STRUCTURAL ASSUMPTIONS UNDERLYING FISHBEIN'S EXPECTANCY - VALUE MODEL OF ATTITUDES

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Concepts of attitudes and attitude structure have been extensively researched in social psychology since the turn of the century. However, ever since the publication of a classic paper by Thurstone (1928), the emphasis has been shifted from theory and content analysis of attitudes to operationalization and empirical or experimental validation of specific models of attitudes (Bem, 1970; Fishbein, 1967; Insko, 1967; McGuire, 1969; Rokeach, 1968; Sherif, 1965; Triandis, 1971). While several models have been tested in the last decade or so, there seems to be a widespread popularity of the so called expectancy - value models of attitudes in social psychology (Fishbein and Ajzen, 1972) and related applied areas such as consumer psychology (Pessemier and Wilkie, 1973) and organizational psychology (Porter and Lawler, 1968). In particular, Fishbein's model of attitude toward the object (A_o) or attitude toward the act (A_{act}) has been widely utilized as representative of the general class of expectancy - value models of attitudes.

All expectancy - value models make several structural assumptions about beliefs and values which have not been validated or even systematically examined in an experimental or empirical setting. We suspect that some of the structural assumptions which go beyond the theory may be one reason why expectancy - value models have not consistently worked well across different situations. The objective of this research study is to empirically examine four major structural assumptions inherent in the

operationalization of expectancy - value models. We have chosen Fishbein's model as representative of the general class of expectancy - value models due to its widespread popularity and usage especially in applied areas of consumer and organizational psychology.

Structure of Expectancy - Value Models

The Fishbein model of attitude toward the object is formally stated as follows:

$$A_o = \sum_{i=1}^{n} B_i a_i$$

A_o = Attitude toward the object or concept,

B_i = Subjective probability of a belief i about the object or concept

a_i = Evaluative aspect of belief i

n = Number of salient beliefs about the object

The B_i component represents the person's expectations about the object or concept with respect to a set of salient beliefs, and the a_i component represents the value of those beliefs. While the two components in expectancy - value models seem conceptually logical and even has face validity, one is not sure about the specific way the attitude score (A_o) is calculated from these two components with the use of the weighted-sum formula. For there seem to be at least four major structural assumptions built into the weighted-sum formula which warrant empirical or experimental validation before it can be accepted as structurally invariant.

First, are both the components (expectancy and value) indeed necessary to measure attitudes? If the answer is yes, as it should be in the expectancy-value formulation, what is the relative contribution of each component in determining attitudes? This is a vital question to determine

in inducing attitude change. The only study in social psychology which addressed itself to this question was by Rosenberg (1956). Based on a survey study among students, he tried to isolate the impact of perceived instrumentalities and value importances by deductive analytical procedures. Unfortunately, several methodological problems in the study forced Rosenberg to conclude that the findings could well have been due to the artifacts of data collection and data analysis (p. 371). This question about the relative contribution of expectancy and values in determining attitudes has been recently revived in consumer psychology by Sheth and Talarzyk (1972). Across a total of 34 distinct attitudinal objects (brands of products), they consistently found that not only value importances were uncorrelated with affect but the correlations of perceived instrumentalities dropped when they were weighted by the value importances. While a number of explanations were put forward by the authors, it still remains a moot question whether value importances are more or less important in determining attitudes as compared to perceived instrumentalities.

A second structural question is with regard to the multiplicative relationship between the two components of expectancy and value. There is no psychological theory nor any evidence which suggests that an individual multiplies his expectancy by the value of that expectancy despite widespread acceptance of this assumption across a number of disciplines (Atkinson, 1964). Furthermore, the multiplicative formula presumes both a trade off and an interaction relationship between expectancy and value; low expectancy of a highly valued belief is equivalent to a high expectancy of a lowly valued belief; and one needs nonzero expectancies and

nonzero values of a belief for it to contribute toward formation of attitudes. What if expectancy and value compensate for one another (sum) rather than interact (multiply)? One, therefore, needs to examine the second structural assumption in the expectancy-value model, namely that expectancy and value interact.

Third, do we really know that an individual sums (aggregates) expected beliefs or their value or both in formulating attitudes? The summation of beliefs, weighted or unweighted, seems more fundamental than the controversy in social psychology between summing and averaging (Fishbein, 1967) because it presumes two things: (a) That the negative and positive values or the more probable and less probable expectancies cancel one another and the cognitive structure is reduced to a single unidimensional scale. Is it not likely that a person retains a profile about an object or concept which then determines his attitude toward that object or concept? In other words, are attitudes unidimensional or multidimensional which has been a major concern in the scaling and measurement of attitudes since 1938 (Torgerson, 1958; Feldman, 1966); (b) That the more valued beliefs are equally important in determining a person's attitude as less valued beliefs since the aggregation is based on a simple summation of more or less valued beliefs.

