

Attitude-Behavior Relations: A Theoretical Analysis and Review of Empirical Research

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Research on the relation between attitude and behavior is examined in light of the correspondence between attitudinal and behavioral entities. Such entities are defined by their target, action, context, and time elements. A review of available empirical research supports the contention that strong attitude-behavior relations are obtained only under high correspondence between at least the target and action elements of the attitudinal and behavioral entities. This conclusion is compared with the rather pessimistic assessment of the utility of the attitude concept found in much contemporary social psychological literature.

Reports of rather low or nonsignificant relations between attitudinal predictors and behavioral criteria have been accumulating for more than 40 years (cf. Wicker, 1969). These negative findings led many investigators to reconsider the nature of the attitude-behavior relation (e.g., Calder & Ross, 1973; D. T. Campbell, 1963; DeFleur & Westie, 1958, 1963; Deutscher, 1966, 1969, 1973; Ehrlich, 1969; Kelman, 1974; Rokeach, 1967; Tittle & Hill, 1967). In a parallel development, it was possible to discern a growing disenchantment with the attitude concept, and the general consensus was that measures of attitude have little value for the prediction of overt behavior.

Recently, however, social psychology has been witnessing a revival of interest in the relationship between attitude and action (e.g., Brannon, 1976; Liska, 1975; D. J. Schneider, 1976; Schuman & Johnson, 1976). The emerging position seems to be that attitude is only one of many factors determining behavior. Although this position reaffirms the importance of attitudes, it leads to the expectation that attitudes will often be unrelated to behavior.

In a number of publications we have presented ideas and data that are clearly at variance with this assessment of the attitude

concept and its utility (Ajzen & Fishbein, 1973; Fishbein, 1967, 1973; Fishbein & Ajzen, 1972, 1974, 1975). We have argued that a person's attitude toward an object influences the overall pattern of his responses to the object, but that it need not predict any given action. According to this analysis, a single behavior is determined by the intention to perform the behavior in question. A person's intention is in turn a function of his attitude toward performing the behavior and of his subjective norm. It follows that a single act is predictable from the attitude toward that act, provided that there is a high correlation between intention and behavior.¹

These arguments can be incorporated within a more general framework that focuses on the question of correspondence between measures of attitude and behavior. The purpose of the present article is to reexamine the attitude-behavior relationship. A theoretical analysis of the correspondence between attitudinal predictors and behavioral criteria is followed by a review of pertinent empirical research. It is shown that people's actions are found to be systematically related to their attitudes when the nature of the attitudinal predictors and behavioral criteria are taken into consideration.

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¹ Even when the intention is primarily under the control of normative considerations, its correlation with attitude toward the action is usually found to be quite high.

Attitude-Behavior Correspondence

Attitudes are held with respect to some aspect of the individual's world, such as another person, a physical object, a behavior, or a policy. Although many definitions of attitude have been proposed, most investigators would agree that a person's attitude represents his evaluation of the entity in question. For purposes of the present review, only measures that place the individual on a bipolar evaluative or affective dimension are considered to be measures of attitude.

Behavioral criteria consist of one or more observable actions performed by the individual and recorded in some way by the investigator. Behavioral acts include attending a meeting, using birth control pills, buying a product, donating blood, and so forth. Sometimes investigators have relied on "behavioroid" measures (Aronson & Carlsmith, 1968), that is, on the individual's commitment to perform the behavior under consideration or on self-reports of behavior. Such measures are treated below as acceptable behavioral criteria only when it would have been difficult or impossible to obtain a direct measure of the behavior in question.

Attempts to predict behavior from attitudes are largely based on a general notion of consistency. It is usually considered to be logical or consistent for a person who holds a favorable attitude toward some object to perform favorable behaviors, and not to perform unfavorable behaviors, with respect to the object.² Similarly, a person with an unfavorable attitude is expected to perform unfavorable behaviors, but not to perform favorable behaviors. The apparent simplicity of this notion is deceptive, since there is usually no theoretical basis for the assumption that a behavior has favorable or unfavorable implications for the object under consideration. Obviously, many behaviors have no evaluative implications for a given object. Eating hamburgers, for example, implies neither a favorable nor an unfavorable evaluation of Russia. However, an investigator might assume that an unfavorable evaluation of Russia is implied by the act of volunteering for military service and might therefore predict

a relationship between attitude toward Russia and a measure of this behavior.

It can be seen that a given behavior is assumed to be consistent or inconsistent with a person's attitude on the basis of largely intuitive considerations. In the absence of an explicit and unambiguous definition of attitude-behavior consistency, therefore, many tests of the attitude-behavior relation reduce to little more than tests of the investigator's intuition. From a theoretical point of view, such tests of the relation between arbitrarily selected measures of attitude or behavior are of rather limited value.

The following analysis attempts to specify the conditions under which attitudes can or cannot be expected to predict overt behavior. Our point of departure is the notion that attitudes are held and behaviors are performed with respect to certain entities. Two important questions in research on the attitude-behavior relation can then be identified: (a) What are the entities of the attitudinal predictors and of the behavioral criteria? (b) What is the degree of correspondence between the attitudinal and the behavioral entities?

Attitudinal and Behavioral Entities

Attitudinal and behavioral entities may be viewed as consisting of four different elements: the *action*, the *target* at which the action is directed, the *context* in which the action is performed, and the *time* at which it is performed. The generality or specificity of each element depends on the measurement procedure employed.

Behavioral criteria based on single observations always involve four specific elements. That is, a given action is always performed with respect to a given target, in a given context, and at a given point in time. Criteria based on multiple observations of behavior generalize across one or more of the four elements. For example, when the behavioral

² Peabody's (1967) work suggests that the basis for consistency may often be logical or denotative rather than evaluative. However, logical and evaluative consistency are usually confounded and the distinction appears to be of greater theoretical than practical significance.

observations constituting the criterion measure involve a very heterogeneous sample of targets, the target element is essentially left unspecified. However, when the different targets constitute a more homogeneous set, their common attributes determine the target element. When all targets are other human beings, for example, the target element is people in general; when the individuals serving as targets are of the same sex, religion, or race, then males, Jews, or Orientals might constitute the target element.

Similar considerations apply to the definition of the action, context, and time elements. To illustrate, when a very heterogeneous sample of behaviors is observed, the action element is left unspecified. Sometimes, however, the specific acts may represent a more general class of behaviors, such as cooperation, aggression, or altruism. Here, the action element is defined by the class of behaviors.³

In conclusion, the measurement procedure determines the behavioral entity. When the same action is observed with respect to heterogeneous targets, in different contexts, and at different points in time, we obtain a behavioral index whose entity is defined only by the action element. The target serves as the entity when heterogeneous behaviors toward the same target are observed in different situations and at different points in time. In a similar manner, indices can be obtained such that the contextual element, the time element, or any combination of elements defines the entity for the behavioral criterion.

As in the case of behavioral criteria, attitudes are also directed at entities that may be defined by a single element or by combinations of two or more elements. Attitudinal predictors frequently specify only the target. Attitudes have been measured toward the church, various ethnic groups, specific persons, and so on without reference to any particular action, context, or time. However, an investigator can specify an entity in terms of any combination of elements and can obtain a measure of attitude toward that entity. For example, an evaluative semantic differential could be used to measure attitudes toward targets (Martin Luther King, Jews), toward

actions (cooking dinner, cooperating), toward contexts (in St. Mary's Cathedral, at home), toward times (3:00 p.m. tomorrow, August), or toward any combination of elements (cooperating with Jews, cooking dinner at home at 3:00 p.m. tomorrow).

Correspondence Between Attitudinal and Behavioral Entities

After defining entities in terms of their elements, we can approach the question of attitude-behavior correspondence. An attitudinal predictor is said to correspond to the behavioral criterion to the extent that the attitudinal entity is identical in all four elements with the behavioral entity. For example, a measure of attitude toward a target such as "my church" (without specification of action, context, or time) corresponds directly only to a behavioral criterion based on the observation of different behaviors with respect to the person's church (e.g., donating money, attending Sunday worship services, participating in church-sponsored activities, etc.), in different contexts, and at different points in time. Similarly, when the attitude measure is an evaluation of a specific action toward a given target, such as the attitude toward "donating money to my church," the corresponding behavioral criterion is an index of monetary donations to the person's church based on multiple behavioral observations in different contexts (e.g., at home, in the church, etc.) and on different occasions. Alternatively, when the behavioral criterion is a single act, such as the person's attendance or nonattendance of next Sunday's worship service in his

³ It is interesting to note that, as in the case of attitudes, personality traits have been found to have little validity for the prediction of specific behaviors (Mischel, 1968; Wiggins, 1973). Personality traits such as dominance or authoritarianism represent general behavioral tendencies without reference to a specific target, context, or time. Given the nature of personality measures, it seems reasonable to suggest that an appropriate behavioral criterion is not a single action but rather an index based on a set of behaviors reflecting the trait in question; target, context, and time should be left unspecified. Data supporting this notion have been reported by Jacard (1974).

church at 10:00 a.m., the corresponding attitudinal predictor would be a measure of the person's evaluation of "attending my church's worship service next Sunday at 10:00 a.m."

Correspondence and the attitude-behavior relation. The central thesis of this article is that the strength of an attitude-behavior relationship depends in large part on the degree of correspondence between attitudinal and behavioral entities. Although, in theory, correspondence is defined in terms of all four elements of the entities involved, for purposes of the present article, examination of the target and action elements is sufficient.

Considering target and action elements alone, two attitudinal predictors can be identified that deserve special attention. The most common measure specifies a given target (be it an object, a person, or an institution) without reference to a particular action. This predictor may be termed *attitude toward a target*. Of less frequent use is *attitude toward an action*, a predictor that specifies both action and target elements (e.g., attitude toward smoking marijuana).

A similar distinction can be made with reference to behavioral criteria. When the criterion is an index based on observations of heterogeneous behaviors with respect to a given target, only the target element is specified and the resulting measure may be called a *multiple-act criterion*. When only one behavior toward a given target is observed, both target and action elements are specified and we obtain a *single-act criterion*.

The above discussion suggests that attitudes toward targets will predict multiple-act criteria, provided that the attitudinal and behavioral entities involve the same target elements. Similarly, attitudes toward actions are expected to predict single-act criteria if the target and action elements of the attitudinal entity are identical with those of the behavioral entity (cf. Fishbein & Ajzen, 1974, 1975).

Generally speaking, high attitude-behavior correlations cannot be expected in the absence of correspondence between attitudinal and behavioral entities. Lack of correspondence, however, does not necessarily preclude a relationship between attitude and behavior.

Whenever the single-act criterion involves an action that is little more than an evaluation of the target, it should be predictable from a measure of attitude toward the target in question.

The relatively frequent use of petition signing or voting as measures of behavior deserves attention in this context. Both of these behaviors constitute single-act criteria that specify the target element as well as the action element. Under most circumstances, however, the act of signing a petition or voting for a given candidate involves little more than expressing an evaluation of the target in question. For example, when a person signs or refuses to sign a petition supporting the legalization of marijuana, the act itself involves little more than the expression of a favorable or unfavorable attitude with respect to the issue. Viewed in this light, a measure of attitude toward the target (legalization of marijuana) should permit satisfactory prediction of the petition-signing behavior.

Similarly, in the United States, the act of voting for a given candidate or issue reflects in large part the voter's evaluation of the candidate or issue under consideration. A measure of attitude toward the candidate or issue would therefore be expected to correlate highly with voting behavior.

Considerations of this kind may also apply to other single-act criteria. That is, a specific act may sometimes have relatively direct evaluative implications for a given target. A procedure for determining such evaluative implications of single-act criteria was discussed by Fishbein and Ajzen (1974). However, even when it can be shown that an action has evaluative implications for the target, the most appropriate predictor of the single-act criterion is the attitude toward the action rather than the attitude toward the target.

The review of empirical research below deals with studies that provide evidence concerning the relation between an evaluative measure of attitude and some behavioral criterion—whether or not these studies were designed to examine the attitude-behavior

relation.⁴ Studies with inappropriate measures of either the attitudinal predictor or the behavioral criterion are included if they were designed to be explicit tests of the relation between attitude and behavior.

Our review is structured in terms of correspondence with respect to target and action elements. Although it is possible to consider degrees of correspondence in each element, for the sake of simplicity we have chosen to classify attitudes and behaviors as either corresponding or not corresponding in their targets and actions. For each study reviewed, we identify the target and action elements of the attitudinal and behavioral entities. When the two targets are identical, the attitudinal predictor and behavioral criterion are classified as corresponding in their target elements. A similar judgment is made with respect to the action elements. In accordance with our previous discussion, if a single-act criterion involves signing a petition or voting, the action element of the behavioral entity is viewed as unspecified.

Research on Attitude-Behavior Relations

Studies that provide data on the relation between attitude and behavior fall into several categories. One category contains studies in which neither the target nor the action element of the attitudinal entity corresponds to the target or action element of the behavioral entity. Our analysis suggests that studies of this kind should obtain very low attitude-behavior relations. Other studies correspond in one of the two elements but not in the other. Our analysis indicates that the results of such studies are likely to be inconsistent and that the obtained relations between attitude and behavior will generally be quite low. It appears that investigators have questioned the predictive utility of attitude measures primarily on the basis of studies in these two categories. However, we shall see that results are quite consistent, and significant relations between attitudes and behavior are usually obtained when there is correspondence with respect to both the target and the action elements.

Lack of Correspondence

Many studies concerning the attitude-behavior issue have obtained measures with little or no correspondence between the elements of the attitudinal and behavioral entities. Usually, attitudes are measured toward a class of people in general without reference to any particular action. The behavioral criteria, however, consist of specific acts with respect to, or in the presence of, one or more particular members of the class of people that serves as the target of the attitude.

