*Better correlations with affect
and intent-to-buy were obtained
when beliefs about two instant
breakfasts were not weighted
by their respective importances.*

Brand Profiles From Beliefs and Importances

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Several recent studies in consumer behavior have examined the cognitive structure of attitudes (Howard and Sheth, 1969; Lutz and Howard, 1971; Sheth and Talarzyk, 1972). Most of these studies postulate that a consumer's attitude toward a brand is determined by his evaluations based on a set of relevant beliefs weighted by importances. For example, a brand of toothpaste may be evaluated on the basis of beliefs about its decay prevention, brightening of teeth, or mouthwash properties. These evaluative beliefs are then weighted by the degree of importance attributed to each belief. Finally, these weighted evaluative beliefs are summed together to create a single attitude score.

The following generalized equation represents the basic theme underlying these studies:

$$A_{ij} = \sum_{k=1}^{n} B_{ijk} \times C_{ik}$$

where A_{ij} refers to individual i's attitude toward brand j;

B_{ijk} refers to individual i's evaluation of brand j on a specific belief k;

C_{ik} refers to individual i's importance of that belief k; and

n refers to number of beliefs and their importances.

Some researchers in social psychology (Rosenberg, 1956; Fishbein, 1967) have proposed a similar attitude measure although the specific wordings or definitions of the two components vary.

For example, Rosenberg scores a subject's attitude toward an object by summing a set of weighted perceived qualities of that object with respect to attaining or blocking goals or values. The weights are the relative importances of those goals or values.

On the other hand, Fishbein calculated a subject's attitude score by summing the weighted perceived probabilities of a set of beliefs about an object. The weights are the evaluative (good-

ness-badness) aspects of the beliefs.

Thus, in studies using the generalized equation to calculate a subject's attitude score, the following ingredients are either implicitly or explicitly considered essential in the measurement of attitude: (1) two factors are needed to obtain a measure of an individual's attitude toward an object; (2) these factors are multiplicatively related; and (3) the elements of these factors are summed together to form a univariate (and presumably also unidimensional) attitude score.

In order to validate attitude scores created by using the generalized equation, most researchers have utilized independent measures of the subject's affective or conative state which is then either correlated with, or predicted from, the attitude scores.

Measurement Assumptions

The weighted-sum measure of atti-

tude, based on a two-factor theory of attitudes, seems plausible and even logical. However, there are at least four major assumptions built into the generalized equation which warrant further investigation because none of them is based on validated theories.

First, are both factors indeed necessary to calculate attitude scores? Although this is implicit, there is no write-up on the relative contribution of each factor. Although Rosenberg tried to vary each factor independently of the other, a number of procedural and methodological problems make his conclusions tentative at best. To add to this problem Sheth and Tatarzyk asserted that the importance factor is not only unnecessary but is also detrimental to the correlation of attitude scores with the affective state.

Second, why should the two factors be multiplied? There is neither a logical basis nor any evidence to suggest that an individual weighs (multiplies) a belief by its importance. This multiplicative relationship presumes that a low evaluative belief weighted by a high importance is the same as a high evaluative belief weighted by a low importance. What about an additive as opposed to the multiplicative relationship between the two factors?

Third, how do we know that an individual aggregates (sums) beliefs or their importances or both? Such aggregation presumes that negative and positive beliefs and their importances cancel one another and reduce the cognitive structure to a single value. Is it not likely that individuals retain a profile of an object with respect to relevant beliefs and their importances rather than a sum score? This profile hypothesis means that beliefs and importances are kept distinct and separate even though they may be correlated.

Finally, even if the presumption is made that an individual does aggregate beliefs or importances or both, are these beliefs and importances summed before or after they are multiplied?

The generalized equation presumes that the aggregation is made after multiplying beliefs by their importances.

These four presumptions and their alternatives generate a total of ten different ways attitudes can be measured from information gathered on beliefs and importances. These possibilities with consequent algebraic relations are fully spelled out in Figure 1.

Unless we find which specific measure of attitudes is most effective in terms of correlating with or predicting affective, conative, and behavioral states, we cannot assess the relevance of the weighted-sum approach. The purpose of this study is to empirically investigate the relative effectiveness of the ten measures of attitudes.

