects of the inclusion of importance weights seems to indicate that they (importance weights) are not likely to reduce the explanatory power of the model; yet, they do not add substantially to prediction, either. In other words, there seems to be no difference in the explanatory capabilities of the model whether or not importance weights are included. If this is true, then why bother to expend time and money on the collection and data processing of importance questions? It may be that a number of other factors add to the presence of suppression effects, some of which have been suggested in the literature: imprecision in attitude measurement, implicit incorporation of importance into belief ratings by respondents, weighting and summing procedures which might remove variations in the independent variables, and respondents weigh many of the attributes as being highly important (Sheth and Talarzyk, 1971, 1972; Cohen and Ahtola, 1971).

Another issue in the conceptualization of the linear compensatory model is the question of whether or not to sum the "products" (Iik Bijk). There have been very few empirical analyses of disaggregation vs. summation. The empirical results favoring either approach appear to be mixed (Cohen and Ahtola, 1971; Cohen and Houston, 1971;

Bass and Wilkie, 1973). However, several authors have offered conceptual criticisms of the summative model in order to show the superiority of the disaggregated model. Some of the criticisms include: summation is not theoretically explained by its advocates, summation of ratings obtained on bipolar scales leads to a compromise (average) value (Sheth, 1970); the disaggregated approach is especially appealing in terms of diagnosis of bases of consumer attitudes and in analysis of attitude change (Cohen and Houston, 1971); and summation results in considerably less utilization of the very information which appealed to marketers in the first place (Lutz and Howard, 1971).

A third issue goes beyond the "static" structural issues of importance weight inclusion and summation to the determination of attributes to be included in the model. As Wilkie and Pessimier (1973) point out, there is a lack of hard theory on the determination of attributes. The number of attributes included in a model is typically determined by using a stepwise multiple regression and selecting those attributes that are significantly related to the overall affect of a particular brand. Holbrook (1978) has gone one step beyond this "static" view, and has tried to answer the question of what determines beliefs (attributes). Using "the principle of information-processing parsimony" (which states that because of man's limited cognitive capacity,

human decision makers adapt heuristics that permit them to process as little data as is necessary to make rational decisions), Holbrook hypothesized and found that the sum of the three most important beliefs were related positively to overall affect, and that this form of the model was not significantly improved by more complex forms (1978, p. 550-551). Although providing a starting point in the work that is needed on the informational determinants of attitude structure, the conclusions derived may be limited due to: the use of overall affect as the criterion measure, the study of only one brand, and the use of graduate students in the sample. Later on in this dissertation it is hypothesized that a personality factor, internal-external locus of control, has an effect on the determination of attributes which best discriminate between brands.

Thus, it appears that both the measurement and conceptualization of attitudes are important methodological factors in the establishment of the attitude-behavior relationship. In the following sections, several personal and situational factors thought to affect attitude-behavior consistency are reviewed.

Personal Factors

A review of the literature has suggested a number of personal factors which may have moderating effects on the attitude-behavior relationship. This discussion is concerned with relatively stable personal factors, as opposed to

transient factors (e.g., mood, state of fatigue, general mental health, attention span, etc.) because it is assumed that the latter group will not have a major impact on measurement (Selltiz, Wrightsman and Cook, 1976). The personal factors which are reviewed in the following sections include: the "competing motives" and "other attitudes" explanations (Wicker, 1969; Gross and Niman, 1975).

Competing Motives

A number of researchers have suggested that motives that are in some way relevant to an attitude toward an object provide only partial information about the strength of motives relevant to the behavior toward an object (Deutsch, 1949; Kendler and Kendler, 1949; Cook and Selltiz, 1964; Day, 1970). In other words, the general motive properties of direction and magnitude of affect are insufficient as indicators of behavior. For example, in a study in which attitude measures indicated the presence of racial prejudice in restaurant and tavern owners, respondents experienced competing motives in the behavioral situation; they could refuse admission or service to Blacks because they or their patrons were offended by Blacks, or do nothing and avoid a disturbance (Kutner, Wilkins and Yarrow, 1952).

Internal-external locus of control. Research has shown that a general personality factor, internal-external locus of control, may serve to moderate the attitude-behavior relationship (Rotter, 1966; Ritchie and Phares, 1969; Hjelle and Clouser, 1970; Sherman, 1973; Lefcourt, 1976; Jenks,

1978; Strickland, 1978). Rotter (1966) describes internal-external (I-E) control as the degree to which an individual relates the occurrence of reinforcements to his/her own actions: thus, externally controlled individuals perceive the events that happen to them as resulting from luck, chance, fate, or powers beyond personal control and understanding; whereas, internals attribute events that happen to them to be a function of their own behavior. Locus of control is measured via various types of questionnaires, of which the Rotter I-E scale (1966) has been chosen most often.

Several areas of the locus of control literature provide reason to believe that I-E locus of control construct may moderate the relationship between attitude and behavior. To begin with, there is the relationship of locus of control with the arousal of social anxiety. Taken directly from Rotter's theoretical framework, externals are seen to gain reward from social approval, while internals are reinforced through intrinsic satisfaction. In fact, research has supported the hypothesis that externals are more socially anxious than internals (Lefcourt, 1976; Lowe, Gormanous and Kersey, 1978). Taking these findings a step further into the realm of consumer behavior, it would seem that externals would be more likely to select products which delivered on benefits that relieved social anxiety than internals. It follows that externals will show greater differences in brand usage based on product attributes which relate to social approval.

Other research has shown a relationship between locus of control and persuasibility (Ritchie and Phares, 1969; Hjelle and Clouser, 1970; Sherman, 1973; Lee, 1976; Jenks, 1978). Thus, persuasive communications are more likely to change the professed attitudes of those who are found to be externally-controlled than those who are internally controlled. In a marketing sense, advertising is more likely to affect the attitudes of externals, than those of internals. Externals may be more susceptible to the persuasive effects of advertising, and consequently express brand differences in terms of benefits conveyed in advertising copy.

A third correlate of locus control, which may relate to the moderation of the attitude-behavior relationship, is health-related behavior. A comprehensive review of research concerning I-E locus of control and health-related behaviors suggests "... that beliefs about internal versus external control are related in significant and even dramatic ways to health-related behaviors" (Strickland, 1978, p. 1192). Internals show a greater desire to maintain their physical health than externals. For example, internals were more likely to engage in the following health-related behaviors than externals: use of seat belts in automobiles (Williams, 1972a); inoculation against influenza (Dabbs and Kirscht, 1971); preventive dental care (Williams, 1972b); participation in voluntary exercise (Sonstroem and Walker, 1973). It is possible that this greater degree of health-consciousness in internals

would carry over into their brand selection in a given product category (i.e., if a particular brand would promote physical well-being, they would select that brand). Therefore, internals may be more likely to see differences between brands on health-related attributes than externals.

Attitude stability. In addition to the I-E locus of control factor already mentioned, Day (1970) suggests that the assessment of two other general motive properties will add understanding to the attitude-behavior relationship. The first of these properties is involvement with the attitude object, or the centrality of the object to a person's ego structure. Generally, the probability of attitude change has been found to vary inversely with the level of involvement (Sherif, Sherif and Nebergall, 1965; Engel and Light, 1968). In addition, Zajonc and Morrisett (1960) have suggested that a person's confidence in his/her attitude judgment may indicate a second unmeasured motive property. The degree of confidence in response could reflect uncertainty as to which judgment is correct, or ambiguity as to the meaning of the attitude object depending on the circumstances. Thus, involvement and confidence are viewed as determinants of attitude stability and, as a result, are thought to have a significant moderating effect on attitude-behavior consistency.

"Other Attitudes" Explanation

The failure of researchers to completely sample the attitudinal domain which is associated with a particular behavior may also weaken the attitude-behavior relationship

(Hyman, 1949; Cook and Selltitz, 1964; Insko and Shopler, 1967; Rokeach, 1967). There may be many attitudes or components of attitude relevant to any given behavior, and consequently, inconsistent relationships may appear due to the oversight of the multi-dimensional nature of the problem (i.e., a single attitude measure may be erroneously used).

This problem may be evident in the everyday marketing research study. In this situation, the researcher may attempt to relate attitudes toward department stores with actual store patronage. A particular consumer may have negative attitudes to all aspects of the department store which is close to his/her home. In addition, this consumer has negative attitudes toward driving, which are not measured. The attitudes toward driving prevail, and as a result, he/she selects the store closest to home. In this case, measured attitudes are a poor indication of behavior since the consumer chooses the store which he/she likes the least.

Situational Factors

Situational factors constitute the final group of variables which have been suggested as influencing the relationship between attitude and behavior. For example, Miller and Ginter (1979) found that attitudes toward restaurants and behavioral choice of restaurant are moderated by eating occasion. Wicker suggests a general postulate regarding situational effects on attitude-behavior consis-

tency: "The more similar the situations in which verbal and overt behavioral responses are obtained, the stronger will be the attitude-behavior relationship" (Wicker, 1969, p. 69). The dimensions along which environments can vary, which will be discussed here, include: normative prescriptions of proper behavior, specificity of attitude objects, alternative behaviors available, unforeseen extraneous events, and the expected and/or actual consequences of various acts.

Normative Prescriptions of Proper Behavior

Behavior may not always be consistent with attitudes because the individual may feel compelled to behave in accordance with social norms and/or role requirements (Hyman, 1949; DeFleur and Westie, 1963; Cook and Selltiz, 1964; Fendrich, 1967). Thus, subjects may assume different roles in each of the respective situations when attitude and behavior are measured. For example, in the interview situation the respondent is guaranteed anonymity of response and, as a result, he/she may choose one of a variety of roles (e.g., respond in a fashion which he/she feels will please the interviewer, or perhaps, provide a "true" unconstrained response). However, in the purchasing situation (i.e., behavior), he/she may choose the product which is dictated by social norms. In this way, social class may have a moderating effect on attitude-behavior consistency.

Specificity of Attitude Objects

Many instances of inconsistency may be due to the fact that the stimulus in verbal response situations tends to be general, while the stimulus in overt behavioral response situations tends to be highly specific (Kendler and Kendler, 1949; Cook and Selltiz, 1964; Fishbein, 1966). Fishbein's discussion provides further clarification:

For example, in many cases we have measured subjects' attitudes toward a class of people or objects, and then we have attempted to predict their behavior with respect to a particular member of that class on the basis of that attitude . . . Thus, we have frequently measured a subject's attitude toward Negroes, and then we have attempted to predict whether the subject would ride with, work with, or cooperate with Negroes. But it is unlikely that the subject's beliefs about the particular Negroes he comes into contact with are similar to his beliefs about Negroes in general (Fishbein, 1966, p. 206).

A study by Wicker (1969) shows support for the thesis that the stimulus dissimilarity is positively related to inconsistency.

Related to this subject is Rokeach's (1968) explanation of the attitude-behavior relationship. His thesis is that behavior is always a function of at least two attitudes: one general (i.e., attitude toward the situation), and one specific (i.e., attitude toward the object). The implications of this hypothesis are: "First, a given attitude-toward-object, whenever activated, need not always be behaviorally manifested or expressed in the same way or to the same degree. Its expression will vary adaptively

as the attitude activated by the situation varies, with attitude-toward-situation facilitating or inhibiting the expression of the attitude-toward-object and vice versa" (Rokeach, 1968, p. 135). Thus, in order for behavior to follow consistently from attitudes, there must be a relative degree of congruence between attitude toward the situation and the attitude toward the object.

Alternative Behaviors Available

Insko and Shopler (1967) have noted that some attitudes may not have corresponding behavior because opportunities for the behavior do not arise. This suggests that the greater the similarity of behaviors available at the attitude measurement- and overt behavioral response-stages, the greater the consistency that will result. Day (1970) has discussed this problem of inconsistency in brand attitude and brand choice behavior. He suggests that the lack of availability of all brands in the store environment could lead to inconsistency in the relationship.

Unforeseen Extraneous Events

Wicker (1969) suggests that many unforeseen circumstances can contaminate what may otherwise have been a strong relationship between attitude and behavior. The possibility of the occurrence of such events increases as a function of the length of the decision process and the

nature of the particular environment. Examples of this type of variable in the buyer behavior situation include changes in the individual's financial position (e.g., loss of job), changes in the general economic environment, or changes in the competitive framework in the period between attitude measurement and behavioral response.

Expected and/or Actual Consequences of Various Acts

Both verbal and overt behavioral response may be influenced by the individual's expectations of outcomes of various acts, whether or not the individual is aware of the possible reinforcement contingencies. An example of this effect is proved by Dollard (1949). He suggests that the employee holding a negative attitude toward labor unions does so out of fear that the investigator inquiring about attitudes toward labor unions represents his employer. Gross and Niman (1975) conclude that the expected and/or actual consequences of various acts may be the most fundamental of the situational factors since most of the other factors can be included within this framework.

Summary

The literature concerning the relationship between attitude and behavior has been reviewed in this section. Empirical research in both the social sciences and marketing leads to the conclusion that the relationship has yet to be

substantiated. A number of methodological, personal and situational factors thought to affect attitude-behavior consistency were also discussed. Of specific interest within this dissertation are the effects of certain methodological and personal factors (namely, attitude measurement, the structural form of the multi-attribute model, and I-E locus of control) on the attitude-behavior relationship. The research methodology used to test these effects is presented in the next chapter.