A good example is the study by Himelstein and Moore (1963). Subjects in this study were 100 white male undergraduates who had volunteered for a psychological experiment. Prior to the experiment, the subjects completed a 9-item scale measuring attitudes toward blacks, which had been adapted from the F scale. The sample of subjects was dichotomized at the median attitude score. Upon reporting for the experiment, the subject found another student, either black or white, already seated in the room. Actually, this student was an experimental assistant. While they were waiting for the experiment to begin, a (white) confederate entered the room with a petition in his hand. The petition contained a proposal to extend the library hours on Saturday until 8:00 p.m. The black or white assistant either signed or refused to sign the petition, and following this manipulation, the subject was requested to sign.⁵ The subject's compliance or lack of compliance with the assistant's response served as the behavioral criterion. A secondary analysis of the data revealed a nonsignificant phi coefficient of .06 between attitudes toward blacks and compliance with the black confederate.

Using the Asch (1951) and M. Sherif (1935) procedures, several other studies have

⁴ We tried to identify all relevant studies, but there are obviously some that we have overlooked. Furthermore, because of the increased interest in the attitude-behavior relation, several new studies will have appeared by the time this review is published.

⁵ Note that this behavior might serve as an indication of the subject's attitude toward "extending library hours on Saturday until 8:00 p.m.," but not as an indication of attitude toward blacks.

also attempted to predict conformity with specific members of racial or ethnic groups on the basis of attitudes toward those groups in general (Berg, 1966; Boyanowski & Allen, 1973; Bray, 1950; Malof & Lott, 1962; F. W. Schneider, 1970). In addition, attitudes toward blacks have been used to predict conditioning in the Taffel (1955) procedure by means of a black or white experimenter (Smith & Dixon, 1968); inviting black or white confederates for coffee (Rokeach & Mezei, 1966); signing releases for photographs to be taken with specific black individuals (Tarter, 1969); sending messages to a black confederate and rejecting that confederate from the group (Burnstein & McRae, 1962); and performing each of 21 different behaviors toward black group members while working on a variety of tasks in racially mixed groups (Katz & Benjamin, 1960).⁶ Like Himmelstein and Moore (1963), virtually all of these studies have reported nonsignificant relations between attitude and behavior. One exception was the investigation by Burnstein and McRae (1962), who found that attitudes toward blacks in general had a significant effect on the proportion of messages sent to a specific black confederate in a communication network. Using Friedman's (1968) table for the rapid estimation of the magnitude of an experimental effect (r_m), the correlation between attitude and behavior in this study is found to be relatively low ($r_m = .30$). Furthermore, the attitude toward blacks had no significant effect on rejection of the black confederate from the group.

Lack of correspondence between attitudinal and behavioral entities can also be found in several studies that measured attitudes toward targets other than racial or ethnic groups. Zunich (1961), like Katz and Benjamin, obtained a number of behavioral criteria. Specifically, he observed the extent to which mothers engaged in each of 17 different behaviors with respect to their children. In addition, attitudes toward 16 different child-rearing practices (e.g., breaking a child's will, egalitarianism) were measured. Although there may have been limited correspondence in the action elements of some attitudinal and behavioral entities, the attitudinal target

element (children in general) clearly did not correspond to the behavioral target element (the mother's own child). Schwartz and Tessler (1972) assessed women's attitudes toward "reducing transplant activities" and recorded their willingness to "join a pool of potential bone marrow donors." Dean (1958) attempted to predict union members' attendance at regular local union meetings on the basis of the members' attitudes toward labor unions in general and their liking for their jobs. C. W. Sherif, Kelly, Rodgers, Sarup, and Tittler (1973, Study 5) assessed attitudes toward personal adjustment, black rights, and achievement in education and attempted to predict attendance at a group discussion dealing with one of these issues. Finally, Genthner and Taylor (1973) measured attitudes toward desegregation and used the average intensity of electric shocks administered to a black confederate as their behavioral criterion. Once again, in none of these studies were attitudes found to make significant contributions to the prediction of behavior.

Although the study by Kutner, Wilkins, and Yarrow (1952) has usually been considered as a test of the relation between attitude and behavior, from our point of view it failed to obtain an adequate measure of attitude. These investigators recorded whether reservations for a racially mixed group were accepted over the telephone by 11 different restaurants. Prior to the requests for reservations, all 11 restaurants had allowed a black woman to join two white women already seated at a table. It can be seen that no measure of attitude was obtained. On the two occasions the investigators assessed two different behaviors: accepting or refusing to accept a reservation for a racially mixed group and admitting or refusing to admit a black woman. No relation between these two behaviors was found. Although all of the

⁶ Had Katz and Benjamin constructed a multiple-act criterion on the basis of their 21 behaviors, the behavioral action element would have been unspecified and would thus have corresponded to the attitudinal action element. Even so, their measures of attitude and behavior would still have lacked correspondence in terms of the target elements.

restaurants admitted the black woman, none of the restaurants accepted the reservation. An analysis of the entities of the two behaviors revealed that there was no correspondence between their target elements or between their action elements. In one case the target was a racially mixed group, and the action element consisted of accepting a reservation. The second behavior involved a specific target person (the black woman) and a different action element (admittance to a restaurant). Although this study had little to do with the attitude-behavior relation, its negative results are hardly surprising.

Conclusion

This section reviewed 17 studies in which the target and action elements of the attitudinal entity failed to correspond to the target and action elements of the behavioral entity. Only one conclusion can be reached in light of this research: Attitude-behavior relations under lack of correspondence are low and not significant.

Partial Correspondence

Whereas the previous section dealt with the effects of complete lack of correspondence, the studies reviewed below employed measures of attitude and behavior that corresponded in one of the two major elements of the attitudinal and behavioral entities. Our analysis of correspondence between entities suggests that under conditions of partial correspondence, relations between attitude and behavior will tend to be inconsistent, and even where they are significant, they should normally be quite low. In most investigations involving partial correspondence, we find correspondence between target elements but little correspondence between action elements. First, however, we examine several studies in which the opposite is true, that is, in which the action elements corresponded but in which there was little correspondence between the target elements.

Lack of Correspondence between Target Elements

Ten investigations, dealing with a variety of different targets and actions, were found

to fall into this category. Seven of these studies lacked correspondence in the target elements because the attitudinal predictors involved unspecified or general targets, whereas the behaviors were observed with respect to very specific targets.

For example, Corey (1937) measured students' attitudes toward cheating and attempted to predict actual cheating on a given set of tests. Over a period of 5 weeks, Corey's students took five true-false examinations. Each week's test papers were returned unmarked after the students' scores had been recorded. The students then graded their own papers during the following class session. The difference between the true score and the score each student reported for himself, summed over the five tests, constituted the primary behavioral criterion. A second index was derived by computing the ratio of this actual cheating score over the maximal cheating score (the difference between the true score and the best possible score on each test).

It can be seen that the attitudinal and behavioral entities in this study corresponded in terms of their action elements, in that both dealt with cheating. However, the attitudinal target element did not correspond closely to the behavioral target element. The former refers to cheating in general, whereas the latter concerns cheating on a given set of tests. That this distinction is important can be seen by examining the results. The attitude score did not correlate significantly with either of the two behavioral criteria ($r_s = .024$ and $.13$, respectively). By way of comparison, the author reported that the maximal cheating score (representing an index of "temptation") correlated significantly ($r = .46$) with actual cheating. That is, students were likely to cheat on a test if cheating on that test was potentially useful or desirable, irrespective of their attitudes toward cheating in general.

Nonsignificant correlations between attitudes toward cheating in college and actual cheating on specific examinations were also reported by Freeman and Ataöv (1960).

Sample and Warland (1973) and Warland and Sample (1973) measured attitudes toward participating in student government among undergraduates enrolled in social sci-

ence classes. A 15-item Likert scale developed by Tittle and Hill (1967) was used. The behavioral criterion, based on voting record, was whether or not a subject had voted (i.e., participated) in a given student election (a much more specific target than student government). Although the attitude-behavior correlations in the two studies were significant, they were of relatively low magnitude ($r_s = .29$ and $.26$).

The other studies in this group assessed beliefs (Bickman, 1972) or intentions (LaPiere, 1934; McGrew, 1967) instead of obtaining measures of attitude, as defined in this article. All three reported nonsignificant relations with behavior.

Undoubtedly the best known of these studies is LaPiere's investigation of racial prejudice. In the early 1930s, LaPiere accompanied a young Chinese couple in their travels through the United States. Calling upon 251 restaurants, hotels, and other establishments, they were refused service only once. About 6 months later, LaPiere sent a letter to each establishment visited, asking the same question: "Will you accept members of the Chinese race as guests in your establishment?" Of the 128 establishments that replied, over 90% answered, "No."

Clearly, the letter-questionnaire in this study was not a measure of evaluation. It can best be described as a measure of behavioral intention, or perhaps of behavioral commitment. Disregarding this problem, we can see that the entities of the two measures corresponded only in part. Whereas the action element in both measures involved accepting someone in an establishment, the target elements differed. The overt behavior was directed at a specific Chinese couple (usually accompanied by LaPiere). The letter, however, referred more generally to "members of the Chinese race."⁷

The final three studies used measures of attitudes toward targets to predict criteria with unspecified action elements. Attitudinal and behavioral entities thus corresponded in their action elements, but unfortunately, they involved different target elements.

Fendrich (1967b) measured attitudes toward blacks by means of two instruments: a 32-item Likert scale and a 10-item be-

havioral intention scale. The behavioral criterion was a 4-item Guttman scale of activities with respect to members of the National Association for the Advancement of Colored People (NAACP), ranging from refusing to participate in a group discussion sponsored by the NAACP to signing up for various civil rights activities with members of the NAACP. In a second study, Fendrich (1967a) used only the Likert scale to measure attitudes toward black students and added one item to the behavioral scale. Since the behavioral criterion in both studies generalized across a variety of specific actions, it may be viewed as having an unspecified action element that corresponded to that of the attitudinal predictor. However, the behavioral target element involved members of the NAACP, whereas attitudes were measured toward black students in general.

Secondary analyses of the data resulted in significant correlations between attitudes and behavior. In the first study, the two scales correlated .49 and .38 with the criterion, and in the second study the correlation was .30.⁸

⁷ For a discussion of other problems in the LaPiere study, see Ajzen, Darroch, Fishbein, and Hornik (1970) and Dillehay (1973).

⁸ The secondary analyses were performed in order to enable comparisons of the results in the two studies. The data from the two conditions in the first study were combined for these analyses. That is, Fendrich (1967b) administered the two attitude scales in counterbalanced order, and order of administration was found to have a strong effect on the attitude-behavior relation. When the Likert scale was administered before the intention scale, neither measure predicted the behavior significantly ($r_s = .12$ and $.18$, respectively). However, when the scales were administered in the reverse order, the gamma coefficients were .69 for the Likert scale and .72 for the intention scale, both significant. Fendrich argued that a typical attitude measure, such as his Likert scale, elicits role playing, whereas the intention scale involves commitment to actual behavior. However, the intention scale also failed to predict behavior when it was preceded by the Likert scale. Furthermore, after dichotomizing the variables, a secondary analysis revealed an overall gamma of 1.0 for the Likert scale, which compares with a gamma of .71 in the second study (Fendrich, 1967a). Finally, we shall see below that appropriate measures of attitude can predict behavior, even when they involve no explicit behavioral commitment.

Finally, DeFries and Ford (1968, 1969) also measured attitudes toward "Negroes in general." Their behavioral criterion was the act of signing a petition for or against integrated housing. As noted in the introduction, this behavior may be viewed as an evaluation of the issue in question, and it may thus be argued that the behavioral entity, like the attitudinal entity, had no specific action element. However, the target elements (blacks versus integrated housing) were quite different. A secondary analysis of the data was performed by assigning a score of 1, 2, or 3 to subjects who signed the petition against integrated housing, neither petition, or the petition in favor of integrated housing, respectively. These scores were correlated with the attitude scores, yielding a correlation coefficient of .39 ($p < .01$).

To summarize briefly, the studies reviewed above obtained measures that corresponded in their action elements but not in their target elements. Five of these studies reported nonsignificant relations and five studies reported relatively low but significant attitude-behavior relations.

Lack of Correspondence between Action Elements

Individuals as targets. Most studies exhibiting lack of correspondence between action elements have measured attitudes toward a person and have attempted to predict specific behaviors with respect to, or in the presence of, that person. Various types of persons have served as the targets of the attitudinal and behavioral entities, including opponents in experimental games, interviewers, the experimenter, confederates of the experimenter, and simulated or fictitious persons. The actions directed at these target persons have included cooperation and competition (Gardin, Kaplan, Firestone, & Cowan, 1973; Krauss, 1966; Oskamp & Perlman, 1966; Tornatzky & Geiwitz, 1968); imitation, modeling, and conformity (Baron, 1970; Greenberg & Frisch, 1972; Hendrick & Taylor, 1971; Sampson & Insko, 1964; Stapleton, Nacci, & Tedeschi, 1973); prosocial or helping behavior (Baron, 1971; Epstein & Hornstein, 1969; Goodstadt, 1971; Nemeth,

1970; Regan, 1971; Schopler & Thompson, 1968); and verbal and nonverbal communication (Byrne, Baskett, & Hodges, 1971; Byrne, Ervin, & Lamberth, 1970; Ehrlich & Graeven, 1971; Goldberg, Kiesler, & Collins, 1969; Goldberg & Mettee, 1969; S. Rosen, Johnson, Johnson, & Tesser, 1973; Sapolsky, 1960; Worthy, Gary, & Kahn, 1969).

Since in all of these studies the measures of attitude made no reference to any particular behavior, the attitudinal and behavioral entities corresponded only in terms of their target elements but not in terms of their action elements. These studies, perhaps more than any other category of research, illustrate the inconsistent and disappointingly low relations between attitude and behavior.

Consider, for example, three studies on cooperation and competition in the Prisoner's Dilemma. Gardin, Kaplan, Firestone, and Cowan (1973) asked male undergraduates to play 50 trials of a Prisoner's Dilemma game. The number of cooperative moves by each subject served as one behavioral criterion. After the game, the subjects were asked to be seated around a table with eight unoccupied chairs. Each subject's physical distance from the other participant was recorded; this measure may be viewed as a second behavioral criterion. While seated at the table, the subjects completed a questionnaire that included two measures of attitude toward the other person. Correlations were computed between the two attitude measures and the two behavioral criteria. All four attitude-behavior correlations were below .20 and nonsignificant.

