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ABSTRACT

This paper describes and reports research on a model of the determination of behavioral intention by belief structures, derived from a theory proposed by Don Dulany in 1968. The new model construes "belief structures," and defines message variables, in ways suggestive for communication research. Findings reported support several propositions suggested by the model, and are generally consistent with the model, though not strongly supportive of it. Suggestions are made for future research. (Author)

DERIVATION AND TEST OF A NEW MODEL OF MESSAGE-ATTITUDE-BEHAVIOR RELATIONS

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DERIVATION AND TEST OF A NEW MODEL OF MESSAGE*ATTITUDE*BEHAVIOR RELATIONS

In a recent review of the literature, Seibold (1974) finds various and inconsistent effects of messages on attitudes and behaviors. This lack of cumulative findings in the literature seems to me to indicate the need for a revised model of message-attitude-behavior relationships. One such model can be derived from the work of Don Dulany (1961, 1962, 1963, 1968) in verbal conditioning; it is the purpose of this paper to present, and report an experimental test of, that model.

A model designed to account for attitude-behavior inconsistencies has previously been derived from Dulany's work by the social psychologist Martin Fishbein (1967)--indeed, his model gave impetus and direction to the present derivation. Fishbein's model has been extensively tested and supported in the social psychological literature, and has received as well some attention in the communication literature (see Mortensen and Sereno, 1973, part I; Holdridge and Lashbrook, 1973; and Seibold, 1974, for references in the communication literature). This derivation of a new model from Dulany's work was underatken for two main reasons. First, Fishbein reinterpreted Dulany's theory in terms of psychological variables--enduring internal constructs. But Dulany originally hypothesized that the variables determining behavior could be cast in terms of their different "propositional forms," reflecting the different kinds of reasons for behaving, as stated in everyday language. Two implications of Dulany's theory in this regard are clear: (1) the number and kinds of variables which will account for behavior may be different for different kinds of behavior (and are thus not best regarded as enduring psychological variables); and (2) these relevant variables might be determinable by, e. g., content-analyzing a variety of naturally-occurring persuasive messages advocating the behavior or reasons people actually give for behaving. In short, Dulany's theory allows the derivation of a model whose variables are cast in Communication, rather than Psycological, terms. Second, a model derived from Dulany's theory also suggests message variables which may be more fruitful and certainly are less ambiguous than are those suggested by Fishbein's model. Seminal research using Fishbein's model has characterized messages only as "aimed at" one or another component of his model. Dulany's original approach has been incorporated into the present research, as explained below.

In the remainder of the paper I shall explain the model of message-attitude-behavior relationships which I derived from Dulany's theory, and describe the results of an experiment which allows a test of the theory.

Summary of Dulany's Theory

Dulany's theory was formulated as a new approach to the field of conditioning, especially verbal conditioning, which has been dominated by behavioristic paradigms. Behaviorists usually argue that learning occurs under the control of functional reinforcers--rewards or punishments--with or without subject awareness of whether he is being conditioned or of the principle governing the conditioning--i.e., the rule of behavior he is being taught.

Dulan's theory is rather revolutionary for that domain--he believes that "conditioned" verbal responses are actually under the conscious control of subjects, and are made for reasons which subjects can voluntarily report. He argues that theories taking account of subject awareness are advances over simple behavioristic theories for several reasons. First, such a theory can explain why certain verbal statements by experimenters are in fact reinforcing in certain situations and not in others, while other verbal statements are not reinforcers. Second, conditioning effects like speed of learning and overall increase in accuracy have a quite wide variance over subjects. In some experiments, nearly all of this variance can be explained by reported subject awareness of the rule being taught or of a "correlated" (functionally similar) rule. In at least one experiment, conditioning which did not induce subject awareness of a proper rule governing reinforcement could produce no significant increases in accuracy of response over chance (Dulany, 1961).

Dulany's theory, loosely stated, consists in two main assertions. The first assertion is simply that we can predict subjects' responses if we ask them how they intend to respond. The second assertion, more complex, goes back a step and deals with the prediction of subjects' intentions to respond. Here Dulany asserts that we can predict subject intentions by knowing how they interpret the reinforcement situation, i.e., what they understand to be going on when the experimenter reinforces one of their responses.

In particular, Dulany's "theory of propositional control" can be summarized in seven main principales:

1. Mental contents--subjectively received information, of which we are aware--are encoded as propositions.
2. The effect of information depends on the form of the proposition in which it is mentally encoded.
3. There exists a class of behaviors--conscious acts--which are entirely under the control of the subject, and thus are determined by information received by him.
4. Certain propositional forms are particularly relevant to the determination of behavior:
   a. RHd--Hypothesis of the Distribution of Reinforcement--which is of the form, "Response Class X is followed by reinforcement."
   b. BH--Behavioral Hypothesis--which is of the form, "Response Class X is what I am supposed to do."
   c. BI--Behavioral Intention--which is of the form, "Response Class X is what I am trying (or intend) to do."
   d. RHs--Hypothesis of the Significance of a Reinforcer--which is of the form. "Occurrence (nonoccurrence) of the consequence meant that I had just done what I was supposed to do (supposed not to do, or neither)."
   e. RSv--Subjective Value of the Reinforcer--which is of the form, "Occurrence (or nonoccurrence) of the consequence felt pleasant (unpleasant, or neutral)."
   f. "MC--Motivation to Comply--which is of the form, "whatever I am supposed to do (or not to do), I want to do (or want not to do, or neither)."

5. The determinative relations among these propositional forms are statable in the following equations:

$w_0(RHd \times RHs)=BH, \qquad w_1(RHd \times RSv)+w_2(BH \times MC)=BI.$

6. For conscious acts, BI determines behavior, provided that the actor is able to do what he intends to do. Such acts are said to be under propositional control--that is, they are under the control of, or directed by, certain propositions of which we are aware and about which we can report.
7. The research paradigm implied is experimental--subjects are asked to proform fairly simple acts, different reinforcement schedules are administered, and questions asked during the series of responses are used to get the six classes of propositional answers from subjects. These answers are cast into a regrssion format (the w's then are regression slopes), and are used to predict BI and behavior.

In ordinary language, to predict intention we must at least know:

a) whether the subject thinks a particular response will be reinforced;
b) whether the subject likes or values the reinforcement;
c) what the subject thinks the reinforcement means--for example, does the experimenter want him to do just those behaviors that are reinforced, or not? and
d) whether the subject cares what the experimenter wants.

In this summary I have perhaps over-stated Dulany's position, by stripping it of several nuances which made it more defensible in the field of verbal conditioning, and putting the whole thing rather baldly. For instance, Dulany would merely say in (1) above that a mental content "can be represented as a proposition." (1968, p. 342). But a reading of Dulany (1968) makes it clear that the interrelations and dynamics of the components of his model follow strictly the patterns of natural implications of those propositional forms (though not a formal logic of any apparent sort). If mental contents can be represented as propositions and follow the logic underlying those propositions, then we are at least somewhat justified in saying that they are encoded as propositions.

