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The Theory of Reasoned Action: A Meta-Analysis of Past Research with Recommendations for Modifications and Future Research

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Two meta-analyses were conducted to investigate the effectiveness of the Fishbein and Ajzen model in research to date. Strong overall evidence for the predictive utility of the model was found. Although numerous instances were identified in which researchers overstepped the boundary conditions initially proposed for the model, the predictive utility remained strong across conditions. However, three variables were proposed and found to moderate the effectiveness of the model. Suggested extensions to the model are discussed and general directions for future research are given.

Fishbein and Ajzen's model of reasoned action (1975; see also Ajzen and Fishbein 1980b; Fishbein 1980) has received considerable and, for the most part, justifiable attention within the field of consumer behavior (e.g., Ryan and Bonfield 1975, 1980). Not only does the model appear to predict consumer intentions and behavior quite well, it also provides a relatively simple basis for identifying where and how to target consumers' behavioral change attempts.

LIMITATIONS DUE TO THE GENERALITY OF THE MODEL

According to Fishbein and Ajzen (1975; see also Ajzen and Fishbein 1977, 1980; Fishbein 1980), a behavioral intention measure will predict the performance of *any voluntary act, unless intent changes prior to performance or unless the intention measure does not correspond to the behavioral criterion in terms of action, target, context, time-frame and/or*

specificity. They suggest that, in practice, the latter two constraints can be minimized by paying careful attention to the correspondence between the performance criterion and the wordings of the attitude, subjective norm, and intention questions, and by administering the measures of attitudes, subjective norms, and intentions as close as possible to the performance time.

Fishbein and Ajzen's model appears to hold quite well within the constraints they define. However, researchers are interested in the understanding and prediction of situations that do not fit neatly within Fishbein and Ajzen's framework (Warshaw, Sheppard, and Hartwick forthcoming). In particular, the Fishbein and Ajzen model is applied frequently to situations in which (1) the target behavior is not completely under the subjects' volitional control, (2) the situation involves a choice problem not explicitly addressed by Fishbein and Ajzen, and/or (3) subjects' intentions are assessed when it is impossible for them to have all of the necessary information to form a completely confident intention.

The purpose of this article is to assess the degree to which research utilizing the Fishbein and Ajzen model has gone beyond the intended conditions of the model and thus fallen into such limiting conditions and to determine the empirical implications of failing to meet the model's parameters. Two meta-analyses were conducted to consider the effect of falling within one or more of the three limiting condi-

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tions on (1) the use of attitudes and subjective norms to predict intentions and (2) the use of intentions to predict the performance of behavior.

Goals Versus Behaviors

Fishbein and Ajzen have explicitly acknowledged their model's limitation concerning the distinction between a goal intention and a behavioral intention. Their model was developed to deal with behaviors (e.g., taking a diet pill, applying for a consumer loan, or shopping for a new car) and not outcomes or events that result from behaviors (e.g., losing ten pounds, obtaining a consumer loan, or owning a new car), and the model deals with only those behaviors that are under a person's volitional control. Therefore, actions that are at least in part determined by factors beyond individuals' voluntary control fall outside the boundary conditions established for the model. Whenever the performance of some action requires knowledge, skills, resources, or others' cooperation, or necessitates overcoming environmental obstacles, the conditions of the model cannot be met. In such cases, the person may not be able to perform the action, even if the intention to do so is strong. For example, a person may be prevented from purchasing a new house if the current owner does not accept the purchase offer, if the mortgage from the bank is unobtainable, if the interest rate is unaffordable, and so on.

This distinction between a goal intention and a behavioral intention, then, concerns circumstances in which the ability to achieve one's intentions, given total effort, is not certain. Fishbein and Ajzen initially claimed that there are few actions that fall outside of this boundary condition. "Since much human behavior is under volitional control, most behaviors can be accurately predicted from an appropriate measure of the individual's intention to perform the behavior in question" (Fishbein and Ajzen 1975, p. 380). However, a variety of consumer activities involve limits on the consumer's ability to perform a given intended action or to achieve a certain outcome. Examples include purchase intentions formulated well in advance of the purchase (where potential impediments may emerge over time), intentions to purchase expensive items (for which the necessary resources may not be available), intentions to purchase products that may not be available or that involve negotiations between the buyer and seller (as one party may refuse to deal), and so on. In fact, Ajzen (1985, p. 24) recently acknowledged that

some behaviors are more likely to present problems of control than others, but we can never be absolutely certain that we will be in a position to carry out our intentions. Viewed in this light it becomes clear that strictly speaking every intention is a goal whose attainment is subject to some degree of uncertainty.

As our classification of studies appearing later in this article will show, several researchers have employed the Fishbein and Ajzen model to study goals for which attainment involves a degree of uncertainty. Two potential problems exist when the model is extended to this domain. The most obvious difficulty concerns the strength of the intention-performance relation, because a variety of factors in addition to one's intentions determine whether goals are achieved (e.g., resources, skills, or others' cooperation). As a consequence, the accuracy of predicting goal attainment from individuals' intentions should be much lower than that achieved when using intentions to predict volitional behavior. Moreover, the degree of this attenuation of predicting goals will be related to the probability of goal attainment. When the obstacles are few or weak, so that the probability of being able to achieve a goal is high, there is apt to be little attenuation of the intention-performance relationship. When the obstacles are many and strong, so that the probability of being able to achieve a goal is not high, an accurate prediction from the model is unlikely.

The second potential problem of using the Fishbein and Ajzen model in goal situations concerns how consumers determine their goal intentions. Specifically, there seems to be no provision in the model for considering either the probability of failing to achieve one's goals or the consequences of such failure (cf. Atkinson 1958). For example, without such consideration, people would apply for exorbitant loans, buy houses and cars they cannot afford, take perfume to the persons they have always secretly admired, and so on. People do not do such things, because success is unlikely and failure is costly in terms of self-esteem and wasted time and resources. Fishbein and Ajzen acknowledge that such considerations are taken into account by individuals, but only in extreme cases. "People do not intend to perform behaviors that they realize are beyond their ability" (Fishbein and Ajzen 1975, p. 372). However, how consumers incorporate such considerations into goal intentions in less extreme cases is lacking in the model.

The Choice Among Alternatives

As originally developed and typically used, the Fishbein and Ajzen model focuses on the determinants and performance of a single behavior. Ajzen and Fishbein (1980b) have argued that not considering the possibility of choosing among alternative behaviors represents a serious omission in the model. Consumers are constantly faced with a choice among stores, products, brands, models, sizes, colors, and so on. It is important to know, therefore, what happens when the theory of reasoned action is extended to situations in which individuals are forced to choose among alternative behaviors.

According to Fishbein and Ajzen (1975), the thoughts and feelings toward alternative behavior, if they have any influence at all, influence performance only through their effect on individuals' attitudes and subjective norms toward the particular behavior of interest. Thus, when attempting to assess the immediate determinants of a given behavior, researchers need only be concerned with attitudes, subjective norms, and intentions toward that particular behavior. The more positive such factors are, the more likely it is that individuals will perform the behavior.