CHAPTER III

RESEARCH METHODOLOGY

Throughout this dissertation, the nature of the relationship between attitude and behavior, and factors affecting the validity of the relationship have been discussed in detail. The integration of these areas has suggested several theoretical causes of inconsistency in the attitude-behavior relationship. Two methodological factors, namely the imprecision inherent in traditional scaling methods and the conceptualization of attitude (i.e., via alternative multi-attribute models), are thought to be largely responsible for the inconsistent relationship between attitude and behavior. In addition, a generalized personality factor (i.e., internal-external locus of control) has been suggested as a moderating variable in the attitude-behavior relationship. As noted previously, these generalizations need to be tested through empirical research. As a result, the purpose of this chapter is to provide an outline for the investigation of the relationship between brand attitudes and purchasing behavior which has been conducted in this dissertation. The hypotheses, experimental design and method of data collection are discussed in the remaining sections of this chapter.

Hypotheses

In order to achieve the objectives of the study, several hypotheses have been formulated. The first of these hypotheses deals with the comparative sensitivity of traditional category scaling and magnitude estimation as attitude measurement methods. On its face, the method of magnitude estimation seems to provide greater discrimination ability, and appears to be less affected by response biases than category scaling. This suggests that magnitude estimation may provide a more precise alternative to traditional methods.

H₁: Magnitude estimation of attitudes provides a higher level of validity than category scaling when used to predict purchasing behavior from brand attitudes.

The conceptualization of attitude may be another methodological factor responsible for attitude-behavior inconsistency. In a previous chapter of this dissertation it was argued that multi-attribute measures of attitude were more predictive of behavior than single-item measures. Further, the multi-attribute attitude model would seem to have greater applicability in a marketing context because its multidimensional approach allows for the assessment of the positioning of products/brands and, hence, aids in strategy formulation. In reviewing the literature on the basic linear compensatory model, it was suggested that

certain issues concerning the structure of the model were unresolved. More specifically, previous research has shown that the inclusion of importance weights is not likely to enhance the explanatory power of the model. In addition, conceptual criticisms against the use of the summative model, provide support for the use of the disaggregated model in assessing brand attitudes. Following this reasoning, the disaggregated linear compensatory model without importance weights should outperform the other three versions of the basic model.

H₂: The disaggregated linear compensatory model of brand attitude without importance weights provides a stronger relationship between attitude and behavior than the basic summative model ($A = \sum IB$).

H₃: The disaggregated model without importance weights provides a stronger relationship between attitude and behavior than the basic summative model without importance weights ($A = \sum B$).

H₄: The disaggregated model without importance weights provides a relationship which is as strong or stronger than the disaggregated model with importance weights.

One generalized personality factor has been postulated as having a moderating effect on the attitude-behavior

relationship. Internal-external locus of control has been suggested as a moderating variable in the relationship between brand attitudes and purchase behavior based on a number of perspectives. As a starting point, a review of the literature has shown a relationship between locus of control and the arousal of social anxiety: that is, externals have been found to be more socially anxious than internals (Lefcourt, 1976; Lowe, Gormanous and Kersey, 1978). In a consumer behavior context, externals would show a greater likelihood of selecting products (brands) which deliver on benefits that relieve social anxiety than internals. More specifically, in a toothpaste product, externals are more likely to differentiate between brands based on characteristics which lead to social approval (e.g., creation of fresh breath, whitening of teeth, attractiveness of color, etc.) than internals.

H₅: Externals are more likely to show brand differences on attributes related to social approval than internals.

A second group of researchers has found a relationship between I-E locus of control and persuasibility (Ritchie and Phares, 1969; Hjelle and Clouser, 1970; Sherman, 1973; Lee, 1976; Jenks, 1978). Thus, externally controlled individuals show a greater propensity toward attitude change when presented with a persuasive communication, than internally controlled individuals. It follows that advertising is more likely to affect the brand attitudes of externals, than those of internals. As a result, externals are expected to differ-

entiate between brands in terms of benefits conveyed in advertising copy (e.g., Colgate and Crest should be differentiated on taste and cavity prevention).

H₆: Externals are more likely (than internals) to show brand differences based on the portrayal of those brands in their respective advertising communications.

Internal-external locus of control has also been shown to be associated with the incidence of certain health-related behaviors (Dabbs and Kirscht, 1971; Williams, 1972a, 1972b; Sonstroem and Walker, 1973; Strickland, 1978). Internals exhibit a greater desire to maintain their physical well-being than externals. It was previously argued that this higher level of health-consciousness among internals could effect their brand choice behavior (i.e., they would select brands on health-related qualities). For example, in toothpaste brand selection, internals are more likely to choose a particular brand based on its ingredients and cavity prevention efficacy.

H₇: Internals are more likely to show brand differences on health-related attributes than externals.

The hypotheses mentioned above attempt to assess the impact of certain methodological and personal factors which may weaken the attitude-behavior relationship. In the next section, the experimental design which allowed for the test-

ing of these hypotheses is discussed.

Experimental Design

The experimental design employed in this study represents the generalized case of the traditional "after only with control group" design. In the traditional sense, a control group represents the group in a study that does not receive the experimental treatment. However, Kerlinger (1973) suggests a more general rule of control in order to establish the internal validity of the experiment:

Whenever there is more than one experimental group and any two groups are given different treatments, control is present in the sense of comparison. As long as there is an attempt to make two groups systematically different on a dependent variable, a comparison is possible. Thus, the traditional notion that an experimental group should receive the treatment not given to a control group is a special case of the more general rule that comparison groups are necessary for the internal validity of any scientific research (Kerlinger, 1973, p. 33).

In this dissertation, there were two experimental groups receiving two different treatments. Each of the groups completed a typical attitude and usage questionnaire concerning toothpaste. The questionnaires were identical in layout of questions. However, the scaling technique used to complete the attitude questions differed within experimental group. Group I utilized magnitude estimation to answer the product specific attitude questions, and Group II used a traditional category scaling method to answer those

same questions. This design allowed for the testing of all hypotheses in the study, because the variations of the multi-attribute model to be tested were only mathematical manipulations of data which were collected in both cells. The data on the personality factor to be tested were also gathered in both groups. Detailed discussion of the method of data collection is presented in the next section.

Method of Data Collection

Data collection for this dissertation was conducted in two stages. In the first stage, forty undergraduate students were employed to conduct personal interviews. The students were all junior and senior level rank at Baruch College, City University of New York in the Fall 1980 semester. They were trained extensively over two sessions (3 hours) in their respective marketing research and consumer behavior courses. The training included discussion about: the proper selection of respondents, instructions on general interviewing techniques, handling non-response and the completion of practice interviews.

Each interviewer was requested to complete 12 interviews within a one month period as part of his/her course work. (Students were given a choice of conducting the interviews or writing a term paper. In either case, the selected task was worth 25% of the student's final grade. The

qualities of completeness and validation were the criteria for acceptable performance. If the student was unable to meet these criteria on less than 10 [out of 12] interviews, he/she received no credit for the task.) Specific quota assignments were given to each interviewer and are discussed within the "sample" section of this chapter.

Almost all (39 out of 40) of the interviewers completed their assignments, and 465 interviews were returned. After editing and validation, there was a total of 427 usable interviews. Validation was accomplished in stage II of the data collection process when this researcher re-interviewed respondents by telephone (approximately four weeks after the initial interview) in order to obtain additional behavioral information needed for the testing of hypotheses. A detailed discussion of the sample and questionnaire design is provided in the following paragraphs.

Sample

A non-probability quota sample was the method used to select experimental subjects in this dissertation. A demographic control characteristic (age) was utilized to assign specific quotas to each interviewer. The interviewers resided in geographically dispersed areas within the New York metropolitan area. This dispersion provided a good cross-section of the New York population.

The sampling universe for this study included female heads-of-household aged 18-49 in the New York metropolitan

area. This frame was chosen because it represents the typical definition of the target market for toothpaste.¹

A total of 480 interviews were assigned to interviewers. Respondents were pre-screened for toothpaste purchase in the past month, and age. The age question allowed for the assignment of respondents into specific quota groups, which would ultimately represent the target market. Two equal quota groups were established within each cell (questionnaire type) in order to assure adequate representation of younger (18-34) and older (35-49) age groups within the target market. Prior to the data collection phase, it was expected that a minimum of 300 usable (and valid) interviews would result from the 480 interviews assigned. The assigned number of interviews allowed for adequate size quota groups even if several of the interviewers did not complete their assignments. Fortunately, the number of usable interviews (427) exceeded the number of interviews needed to represent each of the sub-samples (see Table 1).

Questionnaire Design

In order to test the hypotheses, it was necessary to develop two versions of the questionnaire (Appendix A). The questionnaires were identical in that the types of questions and their placement within the questionnaire were the same. The questionnaire was modified after those traditionally used in attitude and usage studies. Respondents were asked

Table 1
Sample Allocation

Quota Group	<u>CELL I (Magnitude Estimation)</u>			<u>CELL II (Category Scaling)</u>		
	<u>Assigned Quota</u>	<u>Expected Usable Number</u>	<u>Actual Usable Number</u>	<u>Assigned Quota</u>	<u>Expected Usable Number</u>	<u>Actual Usable Number</u>
Age 18-34	120	75	103	120	75	106
Age 35-49	<u>120</u>	<u>75</u>	<u>107</u>	<u>120</u>	<u>75</u>	<u>111</u>
	240	150	210	240	150	217

brand awareness, purchase and usage.

After these measures of market definition were secured, respondents were asked to rate the importance of specific characteristics in a toothpaste (see Table 2). The characteristics were developed from this researcher's previous experience within the product category at two commercial marketing research suppliers. This question served the purpose of providing respondents within each cell with an orientation to each of the respective scaling techniques (i.e., magnitude estimation and category scaling).

Respondents using the magnitude estimation scaling were instructed to indicate whether the specific characteristic being considered was either important or unimportant by checking the box in the appropriate column (Figure 1). After indicating the direction of the attitude, respondents indicated the intensity of the attitude by entering a number -- large numbers showed intense feeling, small numbers a somewhat weaker feeling. If the attitude was neutral, both columns were left blank, and a zero (0) was entered on the line labelled "HOW MUCH."

Figure 1

	<u>IMPORTANT</u>	<u>UNIMPORTANT</u>	<u>HOW MUCH?</u>
Clean teeth	[]	[]	_____

Table 2
Product Characteristics

Clean teeth
Leave your mouth feeling fresh
Prevent cavities
Prevent bad breath
Whiten teeth
Prevent tooth decay
Have a good taste
Rinse easily
Protect teeth
Have an attractive color
Contain fluoride
Have a gel-like consistency
Be a good value for the money
Be approved by a dental association
Eliminate a bad taste in your mouth

A similar set of instructions was provided for those using the category scale. Respondents were asked to indicate whether they considered each of the characteristics extremely important, moderately important, slightly important, neither important nor unimportant, slightly unimportant, moderately unimportant or extremely unimportant in a toothpaste (Figure 2).

Figure 2

	<u>Extremely</u> <u>Important</u>	<u>Moderately</u> <u>Important</u>	<u>Slightly</u> <u>Important</u>	<u>Neither</u> <u>Important</u> <u>Nor</u> <u>Unimportant</u>	<u>Slightly</u> <u>Unimportant</u>	<u>Moderately</u> <u>Unimportant</u>	<u>Extremely</u> <u>Unimportant</u>
Clean Teeth	[]	[]	[]	[]	[]	[]	[]

Following this orientation to each of the scaling techniques, respondents in each of the respective groups were asked to rate the brand of toothpaste they purchased last time on an overall basis, and then on the delivery of specific characteristics using the scaling technique which they were assigned to use. This measure of product delivery was used for the testing of the various multi-attribute models of brand attitude. Characteristics used in the rating of the importance of specific characteristics in a toothpaste, and brand delivery on specific characteristics were presented in random order within their respective groups to prevent order bias. This randomization occurred in both the magnitude estimation and category scaling questionnaires.

After these attitudinal measures were secured, it was necessary to ask questions which would facilitate the assessment of the personality factor to be tested. The personality factor measured in this study, internal-external locus of control, was assessed using the scale developed by Rotter (1966). The scale contains 29 items (6 of which are not scored), and has been used in many studies (Lefcourt, 1976) since its development by Rotter in 1966. Demographics were asked following these questions.

The callback interview was very brief -- it only included two questions. First, a validation question was asked to be certain that the personal interview actually took place. Secondly, respondents were asked to state the brand of toothpaste that they had purchased last time. This question was asked in order to obtain a behavioral response which was taken at a later point in time (approximately four weeks) than the verbally reported attitude, and was a necessary component in the establishment of the predictive validity of the attitude-behavior relationship.

Summary

In this chapter, the research methodology employed in this dissertation has been described. The objectives of the study were set forth in the form of specific hypotheses. A modification of the "after only with control group" experimental design comprised of two experimental questionnaire

(i.e., magnitude estimation and category scaling) cells was discussed as the method for testing the hypotheses. The results of the procedures set forth are evaluated in the next chapter.

FOOTNOTES

¹A conversation between this researcher and Linda James, a research account executive at Simmons Market Research Bureau, November 1980.

CHAPTER IV

ANALYSIS OF DATA COLLECTED

In the previous chapter, the research methodology utilized in this dissertation to investigate the problem of attitude-behavior inconsistency was discussed. As part of that discussion, specific hypotheses were posed in order to help this researcher arrive at the solution to the problem. Consequently, data were collected as previously specified, and analyzed in order to test these hypotheses. The analytical procedures employed, and results obtained from these analyses are presented in this chapter.

Analytical Procedures

In order to accomplish the testing of hypotheses, it was necessary to use a statistical technique which had the ability to assess the relationship between a given set of "interval scaled" product characteristics (i.e., attitude measured as: $A = \sum I_n B_n$, $A = \sum I_n B_n$, $A = B_1 + B_2 + \dots + B_n$, or $A = I_1 B_1 + I_2 B_2 + \dots + I_n B_n$) and the "nominal scaled" brand purchased last time (i.e., behavior). Discriminant analysis provided these qualities, and was chosen as the method of analysis.