Data

The data for this study were obtained from the Columbia Buyer Behavior Project. Based on a probability sample, a longitudinal panel of 954

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housewives was established in one test market area.

The panel members recorded purchases of several convenience food products including milk additives (instant breakfast, dietetic powders, and meal supplements) for a period of five months. In addition to reporting purchase behavior, the panel members were interviewed four times.

The data came from the first mail questionnaire. It asked about the respondent's home involvement, breakfast eating habits, and attitudes toward both general and specific brands of milk additives.

From a prior pilot study of 100 housewives, a total of 13 beliefs were obtained and used as relevant beliefs, and respondents were asked to rate the degree of importances of these beliefs.

In addition, several brands were directly evaluated by the respondents on the basis of these 13 beliefs. Thus, we have operational measures of the two components specified in the generalized equation.

The data relate to beliefs about Carnation Instant Breakfast (CIB) and Sego, and their importances. In addition, questions were also asked relating to the subjects' affective and conative states regarding these brands. A description of these measures follows:

Beliefs. These are about CIB and Sego, measured on a seven-point bipolar scale.

1. Very easy to use - a little trouble to use
2. Poor substitute for a meal - good substitute for a meal
3. Low in calories - high in calories
4. Delicious tasting - not delicious tasting
5. Somewhat nutritious - very nutritious
6. Very good for a snack - not good for a snack
7. Low in price - high in price

8. Very filling - not very filling
9. Does not dissolve easily - dissolves easily
10. Provides lots of energy - provides little energy
11. Good buy for the money - not a good buy for the money
12. Has a real flavor - has an artificial flavor
13. Good source of protein - not a good source of protein

Importances. The beliefs were rated on a three-point scale. Following is the specific question.

"In general, in deciding whether or not to buy ———, how important to you is each of the characteristics below? For each characteristic, please check whether it matters a great deal, matters somewhat, or matters very little."

Affective State of Respondent. This was operationally measured in terms of overall degree of liking or disliking the specific brand. The following seven-point bipolar scale was used:

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

Conative State of Respondent. This was operationally measured in terms of the respondent's intention to buy the brand within the next month. The specific question was a five-point scale given below: "How likely are you to buy ——— in the next month?" (Please check one.)

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

The measures of affect and behavioral intention were utilized for validating and comparing various attitude measurements. The greater the correlation of a particular attitude measurement to these two validating questions, the more effective that measure was considered.

Results

Each respondent's attitude was measured in ten different ways, based on

Table 1

Regression for Carnation Instant Breakfast

Equation	Simple Regressions of Affect	Simple Regressions of Behavioral Intention
1. $\Sigma (B_k \times C_k)$	.63	.55
2. $\Sigma(B_k + C_k)$	.65	.53
3. $[(\Sigma B_k) \times (\Sigma C_k)]$	.61	.53
4. $[(\Sigma B_k) + (\Sigma C_k)]$	.65	.54
5. ΣB_k	.67	.49
6. ΣC_k	.14	.34

Multiple Regressions of Affect on Beliefs and Importances

Equation =	7. $X_k=(B_k \times C_k)$ $k=1,2,\dots13$	8. $X_k=(B_k+C_k)$ $k=1,2,\dots13$	9. $X_k=B_k$ $k=1,2,\dots13$	10. $X_k=C_k$ $k=1,2,\dots13$
1. Easy to Use	.10	.11	-.07	.17
2. Meal Substitute	-.10	-.10	-.10	.13
3. Low Calories	.04	.04	-.03	.00
4. Delicious Tasting	.39	.39	-.36	.03
5. Very Nutritious	.09	-.01	-.02	-.05
6. Snack	.05	.05	-.06	.09
7. Reasonable Price	-.02	-.00	-.01	-.05
8. Filling	.09	.06	-.05	.09
9. Dissolves Easily	-.02	-.01	-.00	.05
10. Lots of Energy	.05	.05	-.04	.05
11. Good Buy	.05	.07	-.09	-.11
12. Real Flavor	.19	.19	-.25	-.00
13. Rich in Protein	-.01	-.01	-.01	.07
Multiple R	.72	.75	-.76	.37