Tornatzky and Geiwitz (1968) were somewhat more successful in their attempt to predict the behavior of male college students in the Prisoner's Dilemma game. These investigators used Byrne's (1961) similarity manipulation to create favorable or unfavorable attitudes toward the partner in the game.

A manipulation check indicated that the desired difference in attitudes had been established. The subjects then played the game for 18 trials. Tornatzky and Geiwitz found that players in the high-similarity condition made significantly more cooperative choices than did subjects in the low-similarity condition.

Note that the significant relation reported was between similarity and cooperation, not

between attitude and cooperation.⁹ Using Friedman's (1968) table, the magnitude of this effect is estimated to be .25. That is, even assuming that similarity can be equated with attitude, the correlation between attitude and behavior is relatively low.

To further confound the relation between attitudes toward a target person and cooperation with that person in Prisoner's Dilemma games, Oskamp and Perlman (1966) reported a significant linear relation for one sample of subjects and a significant curvilinear relation for another. The male college students in this study played 30 trials of a Prisoner's Dilemma game against either their best friends, acquaintances, strangers, or disliked persons. A 7-point posttest measure of liking for the other player was trichotomized. One group of subjects was sampled at Pomona College, the other at Claremont Men's College. Cooperation increased with liking only at Pomona College. At Claremont, the most cooperation was exhibited by players with neutral attitudes toward their partners, and the least cooperation by players with the most favorable attitudes.

The three studies reviewed illustrate the inconclusive findings obtained when measures of attitude toward a specific target individual (without reference to any particular action) are used to predict a specific behavior with respect to the target person. In fact, of the 23 studies cited above, 8 reported nonsignificant attitude-behavior relations (Ehrlich & Graeven, 1971; Gardin et al., 1973; Goldberg et al., 1969; Goldberg & Mettee, 1969; Goodstadt, 1971; Hendrick & Taylor, 1971; Nemeth, 1970; Stapleton et al., 1973), 5 reported significant attitude-behavior relations of low to moderate magnitude (Byrne et al., 1970; Greenberg & Frisch, 1972; Krauss, 1966; Tornatzky & Geiwitz, 1968; Worthy et al., 1969), and 10 studies obtained inconsistent findings across different conditions of a given experiment (Baron, 1970, 1971; Byrne et al., 1971; Epstein & Hornstein, 1969; Oskamp & Perlman, 1966; Regan, 1971; S. Rosen et al., 1973; Sampson & Insko, 1964; Sapolsky, 1960; Schopler & Thompson, 1968). Examination of the pattern of results reveals no systematic effects

due to either the kind of individual serving as the target, the type of action considered, or the specific measurement procedures employed.

Organizations and institutions as targets. Lack of correspondence between action elements can also be found in studies that have attempted to predict specific behaviors toward such targets as the church, public housing, and the person's job or company, from attitudes toward these targets.

For example, numerous studies have been conducted in attempts to predict absenteeism, turnover, tardiness, productivity, and other work-related behaviors from various measures of job satisfaction or morale (e.g., Bernberg, 1952; Cherrington, Reitz, & Scott, 1971; Waters & Roach, 1971; Weitz & Nuckols, 1953). Since several reviews of this literature are available (e.g., Brayfield & Crockett, 1955; Porter & Steers, 1973; Schwab & Cummings, 1970; Vroom, 1964), no attempt is made to discuss studies of this kind in detail, here or in subsequent sections. It is sufficient to note that the studies cited above, as well as most other attempts to predict specific work-related actions from general measures of job satisfaction and morale, have met with little success.

Other studies concerned with work productivity have measured attitudes toward work in general (Friedlander & Greenberg, 1971), toward groups or training programs (Sagi, Olmsted, & Atelsek, 1955; Webb & Hollander, 1956), and toward effort on the job (Graen, 1969), in attempts to predict specific work-related behaviors. Studies of this kind have also provided little evidence for a systematic relation between attitude and behavior.

Lack of correspondence in action elements led to inconsistent findings in a study by Ostrom (1969). Students' attitudes toward

⁹ Although similarity was shown to have a significant effect on attitudes, the study does not provide direct evidence for a link between attitudes and behavior. Studies of this kind are reviewed here only because the sole purpose of the similarity manipulation was to create different degrees of attraction. Nevertheless, as far as the attitude-behavior relation is concerned, results of such studies must be treated with caution.

the church were measured by means of 12 attitude scales (3 Thurstone scales, 3 Guttman scales, 3 Likert scales, and 3 self-rating scales).¹⁰ Seven self-reports of behavior were elicited, including attendance of church services, time spent in church-related activities, and meditation outside formal church services. In addition, subjects could leave their names and addresses if they were interested in attending a discussion of the results of this research project and its contribution to the church in modern society. Thus, the criteria in this study were seven self-reported behaviors and one behavioral commitment. A total of 96 attitude-behavior correlations (12 attitude scales \times 8 behavioral criteria) were computed. Of these correlations, 37 (39%) were below .15 and not significant. The remaining correlations, although significant, were also very low. Only for self-reports of church attendance did the attitude-behavior correlations exceed .40.

Finally, rather than measuring attitudes, Bellin and Kriesberg (1967) assessed several specific beliefs about public housing and found them to be unrelated to whether or not the respondents actually applied for public housing in the course of a 3-year period.

Blacks as targets. In contrast with some of the research reviewed under *Lack of Correspondence*, a few studies have measured attitudes toward blacks in general and have used criteria that involved specific actions with respect to hypothetical representatives of this racial group (DeFleur & Westie, 1958; Green, 1972; Linn, 1965; Warner & DeFleur, 1969; Warner & Dennis, 1970). Attitudinal and behavioral entities thus corresponded in their target elements (blacks) but not in their action elements. Although the criteria in these studies were intentions instead of behaviors, they are reviewed here because they were explicitly designed to test the attitude-behavior relation.

The best known of these investigations was the study by DeFleur and Westie (1958), which measured attitudes toward blacks and used as its criterion a behavioroid measure involving signed agreements to be photographed with a black person of the opposite sex.¹¹ Subjects could allow the photograph to

be used for seven different purposes, ranging from use in "laboratory experiments where it will be seen only by professional sociologists" to use in a "nation-wide publicity campaign advocating racial integration." By permitting the subject to sign any, all, or none of the release agreements, this measure resulted in an 8-point behavioral index. Although DeFleur and Westie concluded that their data revealed a great deal of inconsistency between attitudes and behavior, their analysis showed a statistically significant association ($\chi^2 = 7.264, p < .01$). A secondary analysis of the data was performed to obtain an estimate of the magnitude of this relation. The phi coefficient was found to be .40, suggesting a correlation of moderate size.

In a similar study, Green (1972) measured subjects' willingness to be photographed with blacks in a variety of situations and found a significant relation of comparable magnitude ($r_m = .40$) between this criterion and attitudes toward blacks.

Linn (1965) used a measure of attitude toward blacks as well as a measure of willingness to be photographed with blacks to predict signing releases for interracial photographs. Although Linn reported no significant relations, a secondary analysis showed that the attitude measure had a correlation of .29 (*ns*), whereas the commitment scale correlated .39 ($p < .05$) with the criterion.

Significant but relatively low attitude-behavior relations were also reported by Warner and DeFleur (1969) and Warner and Dennis (1970). Warner and DeFleur measured attitudes toward blacks by means of a 16-item Likert scale. The sample of 537 college students was divided at the median attitude score. The behavioroid criterion was each subject's signed indication of willingness or refusal to perform a given behavior with respect to blacks. These commitments were elicited by means of a letter sent to each subject. Although a given subject received

¹⁰ One of the self-rating scales could be viewed as a self-report of behavior, rather than as a measure of attitude.

¹¹ Strictly speaking, the target of this behavior was blacks of the opposite sex, whereas the attitudinal target was blacks in general.

only one letter dealing with a single behavior, a total of eight behaviors were used for different subjects. These behaviors ranged from "making an anonymous contribution to a Negro educational charity" to "dating a Negro."

Although data for single behaviors were not made available, the authors reported the number of students who failed to return the letter, as well as the number of students who returned signed agreements or signed refusals to perform one of the eight behaviors. A secondary analysis of these data resulted in a significant index of association ($\chi^2 = 8.68$, $p < .05$). A phi coefficient of .13 indicates that the relation between attitude and behavior was of very low magnitude. Note, however, that most subjects did not reply to the letter. When only the subjects who replied are considered, the phi coefficient is found to be .26—somewhat higher but still not very impressive.

As part of the same study, attitudes toward blacks were also measured by means of an 8-item Guttman scale (see Warner & Dennis, 1970). These attitude scores, dichotomized at the median, correlated .27 with the above criterion when only subjects who replied were considered.

The five studies reviewed in this section all found relatively low but significant relations between attitude and behavior. These findings contrast with the generally nonsignificant relations reported by other studies whose attitudinal and behavioral entities failed to correspond in their action elements. One possible explanation is that the studies reviewed above all used more than a single response to construct their criteria. In the studies by DeFleur and Westie, Green, and Linn, subjects could sign a number of different release agreements. Subjects in the Warner and DeFleur and Warner and Dennis studies could volunteer for only one activity, but the activities varied for different subjects. Behavioral criteria of this kind tend to provide some degree of generality with respect to the action element, thus leading to somewhat greater correspondence with the action-free attitudinal predictor. In addition, it must be recalled that all five studies used behavioral commitments as their criteria. It is

possible that actual behavior (e.g., actually posing for a photograph and releasing it) would show a lower or nonsignificant relation to attitude.

Conclusion

The studies reviewed above reported relations between attitudes and behavioral criteria whose entities corresponded only in one of their two major elements. Ten investigations used measures that corresponded only in terms of their action elements, but the majority of studies (37) corresponded in their target elements and failed to provide for correspondence in their action elements. Our analysis of the nature of attitude-behavior relations suggests that partial correspondence between attitudinal and behavioral entities cannot be expected to yield consistently high relationships. The review of empirical research above supports this contention. Forty-seven studies conducted under partial correspondence were reviewed. Of these studies, 17 reported nonsignificant relations, 15 reported significant relations of low to moderate magnitude, and the remaining 15 studies obtained inconsistent results.

High Correspondence

The research reviewed in this section permits us to compare the low and inconclusive attitude-behavior relations found under lack of correspondence and partial correspondence with attitude-behavior relations under high correspondence. Some studies have examined relations between attitudes toward behaviors and single-act criteria. Others have measured attitudes toward targets in an attempt to predict multiple-act criteria. The remaining studies have investigated the relation between attitudes toward candidates or issues and voting or signing a petition for or against the candidate or issue. As noted in the introduction, the acts of voting or signing a petition are viewed as behavioral criteria with unspecified action elements. They should therefore be related to attitudes toward the targets in question.

Our analysis suggests that high correspondence between attitudinal and behavioral

entities will result in strong relations, provided that the investigator has in fact obtained measures of attitudes and behaviors, as defined in this article. The first group of studies reviewed below not only demonstrate high correspondence between attitudinal and behavioral entities but also appear to have employed appropriate measures of attitudes and behaviors. These studies should reveal high attitude-behavior relations. The second group of studies reviewed in this section used predictor or criterion measures that, from our point of view, may be problematic. Inappropriate measures of this kind tend to attenuate the attitude-behavior relations.

Appropriate Measures

Attitudes toward behaviors and single-act criteria. An example of a study conforming to our requirements is Veevers' (1971) investigation of drinking behavior, in which attitudes toward a behavior were used to predict a single-act criterion. Residents of two Alberta communities reported the frequency of their drinking, and the amount and kind of alcoholic beverages consumed. On the basis of these self-reports, 25 heavy drinkers, 25 light drinkers, and 25 abstainers were identified. Each respondent also completed five instruments measuring attitudes toward drinking alcoholic beverages. Gamma coefficients were computed to assess the degree of relationship between each attitude measure and the self-reported behavior. The five attitude measures were all significantly related to the behavioral criterion, the coefficients ranging from .46 to .72.

Strong relations between attitudes toward actions and single-act criteria were also reported by Janis and Hoffman (1970), Kothandapani (1971), and Nisbett (1968). Kothandapani investigated birth control practices among 452 married black women. Attitudes toward personal use of birth control methods were measured by means of 12 attitude scales: 3 Thurstone scales, 3 Guttman scales, 3 Likert scales, and 3 self-rating scales. The criterion was the self-reported use or nonuse of birth control methods. All 12 attitude-behavior correlations were significant and generally quite high. One correlation was

.36, and the remaining correlations ranged from .54 to .82. The average correlation, after transformation to Fisher's Z , was .69.

Although Janis and Hoffman (1970) and Nisbett (1968) failed to report coefficients of association, examination of their data again reveals strong attitude-behavior relations. Six months after participation in a program to reduce smoking, Janis and Hoffman's subjects whose attitudes toward cigarette smoking were above the median, reported smoking 29 cigarettes per day, whereas subjects with attitudes below the median smoked only 9.4 cigarettes per day. Nisbett provided data concerning the relation between attitudes toward the ice cream that subjects had just eaten and the amount that they had eaten. A secondary analysis of the plotted data revealed a correlation coefficient of about .80 for the total sample of 168 college students.

Attitudes toward targets and multiple-act criteria. Studies measuring attitudes toward targets and multiple-act criteria have also obtained strong attitude-behavior relations. For example, Bandura, Blanchard, and Ritter (1969) obtained two measures of attitude toward snakes. The avoidance behavior of 48 male and female subjects was then recorded with respect to a 29-item graded Guttman-type scale involving various interactions with a snake. These interactions ranged from "approaching the snake in an enclosed glass cage" to "passively permitting the snake to crawl in one's lap." Following the behavior, attitudes were reassessed. Both attitude measures were found to predict the criterion with a high degree of accuracy. When administered prior to the behavior, the two attitude scales correlated .73 and .56 with the criterion, respectively. Measured after the behavior, the corresponding correlations were .87 and .70.