Discriminant Analysis

The object of discriminant analysis is to classify individuals into two or more groups on the basis of a given set of independent variables. In other words, the goal is to discriminate between a set of groups. Using this technique the "discriminating" variables are weighted and combined linearly so that the groups may be as statistically distinct as possible. The absolute magnitude of the standardized weights indicates the relative importance of the independent variables in discriminating between the groups. When there are two groups, only one linear discriminant function is necessary to account for the separation between the groups. However, when there are more than two groups (as is the case in this dissertation with five user groups), more than one function may be needed in order to maximize the separation between the groups, up to a maximum of $K-1$ discriminant functions (where K is the number of groups) [Frank, et al., 1965; Morrison, 1969; Bolch and Huang, 1974; Johnson, 1976].

Selection of Variables to be Included

In many cases, it is difficult for the researcher to know a priori, which variables have the greatest discriminating power. It is quite possible, and likely, that all the variables used as input to the analysis do not contribute

to increased discrimination between the groups. As a result, the researcher may select a "stepwise" procedure which allows for sequential selection of the set of discriminating variables which are as good as, and sometimes better than the full set. In this dissertation, the stepwise procedure was chosen in order to maximize the attitudinal distance between the two closest brand user groups.

Evaluation of the Discriminant Functions

In evaluating each discriminant analysis performed, several criteria must be kept in mind. The first two of these criteria have to do with the usefulness of the model employed. To begin with, it must be determined whether or not the model in question achieves discrimination at some pre-specified level of statistical significance. While there are a number of comparable statistics commonly used to achieve this test (i.e., Wilk's lambda, Rao's V, etc.), Wilk's lambda was employed in this dissertation because of easy accessibility to it in the SPSS routine (Nie, et al., 1975). In addition, the level of statistical significance was selected to be $\alpha = .05$ because a stringent test of each of the models was necessary.

A second test of the usefulness revolves around the classification of individuals by using the derived discriminant function(s). In this way, the original set of cases

can be classified in order to establish the level of "correct classification" with the variables being used. This measure is similar to the coefficient of multiple determination (R^2) in regression analysis. It helps to establish whether or not the derived functions classify individuals better than chance assignment.

A final criterion to be considered in the evaluation of any particular set of discriminant functions has to do with the ability of the derived functions to correctly classify individuals taken from another set of data. This "validation" of the model may be accomplished by holding out a sample of data from the total base before deriving the discriminant functions. Once the classification functions have been computed, the model may be validated by checking the level of correct classification by using the smaller "holdout sample." If the level of correct classification achieved using the holdout sample is better than chance, the model is said to be valid. Before discussing the discriminant analyses which were run in order to test the hypotheses posed, the data base and the transformation of data are presented in the following sections.

Data Base

Prior to conducting the necessary analyses, the total base was reduced in order to achieve "statistically

representative" (i.e., approximately normally distributed attitudinal responses) sub-groups in each of the test cells. In this process, brand user groups with base sizes less than 18 were eliminated from the analyses. As a result, the actual data base employed in the discriminant analyses (n=365) was smaller than the number of usable questionnaires (n=427). This "reduced" sample was composed of five brand user groups (i.e., Aim, Aqua-Fresh, Close-Up, Colgate, Crest), each with a minimum total base size of at least 18 respondents within each of the two cells (see Table 3). These minimum sub-group sizes allowed for an approximate normal distribution of attitudinal response for each brand. (It was extremely difficult, if not impossible, to increase these user group sizes a priori because brand usage was determined as a result of the callback interview, which took place approximately four weeks after basic data collection [personal interview].)

In addition, a holdout sample of approximately 25% (45 respondents) was randomly generated within each of the test cells, leaving the effective base size for the derivation of discriminant functions to be 134 cases in the magnitude estimation cell and 145 cases in the category scaling cell (see Table 3). The holdout samples were utilized in the "validations" of the discriminant functions derived for each of the respective cells.

Table 3
Analytical Data Base

Brand User Group	Cell I (Magnitude Estimation)			Cell II (Category Scaling)		
	Total	Effective Base	Holdout Sample	Total	Effective Base	Holdout Sample
	#	#	#	#	#	#
Aim	25	21	4	29	24	5
Aqua-Fresh	21	16	5	24	20	4
Close-Up	22	19	5	18	17	1
Colgate	60	43	17	55	35	20
Crest	51	37	14	60	45	15
	179	134	45	186	141	45

Transformation of Data

In the previous section, it was implied that approximate normality of attitudinal response was achieved through "statistically representative" brand user group base sizes. This prerequisite was necessary because discriminant analysis requires that the set of independent variables (e.g., attitudinal responses) be normally distributed. However, unlike scores provided by category scales, those provided by the method of magnitude estimation are not normally distributed (even when assuming adequate base sizes). As a result, it was necessary to "normalize" the magnitude estimates in this study.

Moskowitz (1977) suggests that "normalization" of magnitude estimation scales can be accomplished by dividing each of the individual's specific attribute ratings by his/her overall rating of that brand. The procedure, as suggested by Moskowitz, was used to normalize respondents' ratings of the importance of specific characteristics in a toothpaste, and ratings of brand purchased last time on those characteristics. It should be noted that this procedure may possibly be responsible for the removal of certain response biases in the data. After this transformation, the appropriate discriminant analyses were conducted; the results are reported in the next section.

Results

As noted previously, discriminant analysis served

as the core tool in the testing of hypotheses. One discriminant analysis was run for each treatment combination of the two methodological factors considered in this dissertation (i.e., one analysis for each of the four versions of the multiattribute attitude model tested [the disaggregated model without importance weights, the disaggregated model with importance weights, the aggregated model without importance weights and the basic linear compensatory model] within both the magnitude estimation and category scaling cells). These analyses were then compared to allow for the testing of hypotheses. In comparing these analyses, the "best" functions (i.e., most predictive) were derived, and served as the basis for testing the moderating effects of the personality factor being studied (i.e., internal-external locus of control. The detailed results of the analyses described in this paragraph are presented in the following two sections: methodological factors and personal factor.

Methodological Factors

The discriminant analyses that were run in order to determine the effect of methodological (i.e., attitude measurement and conceptualization of attitude) factors on attitude-behavior consistency are presented in this section. Results for these analyses are discussed in three sections

which relate to the conceptualization of attitude, and are presented in the following order: the disaggregated model without importance weights, the disaggregated model with importance weights, and the aggregated models: with and without importance weights. The discriminant functions derived using magnitude estimation, and category scaling are described within each of these sections. Following the discussion of the individual analyses, the predictive capabilities of all of the functions will be compared in order to test the hypotheses posed in the previous chapter.

The Disaggregated Model Without Importance Weights

The reader will recall from previous discussion that the disaggregated model without importance weights assumes that each of the brand ratings on specific attributes is treated as a separate piece of information in determining the relationship between attitude and behavior (i.e., usage behavior = $f [B_1 + B_2 + \dots + B_n]$). Thus, the differential contribution (or importance) of each of the attributes in predicting behavior is empirically derived through the computation of the discriminant functions, rather than being collected as a separate piece of information. The discriminant models derived for both magnitude estimation and category scaling are presented below, with the emphasis of discussion being placed on the usefulness and validity of the two alternatives.

Magnitude estimation. Using magnitude estimation scaling, the stepwise discriminant procedure produced a model consisting of two discriminant functions (see Table 4). Although 15 variables were input to the analysis, only 7 were needed to find significant discrimination among the five brand user groups. The model generated a Wilk's lambda = .6601, which was equivalent to a chi-square statistic of 52.746 with 18 degrees of freedom, indicating significance at the .01 level.

As a further test of the usefulness of the model, the derived discriminant functions were used to classify the set of individuals, whose responses were used to compute the model. The percent of correctly classified cases was 58.96%; that compared to 23.41% that could have been achieved by chance assignment (see Table 5).

Having established the usefulness of the functions, an attempt to "validate" the results was made. The "validation" test was accomplished by classifying respondents in the holdout sample with the derived functions. These computations yielded a correct classification rate of 37.78% (see Table 6). Although this rate (37.78%) was more than 20% less than the classification for the original data, it is still 14% more accurate than chance assignment. The decrease in percent correctly classified may be a function of a substantially smaller base size in the holdout sample

Table 4
 Disaggregated Model Without Importance Weights --
 Magnitude Estimation (Dependent Variable --
 Brand Purchased Last Time)

<u>Variables Included</u>	<u>Standardized Coefficients</u>	
	<u>Function 1</u>	<u>Function 2</u>
Cleans teeth	-1.10	0.22
Prevents bad breath	0.46	-0.36
Prevents tooth decay	-0.20	0.68
Protects teeth	-0.04	-2.08
Has an attractive color	0.05	0.46
Contains flouride	-0.55	1.61
Has a gel-like consistency	1.62	.17

Wilk's Lambda = .6601

Chi-Square = 52.746, df = 18

$p < .01$

Table 5
 Classification Results (Original Data) --
 Disaggregated Model Without Importance Weights --
 Magnitude Estimation

Actual Group Membership	Predicted Group Membership					Total #
	Aim	Aqua- Fresh	Close- Up	Colgate	Crest	
	#	#	#	#	#	
Aim	17	0	2	2	0	21
Aqua-Fresh	9	3	2	2	0	16
Close-Up	3	0	8	6	0	17
Colgate	3	0	3	31	6	43
Crest	<u>4</u>	<u>0</u>	<u>0</u>	<u>13</u>	<u>20</u>	<u>37</u>
(Total)	(36)	(3)	(15)	(54)	(26)	134

Correctly Classified: 58.96%

Chance Accuracy: 23.41% = $(.1567)^2 + (.1194)^2 + (.1269)^2$
 $+ (.3209)^2 + (.2761)^2$

Level of Correct Classification Better Than Chance:

$$58.96 - 23.41 = 35.55\%$$

Table 6
 Classification Results (Holdout Sample) --
 Disaggregated Model Without Importance Weights --
 Magnitude Estimation

Actual Group Membership	Predicted Group Membership					
	Aim	Aqua- Fresh	Close- Up	Colgate	Crest	Total
	#	#	#	#	#	#
Aim	3	1	0	0	0	4
Aqua-Fresh	1	1	1	2	0	5
Close-Up	1	0	2	2	0	5
Colgate	2	0	2	8	5	17
Crest	1	0	2	8	3	<u>14</u>
						Total = 45

Correctly Classified: 37.78%

(i.e., holdout base = 45, original data base = 134); in addition to a natural positive bias which occurs when the data used to produce the discriminant equation is used to compute percent correct classification in the holdout sample. [The reader may note that this decrease in correct classification was experienced across all holdout samples in each of the models derived.]

Category scaling. On its face, the discriminant analysis derived for the disaggregated model without importance weights using category scaling did not appear to achieve the level of usefulness that the magnitude estimation version had. Ten out of the fifteen variables input were needed in order to achieve significant discrimination among the brand user groups (see Table 7). With the exception of "cleans teeth," the category scaling computation included all the the discriminating variables found to exist in the magnitude estimation version of this model.

Despite its significant discrimination at the .01 level, it produced a lower level of correct classification, 46.81% (see Table 8), than that achieved by the magnitude estimation version of the disaggregated model without importance weights (58.96%). These differences will be tested for statistical significance in a later section.

Table 7
 Disaggregated Model Without Importance Weights --
 Category Scaling (Dependent Variable --
 Brand Purchased Last Time)

<u>Variables Included</u>	<u>Standardized Coefficients</u>		
	<u>Function 1</u>	<u>Function 2</u>	<u>Function 3</u>
Leaves your mouth			
feeling fresh	0.37	0.16	0.21
Prevents cavities	0.07	0.80	-0.27
Prevents bad breath	0.10	-0.62	-0.32
Prevents tooth decay	-0.51	-0.30	0.88
Protects teeth	0.30	-0.28	-0.55
Has an attractive color	0.23	0.50	-0.32
Contains flouride	-0.28	-0.15	0.13
Has a gel-like consistency	0.69	-0.01	0.65
Is approved by a dental			
association	-0.45	0.32	0.49
Eliminates a bad taste in			
your mouth	-0.40	0.72	-0.25

Wilk's Lambda = .7745

Chi-Square = 33.86, df = 16 $p < .01$

Table 8
 Classification Results (Original Data) --
 Disaggregated Model Without Importance Weights --
 Category Scaling

Actual Group Membership	Predicted Group Membership					Total #
	Aim	Aqua- Fresh	Close- Up	Colgate	Crest	
	#	#	#	#	#	
Aim	16	1	2	0	5	24
Aqua-Fresh	4	13	1	0	2	20
Close-Up	4	2	6	5	0	17
Colgate	4	4	3	2	22	35
Crest	<u>10</u>	<u>1</u>	<u>1</u>	<u>4</u>	<u>29</u>	<u>45</u>
(Total)	(38)	(21)	(13)	(11)	(58)	141

Correctly Classified: 46.81%

Chance Accuracy: 22.71% = $(.1702)^2 + (.1418)^2 + (.1206)^2$
 $+ (.2482)^2 + (.3192)^2$

Level of Correct Classification Better Than Chance:

$$46.81 - 22.71 = 24.1\%$$

Table 9
 Classification Results (Holdout Sample) --
 Disaggregated Model Without Importance Weights --
 Category Scaling

Actual Group Membership	Predicted Group Membership					
	Aim	Aqua- Fresh	Close- Up	Colgate	Crest	Total
	#	#	#	#	#	#
Aim	3	1	1	0	0	5
Aqua-Fresh	3	0	0	1	0	4
Close-Up	0	0	0	1	0	1
Colgate	0	0	1	5	14	20
Crest	2	1	0	6	6	<u>15</u>
					Total =	45

Correctly Classified: 31.11%

The "validation test" of the model produced similar results to that achieved by the magnitude estimation version. By classifying respondents in the holdout sample, a correct classification rate of 31.11% (see Table 9) was achieved. This decrease in percent correctly classified (15.7%) when the holdout sample was used was similar to the drop experienced by the magnitude estimation cell when the classification rates of the original data base and the holdout sample were compared.