Multiple Regressions of Behavioral Intention on Beliefs and Importances

	7.	8.	9.	10.
1. Easy to Use	.13	.08	.01	.20
2. Meal Substitute	-.07	-.09	-.18	.18
3. Low Calories	.04	.01	-.03	.01
4. Delicious Tasting	.23	.21	.17	.13
5. Very Nutritious	.07	.06	.02	.02
6. Snack	.09	.09	.09	.10
7. Reasonable Price	.01	.02	.04	-.11
8. Filling	.09	.07	.04	.09
9. Dissolves Easily	.00	.02	.03	.04
10. Lots of Energy	.09	.07	.02	.21
11. Good Buy	.11	.15	.19	-.13
12. Real Flavor	.09	.10	.11	.01
13. Rich in Protein	-.09	-.06	-.06	.02
Multiple R	.61	.59	.59	.49

the possible combinations of beliefs and importances given in Figure 1. To compare their relative effectiveness, we must correlate and validate them with the respondent's affective and conative states.

Table 2

Regression for Sego

Equation	Simple Regressions of Affect	Simple Regressions of Behavioral Intention
1. $\Sigma \ (B_k \times C_k)$	.51	.42
2. $\Sigma(B_k + C_k)$	.58	.46
3. $[(\Sigma B_k) \times (\Sigma C_k)]$	.49	.42
4. $[(\Sigma B_k) + (\Sigma C_k)]$	.64	.49
5. ΣB_k	.64	.47
6. ΣC_k	.01	.08

Multiple Regressions of Affect on Beliefs and Importances

Equation =	7. $X_k = (B_k \times C_k)$ $k=1,2,\dots,13$	8. $X_k = (B_k + C_k)$ $k=1,2,\dots,13$	9. $X_k = B_k$ $k=1,2,\dots,13$	10. $X_k = C_k$ $k=1,2,\dots,13$
1. Easy to Use	.02	.00	−.01	.01
2. Meal Substitute	−.18	−.14	−.08	−.02
3. Low Calories	−.05	−.05	−.02	−.02
4. Delicious Tasting	.34	.37	−.39	−.05
5. Very Nutritious	.06	.08	−.11	.06
6. Snack	−.01	−.01	−.02	.06
7. Reasonable Price	−.01	.00	−.03	.05
8. Filling	−.01	−.02	−.01	−.04
9. Dissolves Easily	−.11	−.02	−.00	−.05
10. Lots of Energy	.04	.03	−.03	.03
11. Good Buy	.09	.12	−.13	−.09
12. Real Flavor	.31	.31	−.30	.06
13. Rich in Protein	−.05	−.02	−.01	−.01
Multiple R	.71	.75	−.78	.10

Multiple Regressions of Behavioral Intention on Beliefs and Importances

Equation =	7.	8.	9.	10.
1. Easy to Use	.04	.05	.08	.00
2. Meal Substitute	−.13	−.08	−.09	.03
3. Low Calories	−.09	−.09	−.06	−.09
4. Delicious Tasting	.17	.19	.21	−.07
5. Very Nutritious	.00	.04	.05	.05
6. Snack	−.00	−.03	−.04	.04
7. Reasonable Price	−.04	−.01	−.00	.04
8. Filling	.03	.02	−.02	.05
9. Dissolves Easily	.01	.07	.07	−.00
10. Lots of Energy	.04	.01	.02	.00
11. Good Buy	.18	.19	.19	−.03
12. Real Flavor	.21	.20	.21	.06
13. Rich in Protein	.03	.03	.01	.04
Multiple R	.54	.57	.57	.15

However, the standard procedure of using simple correlations (product moment, rank order, or contingency type) could not be utilized for all ten combinations because attitudes were not reduced to single scores. Instead, both simple and multiple correlations and regressions were used wherever appropriate. The results of these correlations and regressions are summarized in Table 1 for Carnation Instant Breakfast and in Table 2 for Sego.

Even though standardized regression coefficients are provided in these tables, our interest primarily was to examine the correlations between the attitude measures and the validating questions on affect and behavioral intention.

