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ATTITUDINAL VARIABLES AND
BEHAVIOR: THREE EMPIRICAL STUDIES
AND A THEORETICAL REANALYSIS

Martin Fishbein, Icek Ajzen,
Eva S. Landy
University of Illinois

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Technical Report 70-9
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ABSTRACT

Three experiments attempting to predict overt behavior from attitudinal variables are described. In the first two experiments an attempt was made to predict an individual's communicative and compliance behaviors toward his group members from knowledge of (a) his attitudes toward (i.e., affect for) the group members; (b) his beliefs about their expertness on the group task; and (c) his general behavioral intentions toward them (i.e., intentions to subordinate oneself, intentions to show social acceptance). No consistent, and very few significant relations between these attitudinal variables and behaviors were obtained. Further, three often proposed explanations for this lack of relationship (i.e., the attitude measure is incomplete; the attitude measure is inappropriate; the attitude-behavior relationship is moderated by reinforcement) were also not supported. Thus, the conclusion was reached that traditional attitudinal approaches are ineffective in predicting overt behavior. In the third study, an alternative approach, based on a newly-developed theory of behavioral intention and behavior was attempted. Consistent with the theory, an individual's specific intentions to communicate or comply with the other group members were predicted with high accuracy from (a) the individual's attitudes toward performing these behaviors (i.e., communicating and complying) and (b) his beliefs about the norms governing these behaviors, weighted by his motivation to comply with the norms. Overt behaviors on the task were significantly related to the specific intentions, and thus, the theory led to the significant prediction of overt behaviors. The degree of predictability was determined by the strength of the relationship between intentions and behavior, and this latter relationship was itself shown to be contingent upon the occurrence of events that took place between the measurement of intentions and the observation of behavior.

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ATTITUDINAL VARIABLES AND BEHAVIOR: THREE EMPIRICAL STUDIES

AND A THEORETICAL REANALYSIS¹

Martin Fishbein,² Icek Ajzen, Eva Landy
University of Illinois

and

Lynn R. Anderson
Wayne State University

Introduction

Much research on attitudes seems to be based on the implicit assumption that increased knowledge in this area will lead to better understanding and prediction of behavior. Unfortunately, relatively little has been done to verify the postulated relation between attitude and behavior.

Indeed, as Festinger, (1964), McGuire (1969), and Wicker (1970) have concluded, research directed at this question (e.g., LaPiere, 1934; Saenger & Gilbert, 1950; Kutner, Wilkins & Yarrow, 1952; DeFleur & Westie, 1958; Lynn, 1965; etc.) indicates that attitude has a rather low relationship to actual behavior toward the object of the attitude. Further, Fishbein (1967a) has pointed out that "what little evidence there is to support any relationship between attitude and behavior comes from studies showing that a person tends to bring his attitude into line with his behavior, rather than from studies demonstrating that behavior is a function of attitude (e.g., Cohen, 1960; Gerard, 1965)." At least three explanations have been offered for this apparent lack of relationship between attitude and behavior.

First, it has been argued that the inability to predict behavior frequently stems from the failure to take into account all of the components of attitude. This explanation has been offered by the proponents of the multi-dimensional theory of attitude (e.g., Rosenberg, et al., 1960; Triandis, 1964) which views attitude as a complex concept containing affective, cognitive, and conative

components. By contrast, most uni-dimensional approaches define attitude as affect alone and consider cognition (or beliefs) and conation (or behavioral intentions) as separate but related concepts. Specifically, beliefs and behavioral intentions are viewed as the determinants or the consequents of attitude (Fishbein, 1964). Indeed, there is considerable evidence showing that the three attitude components are highly intercorrelated. The research of Rosenberg (1956, 1965), Zajonc (1954), Fishbein (1963, 1965a, 1965b) and others has demonstrated that an individual's attitude (or affect) toward any object is highly correlated with his beliefs about the object (i.e., the probability or improbability that the object is related to some other object, value, concept or goal) and the evaluative aspects of those beliefs (i.e., the evaluation of, or attitude toward, the related concept). Algebraically, this may be expressed as follows:

$$A = \sum_{i=1}^N B_i a_i$$

where: A = attitude toward some object O;
 B_i = belief about O, i.e., the probability or improbability that O is related to some other object X_i ;
 a_i = the evaluative aspect of B_i , i.e., the respondent's attitude toward X_i ;
 N = number of beliefs.

Similarly, the results of a series of investigations by Triandis and his co-workers (Triandis & Davis, 1965; Fishbein, 1964, 1967a; Triandis et al., 1967) indicate that there is also a substantial correlation between affect and the behavioral component of attitude.

In spite of the theoretical differences between a multi-dimensional and a uni-dimensional viewpoint, the separate measurement of affect, behavioral intentions, and beliefs would be desirable according to both approaches. In the first case, all three measures would be considered as parts of the subject's

attitude and, therefore, necessary in an attempt to predict behavior. The second approach, though regarding only affect as attitude, recognizes the possibility that specific behavioral intentions, or beliefs, might be more relevant to some particular behavior or to a certain set of conditions than attitude.

A second explanation of the weak attitude-behavior relationship is that attitude measures are not directed at the appropriate objects. This second explanation was brought forth by LaPiere (1934) in an effort to account for the lack of relationship between his paper-and-pencil measure of behavioral intentions and overt behavior displayed toward an Oriental couple. He attributed this lack of relationship to the fact that the behavior was directed toward particular individuals, while the attitude was measured toward the class of "Oriental couples" as a whole. Intuitively, this explanation seems plausible. It seems that one would not be able to predict behavior toward a specific Jew (for example) on the basis of a subject's attitude toward the stimulus "Jew" since the specific person certainly differs in many respects from the subject's stereotype of a Jew (Kretch, et al., 1962; Fishbein, 1963). Indeed, in order to achieve accurate prediction of behavior, it would at least seem necessary that the attitudinal and behavioral measures be directed at the same object.

Finally, it has been proposed that there is no one-to-one relationship between attitude and behavior and that attitudes may, therefore, be unrelated to any specific behavior (Thurstone, 1931; Doob, 1947). According to Doob, attitude is defined as a learned predisposition to respond. Just as a positive or negative attitude is conditioned to certain stimulus events, so are overt responses conditioned to the attitude. In other words, a person first learns an implicit mediating reaction to a given object, person, or situation, called attitude. He then acquires certain responses to the mediating reaction. Two

persons who hold the same attitude may learn to behave differently toward the object of the attitude, depending upon the reinforcements they receive.

The present paper is a report of three experimental studies designed to test the validity of these explanations. In all three studies, an attempt is made to predict actual behavior from pencil-and-paper measures of beliefs, attitudes, and behavioral intentions. In all cases, the paper-and-pencil measures and the behavior are related to the same specific person. In addition, the studies attempt to investigate the influence of social reinforcement on the attitude-behavior relationship. As the results will show, the present series of studies again indicate that traditional attitudinal measures are not predictive of overt behavior. The first two studies, using a traditional approach, produced few significant relations between attitude and behavior. In contrast, the results of the third experiment will show that a newly developed theory can provide a more accurate basis for behavioral prediction.

The Group-Task Situation

In all three experiments, three-person groups worked on a task that had a joint goal requiring mutual cooperation and communication among the members. The group task involved getting a board (in the shape of an equilateral triangle) parallel to a horizontal surface. This apparatus is similar to the triangle board previously used by Raven and Eachus (1963) and Raven and Shaw (1970). At each corner, a scissor jack attaches the triangle board to a horizontal surface, such that each group member can raise or lower his corner of the board by turning a handle to the right or to the left. Fifty-eight turns are necessary to bring the corner from its lowest to its highest position. In addition, a carpenter's spirit level is mounted on top of the triangle board at each of the corners. Depending upon the positioning of this spirit level, each member

can obtain some information about the position of the board vis a vis a horizontal surface. For example, if the spirit levels are set perpendicular to the individuals' line of sight and parallel to the opposite side of the triangle (see Figure 1) the individual can tell whether each of the other corners are high or low. It should be noted that a person's own spirit level will not be affected by his lowering or raising his corner of the triangle, since the spirit level is being raised or lowered in its own plane. However, raising or lowering his corner does affect the spirit levels mounted on the other two corners.

In this situation, then, it should be clear that each group member is equally dependent upon his two partners for "balancing" his own corner. That is, a person's own behavior does not affect his spirit level and he can only get his air-bubble centered by asking one or both of his partners to raise or lower their corners of the triangle. Further, an individual accomplishes the same result (i.e., the air bubble will move in the same direction) whether he asks one partner to raise or the other partner to lower his (i.e., the partner's) corner. Thus, at least in terms of reaching his goal (i.e., centering his air bubble) it should make no difference to him which of his two partners he communicates with.

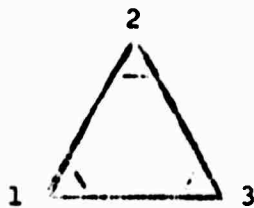
Each experimental session consists of a series of trials, with each trial consisting of the following:

(1) Each group member may send one (and only one) message to one (and only one) of the other people in which he may request him to raise, lower, or hold constant his corner of the board.

(2) After receiving the message (or messages), each person may either raise (make one full turn of his handle to the right), lower (make one full turn of

Figure 1

The Triangle Board Task - Bidependent Condition



Corner	Position	Spirit level provides info. about corners	Correct messages to		
			1	2	3
1	High	2,3	---	Lower	Raise
2	Middle	1,3	Lower	---	Raise
3	Low	1,2	Lower	Raise	---

his handle to the left), or hold constant his corner of the board. On any trial, a person may thus receive either 0, 1, or 2 messages.

Of particular interest are those trials in which he receives two messages, each of which requests him to perform a different behavior (i.e., one message asks him to raise his corner and the other asks him to lower his corner). Such a situation is quite likely to occur for the individual whose corner of the board is midway between the other two corners. Figure 1 presents an illustration of a triangle-board situation and indicates the appropriate or "correct" messages that each person should send to his two partners. It can be seen that the person at position 2 is quite likely to get conflicting messages from his two coworkers. It should be recalled that in this situation, he has no information about the relative position of his own corner and thus he has no objective basis for determining which of the messages are "correct" or which (if either) of the two he should comply with. Presumably then, his final decision here, like his decision with whom to communicate, should be some function of his attitudes (and/or beliefs and/or behavioral intentions) toward his two coworkers.

Other variables in the situation may be manipulated (e.g., different interdependence situations can be created, the nature of intra-group cooperation or competition can be varied); these variables will be considered in reference to the particular experiments. Thus, let us now turn to the first experiment.

EXPERIMENT 1

The first study on the triangle board was designed to explore the relationship between attitude and behavior and to test the validity of the various explanations offered for the lack of relation that has been obtained in previous

studies. More specifically, we wished to investigate the degree to which an individual's attitudes toward his two coworkers was predictive of his communicative and compliance behaviors with respect to them. In order to insure that the individual would have differential attitudes toward his coworkers, two of the three group members were actually confederates of the experimenter. As will be seen below, the use of confederates not only enables the establishment of differential attitudes, but it also allows for the control of "social reinforcement" given the subject by his partners.

Attempts were made to take into account the three explanations offered for the lack of an attitude-behavior relationship, namely:

1. The measure of attitude is incomplete;
2. The measure of attitude is inappropriate; and
3. The attitude-behavior relationship is moderated by the nature of the reinforcement an individual receives upon performing a given behavior.

Following the first explanation, separate measures of the subject's beliefs (cognition) about and behavioral intentions (conation) toward each of his coworkers were obtained in addition to the more traditional measures of attitudes (affect) toward each coworker. Indeed, in order to maximize the possible contribution to behavioral prediction by these three measures, an attempt was made to create a situation where liking one's partner (affect) would not necessarily be related to beliefs concerning the partner's expertness (cognition) or to behavioral intentions (conation) toward that partner.

In accordance with the second explanation, the above measures were taken with respect to the specific individuals the subject would be working with (i.e., her two partners--the confederates), rather than toward a class of persons (e.g., "an undergraduate, female psychology student").

Finally, in order to incorporate the third explanation, two conditions were introduced:

1. A Feedback condition--where each subject could tell whether her partners (i.e., the confederates) had complied with her instructions; and
2. A No-Feedback condition--where the subject was unable to accurately determine whether her partners had complied with her instructions.

If Doob's learning theory analysis is valid, one would expect that the number of messages a subject sends to a given confederate (or coworker) will be related to the number of times the confederate reinforces the subject by complying with her instructions. That is, irrespective of a subject's attitude toward a confederate, the more the confederate complies with the subject's instructions, the more the subject would communicate to the confederate. Similarly, the less the confederate complies with the subject's instructions (i.e., the more the confederate negatively reinforces the subject) the less the subject should communicate to the confederate. Thus, in a situation in which a confederate is not complying, and the subject knows that the confederate is not complying, we would expect to find little relationship between attitude and behavior. However, if the subject has no basis for judging the confederate's compliance behavior, we would expect to find a strong attitude-behavior relationship. Thus, it can be hypothesized that, while behaviors will be related to attitude in the No-Feedback condition, these same behaviors will be a function of social reinforcement in the Feedback condition.

To summarize briefly, the purpose of the first study was threefold:

1. To investigate the relationships between the three attitudinal components (i.e., beliefs, attitudes, and behavioral intentions) and to test the

hypothesis that better prediction of behavior will be obtained from a consideration of all three variables than from a consideration of attitude (affect) alone;

2. To investigate the relationship between attitude and behavior when "appropriate" (i.e., person-specific) measures of attitude are obtained; and

3. To test the hypothesis that the attitude-behavior relationship is moderated by social reinforcement.

In addition, the effects of the group-task situation on attitudes were investigated. Two questions were of relevance here: 1) Do the confederates' behaviors on the task influence the subject's post-task ratings of them? 2) Does the subject's own behavior on the task influence her subsequent ratings of the confederates?

Regarding the latter, several investigators (e.g., Gerard, 1965; Brehm & Cohen, 1962; Festinger, 1957) have suggested that once a person commits himself by behaving toward another person in a specific manner, he engages in "cognitive bolstering" of the behavior by changing his evaluation of the other person and thus reducing the dissonance provoked by the behavioral commitment. In the present study, the subject has the option of committing herself to one of the confederates by cooperating with her on the task. It is therefore feasible to look for evidence of cognitive bolstering in the subject's post-task ratings of the confederates.

Method

Apparatus

In this study, as in the others, the basic apparatus was the previously described triangle-board, constructed in such a manner that a wooden partition prevented the participants from seeing one another or the other members' spirit

levels. At the start of the experiment, the board was placed in a standard position with one corner high, one low, and one in the middle. The naive subject, called member "C", was always placed at corner 2 in the middle position. Member "A" was always at corner 3, the low position, and member "B" was always at corner 1, the high position. Thus, in order to balance her own spirit level, the naive subject should always request member "A" to raise her corner (turn right) and/or member "B" to lower her corner (turn left).

Subjects

Sixty undergraduate females participated in the experiment as part of their requirements for the introductory psychology course. Each subject was assigned to work with two other undergraduate females who were actually confederates of the experimenter.

Confederates

Four upper-division (i.e., Junior or Senior) females were paid to serve as confederates in the experiment. Two of the four took part in each experimental session. While they both pretended to be introductory psychology students, one pretended to be an "Expert" and one a "Non-Expert" on the experimental task. Each confederate was assigned to each role in half of her sessions.³

Procedure

Role-playing manipulation. The subjects reported to the experimenter's office where one confederate was waiting. The naive subject was introduced to the confederate and told that a third subject also was scheduled for the experiment and, hopefully, would be along at any minute. While the experimenter busied himself at his desk, the confederate began discussing with the

naive subject their backgrounds and interests in psychology and psychological experiments. This confederate was trained to take the role of an Expert in that she expressed a strong interest in psychology and indicated she was a psychology major who had participated in a great many psychological experiments. She further indicated that she always had found these experiments extremely simple and always had done extremely well in them. In addition to establishing herself as somewhat of an expert or authority, this confederate was also trained to be aloof, unfriendly, and rather perturbed with the second confederate who, as instructed, was now some minutes late for the experiment. When the second confederate did arrive, she was introduced to the two other members and was immediately reprimanded by the Expert confederate for delaying the experiment and wasting their time.

In contrast to the Expert confederate, the second confederate was instructed to identify herself as a novice or Non-Expert regarding psychology and psychological experiments. She mentioned to the other members that she was not a psychology major, had never participated in any type of psychological experiment, and was quite certain that some type of esoteric probing of her personality would be made in the present experiment. While expressing this trepidation over the experiment, she was, at the same time, extremely friendly and cordial to the other members.

After the initial discussion among the subjects, the experimenter took the group to another room where the triangle board was located. The experiment was presented as a study of group cooperation and communication, and as the experimenter began to explain the actual operation of the triangle board, the Expert confederate mentioned that she was quite familiar with this apparatus from previous psychological experiments and from her reading of the psychological literature. On the other hand, the Non-Expert confederate

expressed total bewilderment with the operation of the board. She would often interrupt the experimenter's instructions with repetitive questions which were immediately answered in a somewhat hostile and impatient manner by the Expert confederate. After giving the complete instructions, the experimenter indicated that he had "accidentally" left some questionnaires in his office which he would like the subjects to complete before they began working on the triangle board. The subjects were told that they could "try out" or experiment with the board and perhaps answer each other's questions while he returned to his office for the questionnaires.