The implications of this theoretic stand, for those familiar with certain writings relevant to information processing and decision theory, are intriguing. Dulany seems to accept, tacitly, the view of Simon and others (Simon, 1957; March and Simon, 1958) that people are "imperfectly rational." A human being, in deciding to choose one act over another, cannot determine the probability and value of each possible consequence of each act, as would be required under strict classical decision theory. It seems consistent with Dulany's views to state that people summarize a whole range of beliefs about facts and anticipated consequences in a "propositional form," which they believe more or less strongly. It is in this summarizing process that rationality becomes imperfect. (I presume that the use of general propositional forms is a customary practice learned in social interaction. In learning to give general reasons for their actions, people begin to use general verbal formulas to reason about, as well as to rationalize, their actions.) For example, if I am deciding whether to attend a public lecture on family communication, I might anticipate a large number of possible consequences.

I might be able to solve communication problems others in my family have, I myself might be able to communicate better, I might be able to use the information in teaching, etc. All these consequences might "come to mind" when I decide to attend or not, but I would not weigh and assign a probability value to each one. Rather, I might sum up my feelings by believing, more or less strongly, that it would be rewarding to attend the lecture. By performing a decision theory analysis on broad statements of consequences like these, the researcher might be able to approximate what the experimental subject is doing inside his head--imperfectly, but rationally, weighing the consequences in making the decision. Something like this logic underlies Dulany's theory.

Experimental evidence adduced by Dulany (1961, 1962, 1963, 1968) indicates that he can successfully predict behavior from intention, and intention from the factors noted above.

Derivation of an Alternative Model

There are three changes in Dulany's model required to render it applicable to message-attitute-behavior study. One of these is along the lines suggested by Fishbein; the others depart from his practice. In every case I presume that these changes do not clash with the underlying logic of Dulany's position, as I believe some of the changes wrought by Fishbein do--but his changes were influenced by traditional attitude theory, while mine reflect the attempt to translate Dulany without being influenced by possibly inconsistent theoretical positions.

1. The term BH--the subject's hypothesis about what he is supposed to do--must be split because of our shift of focus from the conditioning laboratory to the external, social world. The subject no longer is oriented (we hope) to respond to what the experimenter is conditioning him to do; instead, he must adjust his activities to (a) different groups of significant others, and (b) the demands of his own moral code, if such demands are present. This means that the BH term of the model is transformed into several components, from "I am supposed to do X," to (a) "My family (or some other group of significant others) expects me to do X," a propositional form which we shall call a social normative belief, or NBS; and (b) "I (morally) should do X," a propositional form which we shall call a personal normative belief, or NBP. The relevance of personal normative beliefs or the expectations of any particular group of significant others is relative to act X, and there is one social normative belief for each relevant group of significant others.

2. Similarly, RHd--the hypothesis of the distribution of reinforcement, of the form, "if I do X, consequence Y will ensue," is transformed because, for a given social act, it may be intrinsically pleasurable or it may be done on account of its desired and rewarding consequences. Therefore, RHd becomes (a) a Belief about the Intrinsic Value of the act--BIV--of the propositional form "Doing X would be pleasant," and (b) a Belief about the Extrinsic Value of the act, or BEV, of the propositional form "Doing X would be rewarding."

3. Both for Ajzen and Fishbein (1971) and for Schwartz and Tessler (1973), the most troublesome term to operationalize has been MC--motivation

to comply. The main advance made here is to note that, like MC, RSv--the subjective value of the reinforcer--is a subjective measure of a 'motivator,' the reinforcer, although the reward is a direct one rather than due to meeting a given set of expectations. What is intended, in fact, is a measure of the comparative motivations to obey one propositional form rather than another. If this is true, we can measure MC for all propositional forms so as to induce Ss to rate their comparative importance in determining BI. Thus MC is transformed into a comparative variable, measured for each component of the model.

The resulting new model is:

$$B\sim BI=b_1\ (MCxBEV) + b_2\ (MC_2xBIV) + b_3\ (MC_3xNBP) + b_4\ (\Sigma_i MC_{4i}xNBS_i)$$

In this model, BI and MC are defined as above, while: B=behavior and b_i= the regression slope for the ith component of the model. Note that there may be more than one social normative belief term, if there are several groups of significant others relevant to a behavior.

If our theory is correct, several things should be true of this model. First, the independent variables--the five factors--should account for a good deal of the variance in Behavioral Intention. Second, each factor in the model should be important under some conditions--otherwise, we could just drop it from the model. (Note that if the theory suggests that each factor should be important, and one isn't, that finding casts doubt on the validity of the theory.) Third, if the factors are really the immediate determinative causes of Behavioral Intention, no other variable should be able to change BI independently--if BI is changed, that change should reflect a change in one or more of the factors.

Relation of the Model to Communication

At this point a discussion of the implications of this model for communication is in order. The discussion is clearer if the implications of this model are contrasted with the corresponding implications of Fishbein's model.

In a study which used messages to alter the intentions of subjects, Ajzen (1971) used messages in two ways. First, he used messages (not explicitly recognized as such in his study) to establish the "motivational orientation" of the subjects--essentially by telling them either that their own self-interests or their mutual interests with others should control their behavior. These messages affected the relative causal importance (beta weights) of the different components of the model, though effects on MC are not reported. Second, Ajzen used messages to affect the specific attitudes and beliefs held by subjects--that is, to alter the value, rather than the importance, of the causal variables. In both cases, message variables were dichotomous--messages were written to stress one component or another, one behavior or another. In addition, these messages are provided as part of the instructions in playing a Prisoners' Dilemma Game--they provided the only information subjects had about how to play the game.

In contrast, the model presented here provides a rationale for generalizing beyond the special situation of Ajzen's study, and provides a more sophisticated message variable--amount of information.

..ere, messages may similarly be designed to affect the value and importance of one or another component, but a more powerful and accurate message variable, suggested by Dulany's logic, is the amount of information in each message encoded by subjects in each relevant form mentioned in the model. Thus, a message aimed at affecting BEV may still have information which is encoded by the subject so as to affect NBP or NBS. This variable can be operationalized either 'objectively,' according to the experimenter's view of the message, or subjectively, according to estimates by naive subjects.

In addition, it is completely consistent with the logic of this theory to expect the effect of information of a certain propositional form in the message to be inversely dependent on the amount of that type of information already held by the subject. Thus,

--if S already has information that others expect him to do X, telling him that others expect him to do X may have little impact on his intentions.

--if S already has information that others don't expect him to do X, telling him that others expect him to do X may have reduced impact due to his opposed belief.

This confounding effect of outside information available to S has been conceptualized by Woelfel (1973) as the inertial mass of a concept. He reasons that the more information we have about a concept or relationship, the harder it is to change our minds about that concept or relationship. Thus, we will expect that the amount of change in a belief produced by a message will be (a) directly related to the amount of information in the message which has the same propositional form as the attitude and (b) inversely related to the amount of information the subject already has relative to that propositional form.

The most important communication variable to be used in this study is the amount of information in the message bearing on each propositional form in the model. To operationalize this variable, I simply asked an independent sample of subjects to rate the messages (one message per subject) as to the percentage of information in the message stating or supporting each propositional form. This procedure, to be completely valid, would require the assumption that subjects can objectively classify and measure amounts of information in a message. Such an assumption may be false-indeed, much research has shown that a subject's prepotent mental set is as important in determining a message's effect as the message itself. I make the weaker assumption that (a) various "mental sets" are fairly normally distributed in my population and samples, so that (b) the means of various subjective estimates will be accurate in determining at least ordinally the amount of information in the message. The value of this operational definition can be checked by examining the covariation in semantic differential ratings and rank orders, of subject estimates.