Second, the sample size is identical (n=632) for all the correlations, which are directly comparable. Furthermore, due to the large sample size, the additional degrees of freedom lost in multiple regressions do not make this comparison invalid.

An examination of the results in terms of the investigation's objectives reveals, first, that the aggregation of beliefs and importances systematically produces lower correlations with validating measures. This is true whether beliefs are multiplied by their importances (Equation 1 vs. 7), whether beliefs and importances are added (Equation 2 vs. 8), whether only the beliefs are used (Equation 5 vs. 9), or whether only the importances are used (Equation 6 vs. 10).

The greatest drop in correlations due to prior aggregation arises when only the importances are used as the single factor (Equation 6 vs. 10). Also, in all situations where the importances are combined with beliefs, there is substantial reduction in the correlations due to prior aggregation (Equation 1 vs. 7 and Equation 2 vs. 8).

While prior summation also lowers the correlations in situations where only the beliefs are utilized as measures of attitude, the reduction is small

Table 3

Multiple Regressions of Affect and Behavioral Intention on Individual Beliefs and Importances

|	Carnation Instant Milk				Sego			
	Affect		Behavioral Intention		Affect		Behavioral Intention	
	$X_k = B_k$	$X_j = C_j$	$X_j = B_k$	$X_j = C_j$	$X_k = B_k$	$X_j = C_j$	$X_k = B_k$	$X_j = C_j$
Easy to Use	.07	.09	.03	.15	.00	.00	.06	−.01
Meal Substitute	−.09	.03	−.13	.31	−.08	−.02	−.09	.01
Few Calories	.03	−.00	−.01	−.00	−.02	−.01	−.06	−.09
Delicious Tasting	.35	.09	.16	.17	.40	−.04	.21	−.07
Very Nutritious	.03	−.05	.04	.02	.10	.02	.04	−.04
Snack	.05	.00	.05	.05	−.02	.01	−.04	.01
Reasonable Price	.01	−.00	.03	−.05	.03	−.01	−.01	−.01
Filling	.05	−.00	.03	.01	−.01	.00	−.02	.09
Prepares Easily	.01	.01	.02	.00	.00	−.05	.07	−.00
Lots of Energy	.05	.01	.02	.09	.03	.05	−.02	−.01
Good Buy	.06	−.06	.15	−.10	.13	−.04	.20	.02
Good Flavor	.21	−.06	.11	−.03	.29	.04	.19	.05
Rich in Protein	.01	.03	−.05	−.00	−.01	.01	.01	.06
Multiple R	.77		.66		.79		.59	

$u_k, X_j = C_j; k, j = 1, 2, \ldots, 13$

and probably not significant (Equation 5 vs. 9).

Second, the comparisons of multiplicative vs. additive relationships between beliefs and importances reveal that in most cases the additive relationship produces slightly better correlations (Equation 1 vs. 2; Equation 3 vs. 4; and Equation 7 vs. 8). However, there are some exceptions to this generalization when the attitude scores of Carnation Instant Breakfast are correlated with the behavioral intention measure.

In any event, the differences in correlations between the multiplicative and additive linkages of beliefs and importances are insignificantly small. That there is no difference between additive and multiplicative relationships is most surprising in light of the strong controversy over linear additive models in psychological statistics.