The subjects were left alone for several minutes, during which time the role playing continued in an attempt to establish more strongly the Expert and Non-Expert roles of the confederates. The Non-Expert continued to reveal a general confusion and a definite misunderstanding of the instructions concerning the operation of the triangle board. She also expressed a somewhat pessimistic concern about the possibility that their group could actually balance the board in the allotted number of trials. Although somewhat impatient with the Non-Expert's inability to understand the details of the experiment and the operation of the board, the Expert confederate, with a great deal of forbearance, tried to clarify the experimental instructions. Furthermore, she demonstrated the mechanics of the board by raising and lowering a corner of the board and pointing out the resulting changes in the spirit levels. The Expert also indicated that she was quite certain their group could balance the board if the members would only cooperate by following the instructions which they would be sending to each other by means of written messages.

To summarize briefly then, one confederate played the part of an arrogant Expert--intelligent, showing understanding and confidence with regard to the

task at hand, but unpleasant and impatient in relation to the other confederate. In contrast, the second confederate played the role of a friendly Non-Expert--she demonstrated a lack of understanding of the triangle board as well as a lack of confidence regarding psychological experiments in general, but behaved in a pleasant, non-aggressive fashion. These manipulations were designed to create a situation in which the naive subject would have differential beliefs, attitudes, and behavioral intentions toward the two confederates. Essentially, on the basis of earlier findings by Bales (1938), we were hoping to discriminate between the confederate whom a subject would like best and the one she would most prefer as a coworker.

Pre-test questionnaire

When the experimenter returned with the questionnaires, each member was given a booklet, described as a "First Impressions Test," with the identifying letter A, B, or C on the cover. The naive subject was always handed the booklet labeled Member C while letters A and B were alternated between the Expert and Non-Expert confederates from session to session. Since essentially the same questionnaire was used in all three studies, it will be described in some detail here. Basically, this questionnaire consisted of three parts:

1) A measure of attitude toward each confederate (A). Each subject was asked to rate each of the two confederates on Fishbein & Raven's (1962) A scales--five empirically determined, eight-step bipolar evaluative scales of the Semantic Differential form (i.e., wise-foolish, bad-good, sick-healthy, clean-dirty, and harmful-beneficial).

2) A measure of behavioral intentions toward each confederate (BD). Subjects rated each of the confederates on 15 eight-place scales from Triandis' (1964) Behavioral Differential. This instrument asks subjects to

indicate the degree to which they "would" or "would not" engage in various behaviors with a given stimulus person. Factor analyses of these ratings resulted in a two-factor structure and the scales with high loadings on these dimensions were used to compute measures of intentions. More specifically, the first factor was identified as "Social Acceptance," and was defined by the following scales: admire the ideas, ask the opinion, invite to dinner, admire the character, and accept as an intimate friend. The second factor was labeled "Subordination" and was defined by the following: be taught by, be commanded by, work for, and obey. Thus, two behavioral intention scores (BD_I and BD_{II}) were obtained with respect to each confederate, by summing across the above mentioned sets of scales.

3) A measure of beliefs about the expertness of each confederate (BE).

Each subject rated each confederate on three eight-place items that were designed to assess the degree to which the subject believed each confederate understood (from "very well" to "not at all") the experimental instructions and the operation of the triangle board. The following three items were summed to provide the belief measure: "How well did she understand (1) the instructions about the experiment, (2) how the triangle board works, and (3) what the 'spirit level' was indicating."

The task

After the group members had completed the pre-test questionnaire, they were seated at that corner of the triangle board which corresponded to the letter which had been written on the cover of their test booklet. While the members were completing the questionnaire, the triangle board was tilted to the standard starting position. After the subjects (and confederates) had been seated, the experimenter told them that he was going to set each

of the spirit levels in a different position and, in addition, was not going to tell any of the members at what position he had set the levels of her partners. As previously mentioned, the naive subject's level was always set parallel to the opposite side of the board in order to create the desired equal dependence upon the two confederates.

The subjects were told they would be given a series of 28 timed trials to balance the board. No communication was allowed apart from passing mimeographed notes on which the subjects circled the word "left," "right," or "hold." After passing their notes, the members were given 15 seconds to study any notes they may have received and to decide in which direction they were going to turn. The experimenter, who timed each trial, informed the subjects when the 15 seconds had elapsed. After making her move, each member wrote her message for the next trial. All 28 trials were timed in a similar manner. The moves of the three participants were recorded on an Esterline-Angus Multiple Event Recorder, which was wired directly to the handles of the triangle board.

The confederates' behavior. For each of the 28 trials, written instructions concerning communicative and compliance responses were prepared for the two confederates and were taped to the partitions in front of corners A and B and out of view of member C. For each trial, each confederate was told what message to send (i.e., turn left, turn right, or hold), whom to send it to and what move to make in those cases where she did or did not receive a message from the naive subject. The behavior of the confederates was scheduled such that the naive subject received the same number and types of communications from each confederate. More specifically, each confederate sent 16 messages to the naive subject, nine of which asked her to "turn right" and seven of which asked her to "turn left".

On five trials the subject received no message from either confederate, on 12 trials she received one message, on three trials she received two messages each requesting the same behavior, and on seven trials (every 4th trial), she received two conflicting notes (one confederate requested her to turn left and the other requested her to turn right). It is on these latter conflict trials that the compliance behavior of the naive subject is of most interest. Because the setting of her own spirit level provided no information about the relative height of her own corner, the naive subject's decision as to whose instruction she would comply with should have been based mainly on her beliefs, attitudes and behavioral intentions toward the confederates themselves.

In addition, the behavior of the confederates was also scheduled so that the naive subject was complied with (reinforced) by the confederates on 12 of the trials and not complied with on the remaining 16 trials. This scheduling of the confederates' behavior means that all 60 subjects were complied with an equal number of times on the 28 trials. However, each subject was differentially complied with (i.e., reinforced) by the Expert and Non-Expert depending upon which confederate had received her message on any given trial. On those trials where the confederate received no communication from the naive subject, the schedule was such that half the time she turned left and half the time she turned right.

In general then, it can be seen that an attempt was made to program the confederates' behavior such that they behaved identically over the 28 trials. In half of the groups, the Expert confederate was assigned to corner 1 and in the other half she was assigned corner 3.

The Feedback manipulation. Because the compliance behavior of the confederates can be seen as a form of social reinforcement, it was predicted

that the perception of the confederates' behavior would have a strong interaction with attitudes in determining the subsequent communicative and compliance behaviors of the naive subject. Hence, an experimental feedback manipulation was instigated in half of the groups. In the Feedback condition each of the three group members made her turn on the triangle board in succession, with member A turning first, then member B, and finally our naive subject, member C. By watching the changes on her own spirit level as each of the confederates made their moves, the subjects in the Feedback condition should have been able to determine if their notes had been complied with. In the No-Feedback condition all three members turned their handles simultaneously and, hence, the naive subject should have been less able to determine if there had been compliance. Attitudes should have had their greatest impact in this No-Feedback condition where the naive subject could not accurately determine if the other members were indeed complying with her instructions to them. On the other hand, social reinforcement (perception of the compliance behavior of the confederates) should have had a more pronounced effect in the Feedback condition.

Post-test questionnaire. After completing the 28 trials, the subjects again described each other on the Behavioral Differential scales, the evaluative A Scales, and the three expertness items used in the pre-test questionnaire. In addition, the subject estimated (a) the number of messages she sent to each confederate and (b) the number of times each of the confederates complied with her.

Results and Discussion

The presentation of results is divided into four sections. Section A considers the effectiveness of the role-playing and feedback manipulations. In Section B, analyses of variance are reported that check the effect of the experimental manipulations on communicative and compliance behaviors. Section

C presents the correlations between pre-test beliefs, attitudes, and behavioral intentions toward the confederates and behavior with respect to them. Finally, Section D deals with the effect of the group task situation on post-test beliefs, attitudes, and behavioral intentions, and in addition presents the correlations between the subject's own behavior on the task and her post-test ratings of the confederates.

A. A check on the experimental manipulations

The purpose of the role playing was to establish differential beliefs, attitudes, and behavioral intentions toward the two confederates. As described above, separate measures were obtained of the naive subject's attitudes toward each confederate (A), her beliefs about their expertness (BE), and her intentions to socially accept (BD_I) and to subordinate herself (BD_{II}) to them. The intercorrelation of these eight measures (four with regard to each confederate) are presented in Table 1.

Table 1 has been set up as a multitrait-multimethod matrix (Campbell & Fiske, 1959) with the four attitudinal measures serving as "methods" and the two confederates serving as "traits." The intercorrelations demonstrate a high degree of convergent and discriminant validity, indicating that, among other things, the role-playing manipulation did serve to establish two distinctly different types of coworkers. That is, looking at the pre-test section of the matrix only, it can be seen that ratings of the Expert and Non-Expert confederates were relatively independent of one another. Further, it can be seen that perhaps with the exception of intention to show social acceptance (which was highly correlated with attitude and intention to subordinate) none of the other measures of beliefs, attitudes and behavioral intentions were highly enough intercorrelated to justify omitting them when attempting to predict behavior.

Table 1

Pre- and Post-Test Intercorrelations of Subjects' Attitudes (A), Behavioral Intentions (BD_I, BD_{II}), and Beliefs (BE) regarding the Expert (E) and Non-Expert (NE) Confederates
Experiment I

	PRE-TEST						POST-TEST					
	A	IE	BD _I	BD _{II}	E	BE	A	IE	BD _I	BD _{II}	E	BE
PRE-TEST	E						E					
	NE						NE					
	A	24					A					
	IE	67	06				IE					
POST-TEST	BD _I	05	60	-06			BD _I					
	BD _{II}	43	-10	53	-17		BD _{II}					
	E	20	42	-35	46	01	E					
	NE	23	06	23	05	24	NE					
PRE-TEST	A	-10	48	-37	28	-26	A					
	IE					48	IE					
	BD _I					-34	BD _I					
	BD _{II}						BD _{II}					
POST-TEST	E	66	40	34	-16	31	E					
	NE	35	71	-03	48	04	NE					
	A					14	A					
	IE					11	IE					
PRE-TEST	BD _I					07	BD _I					
	BD _{II}					-20	BD _{II}					
	E	63	16	84	10	46	E					
	NE	07	64	-01	P1	-04	NE					
POST-TEST	A					05	A					
	IE					04	IE					
	BD _I					10	BD _I					
	BD _{II}					-15	BD _{II}					
PRE-TEST	E	39	05	35	-04	70	E					
	NE	-06	42	-33	46	11	NE					
	A					06	A					
	IE					49	IE					
POST-TEST	BD _I					-10	BD _I					
	BD _{II}					35	BD _{II}					
	E	20	15	-02	14	16	E					
	NE	02	31	10	14	02	NE					

Note--N = 60; decimal points omitted.

r .05 = .25; r .01 = .33

It will be recalled that an attempt was made to create a situation where the subject would like one confederate more than the other, but would perceive the less-liked confederate as more of an Expert on the task. In addition, given the two dimensions of behavioral intentions, the subject was expected to show higher intentions to socially accept and lower intentions to subordinate herself to the friendly, Non-Expert than to the aloof Expert. The mean ratings of the two confederates on the four measurement instruments are presented in Table 2. Although the role-playing manipulation was highly successful in establishing one confederate as an Expert and the other as a Non-Expert, there were no significant differences in the subject's attitudes or behavioral intentions toward the two confederates.

Thus, while the role-playing manipulation was not completely successful in producing statistically significant differential attitudes and behavioral intentions toward the two confederates, it did create a situation where beliefs, attitudes, and behavioral intentions could all contribute independently toward behavioral prediction.

In order to check the effectiveness of the feedback manipulation, an analysis of variance of the actual and perceived percent compliance of the confederates in the two feedback conditions was performed. The manipulation was designed to allow the subject to accurately perceive the confederates' behaviors in the feedback condition, but not in the No-Feedback condition. It was also expected that in this latter condition subjects would tend to overestimate the Expert's compliance behavior and underestimate the Non-Expert's compliance behavior. Only the main effect of "actual-vs-perceived" was significant. In all cases, the subjects overestimated the compliance behavior of both confederates. Contrary to expectations, there were no significant differences between conditions or between confederates and the

Table 2

Mean Pre-Test Ratings of the Expert and the
Non-Expert Confederates on the Attitudinal Measures

Experiment I

Attitudinal Measure	Confederate		t ^a
	Expert	Non-Expert	
A	28.40	27.13	1.65
BE	20.53	11.05	10.47*
BD _I	21.43	22.10	.43
BD _{II}	16.22	14.45	1.39

^aTwo-tailed t-tests between Expert and Non-Expert; N = 60.

Note - A = Attitude toward the confederates

BE = Beliefs about the confederates' expertness on the task

BD_I and BD_{II} = Behavioral intentions, acceptance (I) and subordination (II) factors.

*p < .01.

three-way interaction was also not significant. Thus, it appears that the manipulation of feedback was not successful.

B. The effect of the experimental manipulations on the subject's behavior

Various analyses were performed to check whether the subjects behaved differently toward the Expert than toward the Non-Expert, and to determine the effect of feedback on the subject's behavior. As mentioned before, the behavioral measures in this study were provided by the subject's compliance and communicative behaviors. The number of times the subject complied with each confederate (a) over all trials and (b) on conflict trials only, constituted two measures, and the number of messages she sent to each confederate was a third.

It was found that the initial tendency was both to write to the Expert and to comply with her. Out of the 60 subjects, 38 (63.3%) wrote their first message to the Expert and 22 (36.7%) to the Non-Expert ($Z = 1.99$, $p = .052$). With respect to compliance, 11 subjects (18.3%) "held" on the first conflict trial. Of the remaining 49, 36 (60%) complied with the Expert and 13 (21.7%) complied with the Non-Expert ($Z = 3.29$, $p < .001$).

Over all 28 trials, an average of 13.53 messages were sent to the Expert and 14.47 to the Non-Expert (non-significant difference). Similarly, over the 28 trials, the Expert was complied with an average of 11.53 times while the Non-Expert was complied with 10.87 times (not significant). When only the 7 conflict trials were considered, a similar picture emerged--the Expert was complied with 3.22 times and the Non-Expert 2.60 times (non-significant difference). Thus, although a subject's initial tendency was to communicate and to comply with the Expert, over the whole 28 trials the subject did not behave differentially toward the two confederates.

In order to assess the effect of the feedback manipulation on the subject's behavior, five two-way analyses of variance were conducted where (a) the two feedback conditions and (b) the Expert's position (either corner 1 or corner 2) served as main effects. The dependent variables in these analyses were:

1. Number of messages to the Expert confederate (since the subject had to write one message on each trial, the number of messages to the Non-Expert equaled 28 minus the number of messages to the Expert);
2. The number of times the subject complied with the Expert minus the number of times she complied with the Non-Expert over all 28 trials (compliance with the two confederates does not sum up to 28 for every subject since (a) there were five trials on which the subject received no message and (b) some subjects chose to "hold" on certain trials);
3. The number of times the subject complied with the Expert minus the number of times she complied with the Non-Expert on the 7 conflict trials;
4. The number of times the subject "held" (i.e., did not make a move); and
5. The number of "wrong" messages the subject sent (it was observed that some subjects on one or more trials, sent incorrect instructions to the confederates. For example, the subject asked a confederate to "turn right" when, on the basis of her spirit level, she should have asked her to "turn left.")

Neither the main effects nor their interactions were significant in any of the five analyses. While significant position effects were not expected, we did expect significant feedback effects. The failure to confirm the

prediction is consistent with the earlier finding that the feedback manipulation was unsuccessful. Therefore, for the remainder of Experiment I, the data from the two feedback conditions have been combined.⁴

C. The correlational prediction of behavior from attitudes, beliefs, and behavioral intentions

A traditional attitudinal approach would predict a significant relationship between a given subject's beliefs about, attitudes toward, and behavioral intentions with respect to a given confederate and her behavior toward that confederate. In order to test this hypothesis, correlations between the four pre-test ratings of the confederates (A, BE, BD_I and BD_{II}) and behaviors toward them (i.e., number of messages sent, number of compliances on all trials, and number of compliances on the conflict trials) were computed. All 24 correlation coefficients (12 with respect to each confederate) were non-significant.

Ajzen and Fishbein (1969), however, have pointed out that attitude research often neglects the fact that an individual usually has a choice between alternative acts. They demonstrated that predictions of choice behavior improved when estimates of attitudes toward each of the available alternatives were taken into consideration. In the present study, it is quite conceivable that difference scores would improve prediction since much of a subject's behavior toward the confederates is complementary. That is, even if a subject has positive attitudes toward both confederates, she can only write to one of them on each trial. Similarly, she can only comply with one of the confederates on each conflict trial. Since the subject is forced to make a choice between the two confederates, it seems likely that it will be the differences in her beliefs, attitudes, and behavioral intentions toward them, rather than the absolute values of these variables,

that will influence her behavior. Thus, for the remainder of this paper, only difference scores will be reported. Table 3 presents the correlations between differences in the subject's attitudinal ratings of the confederates (Expert-Non-Expert) and differences in her behavior toward them.

Looking at Table 3 it can be seen that using difference scores did not improve prediction (none of the 12 correlations was statistically significant).

Even though the separate measures of beliefs, attitudes, and behavioral intentions were not significantly related to behavior, it is possible that simultaneous consideration of all four measures would result in behavioral prediction. Indeed, this is precisely the argument offered by multi-dimensional theorists. In order to test this notion, multiple correlations were computed. These multiple correlations are also given in Table 3. None of the 3 multiple correlations reached statistical significance. Thus, the results indicate that in the present study, neither attitudes, nor beliefs, nor behavioral intentions were consistently related to behavior and further that the simultaneous consideration of these variables did not improve behavioral prediction.

