CHAPTER 4

Affect, Behavioral Intention and Buying Behavior as a Function of Evaluative Beliefs (*)

Jagdish N. Sheth (**)

Introduction

Several researchers in social psychology have suggested a close relationship between *affect* (like or dislike of the individual toward an object or concept), *beliefs* (cognitive structure representing bits of information related to that object or concept), and *behavioral intention* (tendency to respond to the object or concept by approaching or avoiding it). Rosenberg (1956), for example, hypothesized that affect is a function of beliefs related to the perceived instrumentality of an object or concept in attaining or blocking some valued states (motives, values, etc.), weighted by the relative importance of those valued states. Fishbein (1966) considers affect and behavioral intention as both representing the same thing, and both very closely linked to beliefs about the object. Finally, Dulany (1964, 1968), in his theory of propositional control, has found behavioral intention as a function of (1) attitude toward the object defined in terms of beliefs about the object weighted by their reinforcing values, and (2) social and situational pressures, weighted by their reinforcing strengths. This resembles very closely to the Rokeach (1968) distinction between attitude-

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(**) Associate Professor of Business, University of Illinois, U.S.A.

toward-the-object and attitude-toward-the-situation as two determinants of behavior.

Among all of these research propositions, the underlying objective is to search for some invariant linkage among the three broad areas of psychology that deal with cognitions, affects and conations. Although extensive theoretical research is available in the area of attitudes on such linkage among beliefs (representing cognitions), affect and behavioral intention (representing conations) (McGuire, 1968), there is considerably less empirical research. Furthermore, whatever empirical research is available so far, is sketchy and heavily experimental that makes substantive inferences difficult.

The present study attempts to provide a conceptual framework by which beliefs, affect, behavioral intention and behavior are linked to one another. More importantly, it describes a large scale empirical investigation of relationships among beliefs, affect, behavioral intention and behavior related to buying and consumption of three brands of a convenience food product - instant breakfast. The data for this study are based on a longitudinal study of 954 housewives conducted at Columbia University under the leadership of John A. Howard.

This chapter is organized as follows:

I. A conceptual framework of linkage among beliefs, affect, behavioral intention and behavior.

II. Description of data and operational definitions.

III. Prediction of affect by evaluative beliefs.

IV. Prediction of behavioral intention by evaluative beliefs and affect.

V. Measurement of attitude from evaluative beliefs.

VI. Prediction of actual behavior by affect, summated belief and attitude scores derived from evaluative beliefs.

VII. Summary and conclusions.

Section 1 - A Conceptual Framework

Although several researchers have expressed pessimism about attitude's power to predict subsequent behavior (Cohen 1964, Festinger 1964, Insko 1967), attitude still remains a major hypothetical construct in social psychology. Unfortunately, attitude is defined in so many

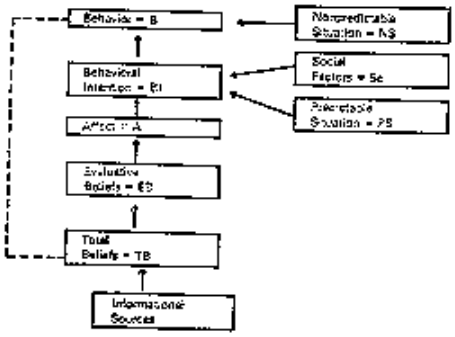
ways (Allport 1935, McGuire 1966) that findings of various studies are not comparable.

Recently, attempts have been made, notably by Fishbein (1966), to sort out various components of attitude and suggest their interrelationships. However, there are some disagreements even in these attempts. For example, Fishbein would consider affect and behavioral intention as being equivalent whereas Dulany (1968) and Howard and Sheth (1969) would consider behavioral intention as a *function* of affect *and* some other factors. Similarly, Dulany would consider behavior and behavioral intention as equivalent but Howard and Sheth would think of behavior as a *function* of behavioral intention *and* nonpredictable (unanticipated) situational factors at the time of manifesting overt behavior.

In this section, an attempt is made to provide a conceptual framework that seems most realistic. It is based on the strenghts of thinkings of researchers including Rosenberg, Rokeach, Dulany and Fishbein. Figure 4-1 below graphically represents the linkages among beliefs, affect, behavioral intention and behavior.

1.1. Verbally stated, *Behavior* (B) is defined as a function of behavioral intention and those situational factors that could not be pre-

FIGURE 4-1. — A Framework for Linking Beliefs, Affect, Intention and Behavior.



dicted by the individual at the time of verbally expressing his behavioral intention. In most experimental studies, both behavior and behavioral intention are expressed contiguously in time and space so that there may be very few nonpredictable factors that would deviate behavior considerably from verbally expressed intentions. However, in naturalistic situations such as voting behavior or buying behavior, there is considerable gap in time and place between behavioral intention and behavior. Chances are very high that a number of nonpredicted situational factors enter into consideration when manifesting behavior that were not present when expressing behavioral intention. In consumer behavior, for example, numerous contingencies arise at the time of shopping and buying, such as unexpected store display of competitive products, experiencing time pressure due to other commitments, and sales pressures from the store personnel.

Thus,

$$B_{i,j} = b_1[BI_{i,j}] + b_2[NS_{i,j}] \qquad (1)$$

where $B_{i,j}$ refers to individuals i's behavior toward object j, $BI_{i,j}$ his verbal expression of intentions to behave toward object j, and $NS_{i,j}$ are the situational factors related to object j that occurred at the time of behavior but were not predicted (anticipated) by the individual. This equation implies a two-factor theory of behavior. It should be pointed out that each factor (BI and NS) is presumed to be at least multivariate and possibly multidimensional.