However, the presence of choice may dramatically change the nature of the intention formation process and the role of intentions in the performance of behavior. Because many of the attributes and consequences associated with various alternatives in the choice set are apt to be quite similar, the attitudes and subjective norms toward each of the alternatives also are likely to be similar. Consider, for example, the consumer who thinks that buying a package of Oscar Mayer hot dogs is a terrific idea. S/he is likely to have similar thoughts about buying Ball Park, Beef Masters, or Hebrew National hot dogs. However, only one package of hot dogs actually will be purchased. In the case of the chosen alternative, our consumer's positive attitude and subjective norm is consistent with his/her purchase but not for each rejected alternative (i.e., for each rejected alternative, the attitudes and subjective norms are positive, but the behavior is not performed). Of course, there will be other consumers with similarly positive attitudes and subjective norms who will choose differently. Thus, a good deal of inaccuracy in prediction likely will exist no matter which alternative a researcher chooses to study. The presence of choice, then, can be expected to diminish the ability of accurately predicting behavior using a measure of intention to perform a single behavior as was originally proposed in the Fishbein and Ajzen model and as has been done frequently in research using the model.

How and where this attenuation of prediction due to choice might occur is dependent on the nature of the choice process itself. One possibility involves an intention comparison process whereby individuals form an intention toward each alternative based on their attitudes and subjective norms toward the alternative. They then compare the strength of their intentions toward each of the alternatives, choosing and performing the alternative with the strongest intention. Thus, choice is seen as a process of comparing and selecting among the intentions associated with each alternative in the choice set. This is the process essentially adopted by Fishbein and Ajzen as they have extended their model into the choice domain (e.g., Fishbein 1980; Fishbein and Ajzen 1980; Fishbein, Ajzen, and Hinkle 1980; Sperber, Fishbein, and Ajzen 1980). The other possibility involves an attitude comparison process whereby individuals assess

their attitudes and subjective norms toward each alternative and select the one with the most positive attitude and subjective norm. Based on this choice, they form an intention to perform that one alternative and subsequently perform the behavior. Thus, choice is seen as a process of comparing and selecting among the attitudes and subjective norms associated with each of the alternatives in the choice set. Extending the model to examine this second process has been the modification for which we have argued (Hartwick 1983; Warshaw et al. forthcoming).

Thus, two possibilities exist for how and where the attenuation of prediction occurs when individuals must choose among alternatives. If the intention comparison process holds, it is the intention-performance relation that is likely to be attenuated. Utilizing only a measure of intention to perform the alternative of interest, researchers will neglect individuals' intentions to perform other competing alternatives. The result is that a less than accurate prediction of performance might be expected whenever alternatives are present. The attitude and subjective norm-intention relation is unlikely to be affected in this case. However, if the attitude comparison process holds, it is the relation between attitude, subjective norm, and intention that is likely to be affected. In this case, researchers who utilize only measures of attitude and subjective norm toward the alternative of interest, as recommended by Fishbein and Ajzen, will neglect individuals' attitudes and subjective norms toward competing alternatives. The result is that a less than accurate prediction of intention might be expected whenever alternatives are present. The intention-performance relation is unlikely to be affected by the presence of choice in this case.

Intentions Versus Estimates

Frequently, researchers are interested in predicting subjects' intentions and behavior for conditions in which subjects' knowledge about and control of events is imperfect (e.g., future behavior). In doing so, researchers utilizing the Fishbein and Ajzen model have failed to distinguish between individuals' intentions to perform some behavior or achieve some goal and their subjective estimates of whether they will actually perform the behavior or achieve the goal (Warshaw and Davis 1985; Warshaw et al. forthcoming).

As a consequence, these two measures have been used interchangeably in studies that use the model. Researchers have asked subjects to respond to questions like, "Do you intend to do X?" Others have asked, "Are you likely to do X?" or "Will you do X?" Although the responses to intention and estimation questions often involve similar considerations and are quite similar, there clearly are times where what one intends to do and what one actually expects to do

are quite different. For example, such questions are considered in our daily lives when someone claims that s/he intends to quit smoking or to lose some weight. Frequently, the person is asked in return, "How likely is it that you will succeed?" or more skeptically, "Do you really think you'll do it this time?"

When trying to estimate whether they actually will perform some behavior or achieve some goal, individuals are likely to consider all factors of which they are aware that could influence their performance of the activity (Warshaw et al. forthcoming). Such estimates therefore are likely to include (1) some consideration of their current attitudes, subjective norms, and intentions toward the action or outcome of interest, (2) their attitudes, subjective norms, and intentions toward alternative actions or outcomes, and (3) various factors that could cause them to be unsuccessful in their attempt to carry out such intentions. Factors that could cause an unsuccessful attempt are likely to lead individuals to change their currently held intentions or lead them to form any of a number of new intentions. Thus, the distinction between estimation and intention has dramatic implications for the prediction of intention (estimate) from attitudes and subjective norms and for the intention (estimate)-performance relation.

A measure of estimation will likely provide the better prediction of performance. An individual may, at the time of questioning, intend to perform some activity, yet later fail in an attempt to carry out this intention or have a change in mind and decide to pursue some other alternative. There are also situations where individuals have not as yet formed an intention to perform some activity, but later do indeed form and carry out such an intention. In these cases, an intention measure is apt to do quite poorly in the prediction of performance. Because individuals' estimates include some consideration of the factors leading to such changes, an estimation measure is likely to predict performance much better than an intention measure is in these cases.

Moreover, the superiority of the estimation measure for predicting performance is likely to be most evident in cases where researchers step outside the bounds claimed for the Fishbein and Ajzen model (i.e., in the prediction of goals and in choice situations). As noted previously, an intention measure may not provide a good prediction of goal attainment, as it is determined not only by intention, but also by a variety of other factors. Individuals' estimates are likely to include some consideration of these other factors. Thus, an estimation measure likely provides a better prediction of performance.

An estimation measure also likely provides a better prediction of performance for situations involving choice among alternatives. It has been argued in this article that, if an intention comparison process drives

choice among alternatives, a single measure of intention is likely to provide an attenuated prediction of actions or outcomes involving a choice. In contrast, individuals' estimates are likely to include some consideration of alternatives. An estimation measure therefore is likely to provide a superior prediction of actions and outcomes involving a choice among alternatives. However, if an attitude comparison process holds in choice situations, the presence of choice is apt to have little impact on the prediction of performance. According to this process, an individual makes choices prior to the formation of an intention. Thus, in this case, both intentions and estimates include some consideration of the various alternatives in the situation. As a result, neither intention nor estimation measures should be affected adversely when utilized to predict the performance of activities involving choice among alternatives when an attitude comparison process holds.

Now consider the prediction of intentions versus estimates. In this case, attitudes and subjective norms likely provide a more accurate prediction of an intention measure than an estimation measure. As we have argued, individuals' estimates of whether they will perform some activity are likely to include consideration of all factors of which they are aware that could influence their performance of the activity. Consequently, the prediction of such estimates, utilizing attitudes and subjective norms alone, is likely to be attenuated. Moreover, the poorest prediction is likely to occur when researchers step outside the bounds initially claimed for the Fishbein and Ajzen model, because it is in such situations that the additional factors, such as the presence or absence of needed resources, abilities, skills, knowledge and experience, cooperation, and so on, have an impact on estimates of performance.