Hypotheses

Hypotheses related to this model can be presented in two areas: relative to the model itself as a predictor of behavioral intention, and to the

effects of messages on variables in the model.

As Schwartz and Tessler point out, if a model of the form proposed is to be accepted, it should contain all the significant immediate determinants of BI, and only such immediate determinants--i.e., there should be no irrelevant or ineffectual components. In particular, communicative influences should change behavioral intention only by changing some other variable(s) in the model.

These requirements are reflected in the following hypotheses:

H 1. The relationship between BIV and BI is necessary (for at least one treatment condition), contingent (on MC), stochastic, irreversible, and coextensive.

H 2. The relationship between BEV and BI is necessary (in at least one condition), contingent (on MC), stochastic, irreversible, and coextensive.

H 3. The relationship between NBP and BI is necessary (in at least one condition), contingent (on MC), stochastic, irreversible, and coextensive.

H 4. The relationship between NBS and BI is necessary (for at least one condition, at least one group of significant others), contingent (on MC), irreversible, stochastic, and coextensive.

H 5. The relationship between a linear combination of the components MC x BEV, MC x BIV, MC x NBP, and MC x NBS, and BI is necessary, sufficient, deterministic, irreversible, and coextensive.

Hypotheses also can be advanced in the area of message variable influence. The theory does not demand any particular quantitative relationship between message information (hereafter termed, after Woelfel, message mass, or MM), information previously held (or previous mass-PM), and components of the model. The simplest available relationship is Woelfel's prediction of a linear relationship between belief change and the ratio of new information to old, $\frac{MM}{PM}$.

H 6. The relationship between MM/PM for any component (including MC as a multiplier) and change in that component, is necessary, sufficient deterministic, irreversible, and sequential.

Our last hypothesis is that, for a message to affect BI, its mass ratio, MM/PM, must affect the components of the model.

H 7. The relationship between message condition and change in BI is substitutable, contingent (on the effect of MM/PM upon the model's determining variables, including MC), stochastic, irreversible, and sequential.

Note that in each of these last two hypotheses we contend that MM/PM may affect MC, by bringing to the subject's attention the fact that a certain propositional form is relevant and that he should comply with it. A diagrammatic model of these hypotheses is as follows (Figure 1):

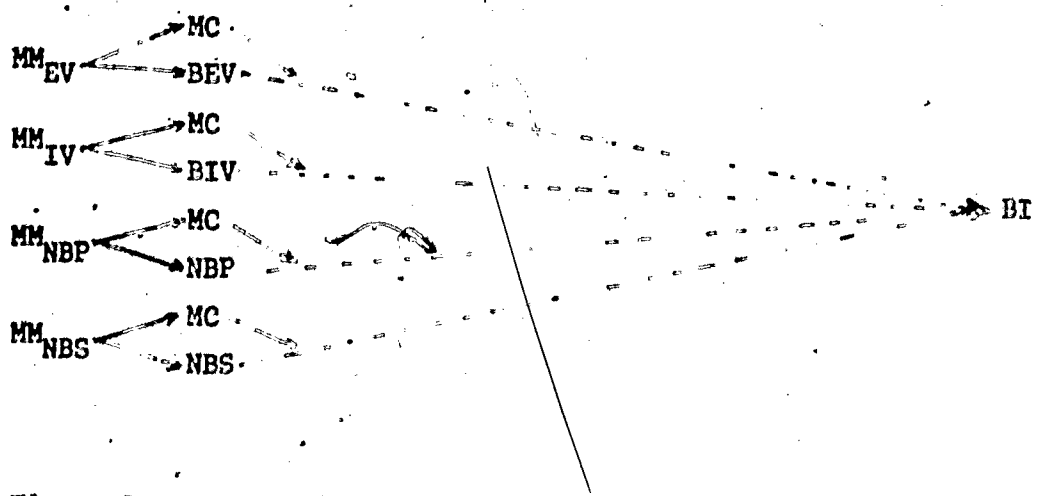

Figure 1.--Hypothesized relations among major variables in model.

In this diagram ——→ is a causal influence, ···→ is a contingent causal influence, and the solid arrow in ·-·→ is a contingency-producing influence: in each case, MC makes the relationship a contingent one.

Design

The study was constructed as a pretest-posttest control group design with three message treatment groups and a control group. Subjects were drawn from five undergraduate communication classes taught during Spring term, 1974.

Between April 22 and May 3, 1974, pretests were administered in the five classes. The pretest form included an announcement that a lecture on family communication would be given by Professor Donald Cushman on May 22 and 23; after this announcement subjects were asked to respond to a series of questions about this lecture and their thoughts about attending it. Two weeks later, between May 15 and 21, a second set of questionnaires, consisting of a message treatment and questions including those used in the pretest, was distributed in the five classes.

There were three message conditions besides the control condition (in which no message beyond the neutral announcement was used.) Messages were constructed with essentially the same informational content but designed to support three different reasons for attending the lecture.

The messages argued either that (a) consequences of going to the lecture would be pleasant and rewarding, or (b) each student had a moral obligation to attend the lecture, or (c) each student's family would expect him to attend the lecture. Subjects were randomly assigned to treatment or control conditions by randomly distributed treatment-instrument packages.

The lectures were indeed held on May 22 and 23, and a record was kept of which students attended the lectures.

194 students completed the first questionnaire, and 178 completed the second; in all, 103 subjects usably responded to both the pretest and the posttest; these subjects were fairly evenly distributed among all four conditions. (Of these subjects, 16 actually attended the lecture.)

The Questionnaire

A cover sheet provided an announcement of the place, time, and subject matter of Professor Cushman's lecture, and indicated that the questionnaire sought information about student reactions to the prospective lecture. The questionnaire itself was 9 pages long for time 1, with a one-page message and one more page of questions for time 2. The items are discussed below in the approximate order of their appearance on the questionnaire.

Behavioral Intention.

Subjects indicated their answers to the question, "Professor Cushman of the MSU Department of Communication intends to give a public lecture on the topic "Family Communication." will you attend that lecture?" Answers were marked on a seven-point scale ranging from "Definitely Not" to "Definitely Yes."

Belief about Extrinsic Value.

Subjects responded to the question:
Attending a lecture by Professor Cushman of the MSU Department of Communication on the topic "Family Communication" would be . . .

Very Quite Slightly Neutral Slightly Quite Very

Punishing:____:____:_____:____:_____:____:____:Rewarding

Belief about Intrinsic Value.

Subjects response to the same question, on a seven-point scale ranging from "unpleasant" to "pleasant."

In order to duplicate Fishbein's procedures, subjects also responded to this question on a scale ranging from "good" to "bad." They were also asked of their certainty on these and other answers.

Personal Normative Beliefs.

The following question tapped students' beliefs about their normative obligations to attend:

The next question concerns whether any moral obligations which you personally feel toward yourself or others will affect your decision whether to attend a lecture on family communication.

Do you think that attending the lecture is something you ought to do or something you should not do?

Obligation Not to Attend			No Obligation Either Way			Strong Obligation To Attend
:	:	:	:	:	:	:
1	2	3	4	5	6	7

Social Normative Beliefs.