1.2. *Behavioral Intention* (BI) is hypothesized to be a function of (1) the individual's affect (A) toward the object, (2) social factors such as power (compliance) and attractiveness (identification) that impinge upon him at the time of expressing his intentions, and (3) those situational factors related to behavior that he could anticipate and therefore forecast at the time of expressing his intentions. Implicitly, therefore, behavioral intention is a *qualified* expression of behavior: Given such and such things to happen in the future, I would or would not behave. This is important to emphasize because it may be very possible to predict behavioral intention but not actual behavior because both the anticipated and unanticipated factors may viciously deviate the individual's behavior from his behavioral intention. History has given numerous examples of this type, for example, in voting behavior where

polls have gone significantly wrong. We can state this as follows:

$$BI_{ij} = b_1[A_{ij}] + b_2[So_{ij}] + b_3[PS_{ij}] \quad (2)$$

where BI_{ij} refers to individual i's intentions of behaving toward object j; A_{ij} his affect toward j; So_{ij} his social factors as they relate to object j; and PS_{ij} his anticipated situation at the time of actual behavior as it relates to j. Affect (A) is hypothesized to be univariate but both social factors (So) and anticipated situation (PS) are likely to be multivariate and possibly multi-dimensional.

It is possible that the three factors (A, So, and PS) which govern behavioral intention may act as opposing forces resulting in some sort of conflict. For example, an individual may very much like Rolls Royce but he cannot afford it, or an individual may like Cadillac, can afford it but social factors may inhibit his expression of behavioral intention because Cadillac may be a socially unacceptable goal-object. In consumer behavior it is common among working housewives to find such a conflict toward many convenience (instant) foods.

I.3. *Affect* (A) is defined as a function of evaluative beliefs (EB). Evaluative beliefs refer to cognitions (bits of information) about an object that portray a connotative meaning of that object as the goal-object. In other words, evaluative beliefs represent potential of the object to satisfy a set of relevant motives (Sheth, 1969a).

Evaluative beliefs, as defined above, are only a small subset of total beliefs (TB) related to an object. Beliefs are cognitions or bits of information which are broadly classified as beliefs *in* the existence of an object and beliefs *about* that object (Fhisbein and Raven, 1962). The first type refers to an individual's awareness and knowledge of the existence of the object and its characteristics. Howard and Seth (1969) call this "Brand Comprehension" in their theory of buyer behavior. On the other hand, a belief *about* an object refers to the relationship of that object to some other object, concept, value or goal. For example, a product such as Maxim freeze-dried coffee may be perceived as superior to some other product, say Nescafé, on taste and flavor.

Evaluative beliefs are part of beliefs about an object but only those that portray the object as leading to or blocking the attainment of relevant goals or valued motivational states. For other categories of beliefs about an object, the reader is referred to Fishbein (1967).

Evaluative beliefs as defined here can be considered equivalent to the perceived instrumentality component of Rosenberg's two-factor theory of attitude (Rosenberg, 1956).

In equation (3) below, the relationship of affect (A) and evaluative beliefs (EB) is specified:

$$A_{ij} = b_0[E.B_{i(j)}] + b_1[E.B_{2(j)}] + \ldots + b_n[EB_{n(j)}] \qquad (3)$$

where A_{ij} refers to individual i's affect toward object j, and EB_{kj} ($k = 1, 2, \ldots n$) refers to the individual's kth evaluative belief about object j.

It will be noted that evaluative beliefs are not summed prior to relating them to affect which is contrary to Rosenberg (1956), Fishbein (1967) and Dulany (1968). Based on a study of 30 products on a sample of more than 2000 respondents, Sheth (1970) gives the following reasons:

a. Summing the beliefs is not theoretically explained by the advocates. There is no reason why we should not expect an individual to distinctly retain these beliefs in his cognitive map. On the other hand, there is enough evidence in multidimensional scaling of attitudes to suggest that the beliefs ought not to be summed.

b. Operationally, beliefs are obtained on a bipolar rating scale. Summing these beliefs entails deriving a compromise (average) value by aggregating extreme and moderate values of beliefs.

c. Beliefs can be positive or negative on a bipolar scale. Summing them presumes one cancels out the other.

d. In regressing affect on beliefs, prior summing of beliefs consistently lowered their predictive power as compared to keeping them separate in a multiple regression.

1.4. Evaluative beliefs are elements of total beliefs (TB) and hence they are shown to be derived from the latter in figure 4-1 (p. 100). Also, total beliefs are acquired from informational sources and experimental sources.

1.5. Finally, dynamics of change over time in total beliefs (and, therefore, possibly in evaluative beliefs, affect and behavioral intention) are suggested in the feedback of consequences of behavior on the total beliefs. Underlying this feedback is a merger of cognitive consistency

theories such as dissonance, balance and congruence, and reinforcement principles of learning theory. It should be noted, however, that this feedback operates simultaneously with learning of new beliefs from informational sources such as mass media, word of mouth and books.

In this conceptualization, evaluative beliefs are fundamental to the determination of affect directly, and that of behavioral intention and behavior indirectly. However, this determination of the latter two is jointly with other factors; social and anticipated situation factors in the case of behavioral intention, and also unanticipated situational factors in the case of behavior. This indicates that predictive power of evaluative beliefs should be less and less as we move from affect to behavior unless other factors are absent or held constant.

One additional point needs emphasis in examining the role of evaluative beliefs. It is that we must precisely define behavior and behavioral intention. Only then can we define and measure evaluative beliefs as representing perceived instrumentality of the object. In other words, to consider it as a goal-object, we must explicitly know the goals (motives, valued states, etc.) that impel a *specific* behavior and behavioral intention toward that object. For it is possible to manifest a variety of behaviors (correlated or uncorrelated) toward the same object. A parent, for example, behaves as father, hero or a friend with his child. Depending on a specific behavior, he would have evaluative beliefs about the child that is likely to differ from evaluative beliefs relevant to other behaviors. Even all of the supposedly strongly correlated behaviors called aggression such as cursing, pushing, punching and killing may not be impelled by the same relevant motives and, therefore, evaluative beliefs about the object toward which aggression is manifested may not be the same from one type of aggression to the other. It would appear that we have in the past committed mistakes in not identifying the appropriate behavior in predicting it from attitudes.

Section 2 - Description of Data and Operational Definitions

The empirical investigation of the relationships among beliefs, affect, behavioral intention and behavior is based on data collected in a large scale study that attempted to test Howard-Sheth theory of

buyer behavior (1969). The theory of buyer behavior provides a description and explanation of consumer's brand choice process and the development of brand loyalty over time. At the core of the theory is the concept of expectancy developed primarily by the process of learning from informational and experential sources.