Similar results were found by Potter and Klein (1957), with respect to the relation between maternal attitudes and behavior, and by Goodmonson and Glaudin (1971), in a study dealing with posthumous organ transplants.

Voting behavior. Political scientists studying the electoral process have collected extensive data on the determinants of voting

behavior. Although much of this work has dealt with determinants other than attitude, evidence concerning the relationship between attitude and voting behavior has also been reported. A complete review of this literature is beyond the scope of the present paper. The following discussion examines several studies that have made an explicit attempt to investigate the relationship between attitudes and voting behavior. Since, as noted in the introduction, attitude toward a candidate and voting for or against that candidate may be viewed as corresponding in both target and action elements, we would expect high attitude-behavior correlations.

In a widely cited series of surveys, A. Campbell, Converse, Miller, and Stokes (1960) obtained sizable correlations between attitudes toward candidates and voting behavior in the 1952 and 1956 presidential elections. Using a free-response format, respondents of voting age indicated what they liked and what they disliked about each party and about each candidate (Eisenhower & Stevenson). References to the candidates were scored as favorable or unfavorable, and summed. This measure of attitude toward each candidate correlated significantly with self-reported voting. For example, in the 1956 election, attitude toward Eisenhower had a correlation of .52 with voting choice. A detailed analysis of the attitude-behavior relations can be found in A. Campbell and Stokes (1959). Using a similar measure of attitude, Repass (1971) reported a correlation of .60 with voting for Johnson or Goldwater in the 1964 campaign.

Strong attitude-behavior correlations were also reported by Fishbein and Coombs (1974), who used attitudes toward Johnson and Goldwater to predict voting in the 1964 presidential election. Two measures of attitude were obtained, a 5-item evaluative semantic differential and a more indirect 24-item scale based on Fishbein's (1963) summation theory of attitude. The two measures of attitude toward Goldwater correlated .70 and .73 with voting, respectively. Attitudes toward Johnson provided correlations of .51 and .72.

In a series of studies, DeFleur and his

associates attempted to predict voting for or against legalization of marijuana. As in the case of voting for a candidate, the action element of this behavioroid criterion may be viewed as unspecified. Albrecht, DeFleur, and Warner (1972) measured students' attitudes toward legalization of marijuana by means of a standard Likert scale. In one condition of the experiment, subjects could vote for or against legalization of marijuana by means of a secret ballot. In a second condition, they could sign a petition supporting or opposing legalization of marijuana. The two conditions were combined, since they yielded comparable results. A gamma coefficient of .71 attests to the relatively high attitude-behavior relation. Similar results were reported by Frideres, Warner, and Albrecht (1971) and by Acock and DeFleur (1972).

Finally, using a somewhat different behavioral criterion, Kamenetsky, Burgess, and Rowan (1956) also found a relatively strong attitude-behavior relation. Several measures of attitude toward "the desirability of legislative measures to abolish discrimination against Negroes in employment matters" were obtained, and student subjects at the University of Illinois could sign or refuse to sign a petition "requesting Illinois congressmen to give their support to the passage of a Fair Employment Practices Act during the next session of congress." The attitude-behavior correlations were quite high and significant, ranging from .54 to .61.

To summarize briefly, the studies reviewed above clearly indicate that significant attitude-behavior relations of considerable magnitude can be obtained consistently by establishing high correspondence between attitudinal and behavioral entities. A total of 14 studies, judged to have used appropriate measures of attitude and behavior, were reviewed. Without exception these studies found strong and significant attitude-behavior relations.

Questionable Measures

The studies reviewed above were selected on the basis of considerations concerning the validity of their attitudinal and behavioral measures. Six other studies with apparent high attitude-behavior correspondence em-

ployed more questionable measures, especially with respect to their attitudinal predictors. They are reviewed here because they were designed to test the attitude-behavior relation and because they illustrate some of the difficulties involved in establishing high correspondence between attitudinal and behavioral entities.

In one of these studies, Mitchell and Nebeker (1973) obtained two measures of students' attitudes toward "time spent on academic activities."¹² The behavioral criterion was a self-report of the average number of hours per week that each subject had spent on academic activities during the preceding quarter. Superficially, it may appear that this criterion corresponded both in its target element and in its action element to the attitudinal predictors. Although it is true that the target (academic activities) was the same, there was an important difference between the attitudinal and behavioral action elements. The attitude measures asked subjects to evaluate "spending time [on academic activities]," without specifying how much time. Subjects could obtain high attitude scores if they had favorable evaluations of spending very little time, a moderate amount of time, or a great deal of time on academic activities. The behavioral criterion, however, was scored in terms of amount of time actually spent; the only way to obtain a high behavioral score was to report spending many hours per week on academic activities. As might be expected, the attitude-behavior correlations, although significant, were very low. One attitude measure had a correlation of .27 with the criterion, the other measure a correlation of .23.

More obvious problems were encountered in the remaining five investigations. Newton and Newton (1950) and Brannon, Cyphers, Hesse, Hesselbart, Keane, Schuman, Viccaro, and Wright (1973) measured intentions instead of attitudes. We noted earlier that intentions are expected to predict corresponding behaviors, and in fact, Brannon et al. found a strong relation between intentions to vote for an open housing law and signing a petition in support of such a law. Although no coefficient of association was reported,

approximately 80% of the respondents behaved in accordance with their intentions. The study by Newton and Newton (1950), however, had an additional problem. Women's intentions to breast-feed their babies were used to predict the degree to which they were successful in doing so. Unfortunately, all mothers were instructed to breast-feed their babies, whether they intended to or not, and success was defined in terms of the mother's ability to provide a sufficient quantity of milk. Clearly, this criterion was not completely under the mothers' control. Despite this problem, a secondary analysis revealed a significant correlation of .48 between the mothers' intentions and their breast-feeding behaviors.

Bowers (1968) used self-reports rather than actual observations of behavior. Although we have argued that self-reports can often substitute for actual behavior, their use in this study is problematic, since the 10 behaviors in question (destroying school property, taking books from the library without properly checking them out, etc.) were socially undesirable and the validity of the self-reports is thus open to question. Nevertheless, a secondary analysis of the data revealed significant attitude-behavior correlations ranging from .36 to .61.

The final two studies in this section (Mazen & Leventhal, 1972; Winters, 1971) entailed methodological problems that make it impossible to reach any conclusions concerning the attitude-behavior relation. For example, Mazen and Leventhal changed atti-

¹² One of these measures ostensibly followed from expectancy-value theory. Subjects were asked to indicate the extent to which the time they spent on academic activities led to good grades. Evaluation of good grades was measured in terms of the expected consequences of obtaining good grades and the subjective values of these consequences. The belief that time spent on academic activities led to good grades was multiplied with this evaluation of good grades. The product may be viewed as an incomplete measure of attitude toward spending time on academic activities. Expectancy theory would suggest that consequences other than obtaining good grades (e.g., learning about interesting issues) need to be taken into consideration when attitude toward spending time on academic activities is measured in this fashion.

tudes by means of persuasive communication, yet the correlations with subsequent behavior that were reported involved the pre-communication attitudes rather than the post-communication attitudes.¹³ As might be expected, the correlations were relatively low, although they did reach statistical significance in some conditions.

Conclusion

The findings of studies with high correspondence between attitudinal and behavioral entities must be judged in comparison with the rather low and mostly nonsignificant attitude-behavior relations obtained under conditions of partial or complete lack of correspondence. When the target and action elements of the attitudinal entity corresponded to the target and action elements of the behavioral entity, attitude-behavior correlations were found to be quite high and significant. This was often true, even when measures of doubtful validity were employed.

Although these conclusions are clearly consistent with our analysis of the relations between attitudes and behaviors, they were not based on direct comparisons of the effects produced by variations in degree of correspondence. The studies reviewed in the following section employed multiple measures of attitudes or behaviors, and they did, intentionally or unintentionally, provide the data needed to make the appropriate comparisons.

Comparisons: Varying Degrees of Correspondence

The advantage of comparing attitude-behavior relations under varying degrees of correspondence within a given study is that other potentially relevant factors are held constant. Differences in the magnitude of the relations between attitude and behavior can then be attributed with confidence to the differences in degree of correspondence.

Partial Correspondence Versus Lack of Correspondence

In the eight studies reviewed in this section, investigators obtained several measures

of attitude that varied in the extent to which they corresponded to the behavioral criterion. One or more attitude measures had no correspondence with the criterion, whereas the remaining attitudes corresponded in either the action element or the target element, but not in both.

For example, in a series of three experiments, Norman (1975) measured undergraduates' attitudes toward "volunteering as a subject" and toward "acting as a subject in psychological research." The behavioral criterion was a measure of volunteering to participate in a given psychological experiment. It can be seen that the first measure of attitude corresponded to the criterion in its action element (volunteering) but not in its target element (psychological research in general vs. the specific experiment-experimenter combination). The second attitude measure failed to correspond to the criterion, not only in its target element but also in its action element, since acting as a subject is very different from volunteering to be a subject.

Our analysis suggests that the first attitude measure, which partly corresponded to the criterion, should have yielded higher attitude-behavior correlations than the second attitude measure. The results in all three studies supported this analysis. The average correlation across studies was .40 under partial correspondence and .21 under lack of correspondence. The same pattern of results was obtained in another study dealing with volunteering to participate in a psychological experiment (Wicker & Pomazal, 1971), although the correlations obtained were of lower magnitude.

Fischer (1971) asked undergraduates to indicate on a 4-point scale their interest in joining the "College Student Companion Program" at Connecticut Valley Hospital. Since it was made clear to the subjects that they would be contacted later if they expressed some interest, this scale may be viewed as a behavioroid measure involving a

¹³ Mazen and Leventhal also reported correlations between attitude change and the behavioral criteria. This analysis again provides little information about the attitude-behavior relation.

relatively low degree of commitment. Attitudes had been measured several weeks prior to the recruitment by means of a 68-item Likert-type scale. A factor analysis of the 68 items resulted in four subscales. Two of these scales were related to helping (one was labeled "helping," the other "social responsibility"), and the remaining two scales measured "sex progressivism" and "attitude toward criminals."

It can be seen that the last two attitude measures lacked correspondence with the behavioral criterion, both in terms of the target and the action elements. The first two attitude measures involved the same action as the behavior (volunteering to help), but they differed in their target elements (the hospital's companion program for the behavior vs. no specific target for the attitudes).

The two measures of attitude toward helping each had a correlation of .36 ($p < .01$) with the partially corresponding behavioral criterion, and as would be expected, these correlations were significantly higher than those obtained for the remaining two attitude measures ($r_s = .15$ and $.21$). Much the same results were reported by Hornstein, Masor, Sole, and Heilman (1971), in another study of helping behavior, and by B. Rosen and Komorita (1971), who attempted to predict a behavioroid measure of commitment to attend a discussion on the "current war on poverty."¹⁴

Carr and Roberts (1965) obtained 29 measures of race-related attitudes and two self-reports of participation in civil rights activities. Only two of the 29 attitude measures corresponded at least in part to the behavioral criterion—one in its target element, the other in its action element. Of the 58 correlations between attitude and behavior, none were higher than .30 and about 80% of the correlations were below .15. Interestingly, however, most of the significant predictions were made by the two attitude measures whose entities corresponded in part to the entities of the two behavioral criteria.

A study by Rokeach and Kliejunas (1972) also permits comparisons between results obtained under partial correspondence and under lack of correspondence. Unfortunately,

the predictor whose action element corresponded to that of the criterion was not a measure of attitude. Rokeach and Kliejunas measured students' attitudes toward specific instructors in five psychology courses and toward psychology instructors in general (by averaging the specific ratings). In addition, they assessed the importance of attending class in general and treated these ratings as another measure of attitude. From our point of view, however, this was not an appropriate measure of attitude, since ratings of importance are not expressions of evaluation.

If we disregard this problem, we can turn to an examination of the correspondence between the predictors and the behavioral criteria. Subjects were asked to report, for each course, the percentage of classes they had cut for reasons other than illness or accident, in each of the psychology courses they had taken. A more general measure of cutting psychology classes was obtained by computing the average percentage. The behavioral criteria thus involved cutting either specific psychology classes or psychology classes in general. Clearly, the attitudes toward specific instructors and toward instructors in general had little or no correspondence with these criteria. The importance of attending class in general corresponded to the criteria in terms of its action element (attending class) but not its target element (no reference to psychology classes).

Consistent with this analysis, the correlation between attitude toward psychology instructors and the general measure of cutting psychology classes (lack of correspondence) was .20 and not significant, whereas the measure of importance (partial correspondence) had a significant correlation of .46 with this criterion. Considering each of the five courses separately, neither the attitude toward the instructor of a given class nor the measure of the importance of attending class in general

¹⁴ The B. Rosen and Komorita study entailed some measurement problems, since of the five predictors, only one was a clear measure of attitude. Despite this problem, the correlations between the predictors and the criterion were .35, .39, and .59 under partial correspondence and .03 and .08 under lack of correspondence.

was systematically related to class attendance. However, with respect to four of the five comparisons, the partially corresponding importance measure was the better predictor of behavior.

One final study (Brislin & Olmsted, Note 1) that permits a comparison of partial correspondence with lack of correspondence involved a behavioral criterion of questionable validity. The criterion was the percentage of phosphate contained in the laundry detergent used by 132 persons in a public launderette. The phosphate content was obtained from a government publication. Since it did not appear on the boxes, it is likely that most subjects were unaware of the percentage of phosphate contained in their detergents. Consequently, the semantic-differential measure of attitude toward low-phosphate laundry detergents obtained by the investigators must be viewed as lacking correspondence with the behavioral criterion in target as well as action elements. Four other attitude measures dealt with using low phosphate detergents. These measures corresponded to the behavior in their action elements but again not in their target elements. Attitude-behavior correlations were significant, but there were no systematic differences under partial correspondence and lack of correspondence. The correlation of the semantic differential measure with behavior was .34; the remaining attitude-behavior correlations ranged from .18 to .38.