While these findings are quite discouraging from an attitudinal point of view, they are not entirely unexpected from Doob's behavior theory explanation of the attitude-behavior relationship. According to Doob, an attitude-behavior relationship will only obtain if the behavior following from the attitude is positively reinforced. More specifically, a subject should send her messages to the confederate who reinforces this communicative behavior by complying with her instruction. Similarly, it is expected that a subject is more likely to comply with the confederate who complies with her. In order to test these notions, correlations between the subject's own behavior and the actual and perceived percent of compliance by the confederates were calculated. Once again difference scores were used.

Table 3
Correlations Between Pre-Test Attitudinal Measures
and Subject's Behaviors - Difference Scores
Experiment I

Attitudinal Measures	Number of Messages sent	Number of compliances All trials	Number of compliances Conflict trials
A	-.11	.06	.05
BE	.10	.00	.08
BD _I	-.07	.11	.09
BD _{II}	-.02	.09	.02
Multiple R	.174	.129	.139

None of the correlations are significant, $N = 60$.

Note - A = Attitude toward the confederates
BE = Beliefs about the confederates' expertness on the task
BD_I and BD_{II} = Behavioral intentions, acceptance (I) and subordination (II) factors.

Contrary to Doob's behavior theory explanation, there were no significant relationships between the subject's behaviors and the actual or perceived percent of compliance by the confederates.

To summarize briefly then, the results of the correlational prediction of behavior were quite negative. First, a subject's beliefs, attitudes, and behavioral intentions toward the two confederates were unrelated to the subject's behavior vis a vis the confederates. Further, in contrast to what was expected from a behavior theory viewpoint, the subject's behavior was not related to the confederates' actual compliance behavior or the subject's perception of that behavior.

D. The effect of the task on beliefs, attitudes, and behavioral intentions.

To determine whether the subject rated the two confederates differently after the task than before, t-tests between the pre- and post-test ratings of each confederate on each attitudinal variable (i.e., A, BE, BD_I, and BD_{II}) were computed. The results showed that a subject tended to perceive the Expert as less of an expert after the task than she did initially ($t_{58} = 2.540$; $p < .05$), and that she increased her intentions to show subordination to the Non-Expert ($t_{58} = -2.135$, $p < .05$). None of the other differences were significant.

In order to assess whether changes in the attitudinal ratings of the confederates (i.e., A, BE, BD_I and BD_{II}) were related to the confederates' behaviors on the task, correlations between the confederates' actual and perceived percent compliance and the pre to post-test changes in the subject's attitudinal ratings were computed.⁵ Only the change in expertness ratings of the Non-Expert was significantly related to the Non-Expert's compliance behavior ($r = .276$, $p < .05$ for actual and $.342$, $p < .01$ for perceived compliance). That is, the higher the proportion of compliances

by the Non-Expert, the more the subject tended to increase her expertness ratings of this confederate.

On the basis of previous research by Gerard (1965) and others, it was hypothesized that the subjects may engage in some form of "cognitive bolstering." That is, the subjects may bring their beliefs, attitudes, and behavioral intentions into line with their behaviors. In order to test this notion, correlations between the subject's communicative and compliance behaviors toward the two confederates during the task and the pre- to post-test changes in her attitudinal ratings of the confederates were computed. Only the change in the expertness rating of the Expert confederate (which previously was found to be significant) was related to the subject's own compliance behavior. The less the subject complied with the Expert, the more she changed her expertness rating in an unfavorable direction ($r = .254$, $p < .05$). Thus, there is only limited support for a cognitive bolstering effect.

Since some changes in the subject's ratings of the confederates during the course of the experimental task were found, it might be interesting to examine the degree to which the post-test attitudinal measures could be used to predict the subject's behaviors. The correlations between the post-test ratings and the subject's preceding behaviors are given in Table 4. It is obvious that, overall, there was little evidence to support (a) an attitude-behavior relationship (none of the 12 correlations presented reached statistical significance) and (b) the argument that the consideration of cognition (belief) and conation (behavioral intention) in addition to affect (attitude) would improve behavioral prediction. None of the multiple correlations of these variables on the task behaviors were statistically significant.

Table 4
Correlations Between Subject's Behavior and her Post-Test
Ratings of the Confederates - Difference Scores
Experiment I

Attitudinal Measures	No. of Messages Sent	No. of Compliances All Trials	No. of Compliances Conflict Trials
A	.03	.11	-.01
BE	.20	.15	.14
BD _I	-.04	.12	.09
BD _{II}	-.04	.15	.03
Multiple R	.236	.202	.195

Note - A = Attitude toward the confederates
 BE = Beliefs about the confederates' expertness on the task
 BD_I and BD_{II} = Behavioral intentions, acceptance (I) and
 subordination (II) factors.

Conclusion of Experiment I

In general, the results of this first study were not very encouraging. If anything, the results indicated that attitudinal variables were not predictive of an individual's behaviors. Knowledge of an individual's beliefs about, attitudes toward, and behavioral intentions with respect to a given stimulus person did not provide enough information to allow prediction of the individual's behaviors with respect to that stimulus person.

There also appears to be little support for any of the proposed explanations for the lack of an attitude-behavior relationship. Overall, the results were negative, despite the fact that (1) the attitudinal measures were person-specific and (2) cognitions and conations were assessed in addition to affect. Further, while the feedback manipulation was unsuccessful, correlational analyses did not indicate a significant relationship between behavior and actual or perceived reinforcement.

Although the attitudinal-type variables were not significantly related to the subject's behaviors, there was some evidence that the subject's own behavior as well as her perceptions of the confederates' behaviors did influence her post-test attitudinal ratings of the confederates. That is, to a certain extent at least, the changes in the subject's beliefs that took place during the task were related to her perceptions of the confederates' compliance behaviors and to her own compliance behavior. More specifically, the more a subject perceived the Non-Expert as complying, the more she rated her as an expert and the less a subject complied with the Expert, the less she believed that this confederate was an expert.

While it may be tempting to conclude from the present study that none of the various explanations given for the lack of an attitude-behavior relationship are valid, there remains the possibility that the negative

findings may be due to methodological difficulties. Three problems are of particular importance.

First, in trying to create a situation in which all three attitudinal components (i.e., affect, cognition and conation) could independently contribute to behavioral variance, we also created a situation in which a subject could have ambivalent feelings toward the two confederates. That is, we attempted to create a situation in which the subject would have a positive attitude toward one confederate, but would also believe that she (i.e., the confederate) was not an expert on the task. In contrast, the other confederate was supposed to be disliked and an expert on the task. While these manipulations were not completely successful, they did serve to create a situation where beliefs about expertness were relatively independent of attitudes. Thus a subject's beliefs and attitudes could have influenced her behaviors in different ways, and the failure to find an attitude-behavior relationship might be due to this intra-attitudinal inconsistency.

Second, and perhaps more important, our efforts to completely control and counterbalance the confederates' behaviors may have had undesirable side effects. That is, the confederates' message-sending behavior was probably perceived as "inconsistent," "irrational" and "erratic," since, as we can now see in retrospect, it indeed was. More specifically, the message-sending behavior of the confederates was not task-oriented, and in many cases the messages they sent were "incorrect." Since the communicative behavior of the confederates (and especially that of the Expert) was probably inconsistent with the subject's expectations, it may have created confusion among the subjects. Some evidence for this can be seen in the finding that subjects believed the Expert confederate to be less of an

expert after the task, and in the increase of the subject's intention to subordinate herself to the Non-Expert.

Finally, the lack of support for Doob's behavior theory explanation may be due to the failure of the feedback manipulation and the consequent lack of adequate control of the social reinforcement variable.

It thus appeared desirable to partially replicate and extend the first study, taking into consideration the above mentioned methodological difficulties.

EXPERIMENT II

In Experiment II an attempt was made to establish a non-ambiguous set of positive beliefs, attitudes and behavioral intentions toward one confederate, and a negative set of beliefs, attitudes, and behavioral intentions toward the other. Further, rather than having the amount of reinforcement being contingent upon the subject's communicative behavior, three reinforcement conditions were established. The ratio of reinforcement given by each confederate was predetermined and varied according to condition. Thus, the percent of reinforcement given by the confederates was controlled and did not depend on the subject's communicative behavior. Finally, in contrast to the first experiment, the confederates' message-sending behavior was consistent and task oriented. That is, the confederates always sent "correct" messages.

Method and Procedure

Apparatus and Group Task

In all respects, the apparatus and the group task in this experiment was identical to Experiment I. The only difference was that in the present experiment corner 2, the naive subject's corner, was labeled "A" rather

than "C", since it was desirable that she go first (rather than last) on each trial. However, in terms of the set-up of the triangle board, the naive subject was in the same (middle) position with one confederate's corner being higher and the other confederate's corner being lower than her own.

Subjects

One hundred and one female undergraduates, enrolled in the introductory psychology course participated in the experiment. For reasons to be described 29 of these subjects were omitted from the analyses, leaving a total of 72 subjects.

Confederates

Six female seniors, participating in a social psychology course, were paid to serve as confederates in the experiment. Two of the six took part in each experimental session. While they both pretended to be introductory psychology students, one assumed the role of a Johnson supporter; the other proclaimed to be in favor of Goldwater.⁶ Each confederate was assigned half of the time to one role, half of the time to the other.

Procedure

The experiment was conducted during the last month of the 1964 presidential election. When the naive subject came to the experimental room, she found the experimenter and one of the confederates. The two were introduced and told that a third participant would be coming. The experimenter then indicated that she had to bring some additional materials and left the room. In her absence, the second confederate arrived wearing a big Goldwater button. This provided an excuse for the first confederate to start a political argument, identifying herself as a Johnson supporter. An exchange followed, in which some of the "hot" issues of the campaign were brought up

(nuclear war in Viet Nam, John Birch Society). If the naive subject failed to join the discussion and to take sides, she was asked by one of the confederates what her stand was.

From the moment the subject expressed her political opinion, there was a further development in the role playing: the confederate on whose side the subject had identified herself attempted to appear agreeable and intelligent; the other confederate became aggressive, unpleasant, and foolish. She became particularly aggressive with respect to the other confederate, attacking her and her political views in an extremely violent and nasty manner. (This was done to provide a justification for the lack of cooperation between the confederates which was to follow.)⁷

When the experimenter returned to the room, she introduced the Goldwater supporter to the other girls and, in the same manner as was done in Experiment I, she proceeded to explain the triangle board and the experiment to the participants.

During the explanation, the confederate of the same political opinion as the subject tried to establish herself as an expert in regard to the mechanism of the triangle board by following the procedure established in Experiment I. Similarly, the confederate of the opposed political opinion took the role of the Non-Expert.

To summarize briefly, one confederate played the part of a likeable expert (positive confederate) while the other presented herself as an unpleasant non-expert (negative confederate). These manipulations were designed to create positive beliefs, attitudes, and behavioral intentions with respect to one confederate and negative beliefs, attitudes, and behavioral intentions with respect to the other. At the conclusion of the role-playing manipulation, the group members were asked to complete the

"First Impressions Test" (i.e., the pre-test questionnaire).

Pre-Test questionnaire

This questionnaire was identical to the one used in the previous study with the two following exceptions.

- 1) One belief item was added; i.e., with respect to each confederate, each subject was asked to indicate, "How well did she understand what should be done to balance the triangle board?", by checking the eight-place semantic differential scale ranging from "very well" to "not at all."
- 2) Only the 11 BD scales that loaded highest on the first two factors obtained in the previous study were used.

Subjects who did not rate the positive confederate higher than the negative confederate on all three instruments (i.e., the A Scales, the BD Scales, and the BE Scales) were eliminated from the experiment. On the basis of this criterion, 18 subjects were eliminated. In addition, 7 subjects were eliminated because of suspicions about the naivete of the confederates and 4 subjects had to be eliminated because of technical difficulties. Thus, as mentioned above, a total of 72 subjects were used in the analyses.

The task

Before the participants sat down in their places, the experimenter asked them to turn away while she reset the board in the standard starting position. As in Experiment I, the naive subject was always assigned to the corner in the middle position. The positive and negative confederates were alternated between the high and the low corners. Each group member sent one and only one message on each trial. After receiving the messages, the

subjects had 15 seconds to read the notes they had received and to decide on their move; after which, one by one, each member would make her move (one turn of her handle either right or left or no move at all) and declare what she was doing. The members made their moves in succession, with A starting; since the naive subject was always Member A, she was the first to move on each trial.

The confederates' behavior

Both confederates sent all their notes to the naive subject. Their instructions were always in conflict; if the positive confederate was asking the subject to go left, then the negative confederate kept asking her to go right, and vice versa. (The conflicting messages were actually compatible with the way the triangle board was set up; since the naive subject's corner was put in the middle, it was too low for one of the confederates and too high for the other.) Therefore, on each trial, unless the subject chose to hold, she had to decide whose instructions to follow and whose to disobey.

Regarding the confederates' compliance with the subject's instructions, three reinforcement conditions were established:

- 1) 75%: the positive confederate reinforced (i.e., complied) 75%, and the negative confederate reinforced 25%;
- 2) 50%: both confederates reinforced 50%;
- 3) 25%: the positive confederate reinforced 25%, the negative 75%.

If the confederate was supposed to reinforce the subject 75% of the time, her schedule instructed her to comply with the subject's messages three times out of four; the 25% reinforcer would comply with one out of every four messages that the subject sent her; and in the 50-50% condition,

both confederates complied with two out of every four of the subject's messages. The ordering of compliance within each group of four trials was randomly determined.

In all reinforcement conditions, the confederates were instructed to vary their behavior (i.e., go half of the time left and half of the time right) on all trials on which they did not receive a message.

Post-test questionnaire

This questionnaire included all the items contained in the pre-test questionnaire, plus items concerning the subject's perceptions of the confederates' compliance behaviors, as well as her perception of her own message-sending behavior.

Results and Discussion

As in the previous study, the report of results is divided into four sections.

A. A check on the experimental manipulation

The purpose of the role playing was to establish a general positive attitude toward one confederate and a general negative attitude toward the other. This was achieved in the case of the 72 subjects used in the analyses, all of whom rated the positive confederate higher than the negative confederate on the three attitudinal measures. The three measures were:

- 1) The sum of the five A Scales which constituted a measure of attitude (A).
- 2) The sum of the eleven scales from the Behavioral Differential (BD) which constituted the measure of behavioral intentions.⁸
- 3) The sum of the four Belief Scales (BE) which constituted the measure of beliefs.

These three measures were obtained for each subject, with respect to each of the confederates, before and after the task. The intercorrelations of the measures are presented in Table 5. Regarding only the pre-test part of the table, it can be seen that attitudes correlated better with behavioral intentions than with beliefs; that both correlations were higher for the negative confederate than for the positive confederate; and that behavioral intentions correlated with beliefs only for the negative confederate. Table 5 also demonstrates that the intercorrelations between the pre-test scores were all higher for the negative confederate than for the positive confederate which seems to indicate that the negative confederate created a consistent "all bad" impression, while there was more "within subjects" diversity with respect to the various aspects of the positive confederate's image.

It should be noted that Table 5 has been set up as a multitrait-multimethod matrix (Campbell & Fiske, 1959) with the A Scales, BD, and BE Scales serving as methods and the positive and negative confederates as traits. With the exception of beliefs about the positive confederate on the pre-test, the intercorrelations demonstrate a considerable degree of convergent validity. Further, although there is considerable evidence of discriminant validity as well, a large method bias was found on the A Scales where a correlation of .61 between the ratings of the positive and negative confederates was obtained.

To check whether the various schedules of reinforcement had in fact been established as planned, and had been perceived as such by the subjects, an analysis of variance of the actual and perceived percent of compliance by the confederates in the three reinforcement conditions was

Table 5

Pre- and Post-test Intercorrelations of Subjects' Attitudes (A),
Behavioral Intentions (BD), and Beliefs (BE) regarding
the Positive (PC) and Negative Confederate (NC)

Experiment II

		PRE-TEST						POST-TEST					
		A		BD		BE		A		BD		BE	
		PC	NC	PC	NC	PC	NC	PC	NC	PC	NC	PC	NC
<u>Pre</u>	PC												
	A												
	NC	61											
	PC	50	20										
	BD	NC	12	54	24								
	BE	PC	30	17	08	-11							
<u>Post</u>	NC	18	40	-03	43	18							
	PC	80	54	54	17	30	24						
	A	NC	66	78	31	45	29	45	65				
	BD	PC	42	15	86	11	13	-05	54	23			
	BE	NC	11	43	18	81	-08	43	16	54	10		
	PC	23	06	13	-22	33	04	41	11	37	-20		
	NC	30	38	10	25	22	60	20	51	03	40	11	

Note--N=72; decimal points omitted.

$r_{.05} = .23$

$r_{.01} = .30$

performed. The means can be seen in Table 6. Looking at the columns of actual compliance, it can be concluded that different ratios of reinforcement had in fact been established in the three conditions. Further, these obtained ratios were quite similar to the planned ones (of 75%, 50% and 25%). In this respect, the experimental manipulation was quite successful.

Although there was a tendency to overestimate the compliance of both confederates (the main effect of actual vs. perceived was significant at the .01 level), the accuracy of estimating the positive confederate's compliance differed very little from that of estimating the negative confederate's compliance. But most importantly, the differential compliance behaviors of the confederates within reinforcement conditions were perceived by the subjects; the Confederate X Reinforcement interaction was significant at less than the .01 level and thus, in this experiment, a direct test of the reinforcement hypothesis is possible.