Based on standard probability sampling procedures, a longitudinal panel of 954 housewives was established. The panel members recorded purchases of several convenience food products including instant breakfast for a period of five months beginning in the month of May, 1956 and ending in October, 1966. In addition to reporting buying behavior including place, time, amount and price of the products, the panel was interviewed four times. The first was a mail questionnaire sent out at the time of recruiting which asked information on several things including housewife's home involvement, breakfast eating habits and attitudes and opinions on several milk additive products including instant breakfast. One month later, a telephone interview was conducted obtaining information on awareness, knowledge, preference and intentions toward three brands of instant breakfast. Two of these brands were newly introduced in the market soon after the recruitment and establishment of the panel whereas the third brand was well-known because it had been in the market for at least two years prior to the study. The second and the third interviews were also conducted by telephone and essentially obtained the same information as the first telephone interview.

The data relevant to this study pertain to the three brands of instant breakfast; they will be called CIB (well-known brand), PIB (new) and FIB (new). The object in question is therefore, a *brand* of instant breakfast, and this investigation examines the interrelationships among evaluative beliefs, affect, buying intention and buying behavior toward three distinct brands of instant breakfast. Furthermore, for each of the brands, there are three separate sets of data collected in the three telephone interviews.

The following are the operational definitions of affect, buying intention, evaluative beliefs and buying behavior:

2.1. AFFECT. — Overall like or dislike of a brand of instant breakfast at the time of interview. The specific rating scale used was:

In general, I like it very much ☐ ☐ ☐ ☐ ☐ ☐ ☐ In general, I don't like it.

2.2. BUYING INTENTION. — Verbal expression of intent to buy the brand of instant breakfast — within some specified time period from the time of interview. The particular scale used was:

How likely are you to buy — in the next month?

- ☐ Definitely will
- ☐ Probably will
- ☐ Not sure one way or the other
- ☐ Probably will not
- ☐ Definitely will not

2.3. EVALUATIVE BELIEFS — Evaluation of a brand of instant breakfast in terms of its certain characteristics which are anchored to relevant criteria of choosing among several alternative brands of instant breakfast.

A set of seven evaluative beliefs were obtained from the respondent about each of the three brands of instant breakfast in the three telephone interviews. The particular characteristics of the brands and the associated criteria of choice were based on a prior depth-interviewing of 100 housewives on milk additive products including instant breakfast. A detailed description of the procedure followed is described in Howard and Sheth (1969, Chapter 6).

The seven evaluative beliefs about a brand were obtained by the following bipolar rating scales.

Delicious tasting	☐ ☐ ☐ ☐ ☐ ☐ ☐	Not delicious tasting
Good substitute for meal	☐ ☐ ☐ ☐ ☐ ☐ ☐	Poor substitute for meal
Very nutritious	☐ ☐ ☐ ☐ ☐ ☐ ☐	Somewhat nutritious
Very good for a snack	☐ ☐ ☐ ☐ ☐ ☐ ☐	Not good for a snack
Very filling	☐ ☐ ☐ ☐ ☐ ☐ ☐	Not very filling
Good buy for the money	☐ ☐ ☐ ☐ ☐ ☐ ☐	Not a good buy for the money
Good source of protein	☐ ☐ ☐ ☐ ☐ ☐ ☐	Poor source of protein

2.4. BUYING BEHAVIOR. — Purchase of a brand of instant breakfast during the five months of panel operation.

Buying behavior was operationally measured from the reported purchases of a brand of instant breakfast in the diary that panel

members filled out every two weeks. Two types of measures are used in this study. One is the number of purchases of a brand between two telephone interviews. The other is a classificatory measure of buying at least once or not buying at all.

There seem to be several advantages in using data from this large scale naturalistic study compared to several experimental studies found in social psychology. They are:

a. The study was conducted in naturalistic environment that dealt with a real situation. It was conducted in cooperation with a large grocery company which was test marketing one of the brands of instant breakfast. It thus reduces the burden of substantive and statistical inference from simulated laboratory type situation to the reality.(1) In short, all the differences that Hovland (1959) pointed out between experimental and survey findings are absent here.

b. The sample size of this study is large enough to statistically put faith in the findings. In addition the sample was based on standard probability sampling procedures.

c. Due to the cooperation of the company, a unique situation was created in which beliefs, affect and behavioral intention preceded actual behavior since the product was not even introduced in the market at the time of first interview and, therefore, no one could buy it.

d. This was a longitudinal study in which we could use time as a factor to build causability between attitude and behavior. It was, therefore, possible to measure prior attitudes for predicting subsequent behavior and also use prior behavior as a prediction of subsequent attitudes.

Section 3 – Relationship between Affect and Evaluative Beliefs

There are several compelling reasons to investigate the cognitive structure that underlies affect toward objects (Sheth 1969a). In marketing and consumer psychology, they can be summarized as follows: First, two buyers may both like a brand to the same extent but for

(1) This does not mean that simulated studies with atypical samples always imply impossibility of inference. See Sheth (1970a).

different reasons. There is considerable literature on product differentiation and market segmentation (Myers 1968) to support this. In fact, several companies have consciously avoided presenting a profile (image) of their products in the hope that *all* potential consumers would buy and consume them based on their own reasons. Second, a brand is usually consumed in a variety of ways and situations even by the same buyer. Affect toward the brand may not reveal this.

Accordingly, in this section an attempt was made to examine the predictive power of the seven evaluative beliefs in explaining variance in affect toward each of the three brands of instant breakfast. Based on earlier discussion, the evaluative beliefs were kept distinct instead of summing them to a single constant prior to correlating them with affect. Multiple regression analysis was performed in nine sets of data (3 brands x 3 telephone interviews) in which affect toward the brand was the criterion variable and the evaluative beliefs were the predictor variables.

Table 1 summarizes the results of these nine multiple regressions. It lists the total predictive power as well as the relative importance of each of the evaluative beliefs in terms of standardized regression coefficients (beta weights).