Figure 1

Possible Combinations of Beliefs and Importances For Producing Attitude Scores
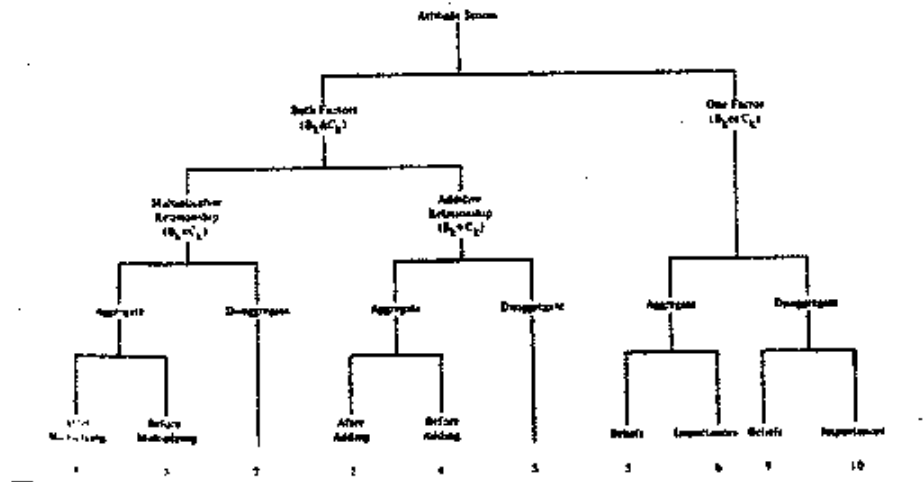
Third, virtually no differences were found between correlations relating each belief with its importance and those relating aggregate beliefs with aggregate importances (Equation 1 vs. 3; and Equation 2 vs. 4). This finding is also surprising because aggregation could be expected to create some type of gestalt phenomenon where the sum will be more than the parts.

Fourth, an examination of the relative correlations of each factor when used alone to generate attitude scores shows that, without exception, the importances are poor correlates of both validating measures. Furthermore, this is true whether we examine the aggregate measure (Equation 6) or the individual importance measures (Equation 10).

The opposite is true when attitude scores are created from the beliefs alone; the correlations are extremely good whether we use the aggregate beliefs measure (Equation 5) or the individual belief measures (Equation 9).

The most surprising finding, however, is that when both factors are added together either in a multiplicative or in an additive manner, the correlations tend to be lower than those found with the beliefs factor alone (Equation 5 vs. 1, 2, 3, or 4; and Equation 9 vs. 7 or 8).

The only exception occurs when correlating with the behavioral intention measure. This is seen in the case of CIS disaggregate belief measures (Equation 7 vs. 9, Table 1). However, the difference is very small.

Similar results have been recently reported for other product categories by Sheth and Talarzyk. However, these findings are contrary to intuition and logic-if importances do not add further correlations, there is no reason to believe that they should take away part of the strong correlations of beliefs with both affect and behavioral intention.

To gain some insights, multiple correlations and regressions were calculat-

ed in which each of the 13 beliefs and 13 importances were kept distinctly separate as independent variables. Without exception, as shown in Table 3, this produces the highest correlation compared to all 10 possible combinations. Once again, the additional degrees of freedom lost (26 independent variables instead of 13) have little bearing on the results due to the large sample size.

The results also show that although the correlations go up when each belief and each importance is distinctly kept separate, the improvement is not considerably more than when only the beliefs are retained as a factor (Equation 9 compared with Table 3). However, the correlations are substantially higher when beliefs and importances are combined together prior to the regressions.

Thus, when beliefs and importances are kept separate and distinct, better correlations are derived than when they are combined together either multiplicatively or additively. Clues about why this is so are found by examining the sizes and signs of Beta weights for each pair of beliefs and their importances in Table 3. The signs of Beta weights for each pair are often opposite. Thus, when one factor is positively correlated with affect or behavioral intention, the other is often negatively correlated and vice versa.

Since only a few beliefs and a few importances have sizeable Beta weights, it is interesting to note that this reciprocal relationship is invariably present in at least one large Beta weight situation. This simply means that prior combining of beliefs and importances, either additively or multiplicatively, tends to produce attitude scores which do not correlate strongly with affect and behavioral intention.

The final observation from Tables 1 and 2 is that affect (like-dislike) is consistently a better correlated variable than behavioral intention. Perhaps this can be explained by the distinc-

tion between affect and behavioral intention in which the latter is also influenced by a social factor and an anticipated situation factor (Sheth, 1971). A similar mediating factor called social normative beliefs was also suggested by Fishbein.

To summarize, this investigation strongly suggests that the most effective measure of attitude can be obtained from measures of a consumer's evaluative beliefs about a brand. These evaluative beliefs should be retained separate and distinct as a profile measure rather than aggregated into a single score. If these evaluative beliefs are strongly intercorrelated and if the multicollinearity problem in further analysis is to be avoided, perhaps the profile could be reduced to component scores by way of principal components analysis. However, in no situation, should beliefs be aggregated to create a single attitude score.

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