In sum, the experimental manipulations were successful in establishing differential attitudes and reinforcement schedules. Furthermore, the correlations between the three attitudinal-type measures were not found to be so high as to justify omitting any of them when attempting to predict behavior. In particular, the beliefs about expertness could be expected to contribute independent variance to the prediction of behavior.

B. The effect of the experimental manipulations on the subject's behavior

Various analyses were performed to check whether the subjects behaved differently toward the positive than toward the negative confederate and to determine the effect of reinforcement on the subject's behavior.

As in Experiment I, the number of times the subject complied with each confederate constituted one behavioral measure and the number of messages she sent to each confederate was the other.

Table 6
Actual and Perceived Percent Reinforcement
by the Confederates

Experiment II

Condition	Positive Confederate		Negative Confederate	
	Actual	Perceived	Actual	Perceived
75%	75.0	67.9	22.1	46.3
50%	52.9	66.7	46.3	55.4
25%	22.5	46.7	73.3	70.0

Note - Each percentage is based on N = 24 subjects.

75% refers to the condition in which PC obeyed 75% of the time and NC obeyed 25% of the time;

50% refers to the condition in which both PC and NC obeyed 50% of the time;

and 25% refers to the condition where PC obeyed 25% of the time and NC obeyed 75% of the time.

A 3 x 2 x 2 Lindquist Type VI mixed analysis of variance was computed. Only the main effect of "Actual vs. Perceived" was significant ($F_{1,69}=18.03, p < .01$). The "Confederate x Reinforcement" interaction was also significant ($F_{2,69}=38.84, p < .01$).

It was found that the initial tendency was both to write to the positive confederate and to comply with her. Out of the 72 subjects, 49 (68%) wrote their first message to the positive and 23 (32%) to the negative confederate ($Z = 3.33$, $p < .001$). With respect to compliance, 12 subjects (16.7%) "held" on the first trial (i.e., complied with neither confederate). Of the remaining 60, 44 (61.1%) complied with the positive confederate, 16 (22.2%) the negative confederate ($Z = 4.09$, $p < .001$). It is worth noting that these results are almost identical to those obtained in Experiment I.

Over all twenty trials, an average of 10.25 messages were sent to the positive confederate, 9.75 to the negative confederate (non-significant difference). There was a bigger difference in compliance behavior--the positive confederate was complied with on 10.51 trials, the negative on 7.39 ($F_{1,69} = 9.81$, $p < .01$).

In order to test the effect of the reinforcement manipulation on the subject's behavior, four two-way analyses of variance were conducted with "reinforcement" and "position" (i.e., whether the positive confederate was assigned to corner 1 or 3) serving as the independent variables. Similar to Experiment I, the four dependent variables were:

- 1) Number of messages to the positive confederate (since the subject had to write one message on each trial, the number of messages to the negative confederate equalled 20 minus the number of messages to the positive confederate);
- 2) Number of times the subject complied with the positive confederate minus the number of times she complied with the negative confederate;
- 3) Number of times the subject "held"; and
- 4) Number of "wrong" messages.

The analyses of variance revealed no significant main effects for the

confederates' "position." The only significant effect of "reinforcement" was on the number of wrong messages. The average numbers of wrong messages sent were 1.08, 0.29, and 1.96 in the 75%, 50%, and 25% conditions, respectively ($F_{2,60} = 8.51, p < .01$). There were no significant interaction effects.

In contrast to expectations based on Doob's behavior theory analysis, but consistent with the findings in Experiment I, there is no evidence that subjects sent more messages to the positive confederate in the condition where the positive confederate reinforced her 75% of the time than in the condition where the positive confederate reinforced her only 25% of the time. Similarly, the subject did not show any more differential compliance with the positive confederate when the positive confederate reinforced her 75% of the time than she did in the condition where the positive confederate reinforced her only 25% of the time.

The average number of messages sent to the positive confederate was 10.25, which was not significantly different from 10.00, the value to be expected in case of an equal distribution of messages between the two confederates. However, the average difference in compliance with the positive and negative confederate was 3.13, significantly different from 0, the expected value in case of equal compliance with both confederates ($Z = 4.43, p < .001$). Thus, in the present study, although a subject did not send more messages to the positive than to the negative confederate she did comply with the positive more than with the negative confederate irrespective of the amount of reinforcement she received from either of the two confederates. Here then, at least with respect to compliance, it does appear that a subject's behavior was related to her attitudes. It is worth noting that just as amount of reinforcement had no significant effect on

communicative or compliance behaviors, it also had no effect on the number of times the subject chose not to comply with either confederate (i.e., to "hold").

Thus, in contrast to our expectations, but consistent with the previous findings, the reinforcement manipulation had little or no influence on the subject's behavior. The subjects did not send significantly more messages to the confederate who was reinforcing 75% nor did they comply more with her. Also consistent with findings in Experiment I, the subjects initially wrote to the positive confederate more and complied more with her. However, in the present experiment the subjects continued to comply with the positive more than with the negative confederate throughout the experiment, although again they did not continue to send her more of their messages. Thus, at least with respect to the subject's own compliance, attitudes did appear to have some influence on her behavior.

C. The correlational prediction of behavior from attitudes, beliefs and behavioral intentions

Table 7 presents the correlations between the differences in the pre-test ratings of the positive and the negative confederate on the A Scales, the BD and the BE Scales, and the differences in subjects' communicative and compliance behaviors toward the confederates over all reinforcement conditions.⁹ In contrast to our expectations, but consistent with our previous findings, the correlations were non-significant. It can again be seen that the simultaneous consideration of all the attitudinal measures did not produce a significant increment in behavioral prediction (i.e., the multiple correlations were also non-significant).

Once again, however, it should be noted that, while these findings are quite discouraging from an attitudinal point of view, they are not unexpected

Table 7
Correlations Between Pre-Test Attitudinal Measures
and Subject's Behaviors - Difference Scores
Experiment II

Attitudinal Measures	Subject's Behavior	
	No. of Messages Sent	No. of Compliances
A	-.11	.13
BE	-.05	.16
BD	-.18	.06
Multiple R	.181	.186

Note - All correlations are non-significant (N = 72).

A = Attitude toward the confederates
BE = Beliefs about the confederates' expertness
BD = Behavioral intentions toward the confederates.

from Doob's behavior theory explanation of the attitude-behavior relationship which suggests that the subject's own behavior is related to the compliance (i.e., reinforcement) by the confederates. As demonstrated above, the results of the analyses of variance did not support this notion. However in order to further investigate the reinforcement hypothesis, correlations between the subject's own behavior and the actual and perceived compliance by the confederates were calculated. Consistent with the findings in Experiment I, the subject's own compliance and message-sending behaviors were found to be unrelated to the confederates' actual compliance behaviors ($r = .016$ and $-.119$, respectively) or the subjects' perceptions of these behaviors ($r = .199$ and $-.081$, respectively).

Thus, not only was there again no evidence for any systematic relationship between attitudinal and behavioral variables, but there also seems to be little or no support for Doob's behavior theory explanation of this lack of relationship.

D. The effects of the task on the subject's beliefs, attitudes, and behavioral intentions

T-tests were computed to determine whether the subjects rated the two confederates differently after the task than before. Separate analyses were performed for the positive confederate and the negative confederate on each of the three attitudinal measures (A, BD, and BE). On all three measures, the post-test ratings of the positive confederate were significantly lower than the pre-test ratings ($t_{71} = 6.96, 3.04, \text{ and } 5.68$ for A, BD, and BE, respectively, $p < .01$ in all cases). For the negative confederate, the post-test ratings were significantly higher than the pre-test ones on all three measures (for A, $t_{71} = 2.21, p < .05$; for BD, $t_{71} = 3.99, p < .01$; and for BE, $t_{71} = 4.88, p < .01$). Thus, subjects were significantly less

favorable toward the positive confederate and significantly more favorable toward the negative confederate after the task than they were before the task.

In order to assess whether these changes were related to the confederates' behavior on the task, correlations between the confederates' actual and perceived compliance with the subject and the changes in the subject's pre- to post-test beliefs, attitudes and behavioral intentions with respect to each confederate were computed.¹⁰ Of these 12 correlations, 3 were found to be significant. Specifically, changes in attitude toward the positive confederate were related to the actual ($r = .356, p < .01$) and perceived ($r = .406, p < .01$) percent of compliance by the positive confederate while changes in the expertness ratings of the negative confederate were related to the subject's perceptions of the negative confederate's compliance ($r = .346, p < .01$). This latter finding is consistent with the results of Experiment I.

Cognitive bolstering was again investigated by correlating the subject's own behaviors toward the confederates with the changes in her pre- to post-test beliefs, attitudes, and behavioral intentions with respect to each confederate. Consistent with the findings of Experiment I, there was only limited evidence for a cognitive bolstering effect. Once again only changes in beliefs about the positive confederate were significantly related to the subject's own compliance behavior. The less the subject complied with the positive confederate, the more she changed (in an unfavorable direction) her beliefs about the expertness of the positive confederate ($r = .335, p < .01$).

Thus, the evidence of Experiments I and II consistently indicated that some of the subject's attitudinal ratings were influenced by the behaviors

of the confederates as well as by her own behavior. Specifically, the negative confederate's compliance affected the subject's beliefs about that confederate's expertness while the subject's own compliance with the positive confederate influenced her beliefs about that confederate.

Once again, as a final analysis, we examined the degree to which these changes in subject's ratings of the confederates were in the direction of increased attitudinal-behavioral consistency. That is, we looked at the postdiction of the subject's behavior from the post-test ratings of the confederates. These correlations are presented in Table 8. There it can be seen that the subject's post-test beliefs and attitudes were now significantly related to her compliance behavior,¹¹ although there was no relation between the three attitudinal variables and the subject's communicative behavior. Consistent with previous findings, the simultaneous consideration of cognition, conation, and affect did not greatly improve behavioral prediction although, as can be seen in Table 8, the multiple correlation with compliance was significant.

Conclusion of Experiment II

In conclusion, this experiment, like the previous one is not very encouraging from an attitudinal point of view. Although some evidence was obtained which indicated that the establishment of differential beliefs, attitudes, and behavioral intentions did have some influence on behavior (i.e., the subjects did obey the positive confederate significantly more than the negative confederate), this influence seemed to be one of "kind" rather than degree (i.e., although the subjects did comply with the positive confederate more than with the negative confederate, their pre-test beliefs, attitudes, and behavioral intentions toward the confederate were not

Table 8
Correlations Between Post-Test Attitudinal
Measures and the Subject's Behaviors

Attitudinal Measures	Subject's Behavior	
	No. of Messages Sent	No. of Compliances
A	-.08	.26 [*]
BE	-.22	.32 ^{**}
BD	-.19	.15
Multiple R	.257	.345 [*]

^{*} p < .05

^{**} p < .01

Note - N = 72.

A = Attitude toward the confederates
BE = Beliefs about the confederates' expertness
BD = Behavioral intentions toward the confederates.

correlated with their behaviors).

Generally speaking, then, the results of the first two experiments indicate that knowledge of a person's attitudes toward some object does not allow one to predict the way the person will behave with respect to that object. These findings are clearly problematic. In contrast to previous studies that failed to obtain a significant attitude-behavior relationship, the present experiments cannot be criticized on the grounds that they failed to measure attitudes toward appropriate objects (i.e., that they measured attitudes toward the class in which the attitude object is a member rather than toward the attitude object per se), or on the grounds that they did not take beliefs and behavioral intentions into account. Both experiments provided strong support for the convergent and discriminant validities of the measures of beliefs, attitudes and behavioral intentions. Despite the relative independence of these variables, their simultaneous consideration did not improve behavioral prediction.

While there was no evidence that the subjects behaved in accordance with their beliefs, attitudes, or behavioral intentions we did find some indication that they tended to bring these attitudinal-type variables into line with their experiences in the group-task situation. That is, the subjects changed their ratings of the confederates in a manner that reflected their perceptions of the compliance by the confederates and/or the subject's own compliance with the confederates. Thus, while beliefs, attitudes, and behavioral intentions had, at best, only a gross effect on behavior, the subject's own behavior and her perceptions of the confederates' behaviors seemed to significantly and systematically influence her attitudinal ratings.

Finally, the third proposed explanation of the lack of attitudinal-

behavioral relationship (i.e., Doob's behavior theory explanation) was also not substantiated. There was little evidence to support the notion that subjects behaved more favorably toward the person they perceived as more reinforcing, and as was shown in Experiment II, differential reinforcement did not significantly influence an individual's behaviors. Further, in neither experiment did the evidence indicate that reinforcement served to moderate the attitude-behavior relationship in any systematic fashion.

At this point, then, we are left with the rather unhappy conclusion that it may not be possible to predict behavior from attitudinal variables, or at least not from the kinds of attitudinal variables that we have traditionally measured. Indeed, psychologists have been investigating the attitude-behavior relationship for more than 75 years with practically no success. In general, this lack of success has been attributed to our attitudinal measures (e.g., they are not appropriate, they are not complete). Yet at the same time, we have come to view behavior as a highly complex phenomenon with many determinants. For example, many investigators have recognized the importance of situational, normative, personality and "other" types of variables as determinants of behavior. Yet most attitudinal studies, or theoretical treatments of attitude, have not dealt with these factors explicitly. Indeed, these other variables have usually been viewed as sources of "error" variance. That is, most investigations of attitude (like our own first two experiments) have generally started out with the assumption or hypothesis that some particular behavior of an individual with respect to some object is a direct function of his attitude toward the object and other factors are viewed as noise in the system. Clearly, if behavioral prediction is to be possible, this larger constellation of behavioral determinants will have to be taken into account. The remainder

of this monograph is concerned with the presentation and the test of a theory that attempts to integrate these other determinants into a coherent framework.

A New Approach to the Attitude-Behavior Relationship

The theory to be presented can best be seen as an extension of Dulany's (1967) theory of propositional control to social behavior. Although Dulany's theory has largely been developed within the context of studies of verbal conditioning and concept attainment, it is essentially a theory that leads to the prediction of overt behavior. More specifically, Dulany has been concerned with predicting the probability with which an individual will make a particular verbal response or class of verbal responses. The central equation of the theory can be expressed as follows:

$$B : BI = [(Rhd) (RSv)] w_0 + [(BH) (Mc)] w_1$$

where: B = behavior;
 BI = the subject's intention to make a particular response or class of responses;
 Rhd = a "hypothesis of the distribution of reinforcement," i.e., the subject's hypothesis that the occurrence of the particular response will lead to a certain event or class of events;
 RSv = the affective value of the reinforcement, i.e., the subject's evaluations of those events;
 BH = the subject's "behavioral hypothesis," i.e., his belief as to what he is expected to do, or what he should do in the situation;
 Mc = the subject's "motivation to comply," i.e., how much the subject wants to do what he believes is expected of him; and
 w_0 and w_1 = empirical weights which may take any value.

Two additional points about the theory should be mentioned:

(1) According to the theory, behavioral intention is the immediate antecedent of overt behavior. Unlike the general types of behavioral intentions that we used in our first two studies and that most attitude researchers (e.g., Triandis, 1964; Triandis et al., 1967) have been

concerned with (e.g., intentions to marry, to show social distance, to subordinate, to accept as a friend), Dulany has introduced a more precise and specific type of behavioral intention--namely, an individual's intention to perform a given action in a given situation. That is, the intention refers directly to the particular overt response one wishes to predict. Because of this close correspondence between the measure of the behavioral intention and the actual behavior, their correlation should be almost perfect. Thus, if one can predict the specific behavioral intention, one may, with only slightly attenuated accuracy, predict overt behavior. It must be emphasized, however, that these near perfect correlations between behavioral intentions and behavior are only obtained, and are only expected, when one considers an individual's intention to perform a specific act in a specific situation. The more abstract or generalized the intention becomes, the lower will be its correlation with a specific behavior. Some additional factors influencing the behavioral intention-behavior correlation will be discussed below.

(2) As can be seen above, the algebraic expression of the theory takes the form of a linear multiple regression equation. That is, [(RHD) (RSv)] is viewed as one component influencing behavioral intentions and [(BH) (Mc)] is seen as a second component. The precise weights to be given these two components as determinants of behavioral intentions within a given situation must be determined by standard multiple regression procedures.

In a recent paper, Fishbein (1967) has extended this theory to social behavior. More specifically, according to Fishbein, an individual's intention to perform a specific act, with respect to a given stimulus object, in a given situation, is a function of:

- (1a). B_1 --his beliefs about the consequences of performing a particular behavior (in a given situation), i.e., the probability or improbability that the performance of behavior x will lead to some consequences y_1 ;
- (1b). a_1 --the evaluative aspect of B_1 , i.e., the subject's evaluation of y_1 ;
- (2a). NB --a normative belief, i.e., the subject's belief about what "others" expect him to do or say he should do in this situation;
- (2b). Mc --his motivation to comply with the norm, i.e., his desire, or lack of desire, to do what "others" think he should do.

Thus, in Fishbein's adaptation of Dulany's theory, RHd (the hypothesis of the distribution of a reinforcer) is conceptualized as being analogous to an individual's beliefs about the consequences of performing a specific behavior, and RSv (the affective value of the reinforcer) is conceptualized as being equivalent to the evaluative aspects of those beliefs. It is interesting to note that this conceptualization redefines the first component of Dulany's theory [$(RHd) (RSv)$] as a measure of attitude. That is, as was pointed out earlier (see p. 2) the work of Rosenberg (1956, 1965), Zajonc (1954), Fishbein (1963, 1965b, 1967a, 1967b), and others has provided strong evidence that an individual's attitude toward any object can be predicted from a knowledge of the individual's beliefs about the object and the evaluative aspects of those beliefs.