A Meta-Analysis of Previous Research

To investigate whether our expectations have any factual basis, two meta-analyses of past studies utilizing the Fishbein and Ajzen model were conducted. The present analyses extend a previous one (Farley, Lehmann, and Ryan 1981) in a number of important ways. First, assessments of both the intention-performance and attitude and subjective norm-intention relationships are undertaken. Second, we utilize in the present analyses more recent and sophisticated techniques developed by Hunter, Schmidt, and Jackson (1982). Third, we look at the impact of the moderators that we discussed:

1. *Is the activity a goal or a behavior?* Actions or outcomes were classified as goals if, in our conservative opinion, there were major obstacles to the individuals' performance of the action or attainment of the goal. For example,

a lack of money would be an obstacle to the purchase of some expensive item like a car; however, it would not be an obstacle to the purchase of soft drinks, toothpaste, magazines, and so on. Certain actions occasionally were classified as a goal for some samples of subjects but as a behavior for others. For example, having sex or drinking an alcoholic beverage would be considered goals for high school boys because high school boys may lack the opportunity to perform such actions. However, because that is not the case with married adults, these actions would be considered behaviors for such individuals.

2. *Does the situation involve a choice among alternative activities or outcomes?* Situations were classified as involving choice only when that choice was quite explicit. For example, the purchase of a Camaro would be classified as involving choice because one is presumably choosing among Camaros, Firebirds, Mustangs, and so on. However, we did not classify the purchase of a car (no make or model mentioned) as involving choice even though an individual is apt to be choosing (implicitly) among the car, public transit, walking, and so on.
3. *What sort of intention measure is employed in the study?* Studies were classified as using either a measure of intention (e.g., I intend/do not intend to do X) or a measure of estimation (e.g., It is unlikely/likely that I will do X).

Based on the classifications and the previous discussion, we offer the following hypotheses concerning the intention-performance relationship.

- H1:** A significant and substantial relationship will be found between individuals' intentions and performance (I-B).
- H2:** The I-B relationship will be stronger when individuals are asked to estimate their future performance than when they are asked to indicate their present intentions.
- H3A:** The I-B relationship will be weaker for goals than for behaviors.
- H3B:** This especially will be true when researchers utilize an intention measure. When a measure of estimation is employed, the difference in predicting the performance of goals and behaviors is apt to be minimized, because such estimates are likely to include some consideration of the additional factors that have an impact on goal performance.
- H4A:** Given that the intention comparison choice process holds, the I-B relationship will be

weaker when the activity involves a choice among alternatives.

- H4B:** However, such a difference will occur only when a measure of intention is utilized. When a measure of estimation is employed, the difference in predicting the performance of choice and no choice activities is apt to be minimal, because individuals' estimates are likely to include some consideration of attitudes, subjective norms, and intentions concerning alternatives.
- H5A:** Given that the attitude comparison choice process holds, no difference in predicting the performance of choice and no choice activities will be found.
- H5B:** Because both intentions and estimates are said to involve some consideration of alternative choices, this will be true for studies using intention measures and for studies using estimation measures.

The following hypotheses concern the attitude and subjective norm-intention relationship.

- H6:** A significant and substantial relationship will be found between individuals' attitudes and subjective norms and their intentions (A+SN-I). However, the possibility of moderators of this relationship will also be suggested by the results.
- H7:** The A+SN-I relationship will be stronger when individuals are asked to indicate their present intentions than when they are asked to estimate their future performance.
- H8A:** The A+SN-I relationship will be weaker for goals than for behaviors.
- H8B:** This should be true both when measures of intention and estimation have been utilized. However, because individuals' estimates are likely to involve some consideration of additional factors that have an impact on performance, this especially will be true when an estimation measure has been employed in the research.
- H9A:** Given that the intention comparison process holds, no difference in the prediction of intentions to perform choice and no choice activities will be found.
- H9B:** However, this is likely to be true only when a measure of intention is employed. Because individuals' estimates are likely to include some consideration of their attitudes and subjective norms concerning alternatives, the A+SN-I relationship will be

weaker when an estimation measure is used and the activity involves a choice among alternatives.

H10A: Given that the attitude comparison process holds, the A+SN-I relationship will be weaker when the activity involves a choice among alternatives.

H10B: Because both intentions and estimates are said to involve some consideration of attitudes and subjective norms concerning alternatives, this will be true for studies utilizing intention measures and for studies utilizing estimation measures.

METHOD

Selection of Studies

The first step in conducting a meta-analysis is the selection of empirical studies to be included in the review. To assess the use of the Fishbein and Ajzen model, an attempt was made to include all studies dealing with the model that were published in the *Journal of Consumer Research*, the *Journal of Marketing*, the *Journal of Marketing Research*, *Advances in Consumer Research*, the *Journal of Personality and Social Psychology*, the *Journal of Experimental Social Psychology*, the *Journal of Social Psychology*, the *Journal of Applied Social Psychology*, and the *Journal of Applied Psychology*. In addition, all relevant articles cited by or reported in Fishbein and Ajzen (1975) and Ajzen and Fishbein (1980b) were included in the review.

From our pool of relevant publications, individual studies were selected for inclusion in the meta-analysis based on a number of criteria. Our first general requirement was the presence of information needed to conduct the meta-analysis. A number of studies were rejected for the following reasons.

1. The studies failed to include all of the terms needed to assess either the A+SN-I or I-B relationships (either A, SN and I, or I and B). Several studies that focus on individual beliefs and their relation to attitudes and intentions have been conducted (e.g., Mazis, Ahtola, and Klippel 1975; Mitchell and Olson 1981; Olson, Toy, and Dover 1982). In many of these studies, no subjective norm term was reported. Therefore, information needed to assess the A+SN-I relationship was not available.
2. The reported statistics did not include bivariate (in the case of the I-B relationship) or multiple (in the case of the A+SN-I relationship) correlations and it was not possible to retrieve these correlations from the authors.

Our second general requirement was a clear, simple, and direct test of the two relationships of interest. Therefore, a number of other studies were rejected for the following reasons.

3. The measures used in the studies failed to correspond. Common examples include studies that utilized attitudes or beliefs toward objects to predict intentions and behavior (e.g., Harrell and Bennett 1974), studies that assessed a different behavior than that specified in the measures of intention (e.g., Schwartz and Tessler 1972), and studies that assessed behavior for a different period than that indicated in the measure of intention (e.g., DeVries and Ajzen 1971).
4. The studies did not deal with single behaviors or goals, such as studies that utilized difference score measures (e.g., Fishbein 1980; Fishbein, Ajzen, and Hinkle 1980) or behavioral indices (e.g., Fishbein 1980; Saltzer 1978).
5. The studies investigated hypothetical estimates and situations. Thus, studies investigating what a person would do should some situation arise were not included (e.g., Ajzen and Fishbein 1972; Ryan 1973). Also rejected were studies requiring subjects to estimate other people's attitudes, subjective norms, and intentions (e.g., Miniard and Cohen 1979, 1981).

One additional issue arose as we collected our sample of studies. Several articles contained more than one correlation relevant to our analysis. For example, Glassman and Fitzhenry (1976) asked a sample of consumers about their attitudes, subjective norms, and intentions to purchase each of two different brands of coffee, detergent, gasoline, and potato chips. In an even more extreme example, Warshaw and Davis (1984, 1985) asked one sample of undergraduate students about their performance of 11 different activities during a weekend and another two samples of undergraduates about their performance of 18 different activities. This situation led to a dilemma; if we included each correlation as a separate study in the meta-analysis, undue influence could be given to some investigations. Moreover, there would appear to be a lack of independence between our different studies, violating certain statistical assumptions of the meta-analysis. If the correlations were combined, however, we potentially would lose a considerable amount of available information.