Finally, the expectancy-value model presumes that the summation of expectancies takes place after each expected belief is multiplied with its value. We do not know whether the aggregation (summation) takes place before or after the multiplication in the mind of the individual.

The above four structural assumptions and their alternative hypotheses generate a total of ten different formulations of the Fishbein's

expectancy - value model of attitudes. These structural variations are summarized in Figure 1. Our objective in this study is to empirically

Insert Figure 1 about here

examine the relative merits of each structural variation of the basic expectancy - value model of attitudes. The specific structural questions raised in the study can be summarized as follows:

1. Is attitude toward the object unidimensional or multidimensional? In other words, should one aggregate the belief expectancies weighted by their values as presumed in the expectancy - value formulation?

2. What is the individual contribution of belief expectancies and their values in determining and predicting a person's attitude toward the object?

3. What is the nature of relationship between expectancy and value? Do they interact or compensate for each other?

Method[3]

The attitudinal objects involved in the study consisted of three different brands of hair shampoo. The choice of hair shampoo was largely due to our strong desire to test the expectancy - value model with respect to everyday concrete reality people face and to get away from contrived laboratory-type issues which often force the researcher to raise simulated or hypothetical questions. Furthermore, prior experience on a prolonged basis is likely to minimize individual differences with respect to familiarity, knowledge and related denotative aspects of the attitudinal object. On the basis of a prior pilot study using 64 randomly selected subjects, eight beliefs were selected which were consistently salient

across individuals. These beliefs were dandruff control, pleasant smell, nondry scalp, clean hair, soft hair, manageable hair, lathering and conditioned hair. The main study was carried out on a total sample of 282 respondents consisting of 230 Head and Shoulders users, 196 Prell users and 156 Breck shampoo users.

The evaluative aspect of each belief (a_i) was measured on a seven-point "good-bad" bipolar scale. The specific question was:

Please indicate your personal evaluation of the following attributes which most people use to evaluate the quality of hair shampoos.

Lots of Lathering	good	:	:	:	:	:	:	bad
Manageable Hair	good	:	:	:	:	:	:	bad
Dandruff Control	good	:	:	:	:	:	:	bad
Clean Hair	good	:	:	:	:	:	:	bad
Conditioned Hair	good	:	:	:	:	:	:	bad
Pleasant Smell	good	:	:	:	:	:	:	bad
Soft Hair	good	:	:	:	:	:	:	bad
Nondry Scalp	good	:	:	:	:	:	:	bad

The subjective probability of a belief (B_i) about each attitudinal object was measured on a seven point probable-improbable bipolar scale. The specific question was:

Please check each scale so as to indicate your personal beliefs about HEAD AND SHOULDERS (PRELL or BRECK).

HEAD AND SHOULDERS

makes lots of lather improbable __:__:__:__:__:__:__ probable

HEAD AND SHOULDERS

leaves hair manageable improbable __:__:__:__:__:__:__ probable

HEAD AND SHOULDERS

controls dandruff improbable __:__:__:__:__:__:__ probable

HEAD AND SHOULDERS

leaves hair clean improbable __:__:__:__:__:__:__ probable

HEAD AND SHOULDERS

conditions hair improbable __:__:__:__:__:__:__ probable

HEAD AND SHOULDERS

smells pleasant improbable __:__:__:__:__:__:__ probable

HEAD AND SHOULDERS

leaves hair soft improbable __:__:__:__:__:__:__ probable

HEAD AND SHOULDERS

leaves scalp nondry improbable __:__:__:__:__:__:__ probable

In order to examine the relative merits of ten structural variations of the basic Fishbein model, we followed the procedure of gathering externally validating measures similar to the one utilized by Rosenberg (1956) and Fishbein (1967). The external validating measures related to the affective tendency of the subject toward the attitudinal object. Three different measures of affective tendency were measured: like-dislike of the attitudinal object, favorableness-unfavorableness toward the attitudinal object, and good-bad evaluation of the attitudinal object. The specific questions were:

Please indicate the extent to which you think HEAD AND SHOULDERS is good or bad.

In general, HEAD AND SHOULDERS is very good __:__:__:__:__:__:__ In general, HEAD AND SHOULDERS is very bad

Please indicate the extent to which you are favorable or unfavorable towards HEAD AND SHOULDERS brand hair shampoo.

Most favorable __:__:__:__:__:__:__ Most unfavorable

Please indicate the extent to which you like or dislike HEAD AND SHOULDERS.

In general, I In general, I

like it very much __:__:__:__:__:__:__ don't like it at all

Following Fishbein, the relative merits of each of the ten structural variations of attitude scores was correlated with the three independent measures of affective tendency. Some of the correlations are simple correlations while others are multiple correlations depending upon whether beliefs are summed or not summed. The multiple correlations were adjusted for the degrees of freedom to make them comparable with each other as well as with simple correlations. Thus, the simple and multiple correlations are directly comparable with respect to their size.