It must be emphasized, however, that the attitude under consideration in the present theory is an attitude toward performing a given behavioral act, and is not an attitude toward a given object, person, or situation. The algebraic formula presented on page 2 leads to the hypothesis that an individual's attitude toward any object is a function of the individual's beliefs about that object. In the present analysis, we are concerned with an individual's beliefs about the performance of a given behavioral act, and thus the attitude being assessed is the individual's attitude toward

the performance of that act. More specifically, from the point of view of Dulany's theory, we should be assessing the individual's beliefs about what will happen if he performs behavior X with respect to stimulus Y in situation Z, and the evaluative aspects of those beliefs, i.e., we should be assessing the individual's attitude toward the performance of a given act, with respect to a given stimulus object, in a given situation. Although these beliefs may vary considerably as a function of the stimulus object (e.g., the person) toward which the act is directed and the situation in which the act is to occur (e.g., in public or in private), these beliefs are still beliefs about the performance of the act, and not beliefs about the stimulus object or the situation.

Turning to the second component of Dulany's theory [(BH) (Mc)], it can be seen that BH (the behavioral hypothesis) has been conceptualized as a normative belief, i.e., a belief about what others expect or say should be done in the situation. Of course, the potential reference groups or individuals whose expectations are perceived to be relevant will vary with the behavioral situation. Thus, while in some instances the expectations of a person's friends or family may be most relevant, in others it may be the expectations of his supervisors or even the society at large which are most influential.

The final element in the equation (Mc--an individual's motivation to comply) is self-explanatory. Here we are concerned with the degree to which the individual "wants" to comply with the norm. Clearly, if two or more norms are considered (i.e., if the expectation of more than one "other" is considered), it will be necessary to measure the individual's motivation to comply with each of them.

Returning to the central hypothesis, it can be seen that in its adapted

form, the theory essentially leads to the prediction that an individual's intention to perform any behavior (and his actual performance of the behavior) is a function of (1) his attitude toward performing the behavior (A-act), and (2) the norms governing the behavior in that situation (NB) weighted by his motivation to comply with those norms (Mc). Algebraically, this can be expressed as follows:

$$B \approx BI = [A-act] w_0 + [(NB) (Mc)] w_1$$

Thus the present approach suggests a radical change in investigating and understanding the attitude-behavior relationship. Instead of assuming some underlying relationship between an individual's attitude toward a given object and his behavior with respect to the object, the proposed theory recognizes the importance of situational variables, norms, and motivation, as factors influencing behavior. Rather than viewing attitude toward a stimulus object as a major determinant of behavior with respect to that object, the theory identifies three kinds of variables that function as the basic determinants of behavioral intentions (and thus behavior): (1) attitudes toward the behavior; (2) normative beliefs; and (3) motivation to comply with the norms.

Thus, it can be seen that, according to the theory, there are two major factors influencing behavior: first, there is a personal or attitudinal influence; and second, there is a social or normative influence. However, it must again be emphasized that the attitudinal component is very different from traditional considerations of attitude since we are here concerned with an attitude toward performing a specific behavior in a given situation, rather than with an attitude toward a person, object, value, or institution.

The relative weights put on these two components are empirically determined. That is, we expect that the relative importance of the two

components will systematically vary across types of behavior and across different individuals. More specifically, it seems quite reasonable to assume that certain types of behavior will be more under the influence of attitudinal considerations than normative ones, while the opposite should be true of other types of behaviors. Similarly, we would expect some types of people to be more under the influence of normative considerations than others.

Although the theory suggests that other variables can also influence behavior, it indicates that these "external" variables operate indirectly, i.e., by influencing either of the two components or their relative weights. Thus, situational variables, personality characteristics or traditional attitudinal variables should influence behavioral intentions, and hence behavior if, and only if, they affect either A-act, the attitude toward the particular act, NB (Mc), the normative beliefs concerning the act multiplied by the motivation to comply, or the relative weights of these components. However, even when some external variable is found to be correlated with one of the two components, it would still be unrelated to behavior if that component carried little or no weight in the determination of behavioral intentions and thus behavior per se.

With regard to the attitudinal measures toward a given person which were of most importance in the present series of studies, it should be fairly clear that there is no necessary relation between these measures and any of the variables in the model. For example, while it is true that in some situations the consequences of communicating to or complying with a liked person may be very different from the consequences of performing the same behaviors vis a vis a disliked person, it is equally true that in other situations these behaviors will lead to the same consequences irrespective of who the stimulus person is. In the former case, some correlation between

our traditional measure of attitude and behavior might be obtained, while this is quite unlikely in the latter case. A similar argument can be made for the second component. Clearly, there are some situations in which the expectations for communicative and compliance behaviors would be very different toward a liked person than toward a disliked one, yet in other situations one is expected to behave the same way irrespective of his affective feeling toward the person. Once again, some attitudinal-behavioral relationship might be obtained in the former case, but it is quite unlikely in the latter case.

Along these same lines, it can be seen that variations in the situation may also influence one or more of the primary determinants of behavior. Clearly, an individual may have quite different beliefs about the consequences of communicative or compliance behaviors if, for instance, the interdependence of the subjects at the triangle board were to be varied. Similarly, we would expect that the individual would have different normative beliefs for these different situations. Here too, however, it must be noted that if the the situational variables that are being considered do not influence the individual's attitude toward the act, or his normative beliefs, or his motivation to comply with these norms, then, according to the theory, they will not influence his behavior. Indeed, one of the advantages of the theory is that it provides an explanation for a large number of results that may initially appear inconsistent. That is, from the point of view presented here, one would expect a considerable amount of variation in the relationship between any variable external to the model and behavior.

Clearly then, if this theory is valid, there seems to be little basis for continuing the search for attitudinal-behavioral consistency, at least

when traditional attitude scores are considered. Thus, let us now turn to the question of the validity of the theory.

EXPERIMENT III

The purpose of our final experiment was to test the above theory in a situation in which a traditional attitude approach had twice failed. Using this theory, an attempt was made to predict communicative and compliance behaviors on the triangle-board task under two different environmental conditions. Before considering the results, however, it is desirable to review the method and procedures of the final experiment since there are some important differences between this experiment and the previous ones.

Method and Procedure

One major difference in this final experiment was that confederates were not used. Since the previous manipulations of beliefs, attitudes, and general behavioral intentions showed relatively little systematic influence on behavior, and since the training and use of confederates is time-consuming and costly, three naive subjects were used in each group. In addition, we still had a somewhat nagging feeling about the possible artificiality of the situation that might have been produced by the confederates' programmed compliance behaviors. Thus, in this experiment, the behaviors of all three members was "task-oriented" and "meaningful."

A second difference is that the subjects in the present experiment were males, while female subjects were used in the two previous studies. However, a series of pilot studies indicated that there were no significant differences between the behaviors of males and females on this task.

Finally, a new task structure was introduced. It will be recalled that, according to the theory, any such situational variable external to the

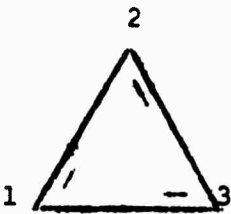
model will influence behavior only if it affects one or both of the model's predictors (i.e., A-act or NB X Mc). We felt that by manipulating the interdependence of the group members, we could vary the subject's beliefs about the consequences of communicating and complying with the other group members without influencing their beliefs about the expertness of the other members or their attitudes toward them.

Specifically, in the first two studies, the spirit levels on the triangle board were set up in such a way that each subject had no information about the relative position of his own corner, but he did have information about the relative positions of the corners of the other two group members. In terms of accomplishing the group task then, the subject was equally dependent upon the other two members for information about his own corner, and he could accomplish the group goal equally well by communicating with either group member. Thus, other things being equal, he should believe that the consequences of communicating or complying with either group member are essentially the same. Following Raven and Shaw (1970) this task structure will be referred to as the "bidependent condition."

By fixing the position of the spirit level such that it is parallel to the left side of the board near the subject, the whole situation is radically changed. Looking at Figure 2, it can be seen that the subject now has information about his own corner (e.g., corner 1) and corner 2, but he has no information about the relative position of corner 3. It therefore makes little sense for him to communicate to corner 3. However, since the person at corner 2 knows nothing about the subject's corner while the person at corner 3 does, the subject should believe that complying with the latter will lead to better consequences than complying with the

Figure 2

Triangle Board Task - Uniddependent Condition



Corner	Position	Spirit Level provides info. about corners	Correct Messages to		
			1	2	3
			(Lower)		
1	High	1, 2	-----	Raise	-----
				(Lower)	
2	Middle	2, 3	-----	-----	Raise
					(Raise)
3	Low	3, 1	Lower	-----	-----

Note - The "instructions" in parentheses indicate the information provided about each position by its own spirit level.

former. Thus, the subjects should have differential beliefs about the consequences of communicating and complying with the two group members and hence different attitudes toward these acts. Again following Raven and Shaw (1970), this task structure will be referred to as the "unidependent condition." It should be recalled that no such differences vis a vis the two group members are expected in the bidependent condition.

In contrast, there is no reason to assume that the subject's attitudes toward his two group members or his beliefs about their expertness will differ between conditions. Thus, while the two conditions are expected to produce marked differences in A-act, NB(Mc), and BI as well as actual behavior on the task, we do not expect them to be related to our traditional attitudinal measures. However, because of the differences between the present experiment and the previous ones, it will be necessary to demonstrate that, at least with respect to our traditional measures, the findings in this study replicate our earlier ones.

Generally speaking, the procedure followed in this experiment was similar to that used in the earlier studies. One hundred and forty-four (144) male undergraduate students participated in 48 three-person groups. As mentioned above, no attempt was made to manipulate the beliefs about expertness or the attitudes each subject held toward the other two members of his group. The subjects were randomly assigned to the three corners of the board. Just as in the preceding experiments, one corner was at a high, one corner was at a low, and one corner was at an intermediate position. With regard to the positions of the spirit levels, the two conditions described above were used (i.e., in the bidependent condition the levels were set parallel to the opposite side of the triangle board while in the unidependent condition the levels were parallel to the left adjacent side of

the triangle board). Twenty-four groups were assigned to each condition.

The groups in both conditions were given exactly the same instructions. The operation of the triangle board, of the spirit levels, and the task were explained; each group was given 10 test trials in order to get used to the procedure and the group members had an opportunity to ask questions. The subjects then completed the pre-test questionnaire.

In the meantime the board was reset to the standard starting position; the subjects were then given 20 trials to balance the board. At the conclusion of the 20 trials they were asked to complete the post-test questionnaires. The subjects were told to complete the questionnaires as carefully as possible but not to spend much time on any one question. The instructions for the post-test questionnaires required the subjects to imagine that they had to do the experiment all over again. Having had more experience on the task, what would be their present opinions.

The pre-test questionnaire. The questionnaire administered immediately after the 10 practice trials included the following measures taken with respect to each of the subject's other two group members. (The person sitting on the subject's left will be referred to as Member 1 and the person sitting on his right will be called Member 2.)

1. Traditional Attitudinal Measures

- a. A--The subject's attitude toward the other members was assessed exactly as in Experiments I and II, except that the semantic differential-type scales had 7 rather than 8 intervals. The potential range of A is thus 5 to 35.
- b. BE--Belief about expertness. A single semantic differential scale scored from 1 to 7 was used to measure the subject's beliefs about the expertness of Members 1 and 2. More specifically, the subject was

asked to indicate "How competent do you think Member ____ is on the triangle board task?" on a seven-point scale ranging from "very competent" to "very incompetent."

2. Measures Required by the New Approach

- a. A-act--The subject's attitude toward communicating and complying with each of his coworkers. The sum of four, seven-place semantic differential-type scales (i.e., good-bad; foolish-wise; harmful-beneficial; and rewarding-punishing), scored from 1 to 7 served as an index of A-act. More specifically, the subject was asked to rate the following concepts on these scales.

- (1) "Sending instructions to Member ____ is"; and

- (2) "Following the instructions of Member ____ is".

The potential range of the A-act scores was thus 4 to 28.

- b. NB₁ and Mc₁. The subject's perceptions of Member 1's expectations about the subject's communicative and compliance behaviors, and the subject's motivation to comply with these expectations. The measures of normative beliefs were taken on 7-place "probable-improbable" scales. Specifically, the subject was asked to indicate how probable it was that Member 1 (i.e., the member on his left) expected him to (1) send instructions to (a) Member 2 (i.e., the member on his right) and (b) himself (i.e., Member 1); and (2) follow the instructions of (a) Member 2 and (b) himself. After each set of questions (i.e., the two about sending instructions and the two about following instructions) the subject was asked to indicate how much he wanted to do what Member 1 expected him to do, by checking a 7-place scale ranging from "want very much to" to "want very much not to."
- c. NB₂ and Mc₂. The subject's perceptions of Member 2's expectations with regard to the subject's communicative and compliance behaviors

and the subject's motivation to comply with these expectations.

The measures taken were equivalent to those of NB_1 and Mc_1 but were now concerned with the second member's expectations.

- d. NB_E and Mc_E . The subject's perception of the experimenter's expectations with regard to the subject's communicative and compliance behaviors and the subject's motivation to comply with the experimenter. The measures were again equivalent to NB_1 and Mc_1 , this time with respect to the experimenter.
- e. BI. Behavioral intentions with regard to the communicative and compliance behaviors. The subject specified the number of messages he intended to send to each of the other group members and the number of times he intended to comply with each in a block of 10 trials.

3. Additional Measures

- a. U-act. A belief about the utility of an act. This measure provides an estimate of the subject's attitudes toward communicating and complying with each of his co-workers based on his beliefs that performing these acts will lead to good or bad consequences. Specifically, the subject indicated the degree to which he believed that giving instructions to each member and following the instructions of each member "will lead to" or "will hinder getting the board balanced," by checking a 7-point scale.
- b. B-turning. A measure was taken of the subject's beliefs as to how he should manipulate his handle. The subjects were asked to be specific, indicating the number of times they thought they should turn their handle to the left, to the right, or hold it. The importance of this measure will shortly become apparent.

The post-test questionnaire. The questionnaire administered immediately after the 20 trials of the experiment included exactly the same measures as the pre-test questionnaire. In addition, and consistent with our earlier studies, each subject was also asked to indicate the number of times he sent messages to and received messages from each of the other group members (perceived number of messages sent by self and by others) and the number of times each of the other members complied with his messages (perceived amount of compliance by others).

C. Some derived scores

- a. $\Sigma NB(Mc)$. Separate products of NB and Mc were computed for each coworker and for the experimenter, i.e., $NB_1(Mc_1)$, $NB_2(Mc_2)$ and $NB_E(Mc_E)$, and those products were summed.
- b. Perceived % compliance by the other members. The subject's perception of the number of times that Member 1 complied with him divided by his perception of the number of messages he sent to Member 1. A corresponding ratio was computed with respect to Member 2.
- c. Index of Incompatibility (II). The discrepancy between the instructions the subject received from each of his two members and his own belief as to how the handle should be turned (B-turning). A score was first computed for instructions, giving a weight of +1 to an instruction asking the subject to turn his handle to the right, 0 for "hold," and -1 for "left." The same weights were applied to the subject's B-turning. The absolute difference between the resulting scores was taken as an Index of Incompatibility. Separate indices were constructed for the pre-test (II_1) and the post-test (II_2).

For example, if a subject received 17 instructions from his right member, 4 asking him to turn his handle to the left, 3 to hold

it, and 10 to turn it to the right, the score for instructions was +6. If his B-turning was that he should turn his handle to the left on all 20 trials, the subject received a score of -20 for B-turning. The incompatibility score for this subject with respect to the instructions which he received from his right member was the absolute difference; i.e., 26. These measures were obtained only for the last 24 groups, 12 in each situational condition; that is, for a total of 78 subjects.

Task behavior (B). As in our previous studies, the two main dependent variables were the number of messages the subject sent to each group member and the number of times he complied with the instructions of each of his coworkers.¹²

Results

The Traditional Approach

As was mentioned above, the various changes introduced in the third experiment make it necessary to first investigate the degree to which a traditional attitudinal approach can lead to behavioral prediction. Since both previous experiments indicated a high correlation between attitude and the general measure of behavioral intentions, and since measures of specific behavioral intentions were required for the new approach, only the traditional measures of attitudes (A) and beliefs about expertness (BE) were obtained in the present study. Consistent with previous reports of results, the discussion will be presented in four sections.

A. A check on the experimental manipulations

Since no attempt was made in the present study to manipulate the subject's beliefs about, or attitude toward, his coworkers, we would expect to find no

differences in his ratings of them in either of the two experimental conditions of interdependence. Support for this expectation may be found in Table 9 where the mean attitude and expertness ratings of each coworker are given for each condition. These scores were submitted to two-way analyses of variance in which "Condition" was the first main effect and "Member" was treated as the second, repeated measures, factor. It can be seen that no significant differences or interactions were found.

Table 10 presents the intercorrelations of attitudes and beliefs with respect to each group member, for both the pretest and the posttest. The table has again been set up as a multitrait-multimethod matrix (Campbell & Fiske, 1959) and it shows that in the present experiment, where no attempt was made to manipulate the subject's beliefs or attitudes, these two variables were more highly intercorrelated than in the two previous studies, particularly on the posttest. While the two measures showed a good deal of convergent validity, it is worth noting that the measure of belief again had considerably more discriminant validity than had the measure of attitude. Thus, we might still expect that some increment in behavioral prediction could be obtained by simultaneously considering both traditional attitudinal variables.

Since confederates were not used in the present experiment, we had no control over either the message sending or compliance behaviors of the subject's two coworkers. However, the two experimental task structures were expected to systematically influence their behaviors.