Three questions tapped social normative beliefs for three possibly influential reference groups: friends, professors, and family. Subjects were asked, "Regardless of your own personal views, would each of the following kinds of people feel you had a moral obligation to attend such a lecture? On the average, would each group think that this is something you ought to do, or something you should not do?" Responses were registered on scales like that used for personal normative beliefs.

Motivation to Comply (Rankings.)

Students were asked to rank items corresponding to the questions cited above-- what would be rewarding to me," "what I feel I should do," "what my best friends would say I should do," etc.--"according to their importance to you in deciding whether to attend a lecture on Family Communication."

Motivation to Comply (Ratings).

Subjects were then asked to rate each of the six items they just ranked on seven point scales ranging from "Very Important" to "Very Unimportant."

Exposure.

Subjects were asked how much they knew (including information from all possible sources) about the following objects: family communication, public lectures, MSU Department of Communication, and Professor Cushman. For example:

	Know Nothing At All		Do Not Know Very Much		Know Fairly Well		Know Extremely Well
FAMILY COMMUNICATION	:	:	:	:	:	:	:
	1	2	3	4	5	6	7

In addition, subjects were asked whether they had attended any prior lecture specifically about family communication, and about whether they had taken courses "in which family communication was a major topic of discussion."

A number of additional variables, including subject attitudes toward objects like "Family Communication," and "MSU Department of Communication," and demographic information, were also measured. Also, on the Time 2 questionnaire, subjects indicated whether they knew of any reason why they could not attend the lecture.

Message Variables

As was mentioned before, the three treatment messages were designed to suggest either that (1) attending the lecture would be rewarding, or (2) subjects had a moral obligation to attend, or (3) subjects' families would expect them to attend. But what we wanted the messages to express and argue for, may not come across in the actual messages, as they are interpreted by naive readers. I therefore sought from naive readers an estimate of the relative impact of the three messages.

Students in undergraduate communication classes were each presented with one message and a questionnaire. Before reading the message, they were informed of my research purpose, the subject of the message, and six possible reasons for attendance:

--because attendance would be pleasant.
--because attendance would be rewarding.
--because they had a duty to attend.
--because their friends would expect them to attend.
--because their best professors would expect them to attend.
--because their families would expect them to attend.

The students read the messages, then were asked to rank the six reasons on the basis of their relative importance in each message, and to rate the messages on the amount of information relevant to each reason they contained, on a seven-point scale from "all" to "none" of the information. Their responses were averaged for each message to provide an estimate of the amount of information in each message supporting each reason. (In Table IV Below, estimates of message mass derived by this technique are reported.)

Analysis and Results:

The First Four Hypotheses

The first four hypotheses, as stated in Chapter I, are as follows:

H 1. The relationship between BEV and BI is necessary (for at least one treatment condition), contingent (on MC), stochastic, irreversible, and coextensive.

H 2. The relationship between BIV and BI is necessary (in at least one condition), contingent (on MC), stochastic, irreversible, and coextensive.

H 3. The relationship between NBP and BI is necessary (in at least one condition), contingent (on MC), irreversible, stochastic, and coextensive.

H 4. The relationship between NBS and BI is necessary (in at least one condition), contingent (on MC), irreversible, stochastic, and coextensive.

Generally, the most important implication of each of these hypotheses is that each component (variable, multiplied by MC) of the model is an important predictor of behavioral intention in at least one treatment condition, at least one point in time. This implication, and the hypotheses themselves, can be tested by examining the results of regression analyses performed on the data, as the model itself strongly suggests and as Dulany and Fishbein have done in the past. Using this approach, the hypotheses would be confirmed if, for every component, in at least one treatment condition its regression coefficient were significantly different from zero. That would mean that, inside the treatment group, that component of the model is important and useful. The full results of the analysis are given in Table 1. (Here, and throughout, $\alpha<.05$ is set for significance.)

Regression equations were estimated for the model as a predictor of Behavioral Intention at time 1 and 2. Within each time-period, overall regressions for the whole sample, as well as regressions for each treatment or control group, were calculated. Three different forms of the equation were calculated in each case-one using Motivation to Comply as measured by semantic differential ratings, one leaving out the MC factor altogether (to provide information about Fishbein's assertion that the factor can be dropped from the theory without loss), and one using MC as measured by ranking--the ranking of propositional forms that was requested of subjects before they filled out the semantic differentials. (The reason for computing alternate forms will become more apparent in the sequel.)

As can be determined from Table I, the components corresponding to Belief in the Extrinsic Value of the act, Belief in the Intrinsic Value of the act, and Social Normative Beliefs are all, at least sometimes, important predictors of Behavioral Intention. (BEV is significant in 6 cases, BIV in 6, and NBS in 4.) (The probability of each of these patterns of findings is a good deal less than .05.) In no cell does Personal Normative Belief as a component have a beta weight which differs significantly from 0. Thus, Hypotheses 1, 2, and 4 may derive support from this data, while Hypothesis 3 is not supported by the data.

Other results of the analysis, though, seem to lend support to the inclusion of NBP in the model. First, the component corresponding to NBP does in several instances have a fairly large beta weight, though it is not statistically significant (e.g., .2117 or .2389 in the NBP group, time 1, .3201 in the control group, time 1). Second, this hypothesis, like H1, H2, and H4, requires the assumption that, if NBP could be triggered as a deter-

minant of BI, it was triggered--that is, that the NBP group manipulation was successful. There is some reason to doubt this, as shall become more apparent in our discussion of the message variables below. Third, and most important, the NBP component is very important in predicting change in behavioral intention, as becomes apparent when we examine Table 2. The third component of the model is in at least one case (MC form, Attitudinal group), the most important and the only significantly predictor in the model. It may therefore be unwise to drop this component from the model: it is surely distinguishable from the other components of the model and from behavioral intention, and sometimes makes significant contributions to explanation; at least further examination of the issue is indicated.

Hypothesis 5: The relationship between a linear combination of the components MCxBEV, MCxBIV, MCxNBP, MCxNBS, and BI is necessary, sufficient, deterministic, irreversible, and coextensive.

The fifth hypothesis concerns the adequacy of the model as a whole. Are the components powerful and immediate predictors of Behavioral Intention? Two ways of testing this hypothesis were suggested in Chapter I. First, we can examine the multiple correlation coefficients to see whether the model, in various forms, accounts for a substantial proportion of the variance in BI. This will give us some index of the predictive power of the model. Second, we can see whether the model mediates the affects of other variables that are strongly related to BI--whether, for example, a variable that can cause change in BI must "first" cause change in one or more of the model's components.

With respect to the first test, the results are mixed. (See Table I.) In the overall sample, and in the Attitudinal and NBP message treatment groups, the model does explain a significant, and sometimes very substantial, proportion of the variance. In the NBS and Control conditions, though, the model fails to explain a significant proportion of the variance.

It is not extremely difficult to find a possible explanation of these findings. Given a very small sample size in some of the groups (due to mistakes in questionnaire completion), we might expect great instability in the correlations, due to sampling error. This would account for the extremely high R^2 found in the two treatment groups (Attitudinal and NBP), too. Of course, this means that the beta weights found in the groups are also unstable. We might also note that our coefficients are in no case as large as those found in laboratory experiments. On the whole, the hypothesis seems to have been supported, but less strongly than we would have desired.