To summarize briefly, relations between attitudes and behaviors under partial correspondence tend to be somewhat stronger than relations under low correspondence between attitudinal and behavioral entities. Even under partial correspondence, however, the relations tend to be of low magnitude.

High Versus Partial or Low Correspondence

Of all studies concerning the attitude-behavior relation, the investigations reviewed in this final section are most directly relevant to our conceptual analysis. In this section we review studies that permit a comparison of the magnitude of attitude-behavior relations under high correspondence with

their magnitude under partial or low correspondence. High correspondence between attitudinal and behavioral entities should, of course, produce stronger relations than should partial or low correspondence. As usual, some of the studies designed to test the relation between attitude and behavior are difficult to interpret, due to problems of measurement or general methodology. A review of these studies is followed by a discussion of studies with appropriate measures and procedures.

Questionable measures. Among the studies that permit comparisons between high and partial or low correspondence, five employed measures of questionable validity. In two studies (Heberlein & Black, 1976; Silverman & Cochrane, 1971) the problem relates to the attitudinal predictor; in the remaining three studies (Bruvold, 1972b; Liska, 1974a; Mann, 1959) problematic criteria were employed.

Heberlein and Black (1976) designed a study that varied degree of correspondence, but some of their predictors were beliefs rather than attitudes. The behavioral criterion was essentially an index of whether a person did or did not purchase lead-free gasoline. Various predictors were used, ranging from a general attitude toward the environment, through attitudes toward air pollution and toward lead-free gasoline, to a general commitment to use lead-free gasoline. Finally, a single item was used to measure the respondent's felt obligation to purchase lead-free gasoline.

It can be seen that the attitudes toward the environment and toward air pollution lacked any correspondence with the criterion; the measures referring to lead-free gasoline corresponded to the criterion in their target elements but not in their action elements; and the remaining predictors, although not measures of attitude, corresponded highly with the criterion. As might be expected, the prediction of behavior became more accurate as degree of correspondence increased. The correlations ranged from .12 to .21 under lack of correspondence, from .36 to .39 under partial correspondence, and from .50 to .59 for high correspondence.

Stronger relations under high correspon-

dence ($r_s = .63$ and $.58$) than under partial correspondence ($r_s = .38$ and $.26$) were also reported by Silverman and Cochrane (1971), who used measures of intention (rather than attitude) to predict the signing of two petitions dealing with open housing.

In the remaining studies, problems were related to the behavioral criterion rather than to the measure of attitude. For example, Liska (1974a) obtained self-reports of eight cheating behaviors that involved receiving help from others during the preceding semester. The 183 college students who served as subjects responded to a 5-point scale (don't remember, never, once, twice, three or more times) with respect to such behaviors as "got help on a term paper from another student" and "secured a copy of an old examination." In addition to these eight single-act criteria, a multiple-act criterion was obtained by summing over the eight behavioral self-reports.

Two problems concerning these measures of behavior must be noted. First, it may be inappropriate to assign the lowest behavioral score to the "don't remember" category. Second, the use of self-reports in this situation must again be viewed with caution, since the behaviors in question had low social desirability.

Attitudes toward each of the eight behaviors were measured by means of a 5-point approve-disapprove scale.¹⁵ Attitudes toward the target of "using others to prepare for and take examinations" were obtained by summing over the eight single scales. In addition, 5-item scales were used to measure attitudes toward cheating in college, intellectualism, and honesty.

The eight attitudes toward a behavior corresponded in both target and action to the eight single-act criteria. High correspondence also existed between the attitude toward "using others" and the multiple-act criterion. All other combinations of attitudinal and behavioral measures corresponded only in part or not at all. This analysis is supported by the data. Under high correspondence, all attitude-behavior correlations were significant. For single behaviors, the correlations ranged from $.21$ to $.43$; the attitude toward a target

correlated $.47$ with the multiple-act criterion. In contrast, under partial or low correspondence, correlations were very low ($r \leq .20$) and mostly nonsignificant.

Bruvold (1972b) interviewed 99 residents in an area near three recreational facilities (a golf course, a park, and a swimming pool) supplied with reclaimed water. The criterion was whether a given facility had been used by the respondent or members of his family with knowledge that the facility was supplied with reclaimed water. In addition to these three single-act criteria—one for each facility—Bruvold also obtained a multiple-act criterion by computing the sum over the three scores. Attitudes toward "reclaimed water for noningestive, close-contact use" were measured by means of a Thurstone scale.

Two problems are associated with the behavioral criteria in this study. First, a person was classified as performing the behavior in question when a member of his or her family made use of a facility, even though the person did not. Second, use of a facility without knowledge of its water supply resulted in a negative behavioral classification, even though the person might have used it in any case.

Users and nonusers of a given facility were not found to differ significantly in their attitudes. These negative results would be expected, since the attitudinal target (reclaimed water) differed greatly from the behavioral targets (the specific facilities) for the three single-act criteria (see also Bruvold, 1972a). The multiple-act criterion, however, corresponded to the attitude in its target element (nonspecific) and its action element (use of reclaimed water). A significant linear trend was found, indicating a significant relation between attitude and the corresponding behavioral criterion. According to Friedman's (1968) table, the magnitude of this relation is about $.35$. Using similar measures of attitude and behavior, Bruvold (1973) again re-

¹⁵ This suggests a methodological problem, since many subjects may have had little opportunity to perform a given behavior during the preceding semester, even if they had favorable attitudes toward that behavior. Failure to take into account lack of opportunity will tend to reduce the attitude-behavior correlations.

ported a significant but low correlation ($r = .30$).

Finally, Mann (1959) failed to obtain any clear measure of behavior. Black and white subjects interacted in six-person groups. Afterward, each subject ranked the other group members in terms of their degree of racial prejudice. The subject's average rank served as the criterion. Clearly, this measure is best viewed as an assessment of racial attitude based on peer ratings, not as a behavior. The patriotism subscale of the Ethnocentrism Scale was used as a general measure of prejudice. In addition, attitudes toward members of the other race were assessed by asking subjects to rank the group member in terms of friendship choice. The average rank of own-race members was divided by the average rank of the other-race members. It can be seen that only the general prejudice measure corresponded to the criterion in both its target and action elements.¹⁶ Its correlation with the criterion was relatively high ($r = .51$) and significant. The second measure of attitude had a lower, though still significant, relation to the criterion ($r = .22$).

In sum, although the five studies reviewed above employed measures of attitude or behavior that do not meet the requirements set forth in this article, the reported attitude-behavior relations were in line with expectations. To be sure, the methodological difficulties resulted in relatively low relations, even under conditions of high correspondence. However, these relations were significant and consistently higher than the relations obtained under low or partial correspondence.

Appropriate measures. The remaining section is devoted to comparisons of attitude-behavior relations under high correspondence with relations under partial or low correspondence, in studies that have obtained adequate measures of attitudes and behaviors. The 10 studies reviewed in this section all dealt explicitly with the attitude-behavior relation, and they were all designed to compare correlations between behavior and different measures of attitude or between attitude and different behavioral criteria.

The first type of comparison is exemplified

by Weinstein's (1972) attempt to predict signing a petition from three measures of attitude. The petition read, "I . . . am opposed to the quarter system and recommend an alternative system" (p. 357). Attitudes were assessed by means of a 7-item evaluative semantic differential. The concepts rated were "signing a petition protesting the quarter system," "the quarter system," and "signing a protest petition." Ninety-four undergraduate college students served as subjects.

The target and action elements of the first attitude corresponded to those of the behavior. The second attitude measure may also be viewed as corresponding highly to the criterion. Although it did not make explicit reference to signing a petition, it did represent an expression of a position concerning the quarter system, and as noted earlier, signing a petition may also be considered as an expression of a position on an issue. Nevertheless, the person's attitude toward "signing a petition opposing the quarter system" is a more appropriate attitudinal predictor. The third attitude measure corresponded to the criterion only in terms of its action element; its target element (protest petition) differed considerably from that of the behavior (a petition opposing the quarter system).

Consistent with these considerations, the attitude toward "signing a petition protesting the quarter system" yielded the best prediction of behavior ($r = .69$), although the attitude toward "the quarter system" also resulted in a significant correlation ($r = .52$). The third attitude did not correlate significantly with the behavior ($r = .22$).

Fishbein, Thomas, and Jaccard (Note 2) compared the predictive validity of an attitude toward a target with an attitude toward voting for the target. Although, as we saw earlier, high correlations between attitudes toward candidates and voting behavior are obtained under the electoral system in the United States (where voting for the most preferred candidate is a reasonable voting strategy), this is not necessarily the case in

¹⁶ Note that the Ethnocentrism Scale is actually a measure of personality, although it is usually found to correlate with racial prejudice.

other democratic elections. For example, in Great Britain, voting for the most preferred candidate may contribute to the formation of a government by the least preferred party under the leadership of a disliked prime minister. Voting for a given candidate in Great Britain may thus be an indication of the person's attitude toward the party rather than toward the candidate. This implies that in Great Britain, the attitude toward voting for a given candidate would correlate more highly with actual voting for that candidate than would the attitude toward the candidate.

Fishbein, Thomas, and Jaccard obtained measures of attitudes toward 12 candidates (3 in each of 4 constituencies) in the October 1974 general election in Great Britain. In addition, measures of attitude toward voting for each of the 12 candidates were obtained. Consistent with expectations, the average correlation between attitude toward a candidate and voting behavior was .51 ($p < .01$), whereas the average correlation between attitude toward voting for the candidate and voting behavior was .85 ($p < .01$).

Jaccard, King, and Pomazal (Note 3) reported comparable findings for the prediction of three different behavioral criteria. In one study, 270 women indicated their attitudes toward "birth control," toward "birth control pills," and toward "using birth control pills." The behavioral criterion was the self-report of current use or nonuse of birth control pills. Consistent with the degree of correspondence, the criterion was predicted best ($r = .65$) from the attitude toward the act of using birth control pills, and with least accuracy ($r = .16$) from the general attitude toward birth control. The attitude toward birth control pills had an intermediate correlation with the criterion ($r = .34$).

In a second study, 49 students in an introductory speech class reported whether or not they had attended church on a given Sunday. Attitudes were assessed toward "religion," toward the "church," and toward "attending church this Sunday." Again, attitude toward the action was the best predictor of actual church attendance ($r = .65$), attitude toward the church yielded an intermediate correlation of .47, and the general attitude toward re-

ligion did not correlate significantly with the criterion ($r = .18$).

Finally, 270 college students expressed their attitudes toward "blood donation" and toward "donating blood at the upcoming blood drive." The correlations of these attitudes with whether or not the respondents actually donated blood at the blood drive in question were .30 and .43, respectively.¹⁷ All three studies thus support the claim that the magnitude of an attitude-behavior correlation increases with correspondence between attitudinal and behavioral entities.

Weigel, Vernon, and Tognacci (1974) also varied the specificity of the attitudinal predictors and observed the effects on their relations to behavior. The subjects were 113 residents of a medium-sized western city who were included in a survey of attitudes toward a variety of environmental issues. Four attitude scales were of interest to the study. The first (A_1) was a measure of attitude toward the Sierra Club (an organization concerned with such issues as conservation of natural resources and pollution control). The second attitude measure (A_2) was a 15-item Likert scale concerning conservation of natural resources. Attitudes toward pollution control (A_3) were also measured by a 15-item Likert scale. Finally, attitudes toward the attainment of ecological goals (A_4) were assessed by means of eight 5-point scales, each of which evaluated the satisfaction derived from attaining a specific goal (e.g., freedom from overcrowding, being able to live in harmony with nature).

The criterion measure was a 4-step behavioral scale concerning the Sierra Club.

¹⁷ The relatively low correlation under high correspondence is explained in part by the fact that many subjects who appeared to donate blood were rejected for medical reasons or because of overcrowding (Pomazal & Jaccard, 1976). If showing up to donate blood had been used as the behavioral criterion, the correlation would have increased considerably. In fact, intentions to donate blood at the upcoming blood drive were found to have a correlation of .46 with actual blood donations, and a correlation of .59 with showing up to donate blood (Pomazal & Jaccard, 1976). Although not reported, we would expect a similar increment for the attitude-behavior correlation.

This measure was obtained 5 months after the assessment of attitudes. The lowest level on this scale consisted of refusing to have any further contact with the Sierra Club. The remaining 3 levels ranged from agreeing to be on the club's mailing list to becoming a club member. It can be seen that this behavioral criterion had the Sierra Club as its target and that it represented a generalization across different behaviors. As such, it corresponded highly only to A_1 , the attitude toward the Sierra Club. A_2 , A_3 , and A_4 corresponded to the behavior in their action elements (unspecified) but not in their target elements. The target elements of A_2 and A_3 , however, seem more relevant to the Sierra Club (the target of the behavior) than does the target element of A_4 .

Consistent with this analysis, Weigel, Vernon, and Tognacci (1974) reported a correlation of .60 between A_1 and the behavioral criterion. The correlations of A_2 and A_3 with behavior, although significant, were much lower ($r_s = .37$ and $.38$, respectively). A nonsignificant coefficient of .16 was obtained for the relation between A_4 and behavior.

In a series of investigations, Ajzen (1971) and Ajzen and Fishbein (1970, 1974) compared the predictive power of different attitude measures. Ajzen and Fishbein (1970) and Ajzen (1971) attempted to predict cooperative behavior in Prisoner's Dilemma games. The subjects in the two studies were pairs of same-sex college students who played three Prisoner's Dilemma games that varied in their payoff matrices. Following a few practice trials, the players were asked to complete a questionnaire that included two semantic-differential measures of attitude comprised of four or five bipolar evaluative scales. These scales were used to obtain measures of attitude toward choosing the cooperative strategy and of attitude toward the other player. The proportion of cooperative strategy choices following completion of the questionnaire served as the behavioral criterion.