In resolving this issue, we followed the basic recommendations of Hunter et al. (1982). We averaged correlations and reported the data as a single study if (1) each correlation was based on responses of the same

sample of subjects, (2) the activities involved represented distinct alternatives to one another (such as in the choice of different brands of a single product, of a method of contraception, and so on), and (3) categorizations according to each of the moderators (activity type, choice, and measure) were identical. However, when one or more of these conditions was not satisfied, each correlation was included as a separate study. This procedure seemed to provide a good resolution of the dilemma with the single exception being the two recent Warshaw and Davis investigations. They contributed more than half of the remaining studies of the I-B relationship. To determine the influence of these investigations, separate meta-analyses were conducted, one including these studies and one excluding them. As it turned out, the results of the analyses were virtually identical. (If anything, including the Warshaw and Davis studies worked against our hypotheses.) Consequently, we decided to report the analyses that include all studies in the present report.

The studies that remain present clear, simple, and direct tests of the Fishbein and Ajzen model. In all, there were 87 separate studies of the I-B relationship and 87 separate studies of the A+SN-I relationship. Tables 1 and 2 list all of the studies used in the two meta-analyses.

Statistical Analyses

In the first of two phases of the data analysis, estimates of the population parameters were derived for the distribution of observed correlations using estimation procedures described by Hunter et al. (1982). To estimate the population correlation, a weighted average of the study correlations was calculated with each study correlation weighted by the number of persons in the study. Thus,

$$\bar{r} = \frac{\sum (N_i X r_i)}{\sum N_i}$$

where r_i is the observed correlation and N_i is the number of persons in each study. The corresponding variance across studies was also weighted according to the number of persons in each study. Thus,

$$s_r^2 = \frac{\sum (N_i (r_i - \bar{r})^2)}{\sum N_i}$$

This variance, however, confounds two things—true variation in the population correlations and spurious variation due to the presence of any of a number of different artifacts (e.g., sampling error, measurement unreliability, range restrictions, computational errors, and so on). In past work, Hunter et al. found

that the largest single source of artifactual variance is sampling error. Accordingly, variance due to sampling error was calculated using the following formula:

$$s_e^2 = \frac{(1 - \bar{r}^2)^2 K}{\sum N_i}$$

where K is the number of studies. This estimate of the variance due to sampling error was then subtracted from the total variance across the studies in our sample to yield an estimate of the population variance. The resulting estimates of the population correlation and variance provide an overall assessment of the efficacy of the Fishbein and Ajzen model as it has been used in research to date.

In the second phase of the data analysis, we considered whether there were likely to be variables that moderate the I-B and A+SN-I relationships. To do so, we calculated the percentage of the variance in the study correlations that is likely due to sampling error. Hunter et al. have suggested that moderators are unlikely if artifacts account for more than 75 percent of the variance in such correlations. Because that was not even close to being the case in our results, we proceeded to examine the impact of our three moderator variables on the I-B and A+SN-I relationships.

To examine this impact, we calculated the population correlations (using the weighted average of the study correlations) for each level of the three variables of interest (activity type, choice, and measure) and for each combination of levels in the two interactions of interest (activity type by measure and choice by measure). In this analysis, the presence of a moderator will show itself in different population correlations for the different levels or combinations of the variables. Moreover, by calculating the variance accounted for by each distinction and expressing it as a percentage of the overall population variance, an indication of the importance or strength of each moderator or combination of moderators on the utility of the Fishbein and Ajzen model can be given.

Potential Moderators of the Fishbein and Ajzen Model

Each study in the meta-analyses was also classified on the basis of our answers to the questions presented prior to our hypotheses in this article. Our classifications are shown in Tables 1 and 2. Although there is obviously a certain amount of conjecture involved in our classifications, steps were taken to assure fair classification of items. First, detailed discussion was conducted among the authors concerning the proper classification. Second, an assistant uninformed regarding the purpose of the research and the results of the

TABLE 1
A META-ANALYSIS OF STUDIES INVESTIGATING THE INTENTION-BEHAVIOR RELATIONSHIP

Study	Activity	Goal	Choice	Measure	<i>n</i>	<i>r</i>
Ajzen (1971)	Choose alternative in PDG	Behavior	Choice	Intention	216	0.80
Ajzen and Fishbein (1970)	Choose alternative in PDG	Behavior	Choice	Intention	96	0.85
	Choose alternative in PDG	Behavior	Choice	Intention	96	0.94
Ajzen and Fishbein (1974)	Send instructions during lab game	Behavior	No choice	Not specified	144	0.69
	Follow instructions during lab game	Behavior	No choice	Not specified	144	0.21
Ajzen, Timko, and White (1982)	Vote in Presidential election	Behavior	No choice	Not specified	130	0.70
	Smoke marijuana in next four weeks	Behavior	No choice	Not specified	130	0.72
Bagozzi (1981)	Donate blood at campus drive this year	Goal	No choice	Intention	95	0.45
Bonfield (1974)	Purchase brand of grape drink	Behavior	Choice	Intention	158	0.40
Bowman and Fishbein (1978)	Vote for referendum initiative	Behavior	Choice	Intention	72	0.89
Brinberg and Durand (1983)	Eat at a fast food restaurant	Behavior	No choice	Intention	104	0.41
Davidson and Jaccard (1979)	Have a child in next two years	Goal	No choice	Intention	242	0.53
	Use birth control pills	Behavior	Choice	Intention	242	0.68
Davidson and Morrison (1983)	Use condoms—husband	Behavior	Choice	Estimate	203	0.76
	Use condoms—wives	Goal	Choice	Estimate	198	0.79
	Use pill, IUD, diaphragm—husbands	Goal	Choice	Estimate	203	0.86
	Use pill, IUD, diaphragm—wives	Behavior	Choice	Estimate	198	0.89
Davidson et al. (1985)	Vote for mayoral candidate	Behavior	Choice	Estimate	44	0.30
Fishbein, Ajzen, and McArdle (1980)	Sign up for alcohol unit	Behavior	No choice	Not specified	160	0.76
Fishbein and Coombs (1974)	Vote for presidential candidate	Behavior	Choice	Estimate	300	0.84
Fisher (1984)	Use condom in next month—male students	Goal	Choice	Not specified	44	0.44
Horn and Hulin (1981)	Reenlist in National Guard	Behavior	No choice	Estimate	236	0.70
Horn, Katerberg, and Hulin (1979)	Reenlist in National Guard	Behavior	No choice	Estimate	228	0.67
Jaccard, Knox, and Brinberg (1979)	Vote for Presidential candidate	Behavior	Choice	Estimate	119	0.86
Loken (1983)	Watch rerun of a particular TV program	Behavior	Choice	Not specified	56	0.58
Miniard, Obermiller, and Page (1982)	Purchase brand of soft drink	Behavior	Choice	Estimate	66	0.49
Newman (1974)	Be absent from work	Behavior	No choice	Estimate	108	0.10
	Resign from job	Behavior	No choice	Estimate	108	0.39
Oliver and Berger (1979)	Obtain a swine flu shot	Goal	No choice	Estimate	469	0.32
	Obtain a swine flu shot	Goal	No choice	Estimate	323	0.34
Pomazal and Jaccard (1976)	Donate blood during campus drive	Goal	No choice	Not specified	270	0.46
Schlegel, Crawford, and Sanborn (1977)	Drink type of alcoholic beverage in specific setting—high school students	Goal	Choice	Not specified	196	0.33
Sejwacz, Ajzen, and Fishbein (1980)	Lose weight in next two months	Goal	No choice	Not specified	88	0.16
	Perform five dieting behaviors for two months	Goal	No choice	Not specified	88	0.55
	Perform three exercise behaviors for two months	Goal	No choice	Not specified	88	0.54
Smetana and Adler (1980)	Have an abortion	Goal	No choice	Estimate	136	0.96
Vinokur-Kaplan (1978)	Have child in next two years	Goal	No choice	Not specified	239	0.55
Warshaw, Calantone, and Joyce (1988)	Donate blood in next two months	Goal	No choice	Intention	750	0.31