Specifically, while we expected no differences in the coworkers' message-sending or compliance behavior in the bidependent condition, we did expect major differences in the unidependent condition. Because of the positioning of the spirit levels in the unidependent condition we expected Member 2 (the coworker on the subject's right) to send more messages to the

Table 9

Group Means of Subject's Attitudes Toward (A) and
Beliefs About the Expertness (BE) of the
Two Members and Analyses of Variance Results

Experiment III

	Group Means				Analyses of Variance		
	Bidependent Member 1	Condition Member 2	Unidependent Member 1	Condition Member 2	F Condition	F Member	F Interaction
A	26.14	25.57	26.25	26.01	.572	3.854	1.321
BE	5.19	5.14	5.70	5.25	.596	.038	1.387

Note - The F values are based on two-way analyses of variance with "Condition" as a between-subjects factor and "Member" treated as a repeated measures factor; df = 1 and 142.

Table 10

Pre- and Post-Test Intercorrelations of Subjects' Attitudes (A)
and Beliefs (BE) Regarding Members 1 and 2

Experiment III

		Pre-Test				Post-Test			
		A		BE		A		BE	
		Member 1	Member 2	Member 1	Member 2	Member 1	Member 2	Member 1	Member 2
P	Member 1	---							
R A									
E	Member 2	.72	---						
T									
E	Member 1	.40	.17	---					
S BE									
T	Member 2	.29	.55	.39	---				
P	Member 1	.59	.46	.44	.36	---			
O A									
S	Member 2	.55	.64	.34	.54	.65	---		
T									
T	Member 1	.22	.17	.46	.31	.57	.32	---	
E BE									
S	Member 2	.13	.34	.26	.53	.24	.61	.33	---
T									

Note - N = 144

$$r_{.05} = .17$$

$$r_{.01} = .22$$

subject than Member 1, while Member 1 should comply with the subject more than Member 2.

The results presented in Table 11 confirm these expectations. Looking at the columns of actual behavior, it can be seen that in the bidependent condition there were only slight differences between the communicative and compliance behaviors of the subject's two coworkers. The "Member" factor in an analysis of variance showed these differences to be non-significant. In the unidependent condition, however, the behaviors of the two coworkers differed as predicted; Member 2 sent significantly more messages to the subject than did Member 1,¹³ while Member 1 complied more with the subject than did Member 2.

Table 11 also shows that the subjects were not very far off in their perceptions of the behaviors of the two coworkers, although the analysis of variance indicated that in the bidependent condition these differences were statistically significant. That is, consistent with our previous findings, the subjects in this condition overestimated the compliance behaviors of both their coworkers.

In general, it can be seen that, within limits, the use of three subjects instead of a single subject and two confederates, did not greatly affect the nature of the task in our standard bidependent condition. A subject's beliefs about and attitudes toward his two coworkers were essentially equivalent (Table 9) and the two coworkers behaved in a similar fashion toward the subject (Table 11). They each sent the same number of messages to the subject and each tended to comply with approximately 75% of the subject's instructions. Further, the subject's perceptions of the behaviors of his coworkers were quite veridical.

A subject's beliefs about and attitudes toward his two coworkers were also very similar in the unidependent condition (Table 9). As expected, however, here the subjects received significantly more messages from Member 2 (their

Table 11

Group Means of the Actual (A) and Perceived (P)
Behavior of the Two Members and Analyses of Variance Results

Experiment III

Bidependent Condition	GROUP MEANS				Analysis of Variance		
	Behavior of Member 1		Behavior of Member 2		F Member	F A vs P	F Interaction
	Actual	Perceived	Actual	Perceived			
No. of messages S received	9.888	8.861	10.194	8.764	.020	18.094*	.341
No. of compliances by members	8.097	8.806	7.722	8.681	.073	11.980*	.188
% compliance by members	77.411	85.212	72.066	84.245	.846	14.671*	.856
Unidependent Condition							
No. of messages S. received	2.319	2.833	17.667	16.444	382.347*	2.897	8.153*
No of compliances by members	12.389	12.542	1.722	1.833	195.941*	.160	.003
% compliance by members	70.495	70.022	31.448	29.113	61.658*	.275	.146

Note - The F values are based on two-way analyses of variance where both factors were treated as within-subjects factors since they represented repeated measures on the same subjects; df = 1 and 142.

* p < .01

right partner) than from Member 1, and they were obeyed more by Member 1 (their left partner) than by Member 2 (Table 11). Here, too, the subject's perceptions of his partners' behaviors tended to be quite veridical.

Thus from a traditional attitudinal point of view, we would expect the subject's behavior in the two conditions to be quite similar. That is, since the subject's attitudes toward his two coworkers were almost equivalent in both conditions, these attitudes should lead to similar behaviors in both conditions. From a reinforcement point of view, however, we would expect very different behaviors in the two conditions. While the subject should be equally likely to send his messages to (or to comply with) either coworker in the bidependent condition (they both reinforced him equally) he should be much more likely to send his messages to Member 1 in the unidependent condition. Similarly, it might also be expected that he would comply more with Member 1 in this condition.

B. The effect of the experimental manipulations on the subject's behavior.

As in our previous two studies, various analyses were performed to check whether the subjects behaved differently toward Members 1 and 2, and to determine the effect of the situational variation on the subject's behavior. Table 12 presents the mean number of messages the subject sent to each of his coworkers and the mean number of times he complied with the requests of his coworkers in each condition. Two-way analyses of variance were performed on these variables; the two main effects were "Condition" and "Member." The "Member" factor was a "within subjects" factor since it represented repeated measures on the same subjects. The results of these analyses are also given in Table 12.

The main reason for including two situational conditions in the present experiment was the expectation that these conditions would produce different

Table 12

Group Means of Subject's Behavior Toward the Two
Members and Analyses of Variance Results

Experiment III

Subject's Behavior	GROUP MEANS				ANALYSES OF VARIANCE		
	Bidependent		Unidependent		F	F	F
	Condition	Condition	Condition	Condition	Condition	Member	Interaction
	Member 1	Member 2	Member 1	Member 2			
Number of messages sent	10.208	9.792	17.681	2.318	.000	129.251*	116.131*
Number of Compliances	7.736	8.111	1.736	12.361	2.011	74.698*	70.458*

Note - The F values are based on two-way analyses of variance with "Condition" as a between-subjects factor and "Member" treated as a repeated measures factor; df = 1 and 142.

* p < .01

behaviors without affecting traditional attitudinal measures toward the confederates. Table 9 presented results showing no significant differences between conditions in either attitudes or beliefs. Table 12 presents results in support of our expectations based on the different patterns of interdependence. In the uniddependent condition, the subjects sent more messages to Member 1 and complied more with Member 2. These differences were significantly greater than those that could be observed in the bidependent condition as witnessed by the significant Condition by Member interactions.

It can further be predicted that the significant Member effects in Table 12 are attributable to the uniddependent condition while there is little or no difference between members in the bidependent condition. Post-hoc comparisons (cf. Hays, 1963; Ch. 14) were used to test the significance of the differences between members in each of the two conditions. The results of these analyses fully supported the hypothesis. In the bidependent condition, the differences between the means for Members 1 and 2 were not significant for either of the behavioral measures. In the uniddependent condition, however, both comparisons were significant beyond the .01 level.

We can thus confidently conclude that the two conditions created by the variations in the positioning of the spirit levels on the triangle board had strong differential impacts on the subject's behaviors in these conditions. In contrast, as we saw above (Table 9), there were no significant differences in the subject's attitudinal ratings of his coworkers under the two conditions. Thus, these traditional attitudinal-type measures cannot account for the strong behavioral differences that were observed.

It should be recalled that different behaviors under the two conditions would be expected on the basis of a reinforcement hypothesis. The obtained results, however, did not conform to these expectations. Specifically, in

the undependent condition (where Member 1 was more reinforcing than Member 2) the subjects complied less with Member 1 than with Member 2. A reinforcement hypothesis would predict more compliance with Member 1.

C. The correlational prediction of behavior from beliefs and attitudes

Table 13 presents the correlations between the differences in the pre-test beliefs and attitudes with respect to Members 1 and 2, and the differences in the subject's communicative and compliance behaviors toward these two coworkers. Since the correlations obtained in the two conditions were very similar, the data were pooled for the computation of the correlations in Table 13. Similar to findings in the first two experiments, the subject's behaviors showed only minimal relations with his beliefs about and attitudes toward his two coworkers, although one correlation did reach statistical significance. Also consistent with previous findings, multiple correlations did not improve the prediction of behavior.

Correlations between the subject's own behaviors and the actual and perceived compliance (i.e., social reinforcements) by his two coworkers were also computed over the total sample of 144 subjects. Once again, difference scores were used. In contrast to earlier findings, the subject's communicative behavior was positively related to the actual ($r = .53, p < .01$) and perceived ($r = .61, p < .01$) percent compliance (i.e., reinforcement) by his coworkers. His own compliance behavior, however, was negatively correlated with the amount of reinforcement he received ($r = -.20, p < .05$ and $-.31, p < .01$ for actual and perceived compliance, respectively).

Thus, some evidence for a reinforcement-behavior relationship was found in the present study although this relationship was inconsistent. Social reinforcement (compliance by the coworkers) was found to be positively related

Table 13
Correlations Between Pre-Test Attitudinal
Measures and Subject's Behaviors - Difference Scores

Experiment III

Attitudinal Measures	No. of messages sent	No. of compliances
A	-.02	.19*
BE	.03	.15
Multiple R	.031	.192

* $p < .05$

Note - N = 144

A = Attitudes toward the coworkers

BE = Beliefs about the coworkers' expertness

to the subject's communicative behavior but was negatively related to his degree of compliance.

I. The effects of the task on the subject's beliefs and attitudes

To determine whether the subjects rated their two coworkers differently after the task than before, t-tests were performed between the pre-test and post-test ratings of each of the two coworkers on the A and BE scales. In the bidependent condition the post-test belief and attitude ratings were significantly higher than the pre-test ratings for each of the subject's two partners ($t_{71} = 1.981$ and 2.450 , $p < .05$ for changes in attitudes toward Members 1 and 2, respectively; $t_{71} = 4.442$ and 8.819 , $p < .01$ for changes in beliefs about the expertness of Members 1 and 2, respectively). Thus, in the standard bidependent condition the subjects significantly increased their attitudes toward both partners and believed that both partners were more expert after the task.¹⁴ In the unidependent condition, although there also was a tendency to raise the ratings of the coworkers, these changes did not reach statistical significance.

In order to assess whether the changes in beliefs and attitudes were a function of the coworkers' compliance with the subject, correlations between the differences in their actual and perceived percent compliance behavior, and changes (from pre-test to post-test) in the subject's ratings of them on the A and BE scales were computed over the total sample of subjects. [The results in the two situational conditions were very similar.]

Consistent with our previous findings, the changes in the subjects' attitudes and beliefs about their coworkers were significantly related to their perceptions of the coworkers' compliance behaviors (i.e., perceived reinforcement) on the task.

For Member 1, the correlations between perceived compliance and changes in attitudes and beliefs were .238 and .266 ($p < .01$), respectively. For Member 2 these correlations were .189 and .195 ($p < .05$), respectively. Only one of the four correlations with actual compliance reached significance.

Further, there was again limited evidence that these changes were related to the subject's own behavior. Correlations were computed between changes in the subject's beliefs and attitudes with respect to each coworker and his communicative and compliance behaviors toward each. Only one of the eight correlations was significant. The greater the number of times the subject complied with Member 1, the more he changed his attitude toward him in a positive direction. This finding again provides limited evidence for cognitive bolstering. Thus, consistent with the results of our first two studies, we found that the attitudinal changes that took place were related to the coworkers' compliance behaviors and to some extent to the subject's own compliance behavior.

Finally, we examined the degree to which a subject's post-test ratings of his coworkers could be used to predict his behaviors on the task. In Table 14 the differences in the subject's post-test ratings of his partners on the A and BE scales are correlated with the differences in his behaviors toward them.

Consistent with Experiment II, relatively low, although significant, correlations were found for the subject's compliance behavior and non-significant correlations were obtained with respect to communicative behavior. Again, multiple correlations did little to improve the predictions.

Thus, consistent with previous findings, the subject's post-test beliefs and attitudes tended to be better predictors of his compliance behaviors than his pre-test beliefs and attitudes.

Table 14
Correlations Between Post-Test Attitudinal Measures
and Subject's Behaviors - Difference Scores

Experiment III

<u>Attitudinal Measures</u>	<u>No. of messages sent</u>	<u>No. of compliances</u>
A	.06	.24*
BE	.00	.29*
Multiple R	.056	.285

* $p < .01$

Note - N = 144

A = Attitudes toward the coworkers

BE = Beliefs about the coworkers' expertness

Conclusions of the Traditional Approach

To summarize briefly, as in Experiments I and II, the traditional attitudinal approach failed to predict behavior in Experiment III. Again there was little or no support for an attitude-behavior relationship even when stimulus-specific attitudinal measures were taken or when the various components of attitude were considered simultaneously.

In contrast to previous findings, however, the present study seemed to provide some support for the behavior theory explanation of the low relationship between attitudes and behavior. That is, the subject's communicative behavior was positively related to the perceived percent reinforcement he received from his coworkers. However, contrary to this explanation, the perceived percent reinforcement was negatively related to his compliance behavior. Thus, the reinforcement hypothesis contributed relatively little to our understanding of the attitude-behavior relationship.

While we were forced to conclude that there is little, if any, evidence that attitudes determine behavior, the findings again indicated that the subject's task experiences somewhat influenced his attitudes and beliefs with respect to his two coworkers. Indeed, as in the first two experiments, it was found that the subject's attitudinal-type ratings of his coworkers changed in meaningful ways. When a coworker was perceived as complying, the subject became more favorable toward that coworker. Similarly, when the subject complied with a given coworker, he tended to become more favorable toward that coworker, or as Gerard has suggested he tended to cognitively bolster or justify his own behavior. Indeed, the most consistent finding throughout the three experiments is that subjects do change their beliefs, attitudes and behavioral intentions toward their coworkers in meaningful ways that reflect their task experiences with these coworkers.

An Alternative Approach to Behavioral Prediction

The evidence presented up to this point leads us to concur in the conclusion of other social psychologists that there is little support for a direct relationship between attitude and behavior toward the object of the attitude. Indeed, there were very few instances in our experiments where even a low relationship could be demonstrated. The remainder of this paper deals with the prediction of communicative and compliance behaviors on the basis of Fishbein's extension of Dulaney's theory of propositional control.

It may be recalled that in this theory an individual's behavioral intention (BI) is considered to be the immediate antecedent of his behavior. Thus, in the present experiment we would expect high correlations between a subject's intentions to communicate and comply with his partners and the behaviors that were actually observed--provided that an appropriate measure of behavioral intentions had been obtained. Further, according to the theory, these behavioral intentions should be a function of two components: (1) The individual's attitude toward performing the behavior (A-act) and (2) his beliefs about the norms governing the behavior (NB) multiplied by his motivation to comply with these norms (Mc).

While at present Fishbein's (1967a) formulation of the theory says nothing about the origins of social normative beliefs or the motivation to comply with the norms, it does specify that a person's attitude toward the performance of any act is a function of his beliefs about its consequences. It will be recalled that, in the present study, measures were taken of such beliefs with regard to communicative and compliance behaviors (U-act). It is expected that A-act will be correlated with this measure.

As to normative beliefs, it seemed reasonable to assume that the relevant referents for the subject were (1) his two partners and (2) the experimenter.

In the absence of any specific theory, we felt that a simple summation of the perceived expectations of these three referents would provide an adequate estimate of the normative component. This sum was denoted : $\sum NB(Mc)$. On the basis of the theory, it is to be expected that behavioral intentions (BI) can be accurately predicted from A-act and $\sum NB(Mc)$ in a multiple regression equation.

A number of additional implications of the theory will presently be discussed. Let us now consider some of the results.

A. Effects of the experimental manipulations on the theory's components

We saw earlier that the differential effects of the two task structures on behavior could not be explained by differences in traditional attitudinal-type variables nor were they completely accounted for by a social reinforcement hypothesis. The observed differences between conditions, however, can easily be understood in terms of the present theory. It stands to reason that the triangle board's set-up would affect the perceived utility of communicating and complying with the other group members, i.e., would influence the attitudes toward these acts with regard to each partner. Thus, in the bidependent condition, the subject would be expected to form equally favorable attitudes toward communicating and complying with his two partners. The set-up in the unidependent condition, however, should lead to the perception of more favorable consequences resulting from communicating with Member 1 (the left member) and complying with Member 2 (the right member) due to the differential distribution of information among the group members. Similar considerations may also have influenced the normative component, i.e., the perceived expectations of the other members and the experimenter as well as the subject's motivation to comply.

It will be recalled that the overt communicative and compliance behaviors

were found to conform to the pattern outlined above. That is, these behaviors did not differ significantly between members in the bidependent condition but showed the expected differences in the unidependent condition (see Table 12, page 60.1). If the present theory is to account for these differences then we would expect its components to exhibit the same effects under the two situational conditions. Further, since A-act is considered to be closely related to U-act, the belief about the act's consequences, we would also expect to find similar effects on U-act. Table 15 presents the mean U-act, A-act, INB(Mc) and BI with respect to Member 1 and Member 2 in each of the two conditions, measured before the task. The results of two-way analyses of variance are also shown in Table 15. The two main effects were Condition and Member, the latter treated as a repeated measures factor.