The target and action elements of the behavioral entity corresponded to the target and action elements of the first attitude (toward choosing the cooperative strategy).

The attitude toward the other player corresponded to the behavior in its target element, but it made no reference to a specific action. As would be expected, the attitude-behavior correlations strongly reflected this difference in correspondence. Looking at the three games played in the two experiments, actual choice of cooperative moves correlated .63, .70, and .65 ($p < .01$ in each case) with attitude toward choosing the cooperative strategy. In contrast, the correlations between attitude toward the other player and cooperative game behavior were very low and inconsistent ($r = .26$, $p < .05$; $r = .09$, *ns*; $r = .27$, $p < .05$, respectively).

Similar results were reported by Ajzen and Fishbein (1974), whose student subjects, in groups of three, were required to coordinate their behaviors on an experimental task. Attitudes toward sending instructions to each of the two co-workers correlated .60 ($p < .01$) with actual communicative behavior, and attitudes toward complying with received instructions correlated .57 ($p < .01$) with actual compliance. In marked contrast, attitudes toward the co-workers (partial correspondence) predicted the two criteria .02 (not significant) and .19 ($p < .05$), respectively.¹⁸

The studies reviewed thus far attempted to predict a given behavioral criterion from different kinds of attitudinal predictors. The results clearly show that high relations are obtained only when the attitudinal entity corresponds to the behavioral entity both in terms of its target element and in terms of its action element. Three other studies held constant the nature of the attitudinal predictor and varied the behavioral criterion. The results again reflect the different degrees of correspondence created in this fashion.

Tittle and Hill (1967) reported a study of political activity among a sample of 301 college students. Attitudes toward involvement in student political activities were measured by means of six different, but inter-correlated, instruments: A 15-item Thurstone scale; a Likert scale based on the same 15

¹⁸ Differences were computed between the behaviors with respect to the two co-workers, and the same procedure was followed for the measures of attitude.

items; a 10-item Likert scale; the sum over the evaluations of five political activities on semantic differentials; a 10-item Guttman scale; and a self-report of attitude toward student politics.

Five behavioral criteria were constructed. By inspecting the voting records, it was possible to determine whether each subject had voted in the last student election (B_1). The second criterion (B_2) was the self-reported frequency of voting in the last four elections. A Guttman scale based on the self-reported frequency of eight political activities served as the third behavioral criterion (B_3). Self-reported frequencies of 10 political activities were scored in a Likert fashion (B_4). The final criterion (B_5) was an index based on the self-reported frequency of five activities, scored as suggested by Woodward and Roper (1950).

Tittle and Hill (1967) intended the first two criteria to reflect specific behaviors (single-act criteria), whereas the remaining three indices were designed to represent general behavioral patterns (multiple-act criteria). From our point of view, B_3 , B_4 , and B_5 corresponded to the attitude measures in both their target and action elements. B_1 and B_2 corresponded to the target element of the attitudes, but not to their action element, since the attitude measures were not action specific. Nevertheless, voting in student elections may be one of the major expressions of political activism for many students. If so, B_1 and B_2 might correlate highly with B_3 , B_4 , and B_5 , and great differences in attitude-behavior correlations could hardly be expected.

Inspection of the data reveals that this was indeed the case. The correlations between B_1 and B_2 on the one hand and B_3 , B_4 , and B_5 on the other ranged from .56 to .79 (all highly significant). The relations between the six attitudinal predictors and the first two (partially corresponding) criteria were of moderate size; the average gamma coefficient was .37. The average gamma for the prediction of B_3 , B_4 , and B_5 from the six attitude scales was .48. Although the average coefficient obtained under high correspondence was indeed greater than the average coefficient

obtained under partial correspondence, the difference was not very impressive. The high correlations between the two types of criteria may be at least in part responsible for this finding.

Much more convincing results were reported by Fishbein and Ajzen (1974) in an investigation of religious behavior. Sixty-two undergraduate college students were given a list of 100 behaviors dealing with matters of religion and were asked to check the behaviors they had performed. These behaviors included praying before and after meals, taking a religious course for credit, and dating a person against parents' wishes. Each response constituted a single-act criterion. In addition, four multiple-act criteria were constructed on the basis of multiple behaviors. The first was simply the sum of the total set of 100 behaviors, taking into account the evaluation of religiosity implied by each behavior. A second index was a Guttman scale of a subset of eight behaviors. The third and fourth indices were Likert and Thurstone scales based on 20 and 13 behaviors, respectively.

Attitudes toward religion were assessed by means of five scales that were highly inter-correlated. The measures were a self-report of religiosity, a semantic-differential evaluation of "being religious," and three standard scales measuring religiosity: a Likert scale, a Guttman scale, and a Thurstone scale.

It can be seen that all multiple-act criteria corresponded both in their targets (religion) and in their action elements (unspecified), to the general measures of attitudes toward religion. In contrast, the 100 single-act criteria corresponded to the attitudinal entities in terms of their targets but not in terms of their action elements. We would thus expect the behavioral indices to be highly related to the different attitude scales, and we should find relatively low and inconsistent relations between attitudes and the 100 single behaviors.

The results of the study strongly supported these expectations. Correlations between single behaviors and attitudes were quite low; the average correlations for the five attitude scales ranged from .12 to .15. In contrast, the

correlations with the behavioral indices were high and significant. The range of attitude-behavior correlations under these conditions of high correspondence was from .45 to .75, and the average correlation was .63.

It could be argued that one weakness of this investigation was its reliance on self-reports (cf. Schuman & Johnson, 1976). A recent study by Weigel and Newman (1976), however, showed the same pattern of results for observations of actual behavior. These investigators used a 16-item Likert scale to measure attitudes toward protecting environmental quality. A total of 14 behavioral observations were obtained 3 to 8 months later. The behaviors involved signing and circulating three different petitions concerning environmental issues, participating in a litter pick-up program, and participating in a recycling program on eight separate occasions. In addition to these 14 single-act criteria, Weigel and Newman constructed four multiple-act indices: one based on petition signing behaviors, one on litter pick-ups, one on recycling, and one overall index based on all 14 single behaviors.

Consistent with our analysis, attitude-behavior correlations increased as the action element of the criterion increased in its degree of correspondence with the unspecified action element of the attitude. The average correlation between attitude and the 14 single behaviors was not significant ($r = .29$), the average correlation with the three behavioral indices of intermediate generality was .42 ($p < .01$), and under the highest degree of correspondence the correlation with the overall index was .62 ($p < .01$).

Conclusion

Studies permitting comparisons between different levels of correspondence have generally been supportive of our analysis of the attitude-behavior relation. The relations between attitude and behavior tend to increase in magnitude as the attitudinal and behavioral entities come to correspond more closely in terms of their target and action elements. This is especially true when we compare partial or low correspondence with high correspondence. Of course, attitude-

behavior relations tend to be attenuated whenever inappropriate measures of attitude or behavior are obtained. Such problems can be avoided by using standard scaling procedures, both with respect to measures of attitude and with respect to behavioral criteria consisting of more than a single behavior. Whenever adequate precautions have been taken, high correspondence has been found to produce relatively strong relations between attitude and behavior.

Ambiguity in Correspondence

We should note at this point that it may sometimes be quite difficult to determine correspondence in a given instance. What, for example, is the target of donating money to the Heart Fund if the money is collected by a neighbor? Is it the Heart Fund, the neighbor, or both? Alternatively, the Heart Fund might be viewed as the target, and the neighbor as part of the context. In fact, the reader may occasionally have disagreed with our interpretation of correspondence in the studies reviewed. With respect to a number of studies, we found it all but impossible to make a decision and we therefore did not include them in our review.

Consider, for example, the study by Holman (1956), which examined attendance at football games among 256 students at the University of Southern California. The subjects were given a 12-item questionnaire designed to measure "attitude toward football games." However, one of the items Holman provided as an example was, "How would you describe attendance at football games? (check one): very worthwhile, worthwhile, not very worthwhile, worthless." Clearly, a subject may have a favorable attitude toward football games but an unfavorable attitude toward *attending* football games. It is not clear whether the questionnaire measured only the latter attitude or a combination of both. The behavioral criteria were self-reports of attendance following each of seven football games, as well as the sum of these seven scores. Depending on our interpretation of the attitude measure, the attitudinal and behavioral entities may or may not have corresponded in their action elements (attending football

games). There was clearly little correspondence of target elements, since attitudes were measured with respect to football games in general, whereas the behavior was directed at the local home games. The attitude-behavior correlations were of low to moderate magnitude, ranging from .21 to .59.

Relatively low and inconclusive findings were also reported by Izzett (1971), O'Keefe (1971), Wicker (1971), Hackman and Porter (1968), and Bostrom (1970). As in Holman's study, the correspondence between attitudinal and behavioral entities in these investigations was ambiguous. For example, Wicker (1971) reported correlations between 13 different predictors and 4 behavioral criteria. Many of these measures were indices based on a number of responses combined in complicated fashions. As a result, it is difficult to identify their target and action elements. The attitude-behavior correlations were low, ranging from $-.01$ to $.45$. However, the measures that appeared to correspond most closely to the criterion were found to provide the most accurate predictions (for a detailed analysis, see Fishbein & Ajzen, 1975, chapter 8).

One other issue deserves comment in this context. Attitudes toward actions, even when they correspond to the criterion in their target and action elements, rarely make explicit reference to the person's own performance of the behavior under consideration. For example, like Kothandapani (1971), Insko, Blake, Cialdini, and Mulaik (1970) attempted to predict use of birth control methods among black and white women between 15 and 44 years of age. Two measures of attitudes toward "using birth control methods" were obtained. The behavioral criterion was the self-reported frequency of use of birth control methods.

Whereas the attitudinal entity in this study dealt with the general use of birth control methods, the behavioral entity referred to the respondent's use of such methods.¹⁹ Although the distinction between attitude toward performing a behavior in general and attitude toward *my* performing the same behavior may often be of little importance, there is reason to believe that this distinction cannot be neglected in the present instance.

A woman who is generally opposed to the use of birth control methods may favor their use in her own case for health-related reasons. Conversely, a woman who holds a favorable attitude toward using birth control methods in general may have a negative attitude toward using such methods herself if, for example, she wants to have a child. Consistent with this argument, Insko et al. reported significant but relatively low correlations between their two attitude scales and their behavioral criterion ($r_s = .29$ and $.25$).

Similar considerations apply when measuring attitudes toward smoking or drinking, as opposed to attitudes toward *my* smoking or *my* drinking. To ensure correspondence, it may be necessary to make the personal reference of the attitude measure as explicit as possible.

General Discussion

The view that attitude is the most distinctive and indispensable concept in social psychology (Allport, 1935) has recently given way to a more skeptical view of the concept's utility. The skepticism is in large part due to the disappointing results of studies attempting to make use of attitudes to predict overt behavior. Although these attempts have occasionally been successful, most have produced rather low and nonsignificant attitude-behavior relations. It is thus hardly surprising that the attitude concept has come under increasingly strong criticism.

The present article has attempted to show that the disenchantment with the attitude concept may be unwarranted. In fact, we have seen that the findings concerning the relation between attitude and behavior only appear to be inconsistent. A person's attitude has a consistently strong relation with his or her behavior when it is directed at the same target and when it involves the same action. Generally low and inconsistent relations are observed when the attitudinal and behavioral entities fail to correspond in one or both of

¹⁹ Recall that Kothandapani (1971) did in fact measure attitudes toward personal use of birth control methods.

these elements. Table 1 shows the effect of correspondence on the magnitude of attitude-behavior relations.

Of the 109 investigations reviewed in this article, 84 displayed either low, partial, or high correspondence between attitudinal and behavioral entities. The remaining 25 studies reported relations under two or three different degrees of correspondence. Consequently, a total of 142 attitude-behavior relations are reported in Table 1. It can be seen that low correspondence produces mostly nonsignificant attitude-behavior relations. Partial correspondence tends to result in highly inconsistent findings. The majority of studies in this category obtained either low but significant relations, or inconsistent results across different conditions and measures. The remaining studies reported mainly nonsignificant relations. In contrast, under high correspondence, significant attitude-behavior relations of considerable magnitude were found. Inappropriate measures tend to reduce the obtained relations between attitude and behavior, but appropriate measures invariably produce strong relationships.²⁰

Our review of research on the attitude-behavior relation has focused on correspondence in terms of target and action elements. Little attention has been given to correspondence in contextual and time elements, primarily because few studies have provided direct evidence concerning the effects of correspondence in these elements. Lack of correspondence in the contextual element may well have contributed to some of the low correlations mentioned in this review. Given the increased interest in the attitude-behavior relation, and the recent concern with the effects of private versus public conditions on this relation (e.g., Acock & DeFleur, 1972; Albrecht, DeFleur, & Warner, 1972; Frideres, Warner, & Albrecht, 1971; Liska, 1974b; Warner & DeFleur, 1969; Schofield, 1975), more attention will have to be paid to correspondence in context. To obtain high attitude-behavior correlations in studies in which the context is systematically manipulated, it is essential to ensure not only correspondence in target and action elements but also correspondence in the contextual element.

Table 1
Effect of Correspondence on the Attitude-Behavior Relation

Correspondence	Attitude-behavior relation		
	Not significant	Low ^a or inconsistent	High ^b
Low	26	1	0
Partial	20	47	4
High			
Questionable measures	0	9	9
Appropriate measures	0	0	26

Note. The cell entries represent the number of attitude-behavior relations.

^a $r < .40$.

^b $r \geq .40$.

Although this discussion may appear to imply that attitude measures have to be specific with respect to target, action, and context, we have argued that the problem is one of correspondence between predictor and criterion, not a problem of specificity. Of course, if the investigator chooses to observe a single action with respect to a given target in a given context in order to obtain correspondence, the attitude also has to be very specific. On the other hand, if she is really interested in a general behavioral pattern, such as discrimination toward blacks, the behavioral criterion should involve observation of different discriminatory behaviors toward various black individuals in a variety of contexts. A general measure of attitude toward blacks will correspond to such a criterion.