TABLE 1—(Continued)

Study	Activity	Goal	Choice	Measure	<i>n</i>	<i>r</i>
Warshaw and Davis (1984)	Go to the campus pub	Behavior	No choice	Estimate	83	0.57
	Skip class	Behavior	No choice	Estimate	83	0.52
	Watch a TV movie	Behavior	No choice	Estimate	83	0.48
	Drink alcohol	Behavior	No choice	Estimate	83	0.64
	Read a newspaper	Behavior	No choice	Estimate	83	0.53
	Read for pleasure	Behavior	No choice	Estimate	83	0.54
	Go to the dormitory pub	Behavior	No choice	Estimate	83	0.34
	Eat in a restaurant	Behavior	No choice	Estimate	83	0.50
	Have sex	Goal	No choice	Estimate	83	0.42
	Attend a sports event	Behavior	No choice	Estimate	83	0.48
	Perform an illegal behavior	Behavior	No choice	Estimate	83	0.55
Warshaw and Davis (1985)	Eat only nonfattening foods	Goal	No choice	Intention	84	0.25
	Go to a party	Behavior	No choice	Intention	84	0.65
	Take a walk	Behavior	No choice	Intention	84	0.38
	Eat an apple	Behavior	No choice	Intention	84	0.46
	Watch something good on TV	Behavior	No choice	Intention	84	0.42
	Eat some junk food	Behavior	No choice	Intention	84	0.29
	Go to weekend job	Behavior	No choice	Intention	84	0.86
	Go out with friends on Saturday night	Behavior	No choice	Intention	84	0.51
	Take a nap	Behavior	No choice	Intention	84	0.38
	Smoke some cigarettes	Behavior	No choice	Intention	84	0.71
	Study a few hours	Behavior	No choice	Intention	84	0.23
	Drink a soft drink	Behavior	No choice	Intention	84	0.39
	Converse with an attractive stranger	Goal	No choice	Intention	84	0.49
	Write a letter	Behavior	No choice	Intention	84	0.36
	Eat a good meal	Behavior	No choice	Intention	84	0.29
	Have a sandwich	Behavior	No choice	Intention	84	0.51
	Go out for dinner	Behavior	No choice	Intention	84	0.40
	Take vitamins	Behavior	No choice	Intention	84	0.67
	Eat only nonfattening foods	Goal	No choice	Estimate	113	0.33
	Go to a party	Behavior	No choice	Estimate	113	0.56
	Take a walk	Behavior	No choice	Estimate	113	0.58
	Eat an apple	Behavior	No choice	Estimate	113	0.51
	Watch something good on TV	Behavior	No choice	Estimate	113	0.46
	Eat some junk food	Behavior	No choice	Estimate	113	0.41
	Go to weekend job	Behavior	No choice	Estimate	113	0.83
	Go out with friends on Saturday night	Behavior	No choice	Estimate	113	0.57
	Take a nap	Behavior	No choice	Estimate	113	0.52
	Smoke some cigarettes	Behavior	No choice	Estimate	113	0.88
	Study a few hours	Behavior	No choice	Estimate	113	0.33
	Drink a soft drink	Behavior	No choice	Estimate	113	0.62
	Converse with an attractive stranger	Goal	No choice	Estimate	113	0.29
	Write a letter	Behavior	No choice	Estimate	113	0.53
	Eat a good meal	Behavior	No choice	Estimate	113	0.24
Make a sandwich	Behavior	No choice	Estimate	113	0.45	
Go out for dinner	Behavior	No choice	Estimate	113	0.45	
Take vitamins	Behavior	No choice	Estimate	113	0.78	
Werner and Middlestadt (1979)	Use birth control pills	Behavior	Choice	Not specified	61	0.83
Zuckerman and Reis (1978)	Donate blood at campus drive	Goal	No choice	Intention	251	0.40

TABLE 2

A META-ANALYSIS OF STUDIES INVESTIGATING THE RELATIONSHIP BETWEEN ATTITUDES AND SUBJECTIVE NORMS-INTENTIONS

Study	Activity	Goal	Choice	Measure	<i>n</i>	<i>r</i>
Ajzen (1971)	Choose alternative in PDG	Behavior	Choice	Intention	216	0.82
Ajzen and Fishbein (1969)	Go to a party	Behavior	No choice	Estimate	100	0.82
	Visit an exhibition of modern art	Behavior	No choice	Estimate	100	0.72
	Watch a western on TV	Behavior	No choice	Estimate	100	0.71
	Go to a concert	Behavior	No choice	Estimate	100	0.79
	Play a game of poker	Behavior	No choice	Estimate	100	0.79
	Go to a French movie	Goal	No choice	Estimate	100	0.79
	Participate in a discussion	Behavior	No choice	Estimate	100	0.78
	Read a mystery novel	Behavior	No choice	Estimate	100	0.68
Ajzen and Fishbein (1970)	Choose alternative in PDG	Behavior	Choice	Intention	96	0.89
	Choose alternative in PDG	Behavior	Choice	Intention	96	0.85
Ajzen and Fishbein (1974)	Send instructions during lab game	Behavior	No choice	Not specified	144	0.76
	Follow instructions during lab game	Behavior	No choice	Not specified	144	0.69
Ajzen, Timko, and White (1982)	Vote in presidential election	Behavior	No choice	Not specified	140	0.52
	Smoke marijuana in next four weeks	Behavior	No choice	Not specified	140	0.80
Bagozzi (1981)	Donate blood	Goal	No choice	Estimate	95	0.28
Bearden and Woodside (1978)	Use marijuana in next four weeks	Behavior	No choice	Estimate	251	0.70
Bowman and Fishbein (1978)	Vote for referendum initiative	Behavior	Choice	Intention	81	0.92
Brinberg (1979)	Go to church	Behavior	No choice	Intention	91	0.68
	Go to church	Behavior	No choice	Intention	69	0.75
	Go to church	Behavior	No choice	Intention	49	0.57
Brinberg and Cussings (1984)	Purchase generic prescription drugs	Behavior	No choice	Intention	96	0.63
	Purchase generic prescription drugs	Behavior	No choice	Intention	109	0.63
Brinberg and Durand (1983)	Eat at a fast food restaurant	Behavior	No choice	Intention	154	0.66
Burnkrant and Page (1982)	Donate blood at campus drive	Goal	No choice	Estimate	124	0.41
Crawford and Boyer (1985)	Have a child in the next three years	Goal	No choice	Intention	163	0.75
DeVries and Ajzen (1971)	Cheat in college	Behavior	No choice	Intention	146	0.57
	Copy answers from others' tests	Behavior	No choice	Intention	146	0.65
	Allow others to copy from own test	Behavior	No choice	Intention	146	0.71
Fishbein and Ajzen (1980)	Purchase brand of beer	Behavior	Choice	Intention	37	0.75
Fisher (1984)	Use condom in next month—male students	Goal	Choice	Not specified	145	0.73
Glassman and Fitzhenry (1976)	Purchase brand of coffee	Behavior	Choice	Not specified	127	0.66
	Purchase brand of detergent	Behavior	Choice	Not specified	127	0.64
	Purchase brand of gasoline	Behavior	Choice	Not specified	127	0.67
	Purchase brand of potato chips	Behavior	Choice	Not specified	127	0.70
Greenstein, Miller, and Weldon (1970)	Pursue a particular career	Goal	Choice	Not specified	88	0.68
Hom and Hulin (1981)	Reenlist in National Guard	Behavior	No choice	Estimate	1,009	0.79
Hom, Katerberg, and Hulin (1979)	Reenlist in National Guard	Behavior	No choice	Estimate	373	0.81
Jaccard and Davidson (1972)	Use birth control pills	Behavior	Choice	Intention	73	0.94
Jaccard and Davidson (1975)	Have two children	Goal	Choice	Intention	270	0.73
	Have a child in the next two years	Goal	No choice	Intention	270	0.84
	Use birth control pills	Behavior	Choice	Intention	270	0.84
Kantola, Syme, and Campbell (1982)	Conserve drinking water	Goal	No choice	Intention	125	0.46
Loken (1983)	Watch rerun of particular TV program	Behavior	Choice	Not specified	56	0.68
Loken and Fishbein (1980)	Have a child in next three years	Goal	No choice	Intention	100	0.92