It can be seen that the Member effects were significant for all dependent variables except U-act with respect to compliance. Thus, the differences in communicative and compliance behaviors found earlier may be related to the differences in the model's components. Inspection of the group means shows that the differences between members in the unidependent condition were in the expected directions; also as expected, there were only minor differences between members in the bidependent condition.

Post-hoc comparisons were computed in order to test the hypothesis that the significant Member effects were due to the differences between members in the unidependent condition rather than to the differences in the bidependent condition. This prediction was fully supported. With respect to both communication and compliance, none of the differences between the two members in the bidependent condition reached statistical significance. In the unidependent condition, the differences between members for A-act and INB(Mc) were significant beyond the .01 level; for BI it was significant

Table 15
Group Means of Pre-Test U-act, A-act, ENB(Mc) and BI
and Analyses of Variance Results

Experiment III

Component	GROUP MEANS				ANALYSES OF VARIANCE		
	Bidependent Condition		Unidependent Condition		F	F	F
	Member 1	Member 2	Member 1	Member 2	Condition	Member	Interaction
Instructions							
U-act	6.292	6.361	6.404	4.139	53.964**	54.386**	61.488**
A-act	22.542	22.569	23.528	16.611	16.342**	50.006**	50.815**
ENB(Mc)	83.925	80.014	86.944	46.000	20.259**	96.910**	68.039**
BI	10.375	9.625	16.069	3.931	0.000	102.251**	79.814**
Compliance							
U-act	5.708	5.847	4.889	5.319	9.648**	2.466	.647
A-act	20.056	21.472	17.417	20.625	6.657*	12.387**	1.859
ENB(Mc)	83.167	92.372	70.611	94.083	4.028*	34.025**	16.479**
BI	6.806	7.056	5.806	6.875	2.451	4.669*	1.801

Note - The F values are based on two-way analyses of variance where "Member" was treated as a within-subjects factor; df = 1 and 142.

U-act = Belief about the utility of an act

A-act = Attitude toward an act

ENB(Mc) = Sum of normative beliefs times motivation to comply

BI = Behavioral intention.

* p < .05

** p < .01

at the .05 level. U-act was only significantly different vis a vis communication between members.

Thus, as for the behavioral measures (see Table 12, page 60.1), the significant Member effects in the model's components could be attributed to the uniddependent condition while there were no significant differences in the bidependent condition.

B. Correlational prediction of behavioral intentions and actual behavior

Since the theory of propositional control did not lead us to expect different correlations between its components under the two task structure conditions and since no appreciable differences were found, it was decided to pool the data of the two conditions for purposes of the correlational analyses to be presented in this section.

Before dealing with the prediction of behavioral intentions (BI) and overt behavior (B), the correlations between A-act and U-act in the pre-test and the post-test questionnaires were computed. As expected, these correlations were high and significant. On the pre-test, the correlations were .64 and .68 for instructions and compliance, respectively. The same correlations were .81 and .84 on the post-test ($p < .01$ for all correlations). These findings provide some support for the notion that the attitude toward an act (A-act) is a function of the beliefs about its consequences and the evaluation of these consequences. In the analyses to follow, only A-act is used as a measure of the attitudinal component.

1. The prediction of behavioral intentions

The immediate purpose of the theory of propositional control is the prediction of behavioral intentions. A-act and Σ NB(Mc) should provide high multiple correlations with BI. Clear support for this prediction can be found in Table 16. There, the correlation coefficients of A-act and Σ NB(Mc)

with intentions to send instructions and to comply are given. As in previous analyses, difference scores between the two members were used. In addition, Table 16 presents the regression coefficients and the multiple correlations of A-act and $\Sigma NB(Mc)$ on BI. As predicted, the multiple correlations on BI for instructions and compliance behaviors were high and significant, lending support for the general validity of the extended version of the theory of propositional control.

2. The prediction of overt behavior from behavioral intentions

It should be apparent by now that the capability of the present theory to predict overt behavior is a function of the correlation between BI and B. We have seen above that BI could be predicted with relatively high accuracy from A-act and $\Sigma NB(Mc)$. We now need to examine the correlation between BI and B.

The reader may recall that a high degree of correspondence between BI and B is expected only to the extent that an appropriate measure of BI has been obtained. In particular, the behavioral intention has to be specific to the behavior under question and be measured as close in time as possible to the actual behavior. This second condition is designed to insure that BI has not changed between the time of its measurement and the performance of the behavior. There is reason to believe, however, that in the course of interaction between the three group members, BI may change as the result of changes in A-act and $\Sigma NB(Mc)$. Thus, the behavioral intention measured in the pre-test questionnaire may differ greatly from that existing toward the end of the interaction. This, of course, would act to reduce the BI-B correlation.

At least two reasons may be suggested for possible changes in BI as a result of interaction. First, at the beginning of the experiment, a person

Table 16
Correlations, Regression Coefficients, and Multiple Correlations
of the Model's Components [A-act and $\Sigma NB(Mc)$] on BI:
Pre-Test - Difference Scores

Experiment III

	Correlation Coefficients		Regression Coefficients		Multiple
	A-act	$\Sigma NB(Mc)$	A-act	$\Sigma NB(Mc)$	Correlations
Instructions	.599	.666	.295	.478	.704
Compliance	.573	.493	.432	.248	.608

Note - N = 144, all correlations and regression coefficients are significant
($p < .01$)

A-act = Attitude toward an act

$\Sigma NB(Mc)$ = Sum of normative beliefs times motivation to comply

BI = Behavioral intention

may intend to send instructions to, say, Member 2. But if he learns that this member tends not to comply with his instructions, he is likely to change his attitude toward communicating with this member and he will thus modify his behavioral intentions accordingly. Indeed, it will be recalled that a significant correlation of .53 was obtained between reinforcement (i.e., compliance by a given partner) and the subject's communicative behavior.

Second, it appears reasonable that a subject's compliance behavior, and behavioral intention, will be influenced by the nature of the instructions he receives. Thus, a person may initially intend to comply with Member 1, but if in the course of interaction he learns that Member 1 tends to send instructions which do not agree with his own perception as to what he should do, he will be likely to modify his motivation to comply with this partner and thus change his BI. It is for this reason that the "Incompatibility Index" (II) was computed. It will be recalled that this index increases with the degree of absolute discrepancy between the instructions received from a given group member and the subject's personal beliefs about the best course of action. We would thus expect a negative correlation between II and compliance behavior; that is, the higher the incompatibility, the less should the subject comply with the received instructions.

Thus, the percent reinforcement a subject receives should influence his behavior over and above the initial pre-test BI with regard to communicative behavior. Similarly, the pre-test Incompatibility Index (II_1) should influence his compliance behavior in addition to his initial compliance intentions.

These considerations, however, also imply that the relative importance of reinforcement and incompatibility in the prediction of behavior should

decline sharply when the post-test measure of BI is used to predict B. That is, after the subjects have had experience in interaction, the things they have learned about the compliance of their partners and about the reasonableness of their partner's instructions should be reflected in the measures of BI on the post-test questionnaire. Adding percent reinforcement to BI for the prediction of communicative behavior and adding II to BI for the prediction of compliance should thus have the following effects: (1) when the pre-test BI is used, the additional variables should contribute significantly to the prediction of behavior but (2) when the post-test BI is used, there should be no significant contribution from the additional variables.

Table 17 presents results relevant to these considerations. The first column gives the correlations between BI and B. It can be seen first that all correlations were significant. While the correlations for communicative behavior were quite high, the correlations for compliance (particularly when pre-test measures were used) were much lower. Indeed, it should be noted that in all cases the post-test measures of BI correlated more highly with B than did the pre-test measures.

Column 2 in Table 17 presents the correlations of percent reinforcement with communicative behavior and the correlations of the Incompatibility Index with compliance. As mentioned previously, II was obtained only for 78 subjects. The correlations with B, the regression coefficients and the multiple correlations are all based on these 78 subjects only.

The positive correlation between percent reinforcement and the number of instructions sent by the subject has been previously discussed. The pre-test Incompatibility Index (II_1) correlated negatively with compliance behavior, as expected. Looking at the regression coefficients in Table 17, it can be seen that our predictions concerning their relative weights in the

Table 17

Correlations of Behavior with Behavioral Intentions (BI),
% Reinforcement, and the Incompatibility Index (II) - Difference Scores

Experiment III

Criterion	Correlation Coefficients		Regression Coefficients		Multiple Correlations
	BI (N=144)	% Reinforcement (N=144)	BI (N=144)	% Reinforcement (N=144)	
Instructions	Pre-test	.690*	.528*	.576*	.756*
	Post-test	.883*	.528*	.076	.885*
	BI (N=144)	II (N=78)	BI (N=78)	II (N=78)	R (N=78)
Compliance	Pre-test	.211*	.086	-.431*	.464*
	Post-test	.502*	-.146	.560*	.513*

* $p < .01$

pre-test vs. post-test were supported. Percent reinforcement and II carried highly significant weights when combined with the pre-test measures of BI. Their weights dropped to nonsignificant when the post-test measures of BI were employed.

Finally, Table 17 presents highly significant multiple correlations for the prediction of overt behavior. While these multiple correlations were significant and while they held for both types of behavior, the prediction of compliance behavior tended to be less successful than the prediction of communication. Although these results are in support of the present theory they do indicate the need for further investigations of the relationship between behavioral intentions and overt behavior.

3. The prediction of overt behavior from A-act and INB(Hc)

In the previous sections it was shown that (1) the model led to highly successful predictions of initial (i.e., pre-test) intentions to communicate and comply, and (2) while the initial intentions to communicate predicted actual communicative behavior reasonably well ($r_{BI,B} = .690$), the initial intentions to comply were only moderately related to actual compliance behavior. Thus, while we would expect relatively good predictions of communicative behavior from the model's components [i.e., A-act and INB(Hc)], we would expect only moderate success in predicting compliance behavior. Multiple correlations of A-act and INB(Hc) on behavior confirmed these expectations. The multiple correlations were .619 ($p < .01$) for instructions and .356 ($p < .01$) for compliance.

C. Effects of the task on the model's components.

It was argued earlier that behavioral intentions tend to change as the result of interaction. At least three possible sources of change in intentions

during the course of the group task situation can be identified:

- 1) The behavior of a subject's coworkers can influence his intentions.

That is, we saw earlier that the subject tended to change his communication intentions to reflect the reinforcement he received from his coworkers and he changed his compliance intentions to reflect the degree of compatibility between his expectations and his coworkers' instructions.

- 2) As a subject becomes more competent on the task, this should be reflected in his intentions; and

- 3) There may be some cognitive bolstering--i.e., the subject may try to bring his intentions "into line" with his actual behavior.

It is assumed that these changes in BI reflect changes in A-act and/or INB(Mc). That is, if behavioral intentions are functions of attitudinal and normative considerations, then, according to the theory, changes in intentions should be a function of changes in A-act and INB(Mc). Support for this hypothesis is presented in Table 18 where the correlations between changes in A-act, INB(Mc), and BI are presented. In addition, Table 18 presents the regression coefficients of $\Delta A\text{-act}$ and $\Delta INB(Mc)$ on ΔBI as well as the significant multiple correlations between changes in the two components and changes in BI. These data make it clear that the above mentioned sources of potential change in BI operate through A-act and INB(Mc).

1. Changes in A-act and INB(Mc) as a function of the group task interaction

Intentions to communicate and comply may have been influenced by "reinforcement" and "incompatibility" respectively. More specifically, it was argued that these "intervening events" led to changes in the model's

Table 18

Correlations, Regression Coefficients, and Multiple Correlations
Between Changes in the Model's Components (Δ -act and $\Sigma NB(Mc)$)
and Changes in Behavioral Intentions

Experiment III

	Correlation Coefficients		Regression Coefficients		Multiple Correlations
	A-act	INB(Mc)	A-act	INB(Mc)	
<u>Instructions</u>					
Member 1	.255**	.237**	.211**	.188*	.313**
Member 2	.303**	.349**	.233**	.287**	.410**
<u>Compliance</u>					
Member 1	.478**	.289**	.436**	.093	.485**
Member 2	.538**	.392**	.455**	.221**	.576**

Note - N = 144

Δ -act = Attitude toward an act

$\Sigma NB(Mc)$ = Sum of normative beliefs times motivation to comply

A change in the favorable direction was scored positively, a change in the unfavorable direction was scored negatively.

*p < .05

**p < .01

components (i.e., A-act and INB(Mc)) and that these changes produced the changes in BI. Table 19 presents the "Correlations Between the changes in A-act, INB(Mc), and the actual and perceived reinforcement received by the subject as well as the summed Incompatibility Index (II_1 and II_2). Consistent with expectations, these "intervening events" influenced A-act and INB(Mc). Reinforcement was significantly related to attitudes toward, and normative beliefs about, sending messages while the degree of incompatibility influenced attitudes toward, and normative beliefs about compliance.

2. Changes in BI, A-act, and INB(Mc) as a function of increased competence

Increased competence may express itself in pre- to post-test changes of the model's components, i.e., of A-act, INB(Mc), and BI that indicate greater comprehension of the task's requirements. We would expect that, in the uniddependent condition, post-test measures of these variables would reflect the differential usefulness of communicative and compliance behaviors toward the two members to an even stronger degree than the pre-test measures. That is, in the uniddependent condition, A-act, INB(Mc), and BI for communication should increase with regard to Member 1 and decrease with regard to Member 2. Similarly, for compliance behavior these variables should decrease toward Member 1 and increase toward Member 2. Thus, in the uniddependent condition, the differences between members should be greater on the post-test than on the pre-test. There is, however, no reason to expect any great changes in the biddependent condition. If anything, the measures for the two members might become more nearly equivalent, i.e., the differences between members should be smaller on the post-test than on the pre-test.

T-tests comparing pre- and post-test differences between the members on A-act, INB(Mc), and BI demonstrate considerable support for these

Table 19

Correlations Between Changes in the Model's Components (Δ -act, Δ IB(Mc)) and "Intervening Events" (actual and perceived reinforcement by Members, Incompatibility Index (II))

Experiment III

	Member 1			Member 2		
	% Reinforce- ment: Actual (N=144)	% Reinforce- ment: Perceived (N=144)	II (N=78)	% Reinforce- ment: Actual (N=144)	% Reinforce- ment: Perceived (N=144)	III (N=78)
DISRUPTIONS						
Δ A-act	.297**	.005	-.031	.301**	.331**	-.174
Δ IB(Mc)	-.035	-.016	-.109	.147	.232**	-.011
CONFLIANCE						
Δ A-act	-.063	-.153	-.436**	-.040	-.226**	-.289**
Δ IB(Mc)	.073	-.078	-.228*	-.104	-.113	.052

Note - A change in the favorable direction was scored positively, a change in the unfavorable direction was scored negatively.

*
p < .05
**
p < .01

hypotheses. In the bidependent condition, with one exception, the differences between the members decreased on the post-test although none of these changes reached statistical significance. Except for A-act toward compliance (where the difference decreased non-significantly-- $t_{71} = .629$) the differences between members in the unidependent condition increased as expected. Specifically, increases were significant for INB(Mc) with respect to both communication and compliance ($t_{71} = 2.001$, $p < .05$ and $t_{71} = 3.145$, $p < .01$, respectively) and for BI with respect to communication ($t_{71} = 2.272$, $p < .05$). While the differences for A-act with respect to communication and for BI with respect to compliance also increased, these increments were not significant ($t_{71} = 1.812$ and 1.024 , respectively). Thus, in support of the hypothesis of increased competence, the subjects' post-test questionnaire responses conformed more closely to the task's requirements than did their pre-test responses.

3. Changes in BI, A-act, and INB(Mc) as a function of cognitive bolstering.

According to Gerard (1965) and others, subjects may bring their post-test questionnaire responses into line with their foregoing behaviors. In order to test this hypothesis, correlations were computed between the pre- to post-test changes in the model's variables [A-act, INB(Mc), and BI toward communicative and compliance behaviors] and behavior on the task (number of instructions and number of compliances with respect to each member). These correlations, presented in Table 20, provide support for a cognitive bolstering effect.

To summarize briefly then, it can be seen that various "events" occurring during the group-task interaction influence and produce changes in A-act and INB(Mc), and these changes in turn influence behavioral intentions. Thus,

Table 20

Correlations of Pre- to Post-Test Changes in the Model's Components
[A-act, Σ NB(Mc)] and Behavioral Intentions (BI) with Subject's Behavior

		Subject's Behavior Toward	
		Member 1	Member 2
Instructions	Δ A-act	.022	.202*
	$\Delta \Sigma$ NB(Mc)	.109	.364**
	Δ BI	.365**	.365**
Compliance	Δ A-act	.362**	.181*
	$\Delta \Sigma$ NB(Mc)	.297**	.097
	Δ BI	.329**	.299**

* $p < .05$

** $p < .01$

Note - N = 144

A change in the favorable direction was scored positively, a change in the unfavorable direction was scored negatively. Changes with respect to instructions are correlated with the number of messages the subject sent to each coworker, while changes with respect to compliance are correlated with the number of times the subject complied with each coworker.

pre-test measures of intentions may not be the most appropriate measure for predicting behavior over a series of trials. However, given the fact that BI, A-act and $\text{ENB}(Mc)$ change over time, two questions need to be considered:

1) Is it possible to predict post-test measures of BI from post-test measures of the model's components [i.e., A-act and $\text{ENB}(Mc)$]; and

2) Given the reasonably high post-test BI-B correlations, does the theory lead to successful prediction of behavior?