TABLE 4-1. — Prediction of Affect by Evaluative Beliefs

Beta Weights	CEB			PIB			FIB		
	T_1 (1)	T_2	T_3	T_1	T_2	T_3	T_1	T_2	T_3
Taste	.57	.62	.63	.52	.58	.69	.63	.59	.59
Substitute for Meal	.05	.11	.06	.14	.16	−.02	.24	.20	.05
Nutrition	.05	−.02	.01	−.09	.01	.03	.22	−.14	.06
Snack	.04	.09	.16	.06	.25	.10	.14	.08	.02
Filling	.12	.05	.04	.11	−.00	.05	.14	.13	−.03
Price	.09	.15	.12	−.00	.10	.20	−.08	.12	.20
Protein Source	.02	.01	.01	.05	−.05	.15	−.12	.05	.04
Multiple R (2)	.75	.82	.84	.64	.82	.78	.74	.82	.78
Multiple R^2	.55	.68	.71	.41	.68	.61	.54	.67	.60
Standard Error	1.18	1.05	1.00	1.37	1.15	0.30	1.12	1.12	1.13
Sample Size	512	467	598	189	296	449	98	175	352

(1) T refers to Telephone Interviews.
(2) All the multiple Rs are significant at .01 level.

a. In all the nine cases, evaluative beliefs are significantly related to affect beyond the .01 level. The amount of variance in affect that could be explained by the evaluative beliefs ranges from a low of 41 per cent (in the case of FIB-Telephone 1) to a high of 71 per cent (in the case of CIB-Telephone 3). Considering the sample size and naturalistic aspects of the study, these percentages are very high. Therefore, we can state that evaluative beliefs are consistently capable of predicting variance in affect.

b. Interestingly, the multiple correlation coefficient between affect and evaluative beliefs tends to increase with time; it is higher in later telephone interviews than in the first ones. Probably, learning of the beliefs about the brands over time causes this correlation to improve.

c. Only a few of the seven evaluative beliefs consistently come out as the important predictors. These include taste, price and substitute for meal. Taste is by far the most significant evaluative belief which individually explains more variance than all other beliefs combined together. Except in the case of FIB-Telephone 1, nutrition and protein are the least important predictors. This is somewhat surprising in view of the fact that a good deal of the promotional effort of all the three brands of instant breakfast was directed with nutritional appeals of the products.

d. Although taste is consistently the most dominant belief across all brands and telephone interviews, there are changes in relative importance of other beliefs from one telephone interview to the next. Furthermore, most of the changes are found in the two new brands. For example, both filling and substitute for meal which were important in the first telephone interview decline sharply in the last interview, and vice versa is true of price and snack. These changes are very probably due to the change in promotional and advertising appeals.

In summary, we can conclude that evaluative beliefs are significantly related to affect.

Section 4 - Behavioral Intention and Evaluative Beliefs

Some researchers have suggested that affect and behavioral intention measure the same thing (Fishbein 1966). However, as we discus-

sed in section I (pp. 99-104). behavioral intention, instead of being equivalent of affect, is at best a function of affect. Furthermore, two other factors (social and anticipated situation) are also hypothesized as determinants of behavioral intention. We should accordingly find less predictive power of evaluative beliefs in explaining variance of behavioral intention than in that of affect.

Table 4-2 summarizes results of nine multiple regressions (3 brands x 3 interviews) in which intention to buy was the criterion variable and the seven evaluative beliefs were the predictor variables.

a. Except for one case (FIB-Telephone 1), all the regressions are significant at .01 level. The amount of variance in intention predicted by the evaluative beliefs ranges from a low of 10 per cent (FIB-Telephone 1) to a high of 38 per cent (CIB-Telephone 3). Compared to the prediction of affect, however, the range is considerably less.

b. Only a small number of the evaluative beliefs are important predictors of intention. These include taste, price, snack and substitute for meal. Furthermore, taste is consistently the most dominant evaluative belief except in the case of FIB-Telephone 1.

c. Although the evaluative beliefs tend to explain more variance as time progresses, the increases are not as large as was the case in prediction of affect.

TABLE 4-2. — Prediction of Behavioral Intention by Evaluative Beliefs.

Beta Weights	CIB			FIB			FIB		
	T_1 (1)	T_2	T_3	T_1	T_2	T_3	T_1	T_2	T_3
Taste	.55	.33	.36	.25	.24	.25	.01	.27	.30
Substitute for Meal	.12	.12	.07	.16	.15	−.03	.13	.15	.11
Nutrition	.03	.01	−.07	−.16	.20	−.01	.03	−.13	.02
Snack	.05	.17	.13	.14	.20	.12	.01	.17	−.03
Filling	.10	.03	.09	.05	.04	.05	.14	.05	.03
Price	.19	.19	.20	.19	.16	.16	−.01	.05	.26
Protein Source	.01	.04	.01	.04	−.10	.03	.02	.09	.03
Multiple R	.59	.60	.62	.50	.54	.47	.31 (2)	.48	.52
Multiple R^2	.35	.37	.38	.25	.29	.22	.10	.23	.28
Standard Error	1.15	1.16	1.09	1.14	1.13	1.04	1.26	1.08	0.98
Sample Size	528	488	621	201	219	473	161	192	367

(1) T refers to Telephone Interviews.
(2) Not significant. All other multiple Rs are significant at .01 level.

The regression analyses clearly indicate that evaluative beliefs are much better predictors of affect than of behavioral intention. This has to be expected from the conceptual framework described earlier. Furthermore, in view of the fact that evaluative beliefs systematically explain from 1 1/2 times to as much as 5 1/2 more variance in affect than in intention, any equivalence between affect and intention has to be ruled out. This does not mean that affect and intention are not significantly correlated. Rather it suggests that the correlation is not likely to be perfect or near perfect.

To examine the extent of relationship between affect and intention, product moment correlations were calculated for each of the three brands at each telephone interview. Table 4-3 summarizes the results. All the correlations are positive as would be expected, but none is perfect. The correlations range from .254 to .631 and all are significant at the .01 level.

TABLE 4-3. — Correlations between Affect and Intention.