In conclusion, our review and theoretical analysis suggest that low and inconsistent attitude-behavior relations are attributable to low or partial correspondence between attitudinal and behavioral entities. To predict behavior from attitude, the investigator has to ensure high correspondence between at least the target and action elements of the measures he employs.

²⁰ The rank-order correlation between correspondence and the magnitude of the attitude-behavior relation in Table 1 was found to be .83.

Lest attitude researchers conclude that all is well and resume their complacency, we hasten to add a few words of caution. First, attitude measurement, even by means of sophisticated instruments, may add little to our understanding of social phenomena. An investigator attempting to explain a certain phenomenon in terms of an attitudinal analysis must first define the behaviors of interest, the targets at which they are directed, and the context and time of their occurrence. Measures of attitude will serve to explain the behaviors to the extent that they involve identical target, action, context, and time elements.

Second, attempts to influence behavior by means of attitude change must also consider the degree of correspondence between the behavior that is to be changed and the attitude at which the influence attempt is directed. Demonstration of attitude change is insufficient evidence for one's ability to change behavior; only behaviors that correspond to the attitude are likely to change as a result of revisions in attitude.

Finally, high correspondence between predictors and criteria will ensure strong attitude-behavior relations only to the extent that appropriate measurement procedures are employed. For too long it has been at the investigator's discretion to select any measures deemed useful and to assign the labels *attitude* and *behavior* to them. Attitudinal and behavioral measures are often selected in an arbitrary manner, leading to apparently inconsistent research findings.

In sum, only when standard procedures are employed to scale attitudes and to select behaviors and only when attention is paid to the correspondence between attitudinal and behavioral entities will the concept of attitude be able to resume the place it was accorded by Allport (1954) as the cornerstone in the edifice of social psychology.

Reference Notes

1. Brislin, R. W., & Olmsted, K. *An examination of two models designed to predict behavior from attitude and other verbal measures*. Unpublished manuscript, East-West Center, Honolulu, Hawaii, 1973.

2. Fishbein, M., Thomas, K., & Jaccard, J. J. *An attitudinal analysis of British voting behavior*. Unpublished manuscript, Social Science Research Council, Survey Unit, London, 1975.
3. Jaccard, J. J., King, G. W., & Pomazal, R. *Attitudes and behavior: An analysis of specificity of attitudinal predictors*. Unpublished manuscript, University of Illinois, 1975.

References

- Acock, A. C., & DeFleur, M. L. A configurational approach to contingent consistency in the attitude-behavior relationship. *American Sociological Review*, 1972, 37, 714-726.
- Ajzen, I. Attitudinal vs. normative messages: An investigation of the differential effects of persuasive communications on behavior. *Sociometry*, 1971, 34, 263-280.
- Ajzen, I., Darroch, R. K., Fishbein, M., & Hornik, J. A. Looking backward revisited: A reply to Deutscher. *The American Sociologist*, 1970, 5, 267-273.
- Ajzen, I., & Fishbein, M. The prediction of behavior from attitudinal and normative variables. *Journal of Experimental Social Psychology*, 1970, 6, 466-487.
- Ajzen, I., & Fishbein, M. Attitudinal and normative variables as predictors of specific behaviors. *Journal of Personality and Social Psychology*, 1973, 27, 41-57.
- Ajzen, I., & Fishbein, M. Factors influencing intentions and the intention-behavior relation. *Human Relations*, 1974, 27, 1-15.
- Albrecht, S. L., DeFleur, M. L., & Warner, L. G. Attitude-behavior relationships: A reexamination of the postulate of contingent consistency. *Pacific Sociological Review*, 1972, 15, 149-168.
- Allport, G. W. Attitudes. In C. Murchinson (Ed.), *A handbook of social psychology*. Worcester, Mass.: Clark University Press, 1935.
- Allport, G. W. *The nature of prejudice*. Reading, Mass.: Addison-Wesley, 1954.
- Aronson, E., & Carlsmith, J. M. Experimentation in social psychology. In G. Lindzey & E. Aronson (Eds.), *Handbook of social psychology* (Vol. 2). Reading, Mass.: Addison-Wesley, 1968.
- Asch, S. Effects of group pressure upon the modification and distortion of judgment. In H. Guetzkow (Ed.), *Groups, leadership and men*. Pittsburgh, Pa.: Carnegie Press, 1951.
- Bandura, A., Blanchard, E. B., & Ritter, B. Relative efficacy of desensitization and modeling approaches for inducing behavioral, affective, and attitudinal changes. *Journal of Personality and Social Psychology*, 1969, 13, 173-199.
- Baron, R. A. Attraction toward the model and model's competence as determinants of adult imitative behavior. *Journal of Personality and Social Psychology*, 1970, 14, 345-351.
- Baron, R. A. Behavioral effects of interpersonal attraction: Compliance with requests from liked

- and disliked others. *Psychonomic Science*, 1971, 25, 325-326.
- Bellin, S. S., & Kriesberg, L. Relationship among attitudes, circumstances, and behavior: The case of applying for public housing. *Sociology and Social Research*, 1967, 51, 453-469.
- Berg, K. E. Ethnic attitudes and agreement with a Negro person. *Journal of Personality and Social Psychology*, 1966, 4, 215-220.
- Bernberg, R. E. Socio-psychological factors in industrial morale: I. The prediction of specific indicators. *Journal of Social Psychology*, 1952, 36, 73-82.
- Bickman, L. Environmental attitudes and actions. *Journal of Social Psychology*, 1972, 87, 323-324.
- Bostrom, R. N. Affective, cognitive, and behavioral dimensions of communicative attitudes. *Journal of Communication*, 1970, 20, 359-369.
- Bowers, W. J. Normative constraints on deviant behavior in the college context. *Sociometry*, 1968, 31, 370-385.
- Boyanowski, E. O., & Allen, V. L. Ingroup norms and self-identity as determinants of discriminatory behavior. *Journal of Personality and Social Psychology*, 1973, 25, 408-418.
- Brannon, R. Attitudes and the prediction of behavior. In B. Seidenberg & A. Snadowsky (Eds.), *Social psychology: An introduction*. New York: Free Press, 1976.
- Brannon, R., Cyphers, G., Hesse, S., Hesselbart, S., Keane, R., Schuman, H., Viccaro, T., & Wright, D. Attitude and action: A field experiment joined to a general population survey. *American Sociological Review*, 1973, 38, 625-636.
- Bray, D. W. The prediction of behavior from two attitude scales. *Journal of Abnormal and Social Psychology*, 1950, 45, 64-84.
- Brayfield, A. H., & Crockett, W. H. Employee attitudes and employee performance. *Psychological Bulletin*, 1955, 52, 396-424.
- Bruvold, W. H. Consistency among attitudes, beliefs, and behavior. *Journal of Social Psychology*, 1972, 86, 127-134. (a)
- Bruvold, W. H. Attitude-belief and attitude-behavior consistency. *Journal of Social Psychology*, 1972, 88, 241-246. (b)
- Bruvold, W. H. Belief and behavior as determinants of attitude. *Journal of Social Psychology*, 1973, 90, 285-289.
- Burnstein, E., & McRae, A. V. Some effects of shared threat and prejudice in racially mixed groups. *Journal of Abnormal and Social Psychology*, 1962, 64, 257-263.
- Byrne, D. Interpersonal attraction and attitude similarity. *Journal of Abnormal and Social Psychology*, 1961, 62, 713-715.
- Byrne, D., Baskett, G. D., & Hodges, L. Behavioral indicators of interpersonal attraction. *Journal of Applied Social Psychology*, 1971, 1, 137-149.
- Byrne, D., Ervin, C. R., & Lamberth, J. Continuity between the experimental study of attraction and real-life computer dating. *Journal of Personality and Social Psychology*, 1970, 16, 157-165.
- Calder, B. J., & Ross, M. *Attitudes and behavior*. Morristown, N. J.: General Learning Press, 1973.
- Campbell, A., Converse, P. E., Miller, W. E., & Stokes, D. E. *The American voter*. New York: Wiley, 1960.
- Campbell, A., & Stokes, D. E. Partisan attitudes and the presidential vote. In E. Burdick & A. J. Brodbeck (Eds.), *American voting behavior*. Glencoe, Ill.: Free Press, 1959.
- Campbell, D. T. Social attitudes and other acquired behavioral dispositions. In S. Koch (Ed.), *Psychology: A study of a science* (Vol. 6). New York: McGraw-Hill, 1963.
- Carr, L., & Roberts, S. O. Correlates of civil-rights participation. *Journal of Social Psychology*, 1965, 67, 259-267.
- Cherrington, D. J., Reitz, H. J., & Scott, W. E., Jr. Effects of contingent and noncontingent reward on the relationship between satisfaction and job performance. *Journal of Applied Psychology*, 1971, 55, 531-536.
- Corey, S. M. Professed attitudes and actual behavior. *Journal of Educational Psychology*, 1937, 28, 271-280.
- Dean, L. R. Interaction, reported and observed: The case of one local union. *Human Organization*, 1958, 17, 36-44.
- DeFleur, M. L., & Westie, F. R. Verbal attitudes and overt acts: An experiment on the salience of attitudes. *American Sociological Review*, 1958, 23, 667-673.
- DeFleur, M. L., & Westie, F. R. Attitude as a scientific concept. *Social Forces*, 1963, 42, 17-31.
- DeFrieze, G. H., & Ford, W. S., Jr. Open occupancy—What whites say, what they do. *Trans-action—Social Science and Modern Society*, 1968, 5, 53-56.
- DeFrieze, G. H., & Ford, W. S., Jr. Verbal attitudes, overt acts, and the influence of social constraint in interracial behavior. *Social Problems*, 1969, 16, 493-505.
- Deutscher, I. Words and deeds. *Social Problems*, 1966, 13, 235-254.
- Deutscher, I. Looking backward: Case studies on the progress of methodology in sociological research. *American Sociologist*, 1969, 4, 35-41.
- Deutscher, I. *What we say/what we do: Sentiments and acts*. Glenview, Ill.: Scott, Foresman, 1973.
- Dillehay, R. C. On the irrelevance of the classical negative evidence concerning the effect of attitudes on behavior. *American Psychologist*, 1973, 28, 887-891.
- Ehrlich, H. J. Attitudes, behavior, and the intervening variables. *American Sociologist*, 1969, 4, 29-34.
- Ehrlich, H. J., & Graeven, D. B. Reciprocal self-disclosure in a dyad. *Journal of Experimental Social Psychology*, 1971, 7, 389-400.
- Epstein, Y. M., & Hornstein, H. A. Penalty and interpersonal attraction as factors influencing the decision to help another person. *Journal of Experimental Social Psychology*, 1969, 5, 272-282.
- Fendrich, J. M. Perceived reference group support: Racial attitudes and overt behavior. *American Sociological Review*, 1967, 32, 960-970. (a)

- Fendrich, J. M. A study of the association among verbal attitudes, commitment, and overt behavior in different experimental situations. *Social Forces*, 1967, 45, 347-355. (b)
- Fischer, E. H. Who volunteers for companionship with mental patients? A study of attitude-belief-intention relationships. *Journal of Personality*, 1971, 39, 552-563.
- Fishbein, M. An investigation of the relationships between beliefs about an object and the attitude toward that object. *Human Relations*, 1963, 16, 233-240.
- Fishbein, M. Attitude and the prediction of behavior. In M. Fishbein (Ed.), *Readings in attitude theory and measurement*. New York: Wiley, 1967.
- Fishbein, M. The prediction of behavior from attitudinal variables. In C. D. Mortensen & K. K. Sereno (Eds.), *Advances in communication research*. New York: Harper & Row, 1973.
- Fishbein, M., & Ajzen, I. Attitudes and opinions. *Annual Review of Psychology*, 1972, 23, 487-544.
- Fishbein, M., & Ajzen, I. Attitudes toward objects as predictors of single and multiple behavioral criteria. *Psychological Review*, 1974, 81, 59-74.
- Fishbein, M., & Ajzen, I. *Belief, attitude, intention, and behavior: An introduction to theory and research*. Reading, Mass.: Addison-Wesley, 1975.
- Fishbein, M., & Coombs, F. S. Basis for decision: An attitudinal analysis of voting behavior. *Journal of Applied Social Psychology*, 1974, 4, 95-124.
- Freeman, L. C., & Ataöv, T. Validity of indirect and direct measures of attitude toward cheating. *Journal of Personality*, 1960, 28, 444-447.
- Frideres, J. S., Warner, L. G., & Albrecht, S. L. The impact of social constraints on the relationship between attitudes and behavior. *Social Forces*, 1971, 50, 102-112.
- Friedlander, F., & Greenberg, S. Effect of job attitudes, training, and organization climate on performance of the hard-core unemployed. *Journal of Applied Psychology*, 1971, 55, 287-295.
- Friedman, H. Magnitude of experimental effect and a table for its rapid estimation. *Psychological Bulletin*, 1968, 70, 245-251.
- Gardin, H., Kaplan, K. J., Firestone, I. J., & Cowan, G. A. Proxemic effects on cooperation, attitude, and approach-avoidance in a Prisoner's Dilemma game. *Journal of Personality and Social Psychology*, 1973, 27, 13-18.
- Genthner, R. W., & Taylor, S. P. Physical aggression as a function of racial prejudice and the race of the target. *Journal of Personality and Social Psychology*, 1973, 27, 207-210.
- Goldberg, G. N., Kiesler, C. A., & Collins, B. E. Visual behavior and face-to-face distance during interaction. *Sociometry*, 1969, 32, 43-53.
- Goldberg, G., & Mettee, D. R. Liking and perceived communication potential as determinants of looking at another. *Psychonomic Science*, 1969, 16, 277-278.
- Goodmonson, C., & Glaudin, V. The relationship of commitment-free and commitment behavior: A study of attitude toward organ transplantation. *Journal of Social Issues*, 1971, 27, 171-183.
- Goodstadt, M. S. Helping and refusal to help: A test of balance and reactance theories. *Journal of Experimental Social Psychology*, 1971, 7, 610-622.
- Graen, G. Instrumentality theory of work motivation: Some experimental results and suggested modifications. *Journal of Applied Psychology Monograph*, 1969, 53(2, Pt. 2).
- Green, J. A. Attitudinal and situational determinants of intended behavior toward blacks. *Journal of Personality and Social Psychology*, 1972, 22, 13-17.
- Greenberg, M. S., & Frisch, D. M. Effect of intentionality on willingness to reciprocate a favor. *Journal of Experimental Social Psychology*, 1972, 8, 99-111.
- Hackman, J. R., & Porter, L. W. Expectancy theory predictions of work effectiveness. *Organizational Behavior and Human Performance*, 1968, 3, 417-426.
- Heberlein, T. A., & Black, J. S. *Journal of Personality and Social Psychology*, 1976, 33, 474-479.
- Hendrick, C., & Taylor, S. P. Effects of belief similarity and aggression on attraction and counter-aggression. *Journal of Personality and Social Psychology*, 1971, 17, 342-349.
- Himelstein, P., & Moore, J. C. Racial attitudes and the action of Negro- and white-background figures as factors in petition signing. *Journal of Social Psychology*, 1963, 61, 267-272.
- Holman, P. A. Validation of an attitude scale as a device for predicting behavior. *Journal of Applied Psychology*, 1956, 40, 347-349.
- Hornstein, H. A., Masor, H. N., Sole, K., & Heilman, M. Effects of sentiment and completion of a helping act on observer helping: A case for socially mediated Zeigarnik effects. *Journal of Personality and Social Psychology*, 1971, 17, 107-112.
- Insko, C. A., Blake, R. R., Cialdini, R. B., & Mulaik, S. A. Attitude toward birth control and cognitive consistency: Theoretical and practical implications of survey data. *Journal of Personality and Social Psychology*, 1970, 16, 228-237.
- Izzett, R. R. Authoritarianism and attitudes toward the Vietnam war as reflected in behavioral and self-report measures. *Journal of Personality and Social Psychology*, 1971, 17, 145-148.
- Jaccard, J. J. Predicting social behavior from personality traits. *Journal of Research in Personality*, 1974, 7, 358-367.
- Janis, I. L., & Hoffman, D. Facilitating effects of daily contact between partners who make a decision to cut down on smoking. *Journal of Personality and Social Psychology*, 1970, 17, 25-35.
- Kamenetsky, J., Burgess, G. G., & Rowan, T. The relative effectiveness of four attitude assessment techniques in predicting a criterion. *Educational and Psychological Measurement*, 1956, 16, 187-194.
- Katz, I., & Benjamin, L. Effects of white authoritarianism in biracial work groups. *Journal of Abnormal and Social Psychology*, 1960, 61, 448-456.