The Disaggregated Model With Importance Weights

The disaggregated model with importance weights bears similarity to the model previously discussed. Both models treat each of the attributes as separate entities when input into the analysis. However, this model utilizes additional respondent information (i.e., the importance of each of the characteristics) in deriving the discriminant functions. Thus, this model represents the attitude-behavior relationship in the following manner: brand purchased last time [behavior] = $f(I_1B_1 + I_2B_2 + \dots + I_nB_n)$ [attitude].

This model is supposed to add precision to the relationship between attitude and usage behavior by allowing respondents to weight the delivery of certain product attributes by the degree to which each of those characteristics has personal utility (i.e., importance). The question of whether or not the addition of these "respondent-

supplied" weights adds to the predictive capabilities of the model will be addressed in a later section concerned with the comparison of models. As background for this comparison, the discriminant analyses for the magnitude estimation and category scaling versions of the disaggregated model with importance weights are presented below.

Magnitude estimation. When the magnitude estimation scaling version of the disaggregated model with importance weights was used as input for the discriminant analysis, three functions consisting of eleven variables each were found to provide significant discrimination at the .05 level (see Table 10). It seemed as though this model required much more input than the magnitude estimation version of the disaggregated model without importance weights in order to achieve the same level of discrimination (i.e., the previous model required only 7 variables and no importance ratings). In addition, the percent of cases correctly classified here (52.99%) was approximately 6% lower than that achieved by the disaggregated model without importance weights -- magnitude estimation version (Table 11).

The model was "validated" as explained previously. The percent of correctly classified cases found to exist when the holdout sample was used was equal to 40.00%, which represented a 13% decrease over the original data base (see Table 12).

Table 10
 Disaggregated Model With Importance Weights --
 Magnitude Estimation (Dependent Variable --
 Brand Purchased Last Time)

Variables Included (Importance X Brand Rating of Each)	Standardized Coefficients		
	Function 1	Function 2	Function 3
Cleans teeth	-2.03	1.46	11.80
Leaves your mouth feeling fresh	-1.89	-3.61	-3.17
Prevents bad breath	2.03	-2.46	3.43
Whitens teeth	-0.24	-0.75	-1.45
Prevents tooth decay	0.30	1.11	-1.94
Has an attractive color	-0.003	0.46	1.17
Contains flouride	-0.83	6.22	-0.25
Has a gel-like consistency	8.09	0.25	-0.80
Is a good value for the money	-2.62	0.10	-4.25
Is approved by a dental association	-2.42	-5.63	0.001
Eliminates a bad taste in your mouth	-0.38	3.16	-4.35

Wilk's Lambda = .7923

Chi-Square = 29.107, df = 18

$p < .05$

Table 11
 Classification Results (Original Data) --
 Disaggregated Model With Importance Weights --
 Magnitude Estimation

Actual Group Membership	Predicted Group Membership					Total #
	Aim	Aqua- Fresh	Close- UP	Colgate	Crest	
	#	#	#	#	#	
Aim	11	3	0	5	2	21
Aqua-Fresh	1	7	2	6	0	16
Close-Up	2	0	6	9	0	17
Colgate	4	0	1	29	9	43
Crest	<u>1</u>	<u>1</u>	<u>0</u>	<u>17</u>	<u>18</u>	<u>37</u>
(Total)	(19)	(11)	(9)	(66)	(29)	134

Correctly Classified: 52.99%

Chance Accuracy: 23.41% = $(.1567)^2 + (.1194)^2 + (.1269)^2$
 $+ (.3209)^2 + (.2761)^2$

Level of Correct Classification Better Than Chance:

52.99 - 23.41 = 29.58%

Table 12
 Classification Results (Holdout Sample) --
 Disaggregated Model With Importance Weights --
 Magnitude Estimation

Actual Group Membership	Predicted Group Membership					
	Aim	Aqua- Fresh	Close- Up	Colgate	Crest	Total
	#	#	#	#	#	#
Aim	2	0	1	1	0	4
Aqua-Fresh	0	1	2	1	1	5
Close-Up	0	0	1	4	0	5
Colgate	1	1	1	9	5	17
Crest	0	0	1	8	5	<u>14</u>
						Total = 45

Correctly Classified: 40.00%

Category scaling. The discriminant model derived from the category scaling version of the disaggregated model with importance weights was found to provide significant discrimination between the five brand user groups at the .05 level (see Table 13). It was composed of three functions, with ten of the fifteen variables input included. This model seemed to perform similarly to the category scaling version of the disaggregated model without importance weights in terms of correct classification rates: 46.81% (no importance weights), 47.52% (with importance weights) [Table 14]. The "validity" of the model, as measured by its ability to classify respondents in the holdout sample, was at a similar level to those achieved by the other models (i.e., 37.78%, or a 10% decrease over the original data base) [see Table 15].

The Aggregated Models: With and Without Importance Weights

The aggregated models, as their name implies, "aggregate" or sum each of the individual attitudinal inputs (i.e., brand attribute ratings) to produce one brand attitude score per respondent. These two models are only differentiated from one another in that the basic model (i.e., with importance weights) supposedly takes the salience of each of the attributes into account by multiplying each brand attribute rating by its associated "importance" rating prior to summation. The scores may serve as

Table 13
 Disaggregated Model With Importance Weights --
 Category Scaling (Dependent Variable --
 Brand Purchased Last Time)

Variables Included (Importance X Brand Rating of Each)	Standardized Coefficients		
	Function 1	Function 2	Function 3
Cleans teeth	-0.04	0.21	0.48
Leaves your mouth feeling fresh	0.68	-0.16	0.04
Prevents bad breath	-0.53	-0.71	-0.28
Whitens teeth	-0.14	0.33	-0.60
Has a good taste	0.37	0.46	0.14
Rinses easily	-0.28	0.35	0.36
Contains flouride	-0.47	-0.39	-0.08
Has a gel-like consistency	0.81	-0.54	0.16
Is approved by a dental association	-0.07	-0.004	0.64
Eliminates a bad taste in your mouth	-0.08	0.73	-0.06

Wilk's Lambda = .8085

Chi-Square = 28.168, df = 16 $p < .05$

Table 14
 Classification Data (Original Data) --
 Disaggregated Model With Importance Weights --
 Category Scaling

Actual Group Membership	Predicted Group Membership					Total #
	Aim	Aqua- Fresh	Close- Up	Colgate	Crest	
	#	#	#	#	#	
Aim	13	0	3	4	4	24
Aqua-Fresh	1	10	2	2	5	20
Close-Up	5	0	10	0	2	17
Colgate	6	2	2	4	21	35
Crest	<u>5</u>	<u>3</u>	<u>2</u>	<u>5</u>	<u>30</u>	<u>45</u>
(Total)	(30)	(15)	(19)	(15)	(62)	141

Correctly Classified: 47.52%

Chance Accuracy: 22.71% = $(.1702)^2 + (.1418)^2 + (.1206)^2$
 $+ (.2482)^2 + (.3192)^2$

Level of Correct Classification Better Than Chance:

$$47.52 - 22.71 = 24.81\%$$

Table 15
 Classification Results (Holdout Sample) --
 Disaggregated Model With Importance Weights --
 Category Scaling

Actual Group Membership	Predicted Group Membership					
	Aim	Aqua- Fresh	Close- Up	Colgate	Crest	Total
	#	#	#	#	#	#
Aim	1	0	2	2	0	5
Aqua-Fresh	2	1	0	1	0	4
Close-Up	1	0	0	0	0	1
Colgate	1	0	1	6	12	20
Crest	2	2	0	2	9	<u>15</u>
					Total =	45

Correctly Classified: 37.78%

input for a discriminant analysis in order to determine the relationship between brand attitude and purchase behavior.

Four discriminant analyses were run on these models; two for each of the types of aggregated models (i.e., one magnitude estimation version and one category scaling version). Unfortunately, none of the four models produced a discriminant analysis which even approached significant discrimination at the .05 level. The results bring the validity of each of the two aggregated models into question, and has eliminated these models from further analysis. As a result, the comparison of models presented in the next section assumes that these models have very limited predictive capabilities, and thus, comparisons with the previously discussed variations of the disaggregated models are not meaningful.

Comparisons of the Models Tested

In the previous sections, the eight versions of the multi-attribute brand attitude model tested were presented. This information was needed in order to accomplish the tests of hypotheses concerning the effects of methodological factors on attitude-behavior consistency. As part of the evaluation of the discriminant analyses run for each of the models, two measures of usefulness were discussed (i.e., significance of discrimination at the .05 level and correct classification

rate). In looking at these measures across the models, it can be shown that two models can elicit significant discrimination at the same level, yet have a divergence of over ten percentage points in the rate of correct classification (e.g., compare the disaggregated model without importance weights for magnitude estimation with same model generated for category scaling). As a result, the correct classification rate is seen as the most sensitive criterion for the comparison of alternative models (and the testing of hypotheses).

Unfortunately, there is no statistical procedure available which allows for the direct comparison of two or more correct classification rates (e.g., 58.96% vs. 46.81%). However, Goldstein (1976) has suggested a method for comparing the results of two discriminant procedures based on the distribution (not the absolute rate) of correctly classified respondents in each of the analyses. Using this method, each procedure has its own computed chi-square statistic which represents the distribution of correctly classified respondents for each brand user group. The chi-squares of two procedures may be compared in a ratio by arranging the hypothetically better procedure's chi-square in the numerator and the standard procedure's chi-square in the denominator:

$$F = \frac{\sum_{i=1}^M [(Mn_i^1 - n_i)^2 / n_i]}{\sum_{i=1}^M [(Mm_i^1 - m_i)^2 / m_i]} \quad , \text{ where}$$

M = the number of groups.

n_i^1 = the number of correctly classified respondents in group i ("better" procedure).

n_i = the total number of respondents in group i ("better" procedure).

m_i^1 = the number of correctly classified respondents in group i ("standard" procedure).

m_i = the total number of respondents in group i ("standard" procedure).

This ratio is distributed as an F statistic with M and M degrees of freedom. Thus, if the calculated ratio is larger than the table value of F with M and M degrees of freedom at some pre-specified level, it may be concluded that one procedure is statistically better than the other.

In evaluating the results that are presented below, the reader should be aware of the stringency of this test, as described by Goldstein and Dillon (1978, p. 99): "However, the authors have found, as probably should be expected, that significant differences only appear when the procedures involved are for a given data set very different." Thus, in order to show a statistical difference between procedures, the "better" procedure must have a chi-square statistic

which is 5 times as large as the "standard" procedure (i.e., when $M=5$ and $\alpha=.05$, the critical F value = 5.05). Despite its hypothetical insensitivity, the Goldstein method will be used to test the hypotheses below.

Magnitude estimation vs. category scaling. On an absolute basis, the magnitude estimation versions of the multi-attribute models tested here, seemed to outperform those utilizing the category scaling technique (see Table 16). However, in testing the hypothesis that magnitude estimation provides a stronger relationship between attitude and behavior than category scaling (H_1), the Goldstein method served as the yardstick of statistical comparison. In using this method, none of the differences in classification rates between the models utilizing magnitude estimation and those using category scaling were found to be statistically significant (see comparisons 1-4 on Table 17). As a result of this analysis, there is no reason to believe that the type of scaling technique utilized will affect the precision of the relationship between attitude and behavior.

Multi-attribute model comparisons. Hypotheses two, three and four addressed the subject of the predictive capabilities of four variations of the basic linear

Table 16
Comparison of Correct Classification Rates

	Magnitude Estimation (ME)		Category Scaling (CS)	
	Absolute Rate (%)	Computed Chi-Square	Absolute Rate (%)	Computed Chi-Square
<u>Multi-Attribute Attitude Model</u>				
Disaggregated Without Importance Weights				
(DWOIW)	58.96	625.22	46.81	481.94
Disaggregated With Importance Weights				
(DWIW)	52.99	405.42	47.52	430.53
Aggregated Without Importance Weights				
(AWOIW)	NA	NA	NA	NA
Aggregated With Importance Weights				
(AWIW - Basic Linear Compensatory Model)	NA	NA	NA	NA

NA = Not Available

Table 17
 Statistical Comparison of Procedures Using
 Goldstein Method

<u>Comparison</u>	<u>Calculated F</u>	<u>P</u>
1. ME (DWOIW) vs. CS (DWOIW)	1.30	NS
2. ME (DWOIW) vs. CS (DWIW)	1.45	NS
3. ME (DWIW) vs. CS (DWOIW)	.84	NS
4. ME (DWIW) vs. CS (DWIW)	.94	NS
5. ME (DWOIW) vs. ME (DWIW)	1.54	NS
6. CS (DWOIW) vs. CS (DWIW)	1.12	NS

Critical $F(5,5,.05) = 5.05$

Key

ME = Magnitude Estimation

CS = Category Scaling

DWOIW = Disaggregated Model Without Importance Weights

DWIW = Disaggregated Model With Importance Weights

compensatory model of brand attitude. All three of these hypotheses involved a comparison between the disaggregated model without importance weights and one of the other three variations of the multi-attribute model tested here (i.e., the basic model, the aggregated model without importance weights, and the disaggregated model with importance weights). In hypotheses two and three, where the disaggregated model without importance weights was thought to perform better than the aggregated model without importance weights and the basic linear compensatory model, respectively, the fact that both of the aggregated models were unable to produce discriminant solutions which provided significant discrimination has shown support for these theoretical contentions. Thus, the disaggregated model without importance weights was found to show a stronger relationship between attitude and behavior than either of the aggregated models.