To perform the second test of the hypothesis, I examined the relations of certain variables, external to the model, with behavioral intention. The statistical hypothesis implied by H5 is that the partial correlation between any outside variable and BI, when controlled for the values of components of the model, is not significantly different from 0. Results of tests of this hypotheses are presented in Table 3. The "raw" (uncontrolled) correlations of all variables presented are different, significantly, from 0. In 26 cases (17 variables, 9 at both time 1 and time 2), controlling for the components of the model reduced the correlation substantially, so that it was

not significantly different from 0. These cases fulfill the hypothesis. But, in five cases, controlling for the components of the model did not substantially enough reduce the original correlation to make the partial correlation not significantly different from 0; indeed, in one case partialling increased an already significant correlation (Reasons, time 2), and in another case partialling doubled the value of an insignificant correlation, making it significantly different from 0 (Attitude toward family comm., #2, time 2). Thus, although the model mediates the effects of a wide number of variables, five cases prove that it is not a sufficient immediate determinor of BI.

The two "Reasons" variables deserve some comment here. They are two-valued variables. The first indicates whether or not the subject said he had a reason why he could not attend the lecture. The second indicates whether or not he had a schedule conflict--whether he was too busy or had another meeting at that time, or had to be out of town--and so could not attend the lecture. Before partialling, their correlations with BI are -.29 and -.35, respectively; after partialling, the correlations are each approximately -.35. The indication is that either of these variables, insofar as they indicate schedule conflicts, explains a fairly large and independent portion of the variance in BI. What they explain, the components in my model cannot explain--thus, schedule conflicts, etc., set an upper limit in the explanatory power of the model. Note also that this variable is usually automatically controlled in a laboratory, usually by the subject's sheer presence to participate in the experiment.

In Table 2, a more inclusive test of the necessity and sufficiency of the model is undertaken. There, I attempt to predict change in BI on the basis of change in the components. If H5 is completely correct, change in BI should take place only because of change in the components of the model, and the strong relation present at times 1 and 2 should also be present in the 'change equation.' Once again, support for the model is uneven; in particular, in the NBP message group, strong relationships present at time 1 and time 2 disappear when we look at the change relationships. (In the regression equations reported in Table 2, I have added one more variable to the equations--Behavioral Intention at time 1. This was done to remove the often-present spurious effect due to relation between change in the model's components and the initial point at which we began to study change--time 1. This procedure thus removes bias in the estimation of the regression coefficients (Werts and Linn, 1970; Cf. also Harris, 1962). On the whole, then, it would be unwise to conclude on this evidence that the model is an immediate, necessary, and sufficient determinor of behavioral intentions. The idea that a relationship exists is supported; the proposition that it mediates the effects of all other variables is simply untrue.

The Communication Hypotheses

The hypotheses read as follows:

H 6. The relationship between MM/PM for any component, including MC as a multiplier, and change in that component, is necessary, sufficient, deterministic, irreversible, and coextensive.

H. 6. The relationship between message condition and change in BI is contingent (on the effect of MM/PM upon the model's determining variables, including MC), stochastic, irreversible, and sequential.

These hypotheses cannot be tested directly, since no prior mass measurements for each component of the model were made. However, comparatively indirect tests can be made, using four measures of exposure to relevant attitudinal objects as indirect indicators of prior mass.

Message Mass (MM), for each message treatment condition, was measured by asking students in 3 Communication 100 classes to determine, for each message, how much of the information in the message supported each component proposition in the model. Thus, there are four variables involved: mass of the message relative to each propositional form; and each of these variables takes on four values, one for each treatment group, plus a value of 0 for the control group. Two different sets of questions, alternative measures of message mass, yielded values of message mass in the three messages that correlated. .98+ (Spearman rank-order correlation for the values for all three messages, all six propositions dealt with (including expectations of friends, professors, and family under social normative beliefs.) This is an indication that the measurement of "mass" in various messages relative to various propositional forms is at least ordinally highly reliable. (See Table 4)

Prior Mass (PM) measured at time 1 in four different ways, for purposes of these tests, as exposure to: family communication, the Communication Department, public lectures, and Professor Cushman. Message Mass relative to each propositional forms was divided by each of these exposure items to yield four indices of MM/PM for each propositional form--a total of 16 MM/PM variables. These are the message variables used to test H6.

The findings in Table V seem to confirm H5, at least for the second and fourth components of the model. There is evidence of a relation between the mass ratio, relative to those components and change in those components. A closer examination of the data, however, revealed that this relationship obtained between mass ratios relative to all components, and change in each of these two components. This can be seen by comparing pairs of columns in Table V; the second column gives the average correlation between component change and mass ratio, no matter with respect to what component mass was measured. In short, the finding is spurious--it exists because of a sharp contrast between the control group and the other groups (between no-message and message conditions), for change in components 2 and 4. When the control group is removed, findings are so mixed, for all components, as to be inconclusive.

Hypothesis 7 can be examined by looking at Table 6. There are no major differences between group means on Behavioral Intention, so the hypothesis cannot be tested as stated. On the other hand, if we assume that the messages were not sufficiently different to produce significant differences in intention, then the data is consistent with the hypothesis. Does this finding cast doubt on the results of H6, since mass ratio is sometimes significantly related to component change, which is in turn related to change in BI? No; the correlations involved are fairly small, so that, unless there were an independent effect of MM on BI, no raw effect could be expected. I tested for an independent effect, and found none that was substantial.

Additional Comments

Two additional comments, based on the results of the analysis, seem worthy of mention here. First, it might be instructive to compare, in Tables 1 and 3, the results when Motivation to Comply is measured in different ways, or not included in the model at all. No clear pattern of superiority or inferiority emerges for a model that includes MC, or that measures it one way rather than another. If there is any noticable trend, it is that social expectations (NBS) have a greater role in explaining BI when MC is included in the model and is measured by rank-order. Moreover, it is slightly more often that the model, and its components, attain significance when MC, measured by ranking, is included in the equation.

However, the intent of the MC operationalization was to have subjects recognize the comparative differences between the importances of components when they marked the semantic differentials, rating MC. The experimental results seem to me to indicate that this purpose was not accomplished in the questionnaire instructions, and thus that MC as a variable deserves more study, with an eye to clearer and more valid measurement. In particular, when we are studying, or designing a message to influence, the perceived social expectations on a subject, we ought to take the motivation to comply with these expectations into account.

The second point I would make relates to the message manipulation used in the experiment. The results, and the measures of message mass, show clearly that the messages were not sufficiently different in content and aim to distinguish among the experimental groups--in every case, the mass of the message was taken by subjects to be focussed on the proposition that attending the lecture would be rewarding--BEV. Given this lack of difference within the manipulation, it may not be surprising that treatment groups displayed no systematic differences in their responses to the messages. Clearly, a repication is indicated, using more powerful and more distinct messages. It is possible that the measure of message mass introduced above will provide a means, unavailable up to now, of insuring the "validity" of a manipulation by pretesting. Also, a message which more clearly focuses on NBP than those actually used, will provide a fairer test of Hypothesis 3.

CONCLUSIONS

This paper has included the description of a 'new' model of message-attitude-behavior relationships, and a test of that model. The model is new in the sense that it is rederived from Dulany's original theory, using, I believe, sounder principles of theory-building than Fishbein has used previously.