- Kelman, H. C. Attitudes are alive and well and gainfully employed in the sphere of action. *American Psychologist*, 1974, 29, 310-324.
- Kothandapani, V. Validation of feeling, belief, and intention to act as three components of attitude and their contribution to prediction of contraceptive behavior. *Journal of Personality and Social Psychology*, 1971, 19, 321-333.
- Krauss, R. M. Structural and attitudinal factors in interpersonal bargaining. *Journal of Experimental Social Psychology*, 1966, 2, 42-45.
- Kutner, B., Wilkins, C., & Yarrow, P. R. Verbal attitudes and overt behavior involving racial prejudice. *Journal of Abnormal and Social Psychology*, 1952, 47, 649-652.
- LaPiere, R. T. Attitudes vs. actions. *Social Forces*, 1934, 13, 230-237.
- Linn, L. S. Verbal attitudes and overt behavior: A study of racial discrimination. *Social Forces*, 1965, 44, 353-364.
- Liska, A. E. Attitude-behavior consistency as a function of generality equivalence between attitude and behavior objects. *Journal of Psychology*, 1974, 86, 217-228. (a)
- Liska, A. E. The impact of attitude on behavior: Attitude-social support interaction. *Pacific Sociological Review*, 1974, 17, 83-97. (b)
- Liska, A. E. (Ed.). *The consistency controversy: Readings on the impact of attitude on behavior*. New York: Wiley, 1975.
- Malof, M., & Lott, A. J. Ethnocentrism and the acceptance of Negro support in a group pressure situation. *Journal of Abnormal and Social Psychology*, 1962, 65, 254-258.
- Mann, J. H. The relationship between cognitive, affective, and behavioral aspects of racial prejudice. *Journal of Social Psychology*, 1959, 49, 223-228.
- Mazen, R., & Leventhal, H. The influence of communicator-recipient similarity upon the beliefs and behavior of pregnant women. *Journal of Experimental Social Psychology*, 1972, 8, 289-302.
- McGrew, J. M. How "open" are multiple-dwelling units? *Journal of Social Psychology*, 1967, 72, 223-226.
- Mischel, W. *Personality and assessment*. New York: Wiley, 1968.
- Mitchell, T. R., & Nebeker, D. M. Expectancy theory predictions of academic effort and performance. *Journal of Applied Psychology*, 1973, 57, 61-67.
- Nemeth, C. Effects of free versus constrained behavior on attraction between people. *Journal of Personality and Social Psychology*, 1970, 15, 302-311.
- Newton, N., & Newton, M. Relationship of ability to breast-feed and maternal attitudes toward breast-feeding. *Pediatrics*, 1950, 5, 869-875.
- Nisbett, R. E. Taste, deprivation, and weight determinants of eating behavior. *Journal of Personality and Social Psychology*, 1968, 10, 107-116.
- Norman, R. Affective-cognitive consistency: Attitudes, conformity, and behavior. *Journal of Personality and Social Psychology*, 1975, 32, 83-91.
- O'Keefe, M. T. The anti-smoking commercials: A study of television's impact on behavior. *Public Opinion Quarterly*, 1971, 35, 242-248.
- Oskamp, S., & Perlman, D. Effects of friendship and disliking on cooperation in a mixed-motive game. *Journal of Conflict Resolution*, 1966, 10, 221-226.
- Ostrom, T. M. The relationship between the affective, behavioral, and cognitive components of attitude. *Journal of Experimental Social Psychology*, 1969, 5, 12-30.
- Peabody, O. Trait inferences: Evaluative and descriptive aspects. *Journal of Personality and Social Psychology Monograph*, 1967, 7(2, Pt. 2, Whole No. 642).
- Pomazal, R. J., & Jaccard, J. J. An informational approach to altruistic behavior. *Journal of Personality and Social Psychology*, 1976, 33, 317-326.
- Porter, L. W., & Steers, R. M. Organizational, work, and personal factors in employee turnover and absenteeism. *Psychological Bulletin*, 1973, 80, 151-176.
- Potter, H. W., & Klein, H. R. On nursing behavior. *Psychiatry*, 1957, 20, 39-46.
- Regan, D. T. Effects of a favor and liking on compliance. *Journal of Experimental Social Psychology*, 1971, 7, 627-639.
- Repass, D. E. Issue salience and party choice. *American Political Science Review*, 1971, 65, 389-400.
- Rokeach, M. Attitude change and behavior change. *Public Opinion Quarterly*, 1967, 30, 529-550.
- Rokeach, M., & Kliejunas, P. Behavior as a function of attitude-toward-object and attitude-toward-situation. *Journal of Personality and Social Psychology*, 1972, 22, 194-201.
- Rokeach, M., & Mezei, L. Race and shared belief as factors in social choice. *Science*, 1966, 151, 167-172.
- Rosen, B., & Komorita, S. S. Attitudes and action: The effects of behavioral intent and perceived effectiveness of acts. *Journal of Personality*, 1971, 39, 189-203.
- Rosen, S., Johnson, R. D., Johnson, M. J., & Tesser, A. Interactive effects of news valence and attraction on communicator behavior. *Journal of Personality and Social Psychology*, 1973, 28, 298-300.
- Sagi, P. C., Olmsted, D. W., & Atelsek, F. Predicting maintenance of membership in small groups. *Journal of Abnormal and Social Psychology*, 1955, 51, 308-311.
- Sample, J., & Warland, R. Attitude and prediction of behavior. *Social Forces*, 1973, 51, 292-303.
- Sampson, E. E., & Insko, C. A. Cognitive consistency and performance in the autokinetic situation. *Journal of Abnormal and Social Psychology*, 1964, 68, 184-192.
- Sapolsky, A. Effect of interpersonal relationships upon verbal conditioning. *Journal of Abnormal and Social Psychology*, 1960, 60, 241-246.
- Schneider, D. J. *Social psychology*. Reading, Mass.: Addison-Wesley, 1976.
- Schneider, F. W. Conforming behavior of black and white children. *Journal of Personality and Social Psychology*, 1970, 16, 466-471.

- Schofield, J. W. The effect of norms, public disclosure, and need for approval on volunteering behavior consistent with attitudes. *Journal of Personality and Social Psychology*, 1975, 31, 1126-1133.
- Schopler, J., & Thompson, V. D. Role of attribution processes in mediating amount of reciprocity for a favor. *Journal of Personality and Social Psychology*, 1968, 10, 243-250.
- Schuman, H., & Johnson, M. P. Attitudes and behavior. *Annual Review of Sociology*, 1976, 2, 161-207.
- Schwab, D. P., & Cummings, L. L. Theories of performance and satisfaction: A review. *Industrial Relations*, 1970, 9, 408-430.
- Schwartz, S. H., & Tessler, R. C. A test of a model for reducing measured attitude-behavior discrepancies. *Journal of Personality and Social Psychology*, 1972, 24, 225-236.
- Sherif, C. W., Kelly, M., Rodgers, H. L., Jr., Sarup, G., & Tittler, B. I. Personal involvement, social judgment, and action. *Journal of Personality and Social Psychology*, 1973, 27, 311-328.
- Sherif, M. A study of some social factors in perception. *Archives of Psychology*, 1935, 27, No. 187.
- Silverman, B. I., & Cochrane, R. The relationship between verbal expressions of behavioral intention and overt behavior. *Journal of Social Psychology*, 1971, 84, 51-56.
- Smith, E. W. L., & Dixon, T. R. Verbal conditioning as a function of race of the experimenter and justice of the subject. *Journal of Experimental Social Psychology*, 1968, 4, 285-301.
- Stapleton, R. E., Nacci, P., & Tedeschi, J. T. Interpersonal attraction and the reciprocation of benefits. *Journal of Personality and Social Psychology*, 1973, 28, 199-205.
- Taffel, C. Anxiety and the conditioning of verbal behavior. *Journal of Abnormal and Social Behavior*, 1955, 51, 496-501.
- Tarter, D. E. Toward prediction of attitude-action discrepancy. *Social Forces*, 1969, 47, 398-405.
- Tittle, C. R., & Hill, R. J. Attitude measurement and prediction of behavior: An evaluation of conditions and measurement techniques. *Sociometry*, 1967, 30, 199-213.
- Tornatzky, L., & Geiwitz, P. J. The effects of threat and attraction on interpersonal bargaining. *Psychonomic Science*, 1968, 13, 125-126.
- Veevers, J. E. Drinking attitudes and drinking behavior: An exploratory study. *Journal of Social Psychology*, 1971, 85, 103-109.
- Vroom, V. H. *Work and motivation*. New York: Wiley, 1964.
- Warland, R. H., & Sample, J. Response certainty as a moderator variable in attitude measurement. *Rural Sociology*, 1973, 38, 174-186.
- Warner, L. G., & DeFleur, M. L. Attitude as an interactional concept: Social constraint and social distance as intervening variables between attitudes and action. *American Sociological Review*, 1969, 34, 153-169.
- Warner, L. G., & Dennis, R. M. Prejudice versus discrimination: An empirical example and theoretical extension. *Social Forces*, 1970, 48, 473-484.
- Waters, L. K., & Roach, D. Relationship between job attitudes and two forms of withdrawal from the work situation. *Journal of Applied Psychology*, 1971, 55, 92-94.
- Webb, W. B., & Hollander, E. P. Comparison of three morale measures: A survey, pooled group judgments, and self-evaluations. *Journal of Applied Psychology*, 1956, 40, 17-20.
- Weigel, R. H., & Newman, L. S. Increasing attitude-behavior correspondence by broadening the scope of the behavioral measure. *Journal of Personality and Social Psychology*, 1976, 33, 793-802.
- Weigel, R. H., Vernon, D. T. A., & Tognacci, L. N. The specificity of the attitude as a determinant of attitude-behavior congruence. *Journal of Personality and Social Psychology*, 1974, 30, 724-728.
- Weinstein, A. G. Predicting behavior from attitudes. *Public Opinion Quarterly*, 1972, 36, 355-360.
- Weitz, J., & Nuckols, R. C. The validity of direct and indirect questions in measuring job satisfaction. *Personnel Psychology*, 1953, 6, 487-494.
- Wicker, A. W. Attitudes versus actions: The relationship of verbal and overt behavioral responses to attitude objects. *Journal of Social Issues*, 1969, 25, 41-78.
- Wicker, A. W. An examination of the "other variables" explanation of attitude-behavior inconsistency. *Journal of Personality and Social Psychology*, 1971, 19, 18-30.
- Wicker, A. W., & Pomazal, R. J. The relationship between attitudes and behavior as a function of specificity of attitude object and presence of a significant person during assessment conditions. *Representative Research in Social Psychology*, 1971, 2, 26-31.
- Wiggins, J. W. *Personality and prediction: Principles of personality assessment*. Reading, Mass.: Addison-Wesley, 1973.
- Winters, L. C. Measuring attitudes and behavior toward ecologically significant products. *Psychological Reports*, 1971, 29, 893-894.
- Woodward, J. L., & Roper, E. Political activity of American citizens. *American Political Science Review*, 1950, 44, 872-885.
- Worthy, M., Gary, A. L., & Kahn, G. M. Self-disclosure as an exchange process. *Journal of Personality and Social Psychology*, 1969, 13, 59-63.
- Zunich, M. A study of relationships between child-rearing attitudes and material behavior. *Journal of Experimental Education*, 1961, 30, 231-241.

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