Telephone Interview

Brand	1		2		3	
	Correlation	Sample	Correlation	Sample	Correlation	Sample
CTB	.610	.665	.599	.607	.631	.655
PTB	.488	.256	.554	.290	.480	.475
FTB	.254	.110	.448	.229	.504	.374

It is interesting also to note that whenever the predictive power of evaluative beliefs is quite disparate between affect and intention, the correlation between affect and intention is low, and vice versa. Take, for example, FTB-Telephone I. The variance explained in affect is 54 per cent (Table 4-1, p. 108) but it is only 10 per cent in the case of intention (Table 4-2, p. 110). This is the largest disparate case in the data, and matches exactly the lowest correlation between affect and intention (Table 4-3). A rank order correlation of .70 was obtained between the ranking of correlations in Table 4-3 and the ranking of differences in predictive power of evaluative beliefs related to affect and intention.

Yet another way to support the proposition that affect and intention are significantly related but that they are not the same, is to

examine the relative contribution of each of the evaluative beliefs in prediction of affect and intention. The evaluative beliefs were rank ordered based on their total contribution in all the nine situations in predicting both affect and intention. The rank order correlation was found to be .90 which is significant at least at .01 level.

Section 5 - Measurement of Attitude from Evaluative Beliefs

It is clear from the evidence presented in the last two sections that evaluative beliefs are central to the prediction and explanation of both affect and behavioral intention. Also, it is possible to consider evaluative beliefs as the fundamental concept that determines subsequent behavior. For behavioral intention as a determinant of behavior is itself determined by evaluative beliefs. All of this suggests that attitude be defined and measured from evaluative beliefs about an object.

If we think of evaluative beliefs as representing an n-dimensional space, then a person's evaluation of an object on the set of n evaluative beliefs can be considered a point in this space. This point represents that individual's attitude toward the object, and the centroid of several points (sample) is a reflection of aggregate attitude toward the object.

This would, however, be true if the evaluative beliefs were uncorrelated because they would then form an orthogonal space which can be mathematically analyzed by the principles of Euclidian geometry. However, seldom are the evaluative beliefs orthogonal (uncorrelated) to one another. It is, therefore, necessary that a set of n evaluative beliefs be reduced to r number of orthogonal dimensions by making linear combinations of truly independent evaluative beliefs. A procedure is developed and fully described in Howard and Sheth (1969, Chapter 6). We will here only very briefly summarize it.

The data related to evaluation of a brand by a sample of respondents on a set of evaluative beliefs can be summarized in a matrix X whose rows are the evaluative beliefs and whose columns are the respondents. Then X_{ji} element represents individual i's evaluation on jth belief. The dimensionality of this matrix can be obtained by the use of Eckart-Young theorem (1936) in which as much of the total information in X is summarized in as few dimensions as possible.

Any rectangular matrix $X(n < N)$ can be resolved into its basic structure. Thus

$$X = UrW \tag{4}$$

where **X** is the data matrix containing buyer *i*'s evaluation of a brand on *j*th belief.

U is *n*X*n* orthogonal matrix of vectors; by definition $\mathbf{U}^1 = \mathbf{U}^{-1}$ and $\mathbf{U}\mathbf{U}^1 = \mathbf{I}$.

Γ is *n*X*N* diagonal matrix of roots containing positive values in the first *n* diagonal cells and zeroes elsewhere; and

W is NXN orthogonal matrix of vectors; by definition $\mathbf{W}^1 = \mathbf{W}^{-1}$ and $\mathbf{W}\mathbf{W}^1 = \mathbf{I}$.

By resolving the data matrix **X** into the product of three matrices as defined above enables us to construct an approximate matrix, $\hat{\mathbf{X}}_r$ of rank *r* whose dimensionality is much less than the original matrix. This approximation is of the least squares type and hence $\hat{\mathbf{X}}_r$ summarizes as much of the original information as possible. It is constructed by taking the first *r* elements of each of the three basic matrices. Thus

$$\hat{\mathbf{X}}_r = \mathbf{U}_r\Gamma_r\mathbf{W}_r \tag{5}$$

where $\mathbf{U}_r$ is *nxr* section of **U**, Γ_r is *rxr* section of Γ, and $\mathbf{W}_r$ is *rx*N section of **W**.

Mathematically, the elements in $\mathbf{U}_r$ represent projections of points corresponding to the row elements of **X** on the unit-length vectors. Since the rows are a set of evaluative beliefs, the $\mathbf{U}_r$ matrix represents *aggregate* (centroid) evaluative beliefs about the brand. Similarly, $\mathbf{W}_r$ represents projections of points corresponding to the column variables of **X** on the same unit length vectors. Since the column summarizes a person's evaluation of the brand on all of the beliefs, the $\mathbf{W}_r$ matrix represents *individual* scores. Every individual then has *r* scores, each representing his score on a dimension. These scores are called the attitude scores.

It will be noted that attitude scores can be unidimensional or multidimensional depending upon the dimensionality of the data matrix **X**. In other words, *r* dimensions range from one to the number of evaluative beliefs. If all the beliefs are completely uncorrelated, then a multidimensional $(r = n)$ attitude measurement will result.

The resolution of the data matrix **X** into its basic structure is easily accomplished by getting a square matrix from **X** and then finding its characteristic roots and vectors. If we post-multiply **X** with its transpose $\mathbf{X}^1$, we obtain a cross-products matrix, $\mathbf{P} = \mathbf{X}\mathbf{X}^1$. The p_{ij}

elements contain the sums of squares in the diagonal and sums of cross products in the off-diagonal cells. These sums are anchored to raw scores as opposed to deviation or standard scores. If the original raw data matrix X were at first transformed to a matrix Y of deviation scores ($Y_{ji} = X_{ji} - \bar{X}_j$), the post multiplication of Y with its transpose Y^t would result in well-known variance-covariance matrix. On the other hand, if the original raw data matrix was transformed into a matrix S of standard scores ($S_{ji} = Y_{ji}/\sigma_j$), and post multiplied it by its transpose, the resultant matrix would be the correlation matrix. Since $P = XX^t$, we can state that

$$P = (U\Gamma W)(W^t\Gamma U^t) = U\Gamma^2U^t \tag{6}$$

Then

$$W = \Gamma^{-1}U^tX \tag{7}$$

The U contains the characteristic vectors of X and Γ^2 contains the corresponding characteristic roots. The characteristic roots are ordered so that $\lambda_1^2 > \lambda_2^2 > \ldots \lambda_n^2$. Their sum equals the trace of P matrix and therefore, the total variance present in the data matrix X. By choosing first r number of roots that summarize a large percentage of total variance (say 85 to 90 per cent), and the corresponding vectors, we can construct the $\hat{X}_r$ matrix.