The first five hypotheses dealt with the model per se as a predictor of Behavioral Intention. The statistical tests showed that subject beliefs about the extrinsic reward he might derive, the intrinsic pleasure he might feel, and the expectations of others were all influential in determining subject intentions. (That is, H1, H2 and H4 were confirmed.) While the model as a whole showed a fairly high correlation with behavioral intention, it proved not to be as substantial a predictor as expected, nor to mediate the influence of all external variables. Thus, H1, H2, and H4 are accepted, H3 and H5 rejected with partially extenuating conditions. A qualification must be placed on these findings, though. The pattern of findings is uneven and unpredictable; while they differ from chance, they do so in no clearly recognizable direction. The problem here may be caused by low sample size, sampling error, weak manipulations, or all three. I cannot find, as Fishbein did in several studies, a straight--forward explanation for the fluctuations in beta weights. (The fluctuation is duplicated in the unstandardized regression coefficients.)

Another perspective on these findings comes when we compare them to selected findings of Dulany, Fishbein (et. al.), and Schwartz and Tessler. In his experimental study of verbal conditioning and propositional control, which was probably most influential on the development of Fishbein's and my models, Dulany (1968) found that his components accounted for 77% of the variance in BI (p. 237). In their review of several studies using Fishbein's model, Ajzen and Fishbein (1973) find many multiple correlations (R's) in the range .80-.95-two exceptionally low R's have values .385 and .594--the second of which exceeds the values found for all regressions run on the total groups (R ranged from .49+ to .58 for the overall group) and the average R was .808. These studies ranged from tightly specified experiments to very broad-ranging surveys. Schwartz and Tessler (1973) found a multiple correlation of about .50 in their study about organ donation. On the whole, the present study does not duplicate these various stronger findings.

The communication hypotheses--that message mass, relative to prior mass, would affect the model components and, through them, intentions, were not supported but were consistent with the results of the study. The manipulations, as measured by message mass relative to various components, were not easily distinguishable, and may thus have failed to produce the variance needed to confirm the hypothesis. At any rate, the findings which seemed to confirm H6 were seen to be produced instead by the strength of the message-no message contrast-a spurious effect. H7 is consistent with the data; since the contrast among message treatments was not clear, no differences among the groups were observable.

Among the contributions of this study to future research are:

(A) the model itself. The underlying idea that the imperfectly rational process of deciding to act can be represented in terms of ordinary-language "propositional forms," and that such forms can also be used to characterize messages about actions, has not received a decisive test here (for reasons mentioned above and below.) I find it still promising and suggestive.

(B) in particular, the operational definition of message mass suggested by the model. This seems reliable, meaningful to naive judges, and potentially powerful.

(C) the discovery of a new propositional form, for people interested in pursuing this line of research. It is, phrased as by Dulany, "schedule conflicts prevent me from doing X." In any but a laboratory experiment, this form is likely to be important. It may also prove useful to speculate on the anomalies in mental information processing suggested by this form.

Among the problems which should be corrected in future studies are:

(A) the lack of multiple indicators for many model variables. This problem foreclosed many useful analytical techniques.

(B) low sample sized in treatment cells.

(C) weak message manipulations. This problem is amenable to correction using the message mass measure herein developed.

(D) non-independent component propositional forms. The component propositions and operational definitions are practically identical to questions used by Fishbein in his research, mainly because I drew the inspiration for this model from an examination of Fishbein's writings. In retrospect, this is regrettable; the logic underlying my model, applied consistently, leads to the rejections of both questions and original propositional forms, for two reasons. First, the questions are not necessarily conceptually distinct--consistently very high correlations between the BEV and BIV components probably indicate that subjects find it hard to separate what is rewarding (especially as opposed to punishing) from what is pleasant. Second, the propositional forms involved seem to exist on different levels of generality, so that one may imply another: would not the fact that X would be rewarding lead others to expect (as a subject might see it) that the subject would do X? A preferred procedure for generating propositional forms would be to intensively interview several subjects, to find out what reasons might justify X, and to find out the relations among those reasons. More valid propositional forms could then be generated and measured more easily.

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ABBREVIATIONS FOR TABLES

*=p<.05; **=p<.01; ***=p<.001

BEV stands for findings related to the Belief in Extrinsic Value component of the model (rewarding-punishing.)

BIV stands for findings related to the Belief in Intrinsic Value component (pleasant-unpleasant).

NBP stands for findings relevant to the Personal Normative Belief component.

NBS stands for findings relevant to the Social Normative Belief component.

MC, MCR, AND (NoMC) stand for different forms of the equation model on a 1-4. MCR stands for the equation, caluclated using Motivation to Comply with each component, measured by rank-orders. MC stands for the equation with the MC factor measured by semantic differential. (NoMC) stands for the model, excluding the MC multiplier.

In Table IV, column 1 was determined by averaging judge rank-orderings of the amount of information relevant to each model component, in each message. Column 2 is equivalent to 6 minus the number in Column 1. Column 3 was calculated by averaging judges' semantic differential ratings of message mass for each component.

TABLE IA--Results of Multiple Regression Analysis
Total Sample--Overall Results

Form	Component	Time I R^2	Time I Beta Weight	Time I Additional Variance Explained	Time 2 R^2	Time 2 Beta Weight	Time 2 Additional Variance Explained
MCR		.3304***			.3406***		
	BEV		.3558***	.1645		.3525***	.2297
	BIV		.2349**	.0479		.1987	.02233
	NBP		.1457	.0300		-.0148	.00012
	NBS		.2740***	.0881		.2555***	.0885
MC		.2498***			.3302***		
	BEV		.2554*	.1735		.2839*	.2574
	BIV		.2257*	.0338		.2665*	.0343
	NBP		.0164	.0181		-.0472	.00003
	NBS		.1563	.0243		.1691	.0385
(NO MC)		.3346***			.3294***		
	BEV		.3048**	.2415		.3690**	.2962
	BIV		.1667	.0159		.1049	.0047
	NBP		.1529	.0551		.0502	.00197
	NBS		.1758	.0222		.1470	.0265

*=p .05; **=p .01; ***=p .001; MCR means Motivation to Comply measured by rankings; MC means Motivation to Comply measured by semantic differential; No MC means model components were not multiplied by MC.

TABLE IB--Results of Multiple Regression Analysis
Group Receiving Attitudinal Message

Form Component	R^2	Beta Weight	Additional Variance Explained	R^2	Beta Weight	Additional Variance Explained
MCR	.5171**			.3846*		
BEV		.3482	.2273		.6268*	.3763
BIV		.5160**	.2373		.00295	.00000
NBP		.02649	.00056		-.01477	.00012
NBS		.07910	.0520		.0898	.00458
MC	.5107**			.3151		
BEV		.2961	.2463		.4285	.2888
BIV		.5151*	.19273		.2641	.0201
NBP		.06089	.0712		-.0499	.0017
NBS		.0267	.0005		-.12688	.0045
(NO MC)	.6066***			.3641*		
BEV		.4384*	.37496		.7735*	.3452
BIV		.4379*	.37496		-.2350	.0186
NBP		-.0072	.00003		-.0126	.00000
NBS		.2030	.0794		-.3375	.00026

TABLE IC--Results of Multiple Regression Analysis
Group Receiving Personal Normative Belief Message