The fourth hypothesis had suggested that the disaggregated model without importance weights produced an attitude-behavior relationship which was greater than or equal to that produced by the disaggregated model with importance weights in terms of predictive ability. Comparisons five and six on Table 17 indicate that in the case of both scaling techniques (i.e., magnitude estimation and category scaling), the disaggregated model without importance weights performed similarly to (i.e., no significant

difference at the .05 level) the disaggregated model with importance weights in its ability to correctly classify respondents. As a result, hypothesis four was supported.

Although all forms of the disaggregated model were found to achieve correct classification rates that were not significantly different, the magnitude estimation version of both the disaggregated model without importance weights and the disaggregated model with importance weights were selected as the models to be used to test the moderating effects of internal-external locus of control. The reason for this selection was that these models achieved the highest absolute levels of correct classification (i.e., 58.96% and 52.99%, respectively) and therefore stood the greatest chance of eliciting the strongest attitude-behavior relationship when the stringency of the Goldstein comparison procedure is taken into account. In the next section, the moderating effects of internal-external locus of control on attitude-behavior consistency are discussed.

Personal Factor (I-E Locus of Control)

Having selected the best versions of the multi-attribute attitude model (i.e., in terms of predictive ability), the effect of a personal factor (i.e., internal-external locus of control) on the attitude-behavior relationship was examined. All three hypotheses concerning I-E locus of control and its moderating effects on the attitude-

behavior relationship involved the comparison of externals and internals. Before performing the appropriate discriminant analyses, which would allow for the testing of these hypotheses, a distribution of individual scores for the I-E Locus of Control scale was run in order to establish the test groups. The distribution was divided at the median, and the test groups were established by incorporating respondents in the two extremes of the distribution into the necessary subgroups (i.e., individuals with scores of 0-10 were labelled "internally controlled [N=90], and those with scores of 11-23 were labelled "externally controlled" [N=89]).

Once the test groups had been established, the appropriate discriminant analyses were then run. Since all of the hypotheses regarding the moderating effects of the locus of control variable on the attitude-behavior relationship concerned substantive model comparisons between the test groups, all hypotheses could be tested using a common set of discriminant analyses. As such, the discriminant models derived (i.e., disaggregated without importance weights and disaggregated with importance weights) for each of the test groups are generally discussed in the next section, and specifically discussed in relation to each of the appropriate hypotheses.

Discriminant Models

Before discussing the actual models computed, a limitation of the discriminant analyses performed should be noted.

This limitation focuses on the generalizability of the analyses performed because of the failure of these models to provide an adequate representation of the marketplace. The reader will recall that when discriminant models were developed to test the hypotheses involving the methodological factors, these analyses were based on five brand user groups in each of the two cells (i.e., magnitude estimation and category scaling). In testing the hypotheses in this section, the magnitude estimation sample has been divided into "external" and "internal" subgroups (i.e., approximately one-half the original sample in each group). This subdivision created a situation where three of the brand user groups included in the original analysis (i.e., Aim, Aqua-Fresh and Close-Up) no longer had base sizes which allowed them to be considered normally distributed. As a result, the discriminant analyses presented here were run on the two brand user groups (i.e., Colgate and Crest) that had base sizes of 20 or more (in both external and internal groups) in order not to violate the assumptions of the procedure. While incorporating these two brands in the analysis provides direction about the construct's moderating effects, conclusions about the product category cannot be made because of the lack of adequate representation of the brands contained therein.

In order to test the moderating effects of the internal-external locus of control variable on the attitude-behavior relationship, four stepwise discriminant analyses

were run to measure the association of brand attitudes with brand choice behavior: one disaggregated model without importance weights and one disaggregated model with importance weights for each locus of control test group. One linear discriminant function was derived for each model since there were only two brand user groups. Each of the derived models were evaluated using the same criteria as was used for the methodological factors: statistical significance based on Wilk's Lambda and rate of correct classification. A general discussion of each of the models is provided below by each of the locus of control subgroups.

Externally-controlled individuals. Using externally-controlled individuals as the base, two discriminant analyses were performed: one for a disaggregated model without importance weights and one for a disaggregated model with importance weights. Using the disaggregated model without importance weights, the stepwise discriminant procedure produced a model consisting of one function. (See Table 18.) Although 15 variables were input to the analysis, only one variable (i.e., attractiveness of color) was found to significantly discriminate between brand user groups. The model generated a Wilk's Lambda = .8757, which was equivalent to a chi-square statistic of 6.702 with 1 degree of freedom, indicating significance at the .05 level. As a further indication of the usefulness of the model, the derived discriminant function was used to classify the set of individuals whose responses were used to compute the model. The

Table 18

Disaggregated Model Without Importance Weights --
 Magnitude Estimation (Dependent Variable --
 Brand Purchased Last Time)

Externally Controlled Individuals

<u>Variables Included</u>	<u>Standardized Coefficients</u>
Has an attractive color	1.00

Wilk's Lambda = .8757

Chi-Square = 6.702, df = 1 $p < .01$

Percent of Respondents Correctly Classified Using
 Derived Function = 58.49%

Chance Accuracy: $50.16\% = (.4717)^2 + (.5283)^2$

Level of Correct Classification Better Than Chance:

$$58.49 - 50.16 = 8.33\%$$

Group Centroids

Colgate	-.3911
Crest	.3492

percent of correctly classified cases was 58.49%; which compares to a chance assignment of 50.16%.

In contrast, when the disaggregated model with importance weights was used as input to the discriminant analysis, four variables were found to significantly discriminate among Colgate and Crest users. (See Table 19.) While achieving the same level of significance in discrimination (i.e., Wilk's Lambda = .7620 with 4 degrees of freedom, $p < .01$), the disaggregated model with importance weights achieved a higher level of correct classification (73.58%) than the previous model, probably the result of the additional variables included in the model. The additional variables included in this model (i.e., with importance weights) were related to cleanliness in the mouth. These models will be discussed in greater detail as they relate to specific hypotheses in later sections.

Internally-controlled individuals. The same analytical plan that was used for externally-controlled individuals was followed for internally-controlled individuals (i.e., one discriminant analysis for each of the types of disaggregated models). Unfortunately, neither of the two models produced a discriminant analysis which achieved significant discrimination at the .05 level. These results substantiate the general notion of locus of control as a moderator variable in the attitude-behavior relationship because the externals showed significant attitude-behavior consistency in both discriminant analyses, while the internals

Table 19

Disaggregated Model With Importance Weights --
 Magnitude Estimation (Dependent Variable --
 Brand Purchased Last Time)

<u>Externally Controlled Individuals</u>	
<u>Variables Included (Importance X Brand Rating of Each)</u>	<u>Standardized Coefficients</u>
Leaves your mouth feeling fresh	11.69
Rinses easily	-5.65
Has an attractive color	2.49
Eliminates a bad taste in your mouth	-8.08

Wilk's Lambda = .7620

Chi-Square = 13.321, df = 4 $p < .01$

Percent of Respondents Correctly Classified Using
 Derived Function = 73.58%

Chance Accuracy = 50.16% = $(.4717)^2 + (.5283)^2$

Level of Correct Classification Better Than Chance:

73.58 - 50.16 = 23.42%

Group Centroids

Colgate -.5803

Crest .5181

performed conversely. The analysis of the specific substantive hypotheses in the next sections provide more insight into the moderating effects of the locus of control variable.

Social Approval

Locus of control has previously been shown to be related to the arousal of social anxiety. This dissertation has taken that finding into the realm of consumer behavior, and postulated that externals would show a greater likelihood of selecting brands which delivered on benefits that relieve social anxiety. In the product category examined here (i.e., toothpaste), it is hypothesized that externals are more likely to differentiate between brands based on characteristics which lead to social approval.

The discriminant functions derived in this dissertation seem to support this hypothesis. In the discriminant solution for the disaggregated model without importance weights, the attractiveness of the color was the single most important discriminating variable. Color may be a characteristic which creates social confidence through a feeling that a particular color (possibly mint green) toothpaste would contain ingredients that would be particularly good at fighting mouth odors. The solution for the disaggregated model with importance weights couples the "color" characteristic with characteristics which would instill social confidence in the user (i.e., leaves your mouth feeling fresh and eliminates a bad taste in your mouth).

These two latter characteristics carry the most weight in discriminating between Colgate and Crest. As a result, support for hypothesis five is evident.

Persuasibility

Externals are thought to be more persuasible than internals: they (externals) have a greater likelihood of attitude change when presented with a persuasive communication. Hypothesis six suggested that externals were more likely to be affected by advertising, and as a result, they would be more likely than internals to show brand differences based on the portrayal of the brands in their respective advertising communications.

In order to test this hypothesis, it was necessary to establish what the manufacturers of Colgate and Crest were trying to convey in their advertising copy. A content analysis was performed on the two most recent commercials (i.e., aired December 1980 - February 1981) for Crest and Colgate (see Appendix B) to determine the primary benefits being communicated. The analysis revealed that Colgate primarily stressed its "great taste" with a minor emphasis on cavity prevention, while Crest was positioned as "fighting cavities" and giving "great check-ups."

An examination of the discriminant analysis run for externals failed to reveal that externals exhibited brand differences which were consistent with the advertising messages of the brands, and thus, failed to support hypothesis six.

Health-Consciousness

Internals have been found to exhibit a greater concern for their physical well-being than externals. This higher health-consciousness has been postulated as a variable that might affect brand selection (i.e., externals may select brands based on health-related qualities). Thus, internals should be more likely to show brand differences on health-related attributes than externals (hypothesis seven).

In order to find support for this hypothesis, internals would have to have shown that attributes relating to ingredients and cavity prevention efficacy were responsible for differences in toothpaste brand usage. This hypothesis remains unsupported because, as the reader will recall, there were no characteristics that provided significant discrimination among Colgate and Crest users, when either form of the disaggregated model was utilized.

Summary

Hypotheses concerning the impact of certain methodological and personal factors on attitude-behavior consistency were tested in this chapter via discriminant analysis. One of the methodological factors, type of attitude measurement device, did not significantly effect the predictive ability of the attitude-behavior relationship. The other methodological factor, type of multi-attribute model utilized, was found to show greater attitude-behavior consistency when presented in disaggregated, rather than aggregated form.

Locus of control, the personal factor studied, was generally shown to have a moderating effect on the attitude-behavior relationship. In a more specific sense, externals were found to be more likely to show brand differences on product attributes which were related to social approval. Other substantive hypotheses relating to locus of control were not supported. Implications of these findings and directions for future research are discussed in Chapter V.

CHAPTER V

CONCLUSIONS, IMPLICATIONS AND DIRECTIONS FOR FUTURE RESEARCH

The focus of this dissertation has been on the nature of the relationship between attitude and behavior. In examining the literature on attitude-behavior consistency, it was found that there was generally a weak relationship between attitude and behavior; thus, calling into question the predictive validity of the attitudinal construct. Several factors were suggested as being causes of this inconsistency. More specifically, this researcher postulated that attitude measurement (i.e., via magnitude estimation or category scaling), the conceptualization of attitude (i.e., type of multi-attribute model used), and a personal factor (i.e., internal-external locus of control) were in large part responsible for this weak predictive relationship. An "after only with control group" experimental design was utilized in order to examine the effects of these factors. The results of this experiment were presented in Chapter IV.

The conclusions and implications of this research, together with the suggested directions for future research, will serve as the three cornerstones of this final chapter.

In the conclusions section, the findings from Chapter IV are summarized. Following the conclusions, implications for market researchers and the scholarly marketing community are discussed. The section on directions for future research provides the behavioral scientist with unanswered questions which relate to the area of attitude-behavior consistency.

Conclusions

As mentioned above, specific types of methodological and personal factors were theorized as having a weakening effect on the relationship between attitude and behavior. Each of the specific factor effects were tested via discriminant analysis in Chapter IV. Conclusions derived from the hypothesis tests of each of the factors (i.e., attitude measurement, conceptualization of attitude and personal factors) are discussed in separate sections below.

Attitude Measurement

A review of the literature had shown that category scales enjoy the greatest application of all attitude measurement techniques as a function of their ease of administration, inherent versatility, amenability to many parametric statistical techniques and assumed validity. Unfortunately, the

predictive validity of these scales has yet to be established in any meaningful way. Articles reviewed for this dissertation suggested that imprecision was built into these techniques as a function of their limited response continuums and susceptibility to a number of response biases. Magnitude estimation (a scaling technique which allows respondents to freely assign numbers to match stimuli) was suggested as a scaling technique that could add precision to the measurement of attitudes by having unbounded response continuums, and possibly avoiding common response biases. As a result, magnitude estimation was hypothesized as showing greater predictive validity than category scaling.

The assessment of the attitude-behavior relationship via discriminant analysis using both techniques indicated that each measurement tool was predictively valid. Further, when the precision of the discriminant functions generated for each technique was compared, no statistical difference was found in terms of correct classification rates. This result indicates that magnitude estimation scaling does not show greater levels of predictive validity (i.e., attitude-behavior consistency) when brand attitudes are assessed in a mature product category (i.e., toothpaste), where there already are well-defined brand positions.

Conceptualization of Attitude

The second methodological factor thought to be

responsible for attitude-behavior inconsistency was the conceptualization of attitude. Discussion of this factor in Chapter II suggested that multi-attribute measures of attitude were not only more predictive than single-item measures, but also were more applicable in a marketing context because the multi-dimensional approach allowed for the assessment of the positioning of products/brands, which in turn would aid in strategy formulation.