Following the above procedures and standardizing the value to remove bias resulting from varying sample sizes (Sheth, 1969b), the aggregate and individual attitude scores were created for CIB, PIB and FIB for every telephone interview. Surprisingly, in every case only one dimension was found to be present since it summarized at least 90 per cent of total variance in every case. Furthermore, none of the second, third, etc. dimensions summarized more than five per cent of variance and hence they were considered insignificant.

The finding of only one dimension may appear to support suggestion by several researchers (Osgood and Tannenbaum 1955; Fishbein 1966) that attitude is a unidimensional concept. But this inference is not fully accurate because all the brands and the evaluative beliefs they are rated upon are very similar. In general, we should expect more than one dimension but, because one attribute (taste) was so dominant in determining affect and intention, that only one dimension was found in this study.

Table 4-4 (p. 115) summarizes the standardized aggregate attitude scores of CIB, PIB and FIB. The aggregate values of each evaluative

TABLE 4-4. — Aggregate Attitude Scores of Three Brands (1)

Evaluative Belief	CIB			PIB			FIB		
	T_1(2)	T_2	T_3	T_1	T_2	T_3	T_1	T_2	T_3
Taste	5.6	5.8	5.6	5.2	5.5	5.6	5.1	5.5	5.0
Substitute for Meal	5.1	5.0	5.0	4.9	4.9	4.8	4.7	4.8	4.3
Nutrition	6.0	6.0	6.0	5.6	6.0	5.5	5.5	5.8	4.5
Snack	5.8	5.9	5.8	5.6	5.7	5.6	5.2	5.6	5.3
Filling	5.6	5.6	5.4	5.2	5.5	5.4	5.1	5.3	4.8
Price	5.3	5.5	5.1	5.2	5.2	5.0	5.3	5.0	4.5
Protein Source	6.1	6.1	6.0	5.7	6.1	5.8	5.6	5.8	5.5
Sample	623	581	954	246	363	479	113	253	374
Aggregate Affect (7-Point Scale)	5.48	5.48	5.25	4.96	4.87	5.02	4.79	4.89	4.66
Aggregate Intention (5-Point Scale)	3.29	3.18	3.20	3.04	2.68	2.59	2.71	2.48	2.54

(1) The aggregate scores are standardized to remove bias due to varying sample sizes. They approximate very closely the average values of each of the evaluative beliefs.
(2) T refers to Telephone Interviews.

belief show only a small change from first telephone interview to the third. However, most of the changes are found to be in the case of the new brands. This is to be expected in view of the fact that they were newly introduced in the market so that consumers could not have strong positive feelings about them, and that heavy promotional effort was done for them between the first and third telephone interviews.

Although at the aggregate level, changes in attitude scores are much smaller, the individual consumer's attitude scores undergo strong changes over time. Also, they are quite different for the three brands. Table 4-5 (p. 116) reproduces attitude scores of some of the individuals to show this wide variation.

Since individual attitude scores summarize (in one dimension in the present case) the information related to evaluative beliefs about the brand it is logical to assume that a high degree of correlation exists between attitude scores and affect, and attitude scores and intention. Particularly this would be true in this study because earlier we found a good relationship between evaluative beliefs, on the one hand, and affect and intention on the other hand.

Table 4-6 (page 116) summarizes product-moment correlations between attitude scores and affect and intention. They range from a low value of 295 (FIB-Telephone 1; attitude with intention) to a

TABLE 4-5. — Some Examples of Standardized Individual Attitude Scores.

Consumer	CIB			FIB		
	T_1 (1)	T_2	T_3	T_1	T_2	T_3
171	1.20	n.a. (2)	.52	1.08	1.13	1.12
350	.67	.89	1.49	n.a.	.84	.78
517	.96	.90	1.10	.88	.89	.96
809	1.16	n.a.	.70	n.a.	1.15	1.24
509	.94	.93	.95	.98	.89	.93

(1) T refers to Telephone Interviews.
(2) n.a. = not available.

TABLE 4-6. — Relationship between Attitude Scores, Affect and Intention

Correlation of Attitude with	CIB			FIB			FIB		
	T_3(1)	T_2	T_1	T_1	T_2	T_3	T_3	T_2	T_1
Affect	.649	.717	.745	.566	.706	.702	.695	.695	.674
Intention	.534	.559	.562	.454	.589	.429	.295	.423	.490
Multiple Correlation of Evaluative Beliefs with									
Affect	.75	.82	.84	.64	.82	.78	.74	.82	.78
Intention	.59	.60	.62	.50	.54	.47	.31	.48	.52

(1) T refers to Telephone Interviews.

high value of .745 (CIB-Telephone 3; attitude with affect). Interesting to note is that the variations of correlations across brands and time periods are identical to the variations in multiple Rs between evaluative beliefs, and affect and intention. In fact, but for a constant difference within a brand, the two values are very similar to each other. This should be expected, however, in view of the fact that an attitude score of a buyer is nothing more than a weighted linear combination of his seven evaluative beliefs about the brand.

Section 6 - Relationship of Affect and Attitude with Behavior

In this section, the final linkage is attempted between affect and behavior and attitude and behavior. Behavior is defined in terms of consumer's buying of a brand of instant breakfast as reported in biweekly diaries.

Prediction of behavior from affect or attitude is a difficult task. First, numerous unanticipated situational factors intervene between a person's predisposition toward an object and his overt behavior with respect to it. Furthermore, confronted with the reality of behaving and the inherent greater commitment to subsequent consequences, the individual tends to hesitate or postpone behavior. Second, and perhaps more important problem is the *interdependent* relationship between beliefs (and therefore affect and intention) and behavior as was pointed out in the earlier section. This interdependence creates problems in establishing one-way causability between affect or attitude and behavior.