Form	Component	R^2	Beta Weight	Additional Variance Explained	R^2	Beta Weight	Additional Variance Explained
		Time I			Time 2		
MCR		.5408***			.48907**		
	BEV		.2578	.1915		.3857	.2498
	BIV		.4513	.1378		.2174	.02298
	NBP		.2389	.0897		-.03596	.00095
	NBS		.3090*	.1217		.4235*	.2153
MC		.46939**			.5899***		
	BEV		.0072	.2167		.3744*	.4328
	BIV		.6223**	.2075		.3612	.0915
	NBP		.2112	.0134		-.2212	.0119
	NBS		-.0448	.0324		.3374	.0538
(NO MC)		.5703***			.4713**		
	BEV		.3063	.46398		.3553	.4110
	BIV		.3953	.0622		.2756	.0286
	NBP		.01836	.01521		.00357	.0257
	NBS		.2195	.0289		.1478	.00596

*=p .05; **=p .01; ***=p .001

TABLE ID--Results of Multiple Regression Analysis
Group Receiving Social Normative Belief Message

Form	Component	R^2	Beta Weight	Additional Variance Explained	R^2	Beta Weight	Additional Variance Explained
		Time I			Time II		
MCR		.2818			.3359		
	BEV		.2885	.1298		.3952	.2847
	BIV		.2643	.0544		.1276	.0078
	NBP		-.0927	.00000		.0173	.0171
	NBS		.2537	.0976		.1667	.0263
MC		.2139			.2899		
	BEV		.2557	.1471		.3113	.2328
	BIV		.2362	.0534		.1219	.00745
	NBP		.0225	.01095		.03798	.0198
	NBS		.05796	.0024		.1936	.0298
(NO MC)		.3128			.3333		
	BEV		.3722	.2720		.3948	.2788
	BIV		.1031	.0083		-.0267	.0003
	NBP		-.04385	.00014		.1679	.0432
	NBS		.2151	.0324		.1471	.0110

TABLE IE--Results of Multiple Regression Analysis

Control Group

Form	Component	R^2	Beta Weight	Additional Variance Explained	R^2	Beta Weight	Additional Variance Explained
		Time I			Time II		
MCR		.2595			.1755		
	BEV		.5414*	.2127		.0052	.0173
	BIV		-.08299	.0035		.3425	.0851
	NBP		.1776	.0239		.0531	.0187
	NBS		.1507	.0194		.2223	.0738
MC		.2295			.2083		
	BEV		.5515*	.1374		-.0149	.0329
	BIV		-.4792	.0515		.3134	.0619
	NBP		.3201	.0324		-.1593	.0118
	NBS		-.0525	.0082		.3281	.1017
(NO MC)		.2040			.1911		
	BEV		.2840	.0723		.0156	.0615
	BIV		-.1109	.0090		.2382	.0345
	NBP		.3965	.1161		.0115	.0002
	NBS		.0950	.0069		.2668	.0913

*=p .05
**=p .01
***=p .001

MCR means Motivation to Comply measured by rankings
MC means Motivation to Comply measured by Semantic Differentials

TABLE IIA

Regression Equations for Change in Behavioral Intention

Group	Form (MC)	Variable (Component)	R^2	Beta Weight	Additional Variance Explained
Overall	MCR		.3393***		
		BI, Time I		-.4505***	.1674
		BEV Change		.3271***	.0668
		BIV Change		-.0191	.00032
		NBP Change		.2297**	.0461
		NBS Change		.2527**	.0587
	MC		.2905***		
		BI, Time I		-.4236***	.1674
		BEV Change		.1873	.0261
		BIV Change		.0459	.0431
		NBP Change		.0604	.00497
		NBS Change		.1958*	.0488
	(No MC)		.2720***		
		BI, Time I		-.4321***	.1674
		BEV Change		.2175*	.05436
		BIV Change		.0348	.0010
		NBP Change		.0917	.0082
		NBS Change		.1262	.04095
Attitudinal Message Group	MCR		.5420**		
		BI, Time I		-.6708***	.4031
		BEV Change		.2169	.0346
		BIV Change		-.2412	.0585
		NBP Change		.1776	.0361
		NBS Change		.1052	.0094
	MC		.5762**		
		BI, Time I		-.7081***	.4031
		BEV Change		.1332	.0129
		BIV Change		-.3082	.0774
		NBP Change		.3582*	.0799
		NBS Change		.06496	.00215
	(No MC)		.5935***		
		BI, Time I		-.67918***	.4081
		BEV Change		.3223	.1487
		BIV Change		-.2099	.0329
		NBP Change		.0838	.0048
		NBS Change		-.0075	.0037
Personal Normative Belief Message Group	MCR		.2176		
		BI, Time I		-.3375	.0453
		BEV Change		.3072	.0881
		BIV Change		.0382	.0029
		NBP Change		.2147	.0452
		NBS Change		.2164	.0421

TABLE IIB

Regression Equations for Change in Behavioral Intention

Group	Form (MC)	Variable (Component)	R^2	Beta Weight	Additional Variance Explained
NBP Message Group (cont'd.)	MC		.2389		
		BI, Time I		-.3207	.0453
		BEV Change		.1822	.0296
		BIV Change		.1433	.0669
		NBP Change		.0862	.0378
		NBS Change		.2846	.0592
	(No MC)		.1797		
		BI, Time I		-.2709	.0453
		BEV Change		.1470	.02498
		BIV Change		.1563	.0338
		NBP Change		.1434	.0435
		NBS Change		.1932	.02998
NBS Message Group	MCR		.4539*		
		BI, Time I		-.2830	.0857
		BEV Change		.4553*	.1765
		BIV Change		.2395	.1740
		NBP Change		.1980	.01545
		NBS Change		.0872	.0021
	MC		.4895*		
		BI, Time I		-.2258	.0857
		BEV Change		.2942	.2652
		BIV Change		.3663	.0983
		NBP Change		.0982	.0232
		NBS Change		.1474	.0171
	(No MC)		.4139		
		BI, Time I		-.2169	.0857
		BEV Change		.0596	.0028
		BIV Change		.4287*	.2138
		NBP Change		.0564	.0026
		NBS Change		.3223	.10897
Control Group	MCR		.3968		
		BI, Time I		-.4495	.2558
		BEV Change		.2440	.0236
		BIV Change		-.2002	.0032
		NBP Change		.2466	.0359
		NBS Change		.3858	.0787
	MC		.3717		
		BI, Time I		-.8692	.2558
		BEV Change		.2176	.0013
		BIV Change		-.2530	.0171
		NBP Change		-.1506	.0294
		NBS Change		.2364	.0684
	(No MC)		.3497		
		BI, Time I		-.4928*	.2558
		BEV Change		.0434	.0006
		BIV Change		-.1088	.00598
		NBP Change		-.1559	.02937
		NBS Change		.2657	.05796

TABLE III

Raw and Partial Correlations of BI with External Variables, Controlling for Model Components