Having decided that the multi-attribute measure had greater face validity in the assessment of brand attitudes, it was necessary to resolve certain research issues concerned with the structure of the basic linear compensatory model: Does the inclusion of importance weights add to the explanatory power of the model? Does the model show greater predictive validity when the individual attribute scores are summed (aggregated), or when they are left in disaggregated form? Prior research concerning the inclusion of importance weights, and conceptual criticisms against aggregation, suggested that the disaggregated model without importance weights would achieve equal if not higher levels of predictive validity than the disaggregated model with importance weights, and higher levels of predictive validity than either of the two aggregated models (i.e., with and without importance weights).

The findings in this dissertation supported the hypotheses. The summation of individual attribute scores

in the assessment of brand attitudes was found to have a debilitating effect on the attitude-behavior relationship assessed here. Further, the utilization of respondent-provided importance ratings in the assessment of brand attitudes fails to enhance the level of predictive validity over that which was achieved without the weights. These results certainly bring into question the validity of the basic linear compensatory model, along with studies which have used a uni-dimensional measure of affect (i.e., attitude not behavior) to validate the model.

Personal Factor

One personal factor, internal-external locus of control, was hypothesized as having a moderating effect on the attitude-behavior relationship. Previous research presented in this dissertation had shown that locus of control was correlated with the arousal of social anxiety, persuasibility, and the incidence of health-related behaviors. More specifically, externals tend to be more socially anxious and have a greater propensity toward attitude change, while internals have greater concern for their physical well-being. It was argued that the locus of control variable would cause differences in attitude structure. Thus, externals should show brand differences on product attributes related to social approval and the portrayal of brands in advertising, and internals should show brand differences on health-related characteristics.

When discriminant functions measuring the association between attitudes and usage behavior were run for each of the test groups (externals and internals), the internals did not discriminate on any attributes. This generally supported the notion of locus of control as a moderator variable. Specifically, locus of control also registered an impact on attitude structure. In this dissertation, it was found that externals were more likely to show brand differences on product characteristics that led to social approval. Other hypotheses regarding the impact of I-E locus of control on attitude structure were not supported.

Implications

The results of this dissertation have implications for the market researcher in the corporate world, and those in the scholarly marketing community as well. In the corporate world, the market researcher is faced with the problem of finding the most accurate information for the least amount of money. The first part of this problem has been addressed in the conclusions associated with attitude measurement techniques. For strategic studies (i.e., similar to the attitude and usage study in this dissertation), there is no reason to believe (at the present time) that any scaling technique is more precise than the traditional category scale. The seven-point bi-polar scale tested in this dissertation was found to be statistically similar to magnitude

estimation in terms of predictive validity. However, the reader should note that this may not be true of other types of studies (e.g., concept or product tests) where respondents may be faced with many stimuli (i.e., products).

In addressing the second part of the market researchers' dilemma, minimizing cost, we may consider the conclusions derived from both the attitude measurement and conceptualization of attitude factors. Magnitude estimation appears to have reached that point where it is about the same cost as category scaling. If the stringency of the Goldstein procedure is considered, magnitude estimation consistently outperforms category scaling in the absolute sense. Thus, if the costs are equivocal, magnitude estimation becomes the superior technique because it has the greatest chance of increased predictive ability. It follows that the multi-attribute model selected for the analysis of the strategic positioning of brands, should also be derived with cost considerations in mind. In this way, the disaggregated model without importance weights is superior because it achieves a statistically similar level of predictive validity without the added data collection and processing needed for the computation of the disaggregated model with importance weights. Therefore, the disaggregated model without importance weights using the magnitude estimation scaling technique is seen as the most cost efficient assessment of brand attitude at the present time for strategic studies.

For researchers in the scholarly marketing community, where cost considerations are not a daily concern, the implications are slightly different. The conclusions for this study become part of the ongoing study of the attitude-behavior relationship. These findings, however, certainly are inconsistent with many studies which claimed to have validated the multi-attribute attitude model with a single-item measure of attitude (i.e., overall affect = f [multi-dimensional affect]). In this dissertation, the multi-attribute attitude model was validated by predicting its relationship with behavior measured at a point in the future. It seems apparent to this researcher that psychological constructs (i.e., in this case attitudes) should be validated by a behavioral measure, rather than other psychological responses having unknown validity. Hopefully, the results from this study will not be overlooked, and the validity of the basic linear compensatory model will be re-evaluated.

This study has also provided some insights into what Holbrook (1978) refers to as "the informational determinants of attitude structure," or what determines the beliefs that we use in brand assessment. Findings in this study indicate that locus of control is somewhat of a determinant of attitude structure in the toothpaste category. It is possible that had there been adequate base sizes in the remaining brand user groups in this study, the diversity of brands in the marketplace may have resulted in a more accurate test of the

hypotheses. In addition, the locus of control variable may be more applicable in other product categories (e.g., automobiles) where brand differences are more pronounced. Thus, the locus of control variable specifically, and other personality variables in general, are potential moderator sources of attitude-behavior consistency.

Directions for Future Research

The conclusions derived in this dissertation certainly do not, by any stretch of the imagination, solve all of the research questions associated with attitude-behavior consistency. To begin with, research questions associated with category scaling are far from being exhausted. Future research in this area should be concerned with the effect of alternative category scale construction procedures on the prediction of behavior: that is, what is the optimal number of categories, and kind of verbal description which should be used to achieve the highest degree of isomorphism? In addition, research designed to establish the validity of all scaling techniques in general is needed: Which measures of brand attitude (e.g., purchase interest, overall opinion, ratings on characteristics) show the most accurate prediction of purchase behavior? More specifically, do certain procedures (perhaps magnitude estimation) show greater precision in different research situations (e.g., product tests,

attitude and usage studies, etc.) and different product categories (e.g., consumer goods, durable goods, etc.)? Thus, a great deal of systematic research is needed in order to determine optimal application of specific scaling techniques.

Another area of investigation within this dissertation which requires more study is the conceptualization of attitude. More research on the basic linear compensatory model and its various structural forms need to be tested across product categories in order to establish the predictive validity of the model. Criterion measures for these tests should in some way assess individual behavior measured at a point in time (i.e., at least the length of the purchase cycle) beyond the initial attitude measurement.

After the validity of scaling techniques and the conceptualization of attitude models have been established, there should be systematic investigation into the confounding situational and personality factors which may affect the attitude-behavior relationship. In doing so, the researcher should make sure that he/she is able to adequately represent the market of the product category being studied. For example, in this study there was a failure to represent the market place in each of the locus of control subgroups. After the fact, it was realized that a sample three times the size that needed to assess the attitude-behavior relationship generally, would be needed to assess the specific impact of the personality variable under study. Having planned for adequate sample sizes

in subgroups at the level of analysis, the researcher may be able to systematically investigate extraneous factors which were thought to affect attitude-behavior consistency.

In examining extraneous factors thought to affect the attitude-behavior relationship, the researcher should not only be concerned with prediction, but also explanation. As previously noted, there is a great need for understanding what determines attitude structure: Are there certain personality, situational or socio-cultural factors that are responsible for determining the beliefs that we consider to be important in differentiating among brands? Is there a "magic" number of beliefs associated with a given brand attitude? Hopefully, this discussion will convey this researcher's feelings about the great number of research questions that still remain unanswered in the area of attitude research.

APPENDIX A

BARUCH COLLEGE
NEW YORK, N.Y.

SERIAL NO.: (1-4)

TOOTHPASTE STUDY I

RESPONDENT'S NAME: _____ ADDRESS: _____

CITY: _____ TEL. #: () _____

INTERVIEWER: _____ 5-
6- CLASS: MCR 3600 [] MCR3605 []

DATE: _____ TIME BEGAN: _____ TIME ENDED: _____

TIME INTERVIEW CONDUCTED: MON.-FRI. (BEFORE 6 PM)...7-[]-1
MON.-FRI. (AFTER 6 PM)..... []-2
SATURDAY/SUNDAY..... []-3

Hello, my name is _____ and I'm a student at Baruch College. Are you/May I speak to the lady of the house? As part of a class project, we are conducting interviews about toothpaste and would appreciate a few minutes of your time. Your responses will be held in strict confidence, and will be used for statistical purposes only.

1. Do you, yourself, currently use toothpaste?

Yes..... (CONTINUE)

No..... (TERMINATE INTERVIEW)

2. Do you purchase the brand of toothpaste that you usually use or does someone else purchase it for you?

Purchase by self..... (CONTINUE)

Purchase by someone else..... (TERMINATE INTERVIEW)

3. Which of the following categories best describes your age? (READ LIST)

Under 18..... (TERMINATE INTERVIEW)

18 - 34..... 8-[]-1

35 - 49..... []-2

Over 50..... (TERMINATE INTERVIEW)

CHECK QUOTAS BEFORE CONTINUING.
IF OVER QUOTA, TERMINATE INTERVIEW.

4. Now, please tell me all the brands of toothpaste you can think of. (RECORD ON SEPARATE LINES BELOW.)

_____ 9-	_____ 10-
_____ 11-	_____ 12-
_____ 13-	_____ 14-
_____ 15-	_____ 16-

5. Which brand of toothpaste did you happen to purchase last time?

_____ 17- _____ 18-

IF RESPONDENT DOESN'T REMEMBER BRAND PURCHASED LAST TIME, TERMINATE INTERVIEW.

6. About how often do you purchase toothpaste?

_____ 19-

7. About how often do you use toothpaste?

Less often than once a day..... 20-[]-1

Once a day..... []-2

Twice a day..... []-3

Three times a day..... []-4

More than three times a day..... []-5

2.

READ THE INSTRUCTIONS TO THE RESPONDENT AS SHE FOLLOWS ALONG WITH YOU.

8. People differ in how important they think it is for certain products to have specific characteristics. Speaking now about toothpaste, please consider each statement listed on page 3 carefully, and then indicate how important or unimportant that feature is to you in a toothpaste.

IN ORDER TO RATE THE CHARACTERISTICS, YOU WILL BE USING A TYPE OF RATING SCALE WHICH YOU WILL CREATE YOURSELF. PLEASE READ THE INSTRUCTIONS ALONG WITH ME AS I READ THEM TO YOU.

Here's how it works:

1. Begin by indicating if the characteristic is important or unimportant in a toothpaste. If you think it is important for a toothpaste to have a specific characteristic, put an "X" in the box in the column labelled "IMPORTANT." If you think that it is unimportant for a toothpaste to have that characteristic, put an "X" in the box in the column labelled "UNIMPORTANT." However, if you feel that it is neither important nor unimportant for a toothpaste to have a specific characteristic, leave both boxes blank.
2. Then indicate just how important or unimportant that characteristic is by writing in a number on the line under the column labelled "HOW MUCH?" A large number will indicate that you find the characteristic either extremely important or extremely unimportant. For example:

	<u>IMPORTANT</u>	-OR-	<u>UNIMPORTANT</u>	<u>HOW MUCH?</u> (large number)
Is easy to store.....	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<u> </u>
Is easy to store.....	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<u> </u>

A small number will indicate that you find the characteristic either moderately important or moderately unimportant. For example:

	<u>IMPORTANT</u>	-OR-	<u>UNIMPORTANT</u>	<u>HOW MUCH?</u> (small number)
Is easy to store.....	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<u> </u>
Is easy to store.....	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<u> </u>

A zero (0) will indicate that the characteristic you are rating is neither important nor unimportant in a toothpaste. For example:

	<u>IMPORTANT</u>	-OR-	<u>UNIMPORTANT</u>	<u>HOW MUCH?</u> 0
Is easy to store.....	<input type="checkbox"/>		<input type="checkbox"/>	<u> </u>

PLEASE REMEMBER THAT THE SCALE YOU USE IS ENTIRELY YOUR OWN. THERE ARE NO LIMITS ON THE SIZE OF THE SCALE THAT YOU USE.

IF RESPONDENT DOES NOT UNDERSTAND THE INSTRUCTIONS, RE-READ THEM. IF RESPONDENT DOES NOT UNDERSTAND AFTER SECOND READING, TERMINATE INTERVIEW.

3.

INSTRUCT RESPONDENT TO START AT "✓" CHARACTERISTIC. WATCH RESPONDENT RECORD HER ANSWERS TO BE SURE THAT SHE UNDERSTANDS THE PROCEDURE.

<u>START AT "✓"</u>	<u>IMPORTANT</u>	<u>UNIMPORTANT</u>	<u>HOW MUCH?</u>
() Clean teeth..... 21-	[]	[]	_____ (22-25)
() Leave your mouth feeling fresh... 26-	[]	[]	_____ (27-30)
() Prevent cavities..... 31-	[]	[]	_____ (32-35)
() Prevent bad breath..... 36-	[]	[]	_____ (37-40)
() Whiten teeth..... 41-	[]	[]	_____ (42-45)
() Prevent tooth decay..... 46-	[]	[]	_____ (47-50)
() Have a good taste..... 51-	[]	[]	_____ (52-55)
() Rinse easily..... 56-	[]	[]	_____ (57-60)
() Protect teeth..... 61-	[]	[]	_____ (62-65)
() Have an attractive color..... 66-	[]	[]	_____ (67-70)
() Contain fluoride..... 71-	[]	[]	_____ (72-75)
() Have a gel-like consistency..... 5-	[]	[]	_____ (6-9)
() Be a good value for the money.... 10-	[]	[]	_____ (11-14)
() Be approved by a dental association..... 15-	[]	[]	_____ (16-19)
() Eliminate a bad taste in your mouth..... 20-	[]	[]	_____ (21-24)

80-1
CD 2

9. Now, in much the same way that you rated the importance of specific characteristics in a toothpaste, please rate the brand of toothpaste you purchased last time on an overall basis. Indicate whether you like or dislike this brand. If you feel neutral toward this brand, that is, you neither like nor dislike it, leave both boxes blank.

Then, enter a number to show how much you like the brand of toothpaste you purchased last time. Remember large numbers show that you LIKE OR DISLIKE this brand strongly, small numbers show that you LIKE OR DISLIKE this brand moderately, and a zero (0) will show that you NEITHER LIKE NOR DISLIKE the brand of toothpaste you purchased last time.