Results and Discussion

A total of 90 different regressions were performed on the data utilizing all possible combinations of ten structural formulations, three attitudinal objects and three different measures of affective tendency. The correlation coefficients are summarized in Table 1.

Insert Table 1 about here

The results are most interesting and at places almost startling. In order to properly draw implications from the large number of correlations, we will systematically examine them from the point of view of three specific questions raised earlier.

Impact of Prior Aggregation (summing) of Expectancies and Values

Without a single exception, the results conclusively show that even

after adjusting for degrees of freedom, prior summing of expectancies and values lowers the correlation of the model with affective tendencies toward the object. That, prior aggregation makes the expectancy - value model correlate significantly less with attitudes is consistently true whether we utilize expectancies alone (equations 1 and 3), values alone (equations 9 and 10), multiply expectancies with values (equations 5 and 2) or add expectancies and values together (equations 4, 8 and 7).

From these results, it appears that the question of summing versus averaging in attitudes is trivial relative to the question of unidimensionality or multidimensionality of attitudes. Furthermore, it appears that prior aggregation of expectancies and values is less interesting from the point of view of bringing about attitude change as a function of controlling or manipulating specific expectancies and their values. By keeping them disaggregate, one is able to infer the magnitude and direction of attitude change from the beta coefficients estimated in the multiple regression.

Relative Contribution of Expectancy and Value Components

The results are also consistent in regard to this issue: the value component contributes very little toward determining attitudes compared to the expectancy component. This is true whether we utilize the aggregate models (equations 3 and 10) or the disaggregate models (equation 1 and 9). This is consistent with the results in the Rosenberg (1956) study.

The most startling conclusion, however, arises when we examine the correlations of expectancies with and without values. No matter how we relate them together, the correlation of expectancies with attitudes drops when values are incorporated in the equation. This is true in the

aggregate multiplicative model (equations 5 and 3), the disaggregate multiplicative model (equation 1 and 2), the aggregate compensatory model (equations 3 and 7), or the disaggregate compensatory model (equations 1 and 4). While these results are consistent with studies in consumer psychology (Sheth and Talarzyk , 1972; Sheth, 1973), we are at a loss to explain them. In addition to several explanations suggested by Sheth and Talarzyk, (1972), we believe that the values in the expectancy-value model are more the determinants of individual differences rather than the intensity and direction of a person's attitudes toward the object. If this hypothesis is true, one should expect heterogeneity in the sample on which statistical analyses such as regression are performed: this heterogeneity, by definition, would lower the correlation with whatever validating measure the researcher is utilizing. The correct procedure then seems to be as follows: 1. Utilize the profile of values of beliefs and perform a cluster analysis of the total sample so that it is broken up into homogeneous segments or subsamples whose value profiles are similar: 2. Perform separate regressions on each segment with the use of expectancy profile. In other words, expectancy and value components may be necessary from the theoretical point of view in determining attitudes but the specific way of relating them to attitudes is not by the weighted-sum ($\Sigma B_i a_i$) formula.

Relationship between Expectancies and Values

In regard to the third specific question, the data clearly indicate that if values are directly related to expectancies in any operationalization of the expectancy-value models, the multiplicative relationship is slightly better than the additive relationship. This is true whether the

the specific structural formulation is at the aggregate level (equations 5 and 6 versus equations 7 and 8) or at the disaggregate level (equations 2 and 4). In other words, the interactive relationship presumed in the model holds true relative to the alternative compensatory relationship between expectancies and values. However, this conclusion should be tempered with the more fundamental question raised by earlier findings whether values should be directly incorporated in the model equation. For as we saw earlier, the correlation drops in both the multiplicative and the additive relationship when we incorporate values in the equation.

The implications from this empirical study are several and can be summarized as follows:

1. The specific weighted-sum formula tends to suppress the correlation between attitudes toward the object and the cognitive structure underlying it. Rather than relying on the formula and probably committing Type I error (rejecting the theory when it is true), it is advantageous to critically conceptualize specific measurement and analytical strategies relevant in testing the expectancy-value theory of attitudes.

2. The value component is more relevant as indicator of individual differences. It should be, therefore, utilized to reduce the heterogeneity in the sample rather than as a predictive element of a person's attitude toward the object.

3. The belief structure underlying attitudes is complex and multivariate. It is self defeating to reduce this multivariate process to a univariate level by aggregating beliefs or expectancies.