TABLE 2—(Continued)

Study	Activity	Goal	Choice	Measure	n	r
Lutz (1973a)	Purchase football tickets	Behavior	No choice	Not specified	100	0.23
	Purchase football tickets	Behavior	No choice	Not specified	77	0.75
Lutz (1973b)	Purchase brand of detergent	Behavior	Choice	Not specified	246	0.64
McCarty (1981)	Use condoms—male students	Goal	Choice	Not specified	53	0.61
	Use condoms—male students	Goal	Choice	Not specified	41	0.70
	Use birth control pills—female students	Behavior	Choice	Not specified	29	0.77
	Use birth control pills—female students	Behavior	Choice	Not specified	76	0.76
	Rely on partner using pill—male students	Goal	Choice	Not specified	25	0.49
	Rely on partner using pill—male students	Goal	Choice	Not specified	67	0.76
Newman (1974)	Be absent from work	Behavior	No choice	Estimate	108	0.45
	Resign from job	Behavior	No choice	Estimate	108	0.70
Pagel and Davidson (1984)	Use particular methods of birth control	Behavior	Choice	Estimate	67	0.56
Pomazal and Brown (1977)	Smoke marijuana	Behavior	No choice	Intention	101	0.75
Pomazal and Jaccard (1976)	Donate blood during campus drive	Goal	No choice	Not specified	270	0.60
Raju, Bhaghat, and Sheth (1975)	Purchase particular make of automobile	Goal	Choice	Estimate	243	0.47
Ryan (1974)	Purchase brand of toothpaste	Behavior	Choice	Not specified	90	0.47
	Purchase particular make of automobile	Goal	Choice	Not specified	80	0.76
Ryan (1978)	Purchase brand of toothpaste	Behavior	Choice	Not specified	97	0.66
Ryan (1982)	Purchase brand of toothpaste	Behavior	Choice	Intention	80	0.71
Ryan and Bonfield (1980)	Apply for loan at particular credit union	Behavior	Choice	Estimate	99	0.47
Schlegel, Crawford, and Sanborn (1977)	Drink alcoholic beverage—high school students	Goal	No choice	Not specified	196	0.75
	Drink beer—high school students	Goal	No choice	Not specified	417	0.69
Smetana and Adler (1980)	Have an abortion	Goal	No choice	Estimate	136	0.72
Songer-Nocks (1976)	Choose alternative in lab game	Behavior	Choice	Intention	320	0.77
Stutzman and Green (1982)	Conserve energy	Goal	No choice	Estimate	67	0.24
	Raise home thermostat—students	Goal	No choice	Estimate	67	0.42
	Lower water heater thermostat—students	Goal	No choice	Estimate	67	0.43
	Use fan instead of air conditioner	Behavior	Choice	Estimate	67	0.35
	Conserve energy	Goal	No choice	Estimate	364	0.36
	Raise home thermostat—consumers	Behavior	No choice	Estimate	364	0.41
	Use fan instead of air conditioner	Behavior	Choice	Estimate	364	0.56
Warshaw (1980)	Purchase detergent	Behavior	No choice	Estimate	178	0.55
	Purchase shampoo	Behavior	No choice	Estimate	178	0.60
	Purchase brand of detergent	Behavior	Choice	Estimate	178	0.71
	Purchase brand of shampoo	Behavior	Choice	Estimate	178	0.57
	Purchase brand of gum	Behavior	Choice	Estimate	34	0.76
	Purchase particular magazine	Behavior	Choice	Estimate	34	0.59
	Purchase brand of soft drink	Behavior	Choice	Estimate	34	0.66
	Dine at an expensive restaurant—students	Goal	No choice	Estimate	34	0.42
Weddle and Bettman (1973)	Purchase term paper	Goal	No choice	Not specified	57	0.26
Wilson, Mathews, and Harvey (1975)	Purchase brand of toothpaste	Behavior	Choice	Estimate	162	0.67
Zuckerman and Reis (1978)	Donate blood at campus drive	Goal	No choice	Intention	251	0.46

coded studies, independently classified each study. The agreement level between this individual and the classifications utilized in the analyses was 0.91 for the classification of studies involving behaviors or goals,

0.95 for the classification of studies involving choice or no choice among alternatives, and 1.00 for the classification of studies using intention or estimation measures.

RESULTS

Predictive Utility of the Fishbein and Ajzen Model

We expected to find strong overall support for the general predictive utility of the Fishbein and Ajzen model. Specifically, Hypothesis 1 stated that there would be a significant and substantial relationship between individuals' intentions and performance (I-B). Hypothesis 6 stated that there would be a significant and substantial relationship between individuals' attitudes and subjective norms and their intentions (A+SN-I).

Based on the data presented in Table 1, a frequency-weighted average correlation for the I-B relationship was 0.53. This correlation is based on 87 separate studies with a total sample of 11,566 and is significant at the 0.01 level. Based on the data presented in Table 2, a frequency-weighted average correlation for the A+SN-I relationship was 0.66. This correlation is based on 87 separate studies with a total sample of 12,624 and is significant at the 0.001 level. These results provide strong support for the overall predictive utility of the Fishbein and Ajzen model.

The Use of the Model in Research to Date

Despite the strong overall evidence in support of the model, we expected to find numerous instances in which the bounds originally established for the model had been overstepped. We also expected to find a frequent use of measures of estimation, not intention, in these studies. The data utilized in this assessment also are presented in Tables 1 and 2.