	<u>LIKE</u>	<u>DISLIKE</u>	<u>HOW MUCH?</u>
25-	[]	[]	_____ (26-29)

HAVE RESPONDENT READ THE INSTRUCTIONS ALONG WITH YOU.

10. At the bottom of this page, there is a series of characteristics that may or may not describe the brand of toothpaste that you purchased last time.

Please indicate how much you agree or disagree that each characteristic printed below describes this brand. Enter an "X" in the appropriate box and a number to show how strongly you agree or disagree. If you neither agree nor disagree that the characteristic describes your brand, leave both boxes blank and enter a zero (0) on the line under the column labelled "HOW MUCH?"

Large numbers mean that you agree strongly or disagree strongly that a particular characteristic describes this brand. For example:

	<u>AGREE</u>	<u>DISAGREE</u>	<u>HOW MUCH?</u> (large number)
Is easy to store.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
	-OR-		
Is easy to store.....	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____ (large number)

Small numbers mean that you agree moderately or disagree moderately that a particular characteristic describes this brand. For example:

	<u>AGREE</u>	<u>DISAGREE</u>	<u>HOW MUCH?</u> (small number)
Is easy to store.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
	-OR-		
Is easy to store.....	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____ (small number)

A zero (0) will mean that you neither agree nor disagree that the characteristic being considered describes this brand. For example:

	<u>AGREE</u>	<u>DISAGREE</u>	<u>HOW MUCH?</u>
Is easy to store.....	<input type="checkbox"/>	<input type="checkbox"/>	_____ 0

PLEASE REMEMBER THAT THE SCALE YOU USE IS ENTIRELY YOUR OWN. THERE ARE NO LIMITS ON THE SIZE OF THE SCALE THAT YOU USE.

INSTRUCT RESPONDENT TO START AT "✓'d" CHARACTERISTIC.

START AT "✓"

	<u>AGREE</u>	<u>DISAGREE</u>	<u>HOW MUCH?</u>
() Cleans teeth..... 30-	<input type="checkbox"/>	<input type="checkbox"/>	_____ (31-34)
() Leaves your mouth feeling fresh..... 35-	<input type="checkbox"/>	<input type="checkbox"/>	_____ (36-39)
() Prevents cavities..... 40-	<input type="checkbox"/>	<input type="checkbox"/>	_____ (41-44)
() Prevents bad breath..... 45-	<input type="checkbox"/>	<input type="checkbox"/>	_____ (46-49)
() Whitens teeth..... 50-	<input type="checkbox"/>	<input type="checkbox"/>	_____ (51-54)
() Prevents tooth decay..... 55-	<input type="checkbox"/>	<input type="checkbox"/>	_____ (56-59)
() Has a good taste..... 60-	<input type="checkbox"/>	<input type="checkbox"/>	_____ (61-64)
() Rinses easily..... 65-	<input type="checkbox"/>	<input type="checkbox"/>	_____ (66-69)
() Protects teeth..... 70-	<input type="checkbox"/>	<input type="checkbox"/>	_____ (71-74)
() Has an attractive color..... 75-	<input type="checkbox"/>	<input type="checkbox"/>	_____ (76-79)
() Contains fluoride..... 5-	<input type="checkbox"/>	<input type="checkbox"/>	_____ (6-9)
() Has a gel-like consistency..... 10-	<input type="checkbox"/>	<input type="checkbox"/>	_____ (11-14)
() Is a good value for the money..... 15-	<input type="checkbox"/>	<input type="checkbox"/>	_____ (16-19)
() Is approved by a dental association..... 20-	<input type="checkbox"/>	<input type="checkbox"/>	_____ (21-24)
() Eliminates a bad taste in your mouth.... 25-	<input type="checkbox"/>	<input type="checkbox"/>	_____ (26-29)

80-2
CD 3

11. How strongly do you hold these attitudes about the brand of toothpaste you purchased last time? Are they (READ LIST):

Extremely strong..... 30-[]-1
 Very strong..... []-2
 Moderately strong..... []-3
 Slightly strong..... []-4
 or
 Not at all strongly held..... []-5

12. Again, thinking about the attitudes toward the brand of toothpaste you purchased last time, how sure are you of the ratings that you have just given? (READ LIST)

Extremely sure..... 31-[]-1
 Very sure..... []-2
 Moderately sure..... []-3
 Slightly sure..... []-4
 Not at all sure..... []-5

13. Listed below, and on the following page, is a series of pairs of statements. Read each set of statements carefully, and then select the statement within each pair that most closely matches your feelings on the subject by placing an "x" in the box next to the appropriate statement. Please remember that there are no right or wrong answers. We are interested only in your opinions.

- i. a. Children get into trouble because their parents punish them too much..... 32-[]-1
 b. The trouble with most children nowadays is that their parents are too easy with them..... []-2
- ii. a. Many of the unhappy things in people's lives are partly due to bad luck..... 33-[]-1
 b. People's misfortunes result from the mistakes they make..... []-2
- iii. a. One of the major reasons why we have wars is because people don't take enough interest in politics..... 34-[]-1
 b. There will always be wars, no matter how hard people try to prevent them..... []-2
- iv. a. In the long run, people get the respect they deserve in this world..... 35-[]-1
 b. Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries..... []-2
- v. a. The idea that teachers are unfair to students is nonsense..... 36-[]-1
 b. Most students don't realize the extent to which their grades are influenced by accidental happenings..... []-2
- vi. a. Without the right breaks one cannot be an effective leader.... 37-[]-1
 b. Capable people who fail to become leaders have not taken advantage of their opportunities..... []-2
- vii. a. No matter how hard you try, some people just don't like you... 38-[]-1
 b. People who can't get others to like them don't understand how to get along with others..... []-2
- viii. a. Heredity plays the major role in determining one's personality..... 39-[]-1
 b. It is one's experiences in life which determine what one is like..... []-2
- ix. a. I have often found that what is going to happen will happen... 40-[]-1
 b. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action..... []-2
- x. a. In the case of the well-prepared student, there is rarely if ever such a thing as an unfair test..... 41-[]-1
 b. Many times exam questions tend to be so unrelated to course work that studying is really useless..... []-2

- xi. a. Becoming a success is a matter of hard work, luck has little or nothing to do with it..... 42-[]-1
 b. Getting a good job depends mainly on being in the right place at the right time..... []-2
- xii. a. The average citizen can have an influence in government decisions..... 43-[]-1
 b. This world is run by the few people in power, and there is not much the little guy can do about it..... []-2
- xiii. a. When I make plans, I am almost certain that I can make them work..... 44-[]-1
 b. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.. []-2
- xiv. a. There are certain people who are just no good..... 45-[]-1
 b. There is some good in everybody..... []-2
- xv. a. In my case getting what I want has little or nothing to do with luck..... 46-[]-1
 b. Many times we might just as well decide what to do by flipping a coin..... []-2
- xvi. a. Who gets to be the boss often depends on who was lucky enough to be in the right place first..... 47-[]-1
 b. Getting people to do the right thing depends upon ability, luck has little or nothing to do with it..... []-2
- xvii. a. As far as world affairs are concerned, most of us are the victims of forces we can neither understand, nor control..... 48-[]-1
 b. By taking an active part in political and social affairs the people can control world events..... []-2
- xviii. a. Most people don't realize the extent to which their lives are controlled by accidental happenings..... 49-[]-1
 b. There really is no such thing as "luck"..... []-2
- xix. a. One should always be willing to admit mistakes..... 50-[]-1
 b. It is usually best to cover up one's mistakes..... []-2
- xx. a. It is hard to know whether or not a person really likes you... 51-[]-1
 b. How many friends you have depends on how nice a person you are..... []-2
- xxi. a. In the long run the bad things that happen to us are balanced by the good ones..... 52-[]-1
 b. Most misfortunes are the result of lack of ability, ignorance, laziness, or all three..... []-2
- xxii. a. With enough effort we can wipe out political corruption..... 53-[]-1
 b. It is difficult for people to have much control over the things politicians do in office..... []-2
- xxiii. a. Sometimes I can't understand how teachers arrive at the grades they give..... 54-[]-1
 b. There is a direct connection between how hard I study and the grades I get..... []-2
- xxiv. a. A good leader expects people to decide for themselves what they should do..... 55-[]-1
 b. A good leader makes it clear to everybody what their jobs are..... []-2
- xxv. a. Many times I feel that I have little influence over the things that happen to me..... 56-[]-1
 b. It is impossible for me to believe that chance or luck plays an important role in my life..... []-2
- xxvi. a. People are lonely because they don't try to be friendly..... 57-[]-1
 b. There's not much use in trying too hard to please people, if they like you, they like you..... []-2
- xxvii. a. There is too much emphasis on athletics in high school..... 58-[]-1
 b. Team sports are an excellent way to build character..... []-2

7.

- xxviii. a. What happens to me is my own doing..... 59-[]-1
 b. Sometimes I feel that I don't have enough control over
 the direction my life is taking..... []-2
- xxix. a. Most of the times I can't understand why politicians
 behave the way they do..... 60-[]-1
 b. In the long run the people are responsible for bad
 government on a national as well as on a local level..... []-2

Now, to complete the interview, a few questions for classification purposes.

- A. Including yourself, how many people are there living in your household? Please include family members away from home on a temporary basis.

One..... 61-[]-1
 Two..... []-2
 Three..... []-3
 Four..... []-4
 Five or more..... []-5

- B. What is your present marital status? (READ LIST AND RECORD BELOW)

Single..... 62-[]-1
 Married..... []-2
 Divorced..... []-3
 Widowed..... []-4
 Separated..... []-5

- C. Are you employed outside of your home at the present time? (IF "YES":) Is that full-time or part-time?

Yes:

Full-time..... 63-[]-1
 Part-time..... []-2
 No..... []-3

(DO NOT READ) Refused..... []-8

- D. What was the last grade of school you completed?

Some high school or less..... 64-[]-1
 Completed high school..... []-2
 Some college..... []-4
 Completed college..... []-5
 Graduate school..... []-6
 Other education beyond high school
 (business, nursing, etc.)..... []-3
 Refused..... []-8

- E. Which of the following categories best represents your family's total yearly income? (READ LIST AND RECORD BELOW)

a. Under \$5,000..... 65-[]-1
 b. \$5,000 but less than \$8,000..... []-2
 c. \$8,000 but less than \$10,000..... []-3
 d. \$10,000 but less than \$15,000..... []-4
 e. \$15,000 but less than \$20,000..... []-5
 f. \$20,000 but less than \$25,000..... []-6
 g. \$25,000 and over..... []-7

(DO NOT READ) { Don't know..... []-8
 Refused..... []-9

THANK YOU FOR YOUR COOPERATION!

BARUCH COLLEGE
NEW YORK, N.Y.

SERIAL NO.: _____
(1-4)

TOOTHPASTE STUDY II

RESPONDENT'S NAME: _____ ADDRESS: _____

CITY: _____ TEL. #: () _____

INTERVIEWER: _____ 5-
6- CLASS: MCR 3600 [] MCR3605 []

DATE: _____ TIME BEGAN: _____ TIME ENDED: _____

TIME INTERVIEW CONDUCTED: MON.-FRI. (BEFORE 6 PM)...7-[]-1

MON.-FRI. (AFTER 6 PM)..... []-2

SATURDAY/SUNDAY..... []-3

Hello, my name is _____ and I'm a student at Baruch College. Are you/May I speak to the lady of the house? As part of a class project, we are conducting interviews about toothpaste and would appreciate a few minutes of your time. Your responses will be held in strict confidence, and will be used for statistical purposes only.

1. Do you, yourself, currently use toothpaste?

Yes..... (CONTINUE)

No..... (TERMINATE INTERVIEW)

2. Do you purchase the brand of toothpaste that you usually use or does someone else purchase it for you?

Purchase by self..... (CONTINUE)

Purchase by someone else..... (TERMINATE INTERVIEW)

3. Which of the following categories best describes your age? (READ LIST)

Under 18..... (TERMINATE INTERVIEW)

18 - 34..... 8-[]-1] →

35 - 49..... []-2]

Over 50..... (TERMINATE INTERVIEW)

CHECK QUOTAS BEFORE CONTINUING.
IF OVER QUOTA, TERMINATE INTERVIEW.

4. Now, please tell me all the brands of toothpaste you can think of. (RECORD ON SEPARATE LINES BELOW.)

_____ 9-	_____ 10-
_____ 11-	_____ 12-
_____ 13-	_____ 14-
_____ 15-	_____ 16-

5. Which brand of toothpaste did you happen to purchase last time?

_____ 17- _____ 18-

IF RESPONDENT DOESN'T REMEMBER BRAND PURCHASED LAST TIME, TERMINATE INTERVIEW.

6. About how often do you purchase toothpaste?

_____ 19-

7. About how often do you use toothpaste?

Less often than once a day..... 20-[]-1

Once a day..... []-2

Twice a day..... []-3

Three times a day..... []-4

More than three times a day..... []-5

4.

11. How strongly do you hold these attitudes about the brand of toothpaste you purchased last time? Are they (READ LIST):

Extremely strong..... 30-[]-1
 Very strong..... []-2
 Moderately strong..... []-3
 Slightly strong..... []-4
 or
 Not at all strongly held..... []-5

12. Again, thinking about the attitudes toward the brand of toothpaste you purchased last time, how sure are you of the ratings that you have just given? (READ LIST)

Extremely sure..... 31-[]-1
 Very sure..... []-2
 Moderately sure..... []-3
 Slightly sure..... []-4
 Not at all sure..... []-5

13. Listed below, and on the following page, is a series of pairs of statements. Read each set of statements carefully, and then select the statement within each pair that most closely matches your feelings on the subject by placing an "x" in the box next to the appropriate statement. Please remember that there are no right or wrong answers. We are interested only in your opinions.