Variable	TIME I			TIME II		
	Raw Correlation	Partial, Controlling for MC form	Partial, Controlling for MCR Form	Raw Correlation	Partial Controlling MC form	Partial Controlling MCR form
Exposure to Comm Dept.	.137(.031)	-.011(.450)	-.021(.406)			
Exposure to Cushman	.240(.001)	.111(.096)	.131(.066)	.177(.010)	-.001(.498)	.017(.423)
Attitude to Fam. Comm.	.197(.004)	.093(.137)	.033(.356)	.183(.008)	-.080(.168)	-.058(.248)
Att. to F.C. --Q.2	.214(.002)	.146(.042)	.074(.199)	.081(.145)	.161(.026)	.169(.024)
Att. to F.C. --Q. 3	.165(.013)	.093(.136)	.077(.189)	.135(.038)	-.066(.213)	-.059(.243)
Att. to Com Dept.--Q. 1	.358(.001)	.285(.001)	.236(.003)	.317(.001)	.052(.265)	.026(.380)
Att. to Com Dept.--Q. 2	.196(.004)	.095(.131)	.056(.259)	.261(.001)	.040(.314)	.033(.348)
Att. to Com. Dept.--Q. 3	.269(.001)	.155(.034)	.119(.085)	.310(.001)	.106(.101)	.0997(.126)
Att. to Publ Lec.--Q.1	.226(.001)	.039(.322)	-.009(.460)	.222(.002)	-.058(.241)	-.105(.110)
Att. to Pub Lec.--Q. 3	.256(.001)	.116(.087)	.058(.252)	.147(.026)	.065(.216)	.101(.119)
Att. to Cushman-Q.1	.248(.001)	.118(.082)	.122(.080)	.202(.004)	-.080(.167)	-.074(.194)
Att. to Cushman--Q.2	.245(.001)	.168(.024)	.154(.038)	.266(.001)	-.001(.497)	-.004(.481)
Att. to Cush--Q. 3	-.230(.001)	-.066(.220)	-.024(.390)	.253(.001)	.041(.313)	.039(.326)
Att. to FC Lec.--Q. 4	-.133(.040)	-.065(.221)	-.052(.254)	-.230(.001)	-.031(.357)	-.009(.457)
Att. to FC Lec.--Q. 5	-.158(.019)	-.102(.114)	-.063(.223)			
Att. to FC Lec.--Sum	-.158(.019)	-.048(.310)	-.139(.055)			
Reasons not to go--form I				-.351(.001)	-.345(.001)	-.3498(.001)
Reasons, form II				-.289(.001)	-.351(.001)	-.3495(.001)

The first number is the correlation coefficient; the second (in parentheses) is the significance level--the smaller it is, the more significant is the correlation. If the significance level is .05 or lower, the correlation is judged to be significantly different from zero.

TABLE IV

Estimations of Message Mass

Treatment Group & Propositional Form	Estimate of Mass Rank	6.0 Minus Rank Estimate	Estimate of Mass (7 pt. scale)	Average
Attitudinal				
BEV	2.1	3.9	4.0	4.0
BIV	1.3	4.7	4.7-	4.7
NBP	3.0	3.0	2.3	2.6
NBS--Friends	5.1+	0.9-	0.8	0.9
NBS--Family	4.5	1.5	2.0	1.7
NBS--Profs	5.1	0.9	1.6	1.2
NBS--Total	---	---	---	1.3
Personal Normative				
BEV	3.2	2.8	3.3	3.0
BIV	2.0	4.0	4.4	4.2
NBP	2.6	3.4	3.1	3.3
NBS--Friends	5.0	1.0	1.3	1.1
NBS--Family	3.3	2.7	3.0	2.8
NBS--Profs	4.7	1.3	1.4	1.3
NBS--Total	---	---	---	1.7
Social Normative				
BEV	3.2	2.8	3.0	2.9
BIV	1.2	4.8	4.7+	4.8
NBP	3.3	2.7	2.6	2.7
NBS--Friends	5.3	0.7	0.9	0.8
NBS--Family	3.7	2.3	2.3	2.3
NBS--Profs	4.4	1.6	1.6	1.6
NBS--Total	---	---	---	1.56

The Spearman rank-order correlation between columns two and three is .98+

TABLE V

Correlations Between (Message Mass/Exposures) and Model Component Change

COMPONENT	EXPOSURE TO FAMILY COMM. Component-Specific Message Mass r	EXPOSURE TO FAMILY COMM. Average r for all Mass Measures	EXPOSURE TO PUBLIC LECTURES Component-Specific Message Mass r	EXPOSURE TO PUBLIC LECTURES Average r for all Mass Measures
BEV Change				
With Control Group				
MC	.1339	.1228	.1323	.1216
MCR	.0950	.0890	.1480	.1404
Without Control Group				
MC	.0217		.0819	
MCR	-.0364		.0952	
BIV Change				
With Control Group				
MC	.3059***	.2698	.0950	.0920
MCR	.3893***	.3514	.1553*	.1517
Without Control Group				
MC	.2035*		-.1760	
MCR	.2043*		-.1525	
NBP Change				
With Control Group				
MC	-.0380	-.0330	-.0090	-.0046
MCR	-.0054	-.0233	-.0167	-.0326
Without Control Group				
MC	-.1319		-.1557	
MCR	-.1325		-.1421	
NBS Change				
With Control Group				
MC	.0899	.0959	-.0471	-.0454
MCR	.1981*	.1970	.0300	.0165
Without Control Group				
MC	-.0674		.3431***	
MCR	-.0812		.2774**	

TABLE V--Continued

COMPONENT	EXPOSURE TO COMM. DEPARTMENT		EXPOSURE TO DR. CUSHMAN	
	Component-Specific Message Mass r	Average r for all Mass Measures	Component-Specific Message Mass r	Average r for all Mass Measures
BEV Change				
With Control Group				
MC	.0620	.0567	.1500*	.1354
MCR	.0240	.0209	.0651	.0600
Without Control Group				
MC	-.0509		.0847	
MCR	-.0509		.0232	
BIV Change				
With Control Group				
MC	.1156	.0944	.1428	.1239
MCR	.2188*	.2091	.2793**	.2501
Without Control Group				
MC	-.0748		-.0699	
MCR	-.0338		.0260	
NBP Change				
With Control Group				
MC	.0116	.0089	.0325	.0280
MCR	.0019	-.0145	.1435	.1276
Without Control Group				
MC	-.1016		-.0252	
MCR	-.1200		.0150	
NBS Change				
With Control Group				
MC	.1053	.1021	.0896	.0944
MCR	.2300**	.2388	.1600*	.1607
Without Control Group				
MC	-.0668		-.0526	
MCR	-.1261		-.0867	

TABLE VI

Message Mass and Component Change--Means across Groups

For Component:	Message Mass:				Mean Change for:			
	Attd. Message	NBP Message	NBS Message	Control Message	Attd. Group	NBP Group	NBS Group	Control Group
BEVxMC	4.0	3.0	2.9	0	39.04	35.26	36.00	34.00
BEVxMCR	4.0	3.0	2.9	0	35.49	34.00	34.53	32.97
BIVxMC	4.7	4.2	4.8	0	38.04	36.37	33.33	30.00
BIVxMCR	4.7	4.2	4.8	0	39.19	36.23	33.86	28.39
WBPxMC	2.6	3.3	2.7	0	37.00	37.47	34.36	35.53
WBPxMCR	2.6	3.3	2.7	0	36.71	39.00	36.00	36.31
WBSxMC	1.3	1.7	1.56	0	38.71	38.09	38.79	31.16
WBSxMCR	1.3	1.7	1.56	0	34.69	35.27	35.46	30,48
Change in Behavioral Intention					7.107	6.676	6.636	6.636

(Scaling constants of 35.0 in the first 8 rows, and 7.0 in the ninth, have been added to the real change score.)