The answers to both questions are examined in Table 21. Comparing Table 21 with Table 16, p. 69.1, it can be seen that the predictions of BI from post-test measures of A-act and $\text{ENB}(Mc)$ tended to be more accurate than from the same variables measured before the task. The same is true with respect to the postdiction of behavior. Even more importantly, however, it can be seen that the model led to highly significant predictions of the two intentions and the two behaviors. That is, in marked contrast to the traditional approach, the present analysis did lead to consistent prediction of behavioral intentions, and, where the intention was appropriate to a given behavior, this approach also led to behavioral prediction.

Conclusion of the Alternative Approach

The present study has provided considerable support for Fishbein's (1967a, 1969) extension of Dulaney's (1967) theory of propositional control. The results indicated that a subject's intentions to communicate and comply with his coworkers were predictable from a consideration of his attitudes toward performing these behaviors and his perceptions of what others expected him to do (NB) multiplied by his motivation to comply with these expectations (MC). More importantly, these intentions were significantly related to actual communicative and compliance behaviors, and thus, the theory permitted a significant degree of behavioral prediction. Further, although it was

Table 21

Correlations, Regression Coefficients, and Multiple Correlations
of the Model's Components [A-act and Σ NB(Mc)] on Behavioral Intentions (BI)
and Behavior (B) Post-Test - Difference Scores

Experiment III

Criterion	Correlation Coefficients		Regression Coefficients		Multiple Correlations
	A-act	Σ NB(Mc)	A-act	Σ NB(Mc)	
Instructions	BI	.681	.786	.253	.607
	B	.636	.761	.199	.621
Compliance	BI	.739	.608	.585	.255
	B	.522	.538	.311	.351

Note - All correlations and regression coefficients are significant ($p < .01$),
N=144.

found that the pre-test measures of intentions to communicate and to comply were not as highly correlated with actual behaviors as had been hoped, it was shown that this was due to the fact that certain events occurring during the performance of the task produced changes in intentions, as well as in behaviors. Several other hypotheses related to the theory were also supported. For example, according to the theory the influence on B_i (and hence on B) of any variable external to the theory should be mediated by its two predictors, A -act and $EMB(Mc)$. In support of this hypothesis, it was shown that the significant effects on behavior of task structure, social reinforcement, and incompatibility were all reflected in the model's components.

General Overview and Discussion

One purpose of the present series of studies was to investigate the validity of three explanations that have been offered to account for the often obtained lack of relationship between attitudes and behavior: (1) incompleteness of attitude measures; (2) inappropriateness of attitude measures; and (3) moderative effects of reinforcement. All three studies were designed to permit an analysis of the attitude-behavior relationship where (1) independent measures of cognitions and conations were obtained in addition to affect (which is the most common measure of attitude); (2) all of the attitudinal measures were taken with respect to the particular person with whom the subject was to interact; and (3) the nature of the social reinforcement the subject received varied in a way which should have permitted social reinforcement to moderate the attitude-behavior relationship in some of the experimental conditions.

Generally speaking, little or no support was found for any of these

explanations. First, in none of the three studies were a subject's communicative or compliance behaviors significantly related to his attitudes toward his coworkers. Second, contrary to a multidimensional viewpoint, the simultaneous consideration of cognition and conation in addition to the affective attitude measure did not produce any significant increase in behavioral prediction. Third, contrary to a behavior theory explanation, neither the manipulation of feedback (Experiment I) nor the manipulation of the ratio of reinforcement received by the subject (Experiment II) significantly influenced communicative or compliance behaviors. Further, although the subject's perception of the percent of social reinforcement given him by his coworkers was positively related to his communicative behavior in Experiment III (this relationship was non-significant in Experiments I and II), his perception of the percent of social reinforcement he received was negatively correlated with his compliance behaviors in this experiment (again, the correlations were non-significant in Experiments I and II). In sum, neither his attitudes toward his coworkers, nor his perception of the reinforcement he received from them were consistently related to the subject's communicative or compliance behaviors vis à vis his coworkers.

In marked contrast, compliance behavior and perception of the amount of reinforcement received were consistently and significantly related to changes in beliefs, attitudes and behavioral intentions toward the coworkers. Thus, while neither "attitudinal variables" nor "social reinforcement" seemed to have any consistent effect on behavior, these behaviors and the perceived reinforcement did "feed back" upon the attitudinal variables.

Clearly, these results are not very encouraging from a traditional attitudinal approach. Indeed, if anything, they provide additional support

for the argument that there is no consistent relationship between these traditional measures of attitudes and behavior. Furthermore, the present series of studies has failed to provide support for any of the three frequently offered explanations for the low and inconsistent attitude-behavior relationship.

A newly developed theory has therefore been presented which provides not only a reasonable explanation for this lack of relationship but at the same time suggests an alternative approach to the problem of behavioral prediction based on attitudinal-type variables. Dulany's (1967) theory of propositional control and its extension to social behavior (Fishbein, 1967a, 1969) deals with the prediction of behavioral intentions (BI) and corresponding overt behaviors (B). According to the model, an individual's intentions to perform any behavior (and thus his actual performance of that behavior) are viewed as a function of (1) his attitudes toward performing the behavior (A-act) and (2) his beliefs about the "norms" governing that behavior (NB) weighted by his motivation to comply with those norms (Mc). Any other variable is assumed to influence behavioral intentions (and thus behavior) only indirectly, by influencing one or both of these two determinants (i.e., by influencing either the attitudinal or the normative component) or their relative weights. Thus, traditional attitudinal variables such as (1) attitude (or affect) toward a given person; (2) beliefs about that person; or (3) general intentions (e.g., to subordinate himself; or to show social acceptance, etc.) toward the person, should only be related to specific behavioral intentions (and thus to behavior) if these traditional variables influence A-act, NB(Mc), or their relative weights. Clearly then, one would not expect traditional attitudinal variables to be consistently related to different behaviors under varying conditions.

Experiment III provided considerable support for these notions. First, consistent with the central equation of the theory, a subject's initial intentions to communicate with his coworkers were correlated .704 with the model's predictors while his initial intentions to comply were correlated .608 with the model's predictors. Following the task, these multiple correlations were .806 and .765, respectively. In contrast to this, the multiple correlations of the traditional measures of attitude and beliefs were only .107 (non-significant) with pre-test intentions to communicate and .321 ($p < .01$) with pre-test intentions to comply. Following the task, these multiple correlations were .119 (non-significant) for communication and .448 ($p < .01$) for compliance.

Under ideal circumstances, a person's overt behavior is expected to be perfectly determined by his preceding behavioral intentions. A methodological problem arises regarding the identification and measurement of appropriate behavioral intentions under suitable conditions. That is, although it is assumed that BI's are the immediate antecedents of overt behavior, the size of the BI-B correlation will be contingent upon several factors. Clearly, the more abstract the intention, or the longer the time interval between the expression of the intention and the performance of the behavior, the lower will this correlation tend to be. As can be seen from Experiments I and II, the use of general behavioral intentions, such as intentions to subordinate oneself, are so far removed from the actual behavior of complying with the specific requests of one's coworkers that these intentions bear little relationship to actual compliance behavior. Moreover, even specific intentions need not correlate highly with behavior when a considerable amount of time has intervened between the statement (or measurement) of intention and the behavioral act. The reason for this is not simply time alone, but rather

that intervening events can occur that serve to change the intentions. If between the time an individual states his intention and the time when he is to perform the act, he obtains new information that changes either his beliefs about the consequences of performing the act (i.e., changes his attitude toward the act) or his beliefs about the expectations of others (i.e., his normative beliefs), these changes will affect his intentions, and thus the original measure of intention will be inappropriate for current behavioral prediction. Similarly, if the kind of behavior to be predicted is not a single discrete act, but involves continuous repetitions of the act over time (i.e., if we are not trying to predict behavior on a single trial, but are trying to predict behavior over a series of trials), it should be clear that trial-by-trial experience on the task may lead to changes in intentions. Changes of this nature were shown to have taken place in the present experiments. Certain events occurring during the interaction on the task influenced intentions to communicate as well as intentions to comply. Further, and more importantly, while the consideration of these intervening events improved behavioral prediction when pre-test measures of intentions were considered, they did not improve behavioral prediction when post-test measures of intentions were considered since these events were already reflected in the post-test intentions.

Specifically, in Experiment III pre-test measures of intentions to communicate were correlated .690 with communicative behavior while post-test measures were correlated .883. Similarly, while pre-test measures of intentions to comply were only correlated .211 with compliance behavior, this same behavior was correlated .502 with the post-test measure of intention to comply. Although this post-test correlation is still relatively low, it must be recalled that it represents a relationship between a behavior

that has changed considerably over 20 trials and an intention that is most appropriate for a single 21st trial. Although it can be argued that this same problem should be true of the relationship between intentions to communicate and the actual communicative behavior, it should be noted that communicative behavior showed less change over the 20 trials than did compliance behavior. This can be seen in the correlations between the first and the last 10 trials. For communicative behavior, this correlation (using difference scores between the two members) was .754. For the number of compliances, the same correlation was .573. The differences between these two coefficients is statistically significant ($p < .01$). Since communicative behavior tends to be more stable than compliance, it is not too surprising that it is more easily predicted from behavioral intentions. Of more importance, however, is the degree to which the consideration of intervening events improved the BI-B relationship. Consistent with expectations, the consideration of "perceived reinforcement" did improve prediction of communicative behavior when pre-test intentions were considered (the multiple correlation between BI, reinforcement and B was .756 and the regression coefficient for reinforcement was .328, $p < .01$), but not when post-test intentions were considered (the multiple correlation was .885 and the regression coefficient for reinforcement was .076, n.s.). Similarly, while a consideration of "incompatibility" did significantly improve the prediction of compliance when pre-test intentions to comply were considered (the multiple correlation between BI, incompatibility and number of compliances was .464 and the regression coefficient for incompatibility was .431, $p < .01$) it did not increase behavioral prediction when post-test measures of intentions to comply were used (the multiple correlation with compliance was .513 and the regression coefficient for incompatibility was .122, n.s.).

Further, it can also be shown that changes from pre-test to post-test in intentions to communicate and to comply were related to changes in the model's components, i.e., in Δ -act or $\text{INB}(\text{Mc})$; and that these changes in the model's components were themselves related to certain intervening events. For example, changes in the subject's intention to communicate with Member 2 were significantly related to the change in his attitude toward the act of communicating with Member 2 ($r = .303$, $p < .01$) and to the change in his normative beliefs weighted by his motivation to comply ($r = .349$, $p < .01$). Further, these changes in the model's components were significantly related to the subject's perception of the percent of reinforcement he received from Member 2 (the correlation between change in Δ -act and reinforcement = $.248$, $p < .01$ and the correlation between the change in $\text{INB}(\text{Mc})$ and reinforcement = $.241$, $p < .01$). Similar data can be presented for changes in intentions to comply and incompatibility.

Thus, it seems clear that although the initial BI-B correlations were not as high as we would have liked (particularly with respect to compliance behaviors), these low correlations can be explained and appear reasonable. Similarly, as was mentioned above, although the post-test BI-B correlation with respect to compliance was still relatively low, here too the correlation seemed reasonable in terms of the nature of the behavior being predicted.

To return to our main point, however, it should be clear that the ability of the model to predict overt behavior is dependent upon the size of the BI-B relationship, since it was designed only for the prediction of behavioral intentions. Thus, we would expect the model to lead to fairly good predictions of communicative behavior since the pre-test BI-B correlation was $.690$. It can not, however, lead to highly successful prediction of compliance since the correlation between initial intentions and compliance was only $.211$.

However, if post-test measures of the model's components are considered, we would expect very good predictions (or postdictions) of communicative behavior (r for BI-B = .883) and moderately good predictions of compliance (r = .502). Consistent with these expectations, the multiple correlation between the model's components and actual communicative behavior was .619 when pre-test measures were used, and .774 for the post-test measures. In contrast, it should be recalled that the multiple correlation between traditional attitudinal variables (i.e., attitudes toward the coworkers and beliefs about their expertise) and communicative behavior was only .031 when pre-test measures were used, and was only .056 for post-test scores.

Turning to compliance, the multiple correlation was .356 when pre-test measures were used and .593 on the post-test. Again, these results should be contrasted with those obtained from a more traditional attitudinal approach. The multiple correlation using pre-test measures of beliefs about and attitudes toward the coworkers was .112 while post-test measures resulted in a multiple correlation of .285.

In conclusion, it would appear that the new approach suggested in this paper may provide a reasonable explanation for the often-obtained finding that attitudes do not correlate very highly with behaviors. While there are still many problems that have to be overcome (e.g., a better understanding of the BI-B relationship; a better definition of the normative component of the model, etc.), it does appear that the model can lead to successful behavioral prediction where other more traditional approaches have failed. More importantly, however, it must be emphasized that although this new approach seriously questions the validity of the assumption of any kind of systematic relationship between traditional attitudinal variables and behavior,

it does (1) suggest that there will be certain situations in which such a relationship will be found; (2) it does not discount the importance of attitudes as factors influencing behavior. That is, we are suggesting that, in a sense, the second explanation of why attitudes have failed to predict behavior (i.e., because the attitudes that have been considered were inappropriate) is indeed correct. Until now, most research has focused on measures of attitudes toward objects, groups or institutions. In contrast, we are suggesting that the appropriate attitudes to consider are those toward the performance of specific behaviors. Further, it was argued that as important as these attitudes toward an act may be, they are not the only, or always the most important factors influencing behavior. More specifically at least normative beliefs regarding the act and motivation to comply with the perceived norms will have to be considered before successful behavioral prediction is possible.

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Footnotes

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- ²Requests for reprints should be sent to Martin Fishbein, Department of Psychology, University of Illinois, Champaign, Illinois, 61820.
- ³The assistance of Patricia Maitland, Sandra McManus, Linda Schneider and Carol Stelzner is gratefully acknowledged.
- ⁴Separate analyses within feedback conditions were computed, and as expected, no differences between conditions were obtained.
- ⁵A change in the favorable direction was scored positively, a change in the unfavorable direction was scored negatively.
- ⁶The assistance of Sue Crossman, Ellen O'Farrell, Donna Feddersen, Sue Liebovich, Diane Riman and Arlene Shapiro is gratefully acknowledged.
- ⁷In case the naive subject refused to state her preference for either of the presidential candidates, the "pleasant role" was assumed by the Johnson supporter and the "nasty" character was assumed by the Goldwater girl. (This was done since previous estimates indicated there were more students on campus favorably inclined to Johnson than to Goldwater.)
- ⁸A factor analysis of the eleven scales had been performed; and, consistent with the findings of Experiment I, two factors were identified-- (1) "Social Acceptance" and (2) "Subordination." The correlation between the two factor scores was .70 for the PC and .64 for the NC. In view of the high correlations, and consistent with Fishbein's contention (1965a) that a large number of an individual's behavioral intentions provide a good estimate of his attitude, it was decided to use the total of the eleven scales in the analyses.
- ⁹Separate correlations were computed within each reinforcement condition, and no significant differences between conditions were obtained. Thus, for ease of presentation, the data was pooled.
- ¹⁰See Footnote 5.
- ¹¹It could be argued that this finding provides additional support for a cognitive bolstering effect.

¹²The % of times a subject complied with the instructions of his coworkers (i.e., the number of times the subject complied / number of messages he received) was also considered

since, in contrast to our previous studies, the communicative behavior of the subject's coworkers was not controlled, and thus, different subjects could have received different numbers of instructions from each coworker. That is, in Experiments I and II, it was only necessary to consider the number of times a subject complied since number and percent were perfectly correlated. Although in the present study these two measures could vary somewhat independently, they were found to be highly correlated ($r = .719$, $p < .01$ $N = 144$) and similar results were obtained with both variables. Consistent with Experiments I and II, only the results obtained with number of compliances will be reported.

¹³Similar results have been reported by Raven and Shaw (1970).

¹⁴In contrast to these findings, the changes in the attitudinal ratings of the coworkers in Experiments I and II were in opposite directions (i.e., subjects became more favorable to one coworker and less favorable to the other). This may be attributed to the use of confederates with different initial attitudinal ratings in the first two studies and naive, equally valued group members in the third.

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13. ABSTRACT

Three experiments attempting to predict overt behavior from attitudinal variables are described. In the first two experiments an attempt was made to predict an individual's communicative and compliance behaviors toward his group members from knowledge of (a) his attitudes toward (i.e., affect for) the group members; (b) his beliefs about their expertness on the group task; and (c) his general behavioral intentions toward them (i.e., intentions to subordinate oneself, intentions to show social acceptance). No consistent, and very few significant relations between these attitudinal variables and behaviors were obtained. Further, three often proposed explanations for this lack of relationship (i.e., the attitude measure is incomplete, the attitude measure is inappropriate; the attitude-behavior relationship is moderated by reinforcement) were also not supported. Thus, the conclusion was reached that traditional attitudinal approaches are ineffective in predicting overt behavior. In the third study, an alternative approach, based on a newly developed theory of behavioral intention and behavior was attempted. Consistent with the theory, an individual's specific intentions to communicate or comply with the other group members were predicted with high accuracy from (a) the individual's attitudes toward performing these behaviors (i.e., communicating and complying) and (b) his beliefs about the norms governing these behaviors, weighted by his motivation to comply with the norms. Overt behaviors on the task were significantly related to the specific intentions, and thus, the theory led to the significant prediction of overt behaviors. The degree of predictability was determined by the strength of the relationship between intentions and behavior, and this latter relationship was itself shown to be contingent upon the occurrence of events that took place between the measurement of intentions and the observation of behavior.

14. KEY WORDS

Attitude
Attitudinal variables
Overt behavior
Behavioral Intentions
Attitude-Behavior Theory