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 b. The trouble with most children nowadays is that their parents are too easy with them..... []-2
- ii. a. Many of the unhappy things in people's lives are partly due to bad luck..... 33-[]-1
 b. People's misfortunes result from the mistakes they make..... []-2
- iii. a. One of the major reasons why we have wars is because people don't take enough interest in politics..... 34-[]-1
 b. There will always be wars, no matter how hard people try to prevent them..... []-2
- iv. a. In the long run, people get the respect they deserve in this world..... 35-[]-1
 b. Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries..... []-2
- v. a. The idea that teachers are unfair to students is nonsense..... 36-[]-1
 b. Most students don't realize the extent to which their grades are influenced by accidental happenings..... []-2
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 b. Capable people who fail to become leaders have not taken advantage of their opportunities..... []-2
- vii. a. No matter how hard you try, some people just don't like you... 38-[]-1
 b. People who can't get others to like them don't understand how to get along with others..... []-2
- viii. a. Heredity plays the major role in determining one's personality..... 39-[]-1
 b. It is one's experiences in life which determine what one is like..... []-2
- ix. a. I have often found that what is going to happen will happen... 40-[]-1
 b. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action..... []-2
- x. a. In the case of the well-prepared student, there is rarely if ever such a thing as an unfair test..... 41-[]-1
 b. Many times exam questions tend to be so unrelated to course work that studying is really useless..... []-2

- xi. a. Becoming a success is a matter of hard work, luck has little or nothing to do with it..... 42-[]-1
 b. Getting a good job depends mainly on being in the right place at the right time..... []-2
- xii. a. The average citizen can have an influence in government decisions..... 43-[]-1
 b. This world is run by the few people in power, and there is not much the little guy can do about it..... []-2
- xiii. a. When I make plans, I am almost certain that I can make them work..... 44-[]-1
 b. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.. []-2
- xiv. a. There are certain people who are just no good..... 45-[]-1
 b. There is some good in everybody..... []-2
- xv. a. In my case getting what I want has little or nothing to do with luck..... 46-[]-1
 b. Many times we might just as well decide what to do by flipping a coin..... []-2
- xvi. a. Who gets to be the boss often depends on who was lucky enough to be in the right place first..... 47-[]-1
 b. Getting people to do the right thing depends upon ability, luck has little or nothing to do with it..... []-2
- xvii. a. As far as world affairs are concerned, most of us are the victims of forces we can neither understand, nor control..... 48-[]-1
 b. By taking an active part in political and social affairs the people can control world events..... []-2
- xviii. a. Most people don't realize the extent to which their lives are controlled by accidental happenings..... 49-[]-1
 b. There really is no such thing as "luck"..... []-2
- xix. a. One should always be willing to admit mistakes..... 50-[]-1
 b. It is usually best to cover up one's mistakes..... []-2
- xx. a. It is hard to know whether or not a person really likes you... 51-[]-1
 b. How many friends you have depends on how nice a person you are..... []-2
- xxi. a. In the long run the bad things that happen to us are balanced by the good ones..... 52-[]-1
 b. Most misfortunes are the result of lack of ability, ignorance, laziness, or all three..... []-2
- xxii. a. With enough effort we can wipe out political corruption..... 53-[]-1
 b. It is difficult for people to have much control over the things politicians do in office..... []-2
- xxiii. a. Sometimes I can't understand how teachers arrive at the grades they give..... 54-[]-1
 b. There is a direct connection between how hard I study and the grades I get..... []-2
- xxiv. a. A good leader expects people to decide for themselves what they should do..... 55-[]-1
 b. A good leader makes it clear to everybody what their jobs are..... []-2
- xxv. a. Many times I feel that I have little influence over the things that happen to me..... 56-[]-1
 b. It is impossible for me to believe that chance or luck plays an important role in my life..... []-2
- xxvi. a. People are lonely because they don't try to be friendly..... 57-[]-1
 b. There's not much use in trying too hard to please people, if they like you, they like you..... []-2
- xxvii. a. There is too much emphasis on athletics in high school..... 58-[]-1
 b. Team sports are an excellent way to build character..... []-2

6.

- xxviii. a. What happens to me is my own doing..... 59-[]-1
 b. Sometimes I feel that I don't have enough control over
 the direction my life is taking..... []-2
- xxix. a. Most of the times I can't understand why politicians
 behave the way they do..... 60-[]-1
 b. In the long run the people are responsible for bad
 government on a national as well as on a local level..... []-2

Now, to complete the interview, a few questions for classification purposes.

- A. Including yourself, how many people are there living in your household? Please include family members away from home on a temporary basis.

One..... 61-[]-1
 Two..... []-2
 Three..... []-3
 Four..... []-4
 Five or more..... []-5

- B. What is your present marital status? (READ LIST AND RECORD BELOW)

Single..... 62-[]-1
 Married..... []-2
 Divorced..... []-3
 Widowed..... []-4
 Separated..... []-5

- C. Are you employed outside of your home at the present time? (IF "YES":) Is that full-time or part-time?

Yes:
 Full-time..... 63-[]-1
 Part-time..... []-2
 No..... []-3
 (DO NOT READ) Refused..... []-8

- D. What was the last grade of school you completed?

Some high school or less..... 64-[]-1
 Completed high school..... []-2
 Some college..... []-4
 Completed college..... []-5
 Graduate school..... []-6
 Other education beyond high school
 (business, nursing, etc.)..... []-3
 Refused..... []-8

- E. Which of the following categories best represents your family's total yearly income? (READ LIST AND RECORD BELOW)

a. Under \$5,000..... 65-[]-1
 b. \$5,000 but less than \$8,000..... []-2
 c. \$8,000 but less than \$10,000..... []-3
 d. \$10,000 but less than \$15,000..... []-4
 e. \$15,000 but less than \$20,000..... []-5
 f. \$20,000 but less than \$25,000..... []-6
 g. \$25,000 and over..... []-7
 (DO NOT READ) { Don't know..... []-8
 Refused..... []-9

THANK YOU FOR YOUR COOPERATION!

APPENDIX B

Radio TV Reports

PRODUCT. CREST

137

80-19994
45 SEC.

41 East 42nd Street New York N.Y. 10017
(212) 599-5500



1. (SFX-WATER SOUNDS)
1st ANNCR: Going down
the river on a raft?



2. MAN: Pretty exciting, huh?



3. 1st ANNCR: And you brush
with Crest?
WOMAN: Always.



4. 1st ANNCR: But I
figured your family for
something a little more
exciting. A stripe or
gel maybe?



5. WOMAN: Nah, no, no,
toothpaste don't excite us.
Great Crest checkups? That
excites us.



6. 1st ANNCR: Well yeah,
but...WOMAN: Look,
Crest works.



7. It has something no other
toothpaste has. More evidence
it works.



8. 1st ANNCR: Evidence?
What evidence?



9. WOMAN: Only Crest has
proof its fluoristan fights
even adult cavities in hard
to reach places.



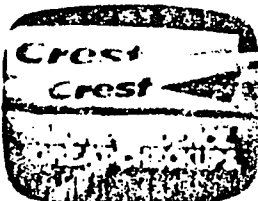
10. 1st ANNCR: Yeah, but
wait a minute. WOMAN
WOMAN: Proof for adults.
Proof for kids.



11. It's the only toothpaste
proven effective for our
whole family.



12. 1st ANNCR: Pretty
impressive, but exciting?
WOMAN: One great
checkup after another.
That's exciting. (SFX-
OUT)



13. 2nd ANNCR: Crest. More
evidence. Great checkups.



14. WOMAN: That's exciting.

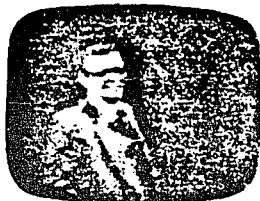
ALSO AVAILABLE IN COLOR VIDEO-TAPE CASSETTE

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Radio TV Reports

PRODUCT

CREST TOOTHPASTE

81-04764
60 SEC.41 East 42nd Street New York N.Y. 10017
(212) 599-5500

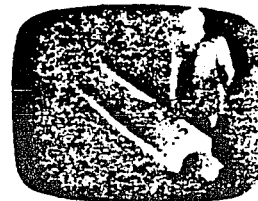
1. ANNCR: Since 1955 we've developed over seventy different toothpastes.



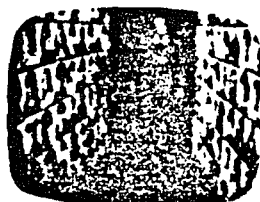
2. Not one has been able to beat Crest at fighting cavities.



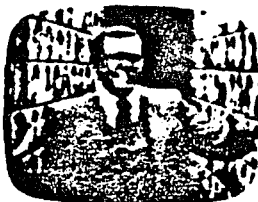
3. But finally after twenty-six years one succeeded.



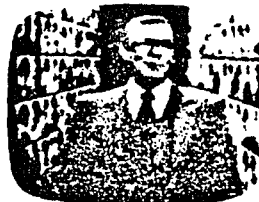
4. It was tested in the largest clinical studies ever done on any toothpaste.



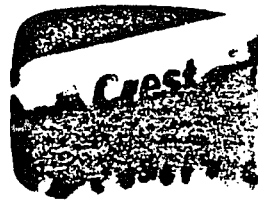
5. Three solid years,



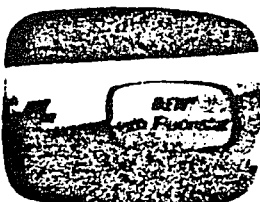
6. over ten thousand dental examinations on thousands of kids like these.



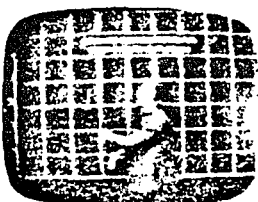
7. And these tests showed that this new toothpaste can give you significantly better cavity protection than Crest.



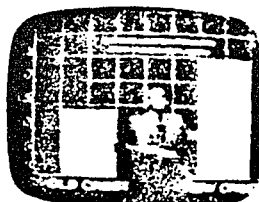
8. Introducing new Advanced Formula Crest.



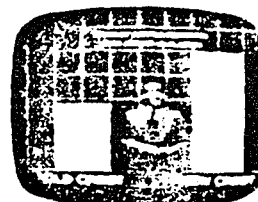
9. With the new cavity fighting system, Fluoristat.



10. And how much better was new Crest shown to be? Look.



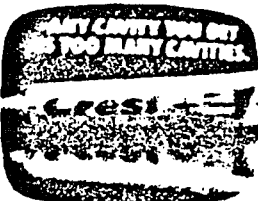
11. Old Crest gave you this much cavity protection. New Crest gives you significantly more.



12. Which can mean fewer cavities with Crest than you ever got before.



13. All new Advanced Formula Crest.



14. Because any cavity you get is too many cavities.



15. Oh, it's accepted by the American Dental Association.

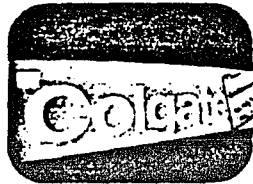
ALSO AVAILABLE IN COLOR VIDEO-TAPE CASSETTE

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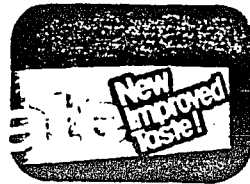
TED BATES & COMPANY
Advertising

CLIENT: COLGATE-PALMOLIVE CO.
PRODUCT: COLGATE
AS FILMED TV COMM'L NO: CLDC 4370
TITLE: "THREE TIMES CLEAN"

LENGTH: 30 SECONDS



1. (MUSIC UNDER)
ANNCR: (VO) Now the
great taste of Colgate



2. tastes better than ever!



3. SUNG: (VO) The smile on
your face



4. is there because you know



5. that your mouth



6. tastes great.



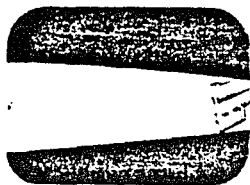
7. And that great taste is



8. even better now.



9. Put the clean in your mouth



10. with Colgate.



11. TEEN GIRL: 100% pure
mint taste.



12. Ummm....



13. better than ever!



14. WOMAN: No toothpaste,



15. beats Colgate's proven
fluoride for fighting cavities.



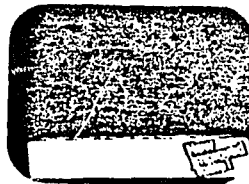
16. SUNG: Put the clean in your
mouth,



17. put the clean in your
mouth,



18. put the clean in your mouth



19. with Colgate!



20. TEEN GIRL: Now better
than ever!

TED BATES & COMPANY

Advertising

**CLIENT: COLGATE-PALMOLIVE CO.
 PRODUCT: COLGATE
 AS FILMED TV COMM'L NO: CLDC 4360
 TITLE: "FAMILY LOVE"**

LENGTH: 30 SECONDS



1. MOM: Now the great taste



2. of Colgate...



3. LITTLE GIRL:...tastes better than ever!



4. SUNG: (VO) The smile on your face is there because....



5. you know that your mouth tastes great.



6. And that great taste is even better now.



7. Put the clean in your mouth



8. with Colgate.



9. LITTLE GIRL: A fresher mint taste.



10. MOM: 100% pure mint taste.



11. Umm....



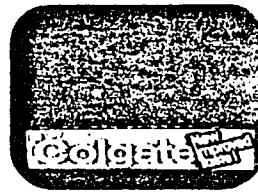
12. better than ever.



13. And no toothpaste beats Colgate's proven fluoride for fighting cavities.



14. SUNG: (VO) Put the clean in your mouth



15. with Colgate.



16. ANNCR: (VO) Now better than ever!

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