4. Not all beliefs determine the attitude toward the object to the

same degree or in the same direction. Some beliefs dominate the cognitive structure underlying attitudes while others though salient contribute relatively little toward formation of attitudes. It is extremely important to know the dominance hierarchy of a set of salient beliefs if the expectancy-value model is to be used for controlling or changing a person's attitude. Thus, it is critical that disaggregate analysis be followed in the utilization of expectancy-value models.

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Footnotes

1. Requests for copies of reprints should be sent to Jagdish N. Sheth, 164 Commerce West, University of Illinois, Urbana, Illinois, 61801.

2. The data used for this paper were a part of a doctoral dissertation submitted in partial fulfillment of the requirements for the degree of doctor of philosophy at the University of Illinois. The study was supported by departmental funds and Graduate Research Board at the University of Illinois to whom we acknowledge our gratitude.

3. We sincerely thank Professor Martin Fishbein in providing assistance in wording and scale construction of his model.

Table I

Correlations Between Affective Tendencies and

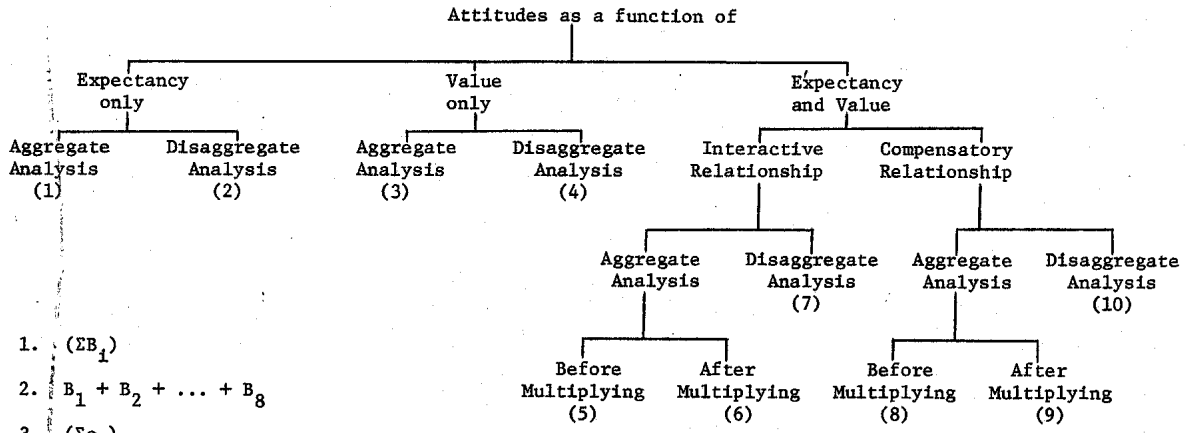
Ten Structural Variations of Fishbein Model[1]

Affective tendency as a function of:	Good-Bad Evaluation			Favorable-Unfavorable Evaluation			Like-Dislike Evaluation		
	H&S	Prell	Breck	H&S	Prell	Breck	H&S	Prell	Breck
1. $B_1+B_2+\ldots+B_8$	.752	.650	.713	.720	.560	.686	.688	.630	.662
2. $B_1a_1+B_2a_2+\ldots+B_8a_8$	.700	.563	.633	.668	.447	.616	.646	.542	.574
3. ΣB_i	.702	.631	.683	.688	.538	.668	.646	.594	.642
4. $(B_1+a_1)+(B_2+a_2)+\ldots$ $+(B_8+a_8)$	.683	.515	.603	.644	.400	.596	.619	.494	.548
5. $\Sigma(B_ia_i)$	.615	.522	.560	.603	.398	.570	.557	.471	.545
6. $(\Sigma B_i)x(\Sigma a_i)$	.594	.500	.541	.588	.376	.554	.539	.446	.528
7.[2] $\Sigma(B_i+a_i)$	.562	.475	.510	.560	.351	.526	.509	.420	.498
8.[2] $(\Sigma B_i)+(\Sigma a_i)$	.562	.475	.510	.560	.351	.526	.509	.420	.498
9. $a_1+a_2+\ldots+a_8$	.306	.253	.029	.265	.178	.010	.251	.243	.011
10. (Σa_i)	.004	.003	.002	.003	.003	.006	.004	.005	.006

1. All correlations are adjusted for different degrees of freedom.

2. Algebraically, these equations are identical in regression analysis.

Figure I



1. (ΣB_i)
2. $B_1 + B_2 + \ldots + B_8$
3. (Σa_i)
4. $a_1 + a_2 + \ldots + a_8$
5. $(\Sigma B_i) \times (\Sigma a_i)$
6. $\Sigma(B_i a_i)$
7. $B_1a_1 + B_2a_2 + \ldots + B_8a_8$
8. $(\Sigma B_i) + (\Sigma a_i)$
9. $\Sigma(B_i + a_i)$
10. $(B_1 + a_1) + (B_2 + a_2) + \ldots + (B_8 + a_8)$