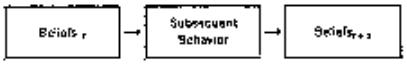
It would appear that without prior expectations of the consequences it is improbable that a person would manifest goal-directed behavior toward an object or entity. These expectations may be built over time or they may be developed very shortly prior to behavior. It is even possible that in the process of examining and sensing the object or entity, the expectations are developed. But expectancy is antecedent to goal-directed, purposeful behavior.

Prior to first-time goal-directed behavior the individual is likely to learn expectations from informational sources. These can be symbolic sources such as mass media, direct mail, or friends and relatives in which either pictorial or linguistic representations of the object are the main avenues of information. Or they can be significative sources such as store display, store shelves, show rooms, free sample, etc. in which the physical attributes of the object directly provide information.

However, once the goal-directed behavior is manifested, the individual experiences consequences of his behavior. He uses this experience as a source of learning in which he revises his total beliefs including evaluative beliefs about the object. It should be pointed out that this revision of beliefs is a function of (1) the need to achieve cognitive consistency with behavior and (2) the positive or negative consequences

actually experienced from behavior. The former has been the major theme of all of the cognitive consistency theorists including balance, dissonance, and congruency schools of thought (Feldman 1966: Abelson *et. al.*, 1968). On the other hand, the latter is a direct derivative of reinforcement learning.

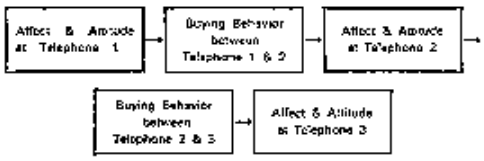
This interdependent relationship can be stated as follows:



It will be seen that one way to reduce interdependent relationship to independent-dependent relationship is by the use of longitudinal analysis in which beliefs and behavior are a priori known to be manifested at different time periods.

The present study had unique opportunity to establish time-related dependencies between attitude and behavior. Since the study was longitudinal it was possible to establish antecedent and subsequent behaviors as respectively determinants and consequences of attitude. Furthermore, with respect to the new brands **PIB** and **FIB**, attitude measures preceded purchase behavior because the brands were not introduced in the market at the time of attitude data collection.

In the case of each of the three brands, therefore, the following time-related linkages were established between affect and attitude with behavior:



Operationally, buying behavior was defined as the number of purchases of a brand of instant breakfast between telephone interviews. Since this time interval was relatively short (one month to two months), there were very few respondents who bought more than three times. Hence the following four discrete categories were used: (1) no purchase (2) one purchase (3) two purchases and (4) more than two purchases.

On the attitude side, three types of variables were used for comparative purposes. First was the *summated* evaluative beliefs as has been suggested by Fishbein (1967). Second was the seven-point affect scale. Third was the attitude score derived from evaluative beliefs as described in section V, (pp. 113-116).

A bivariate regression analysis was performed for each brand at each of the linkages. Furthermore, there are distinct three regressions to include affect, summated beliefs and attitude scores. Hence, a total of 36 (3 brands x 4 linkages x 3 measures of attitude) regressions were undertaken. The results are summarized in Table 4-7 (p. 120). The findings are:

(a) The relationship between attitudes and behavior is very low across all three measures of attitudes.

(b) In general, summated beliefs are least related to behavior, affect next and attitude scores most. This may suggest that in the process of summing evaluative beliefs, an artifact (average) is probably created which suppresses true relationship.

(c) The time-related dependencies operate both ways albeit with low predictions. This implies that there is, in fact, a true *interdependent* relationship between attitudes (beliefs) and behavior.

The findings are disappointing in view of the fact that evaluative beliefs were very good predictors of affect and intention. However, there are several structural aspects that are important to look at. First, all the correlations are positive. This means that the linkage proposed in the conceptual framework is probably valid. Second, there is a clear and consistent finding that attitudes and behavior are interdependent again validating that part of the conceptual framework. Third, while the prediction of behavior from attitudes remains about the same for the well-known brand CIB across two telephone interviews, it increases sharply in the case of both of the new brands. This would be a plausible finding in terms of learning theory.

Finally, the findings clearly suggest the important role that situational factors play. There is evidence from other analyses of this study that there were two major unanticipated situational factors present in the data. The first was the introduction of FIB in the market and the consequent competitive promotional efforts that consumers felt from two new brands with somewhat different appeals. Second, at

TABLE 4-7. — Relationship between Attitudes and Behavior.

Relationship with Buying Behavior	CHL			PHB			PHB		
	Summated Beliefs	Affect	Attitude Score	Summated Beliefs	Affect	Attitude Score	Summated Beliefs	Affect	Attitude Score
$P_{T_3}-T_3 \quad f(A_{T_1})$									
Correlation Coefficient (r)	.22	.24	.23	.03	.04	.09	09	.08	.31
% Variance Explained (r^2)	5	6	5.3	<.1	<.1	<.1	09	<.1	9.5
Sample	656	349	581	263	206	246	122	114	110
$A_{T_2} - f(P_{T_1}-T_2)$									
Correlation Coefficient (r)	.23	.27	.24	.12	.10	.14	.20	.19	.26
% Variance Explained (r^2)	5.5	7.1	5.8	1.5	1	2	4	3.5	6.8
Sample	602	349	581	394	391	372	256	231	231
$P_{T_3}-T_3 \quad f(A_{T_2})$									
Correlation Coefficient (r)	.23	.26	.21	.16	.14	.19	.19	.16	.27
% Variance Explained (r^2)	5.3	6.5	4.4	2.7	2	3.6	3.6	2.4	7.1
Sample	602	349	581	394	391	372	256	231	231
$A_{T_3} - f(P_{T_2}-T_3)$									
Correlation Coefficient (r)	.21	.25	.20	.14	.17	.17	.14	.20	.20
% Variance Explained (r^2)	4.3	6.1	4.4	1.9	2.9	2.9	2	3.9	4
Sample	641	349	628	401	478	479	406	377	374

P = Purchase (number of times a brand was bought)
A = Attitudes (measured in three ways: summated evaluative beliefs, affect and attitude score)
T_1 = First Telephone Interview
T_2 = Second Telephone Interview
T_3 = Third Telephone Interview

times, the new products were not available in the store when the housewife went to buy them. She either did not buy or bought a competing brand instead.