The first consideration was to determine whether the various activities in the reviewed studies were behaviors or goals. According to our categorizations, 21 studies of the I-B relationship (24 percent) and 27 studies of the A+SN-I relationship (31 percent) involved goals. The next consideration was the issue of choice. Eighteen studies of the I-B relationship (21 percent) and 38 studies of the A+SN-I relationship (44 percent) involved an explicit choice among alternative activities or outcomes. The final consideration was the type of measure utilized in the studies. In our sample, 44 studies of the I-B relationship (60 percent of those studies in which an operationalization was specified) and 35 studies of the A+SN-I relationship (58 percent of those studies in which an operationalization was specified) utilized an estimation measure. Overall, then, there appeared to be considerable use of the Fishbein and Ajzen model in domains and with measures not originally intended. Moreover, only 17 studies of the I-B relationship (20 percent of the total sample) and 10 studies of the A+SN-I relationship (11 percent of the total sample) used the model as it was originally intended to be used; that is, the model was developed to study a single behavior that involves

no choice using a measure of intention. Thus, it seems that the Fishbein and Ajzen model has not often been used in the way it was originally intended. The implications of using the model under such conditions is considered next.

Moderators of the I-B and A+SN-I Relationships

A great deal of variation exists in the correlations presented in Tables 1 and 2. Indeed, the 95 percent confidence limits are 0.15 and 0.92 for the I-B relationship and 0.39 and 0.92 for the A+SN-I relationship. Only 9.2 percent and 11.4 percent of the variance in the two samples is due to sampling error. Other artifacts (i.e., variations in measurement error, range restrictions, computational errors, and so on) will account for some of the remaining variance. However, such low figures definitely suggest the presence of moderators of the I-B and A+SN-I relationships. The influence of each of the three hypothesized moderators—the measure of “intention” employed, the type of activity, and the presence of a choice among alternatives—is discussed next.

Measure of Intention. The distinction between intention and estimation was hypothesized to influence both the I-B and A+SN-I relationships. We found, as hypothesized, that individuals' estimates provided the superior prediction of performance. The frequency-weighted average correlation was 0.57 for studies utilizing an estimation measure and 0.49 for studies utilizing an intention measure. (The frequency-weighted average correlation for those studies in which an operationalization was not specified was 0.53). These differences accounted for just 3.5 percent of the variance in study means. Thus, Hypothesis 2 was supported, albeit weakly.

As expected, individuals' attitudes and subjective norms predicted their intentions better than their estimates of performance. The frequency-weighted average correlation was 0.73 for studies utilizing an intention measure and 0.61 for studies utilizing an estimation measure. (The frequency-weighted average correlation for studies in which an operationalization was not specified was 0.67). These differences accounted for 14.9 percent of the variance in study means. Thus, Hypothesis 7 was also supported.

Goals and Behavior. As stated in Hypothesis 3A, the I-B relationship was expected to be weaker for goals than for behaviors. However, as noted in Hypothesis 3B, this attenuation in prediction was predicted to be much greater when an intention measure rather than an estimation measure was employed. As can be derived from Table 3, both hypotheses received support. Overall, the prediction of behaviors (frequency-weighted average correlation = 0.58) was superior to the prediction of goals (frequency-

TABLE 3
THE PREDICTION OF GOALS AND BEHAVIOR

Measure	The I-B relation		The A + SN-I relation	
	Volitional behaviors	Goals	Volitional behaviors	Goals
Intention	.56 (23; 2328)	.38 (6; 1514)	.74 (19; 2376)	.69 (6; 1179)
Estimate	.59 (36; 4248)	.51 (8; 1638)	.67 (25; 4486)	.39 (10; 1297)

NOTE: Parenthetic data indicate number of studies and total n, respectively.

weighted average correlation = 0.45), accounting for 12.3 percent of the variance in study means. Moreover, the attenuation in prediction seemed to occur primarily when an intention measure was used to predict the performance of a goal (frequency-weighted average correlation = 0.38). Together, the goal-behavior and measure distinctions accounted for 16.1 percent of the variance in study means.

As stated in Hypothesis 8A, the prediction of individuals' intentions, utilizing measures of attitudes and subjective norms alone, is expected to be weaker for goals than for behaviors. Further, this attenuation is likely to be even greater when a measure of estimation is employed. As noted, individuals' estimates also are likely to include some consideration of needed resources, abilities, skills and experience, the cooperation of others, and so on. Thus, as stated in Hypothesis 8B, the prediction of individuals' estimates of whether they will achieve various goals utilizing attitudes and subjective norms alone is apt to be attenuated. Both hypotheses receive support. Overall, the prediction of behavioral intentions (frequency-weighted average correlation = 0.69) was superior to the prediction of overall goal intentions (frequency-weighted average correlation = 0.54). The distinction accounted for 14.4 percent of the variance in study means. Moreover, the attenuation of prediction was especially pronounced when an estimation measure was used to predict goal intentions (frequency-weighted average correlation = 0.39; see Table 3). Together, the behavior-goal and measure distinctions accounted for 51.1 percent of the variance in study means.

The Choice Among Alternatives. In the introduction, two distinct choice processes were presented as possible extensions of Fishbein and Ajzen's model. A number of different hypotheses concerning the impact of choice on the I-B (Hypotheses 4A, 4B, 5A, and 5B) and A+SN-I (Hypotheses 9A, 9B, 10A, and 10B) relationships were derived from the possibility of one or the other choice process being operative. However, results obtained in the meta-analysis show that neither of the suggested extensions to the model fared better than the original Fishbein and Ajzen model.

TABLE 4
THE PRESENCE OF CHOICE AMONG ALTERNATIVES

Measure	The I-B relation		The A + SN-I relation	
	No choice	Choice	No choice	Choice
Intention	.42 (23; 2962)	.72 (6; 880)	.67 (15; 2016)	.80 (10; 1539)
Estimate	.50 (36; 4555)	.80 (8; 1331)	.62 (24; 4323)	.57 (11; 1460)

NOTE: Parenthetic data indicates number of studies and total n, respectively.

We unexpectedly found that the presence of a choice among alternatives did not weaken the predictive utility of the Fishbein and Ajzen model. Rather, quite the opposite occurred—overall, the model performed better when used to study activities involving choice. For the I-B relationship, the frequency-weighted average correlation was 0.47 for activities involving no choice and 0.77 for activities involving a choice among alternatives. This difference accounted for 26.8 percent of the variance in study means. No difference in the prediction of choice and no choice activities was found for the A+SN-I relationship (frequency-weighted average correlations were 0.69 and 0.64, respectively).

By comparing the relative predictions of intention and estimation measures in choice and no choice situations, an indication of the choice process being utilized by the subjects in these studies should be possible (see Table 4). For the I-B relationship, the performance of activities involving a choice among alternatives was predicted with greater accuracy than was the performance of activities involving no choice. The magnitude of this increased accuracy was quite similar when intention measures and when estimation measures were utilized in the prediction of performance. Overall, the choice and measure distinctions account for 38.3 percent of the variance in study means, which suggests a very similar relationship of these two constructs with performance. For the A+SN-I relationship, the overall prediction of choice and no choice "intentions" was quite similar, which results from a combination of two very different effects (see Table 4). In no choice situations, individuals' attitudes and subjective norms were found to provide similar predictions of their intentions and estimates (frequency-weighted average correlations of 0.67 and 0.62, respectively). However, in choice situations, the prediction of intentions increased to 0.80, but the prediction of individuals' estimates decreased to 0.57. Overall, the choice and measure distinctions account for 23.4 percent of the variance in study means, which suggests that very different processes underlie the relationship between attitudes and subjective norms and the constructs of intention and estimation.