All of this indicates that what is found to be a very high correlation between behavioral intention and behavior in the laboratory type experimental studies (Dulany 1968, Fishbein 1967) may be due to two factors both of which are likely to be nonexistent in naturalistic situations. They are (1) contiguity of expressing behavioral intention and actual behavior and (2) lack of situational variations from one individual to the other and from one time period to the other because these are controlled in the experiment.

Despite above reasons, the relationship between attitudes and behavior is felt to be too small. Some other explanations must exist for this low relationship. It would appear that part of the problem is anchored to the operational definition of behavior. What was predicted is not buying vs. not buying, but buying a brand so many times within a given time period. At the same time, the intervals chosen were small enough (in relation to the purchase cycle of this product) to allow only a few purchases. In fact, a large number of consumers did not buy even once particularly in the case of the two new brands. That this seems to be a plausible cause of low relationship between attitudes and behavior, there are at least three indications.

First, the relationship between attitudes and behavior is consistently greater for the well known brand where purchase frequency was higher and many more consumers bought the product at least once as compared to the new brands.

Second, Day (1967) utilized the same data with respect to the well-known brand CIB but used the relative frequency measure of purchase over the five month period. He could predict behavior from initial attitudes (his measure was affect) at a substantially higher level than what is found here.

Third, the respondents were classified as buyers vs. nonbuyers depending upon whether the bought a brand of instant breakfast at least once between two telephone interviews. In table 4-8 (p. 122), their average attitudes scores are presented. It is clear that attitude scores of the buyers are consistently larger than those of the nonbuyers.

Similar results between users and nonusers of instant breakfast were found by Pellemans (1969) with respect to affect and attitude scores.

TABLE 4-8. — Average Attitude Scores of Buyers and Nonbuyers (1)

Buying Behavior between	Telephone 1			Telephone 2			Telephone 3		
	CIB	FIB	FIB	CIB	FIB	FIB	CIB	FIB	FIB
Mail & Telephone 1									
Nonbuyer	.632			.602			.668		
Buyer	.926	n.a.	n.a.	.879	n.a.	n.a.	.873	n.a.	n.a.
Telephone 1 & 2									
Nonbuyer	.659	.238	.125	.616	.393	.244	.672	.512	.406
Buyer	.910	.340	.225	.592	.747	.513	.814	.790	.860
Telephone 2 & 3									
Nonbuyer	.660	.250	.216	.604	.397	.244	.653	.502	.382
Buyer	.795	.501	.295	.850	.664	.503	.825	.850	.860

(1) Buyer is a respondent who bought the brand at least once during the time interval specified and nonbuyers are all others.

Section 7 - Summary and Conclusions

In this study, an attempt was made to integrate conceptual propositions related to beliefs, affect, behavioral intention and behavior. Based on the linkages proposed, an empirical investigation in naturalistic conditions was undertaken. The data camefrom a study conducted at Columbia University based on Howard-Sheth theory of buyer behavior. On this longitudinal study of 954 housewives, measures of evaluative beliefs, affect, behavioral intention and behavior were derived with respect to three brands of instant breakfast at three separate time intervals.

The results clearly suggested that evaluative beliefs are very good predictors of affect and behavioral intention. However, their prediction of behavior, although generally better than that of affect, is substantially low. Some explanations were provided for this low prediction in terms of presence of situational factors (new brand introduction and lack of availability) and problems in the operational

measurement of buying behavior. In general, the study provided good support for the conceptual framework that relates beliefs, affect, behavioral intention and behavior.

Section 8 - Counter Report

Maurice Guillaume (*)

This paper is not a counter report but a short appraisal of Professor Sheth's presentation. The latter's characteristics are: clarity, exactness as well as probity and carefulness of its development.

Clarity: All the variables are defined both at conceptual and operational levels. The measurement scales are also specified.

Exactness and carefulness: The conceptual propositions are grounded on observations within an actual framework. In the use of quantitative techniques, the analysis of the data was performed with a maximum of precautions: Results were cross-checked by different methods and the level of significance of each result is specified.

Based on empirical results, Professor Sheth's research paper aims at the integration of the conceptual propositions into a meaningful framework.

We wonder, however, which are the applications to be drawn from the conceptual propositions put forward in the paper: Do they belong to the areas of forecasting, creation of new products, choice of promotional message and media.

Next, in order to make a more refined analysis of the data, we wonder whether it would not be valuable to segment the panel data on the basis of socio-economic variables such as age, education and occupation. We hypothesize that these variables are related to sensitivity to promotional messages and thus to level of opinion and evaluative beliefs. Age, social pressure and unforeseen events explain partially but significantly the discrepancy between buying intention and actual behavior.

Professor Pellemans has insisted on the need of repetitive studies. Research is too often performed by isolated researchers. Did Professor Sheth or his associates check the results obtained so far?

(*) Associate Professor of Business, Namur University, Belgium.

Section 9 – Reply

Jagdish N. Sheth (*)

I find Professor Guillaume's comments extremely relevant and useful.

First, I think the attitude area, in general, is more useful to the marketing manager in his development of marketing strategies with the use of marketing mix variables such as product attributes, advertising and promotion, and price. Attitudes are probably less important in forecasting future behavior although they seem to be a major force which determines behavior. The poor predictability, as was found in my study, is mainly due to a large number of noncontingent, temporary and strong situational factors that intervene between specific behavior at a specific time and place, and the general positive state reflected by the attitude. Out of the same data, we have recently isolated several situational and social factors which are found to be important determinants of this specific buying behavior.

Second, the analysis presented in the paper is admittedly aggregative. As such the correlational measures are also aggregative. I am fully aware of the heterogeneity of the sample on a number of demographic and socioeconomic factors wich may tend to negate some of the relationships hypothesized in the paper. Specifically, I think the linkage between affect and behavioral intention and behavior is found to be relatively small due to probably the averaging of heterogenous segments of the population. For example, heavy users of the product may manifest a much stronger relationship between affect, behavioral intention and behavior as compared to the rest of the sample. As I recall, Professor Pellemans, in fact, carried out an extensive study on the same data to show that this was true to some extent between beliefs and affect on the one hand, and behavioral intention on the other.

(*) Associate Professor of Business, University of Illinois, U.S.A.