Given the results of using intention and estimation measures in situations involving no choice and choice for the intention-performance relationship and the attitude and subjective norms and intention relationship, we suggest that the choice process is working as follows. Concerning individuals' intentions and performance, Fishbein and Ajzen's original theory appears to hold. In this model, other alternatives, if they have any influence at all, influence intentions and behavior through their prior influence on the particular attitudes and subjective norms that a person holds. An individual's intention to perform some alternative is formed solely on the basis of his/her attitude and subjective norm toward that alternative alone. His/her performance of the alternative is determined solely by his/her intention to perform that single alternative. Thus, no explicit choice process is seen as being carried out by the individuals. Concerning the relation between estimates and performance, the extension to the Fishbein and Ajzen model proposed by Warshaw et al. appears to hold. It suggests that individuals, when forming an estimate of whether they will perform a given alternative, consider their attitudes and subjective norms toward all of the alternatives present in the situation. This is not necessarily a choice process; it merely suggests that all alternatives are considered when individuals make predictions of their future behavior. It is this consideration that accounts for the attenuated prediction of individuals' estimates in choice situations.

To summarize, the three moderator variables in our meta-analysis accounted for a considerable amount of the variance in the results of studies conducted to date. Together, they account for 47.3 percent and 64.6 percent of the variance in I-B and A+SN-I study means.

DISCUSSION

Fishbein and Ajzen have long asserted that their model can be used to understand and predict most human behavior. However, our review suggests that more than half of the research to date that has utilized the model has investigated activities for which the model was not originally intended. Our expectation was that the Fishbein and Ajzen model would fare poorly in such situations. However, to our surprise, the model performed extremely well in the prediction of goals and in the prediction of activities involving an explicit choice among alternatives. Thus, it would seem that the Fishbein and Ajzen model has strong predictive utility, even when utilized to investigate situations and activities that do not fall within the boundary conditions originally specified for the model. That is not to say, however, that further modifications and refinements are unnecessary, especially when the model is extended to goal and choice domains.

The Prediction of Goals and Behavior

From the review, many examples of goals (including the purchase of a new car, e.g., Raju, Bhagat, and Sheth 1975; Ryan 1974; a student dining at an expensive restaurant, e.g., Warshaw 1980; the purchase of a term paper, e.g., Weddle and Bettman 1973; and going to a French movie while living in Champaign, Illinois, e.g., Ajzen and Fishbein 1970) and behaviors (including the purchase of coffee, detergent, gasoline, and potato chips, e.g., Glassman and Fitzhenry 1976; the purchase of shampoo, gum, magazines, and soft drinks, e.g., Warshaw 1980; and the purchase of toothpaste, e.g., Ryan 1974, 1978, 1982; Wilson, Matthews, and Harvey 1975) were identified. Both the I-B and A+SN-I relationships were expected and found to be influenced by the type of activity being investigated. For behaviors, an intention measure performed well in the prediction of behavior but less so in the prediction of goal attainment. Similarly, the A+SN-I relationship was found to be weaker in the prediction of goals than for behaviors.

Proposed Solutions to the Prediction of Goals. Overall, our findings suggest that there could be problems when investigating goal situations with the Fishbein and Ajzen model. At the very least, the model is not likely to do as well in goal situations as when it is used to investigate behaviors. Fishbein and Ajzen have acknowledged this and have provided suggestions to researchers wishing to investigate goal situations (see Ajzen and Fishbein 1980b; Sejwacz, Ajzen, and Fishbein 1980). Essentially, their proposal amounts to a circumvention of the problem. Instead of investigating goals themselves, researchers are urged to study the behaviors through which goals are accomplished. Thus, for example, researchers are directed to study whether individuals save for a downpayment, visit houses that are for sale, make a purchase offer, apply for a mortgage, and so on. The knowledge of whether individuals perform these behaviors can then be used to predict whether they will succeed in purchasing a new house. Unfortunately, Fishbein and Ajzen's recommendation is both conceptually and practically problematic.

The suggestion is difficult to implement practically. For example, how does one select the particular behaviors to be investigated? There are often hundreds of different ways to achieve goals, such as the countless number of ways to lose weight or the many steps involved in purchasing a house. Are all such behaviors studied or is a subset selected for investigation? If all are to be studied, the questionnaire might be prohibitive in length. If a subset is desired, how is it to be selected? And, if a subset is used, won't prediction be attenuated? Such questions need to be answered. In a different vein, we also need to know how the various behaviors can (and should) be combined to predict goal attainment. These behaviors are not independ-

ent, and occasionally are interchangeable. For example, one can save money by opening a bank account, by buying bonds, by investing in stocks, and so on. Other behaviors occur in combination. One must both save for a downpayment and apply for (and obtain) a mortgage to be able to afford a house. Such possibilities make the investigation of combinations of behaviors difficult.

However, even if researchers can overcome the problems of Fishbein and Ajzen's recommendation for using their model in goal situations, there are still conceptual concerns. Essentially, their approach raises an important question: why should researchers not attempt to study goal intentions directly? Lewin (1951) and many others (cf. Locke 1968) have pointed out that people do have goal intentions. Moreover, as our review of the research indicates, researchers frequently are interested in predicting whether individuals intend to achieve various goals.

A desire to directly study goal intentions and attainment already exists. Warshaw et al. (forthcoming) and Ajzen (1985) have specified certain relatively small adjustments that incorporate considerations of success and failure into Fishbein and Ajzen's model, permitting its application to goal situations. Initial tests of these modifications have yielded promising results (Hartwick, Sheppard, and Grenier 1987), but further study is required.

The Prediction of Activities Involving a Choice Among Alternatives

The issue of choice and the process through which individuals make their choices are a prime concern of consumer researchers. Consumers are constantly faced with choosing among the different product models and brands, among the different available styles and sizes, among the different stores or outlets, and so on. It has been suggested that the original Fishbein and Ajzen model be extended to include choice by incorporating either an intention comparison choice process or an attitude comparison process. Determining which process to include is subject to where and how prediction is attenuated during the A+SN-I or I-B relationships. However, neither the I-B relationship nor the A+SN-I relationship was attenuated. Surprisingly, the basic Fishbein and Ajzen model, which was originally developed to investigate an intention to perform a single behavior with no choice, performed best in situations involving an explicit choice among alternatives.

It is not clear why the Fishbein and Ajzen model better predicted activities involving choice. By spelling out a particular alternative in specific terms, researchers possibly enabled their subjects to be more precise in their answers, which in turn allowed a clearer and more reliable prediction to be achieved.

The concreteness of such descriptions possibly caused the subjects to give greater thought and consideration to such activities, which in turn resulted in stronger, more stable attitudes and intentions. It is also possible that studies investigating choice activities differed in other characteristics unrelated to choice per se. Inspection of the activities suggests that such studies were relatively important to the subjects (four of 14 such studies involved voting behavior while five involved birth control). It may then be a high involvement level that leads to the superior prediction. Clearly, additional research directly comparing the different models in choice and no choice situations is needed. In this area, it is not enough to compare the overall prediction of the Fishbein and Ajzen model against suggested extensions to it. Specific predictions concerning the attitudes, subjective norms, and intentions toward various alternatives must be derived and empirically tested. We are not yet ready to abandon either of the suggested extensions to the original model for including a choice among alternatives. However, for the moment, it would appear that the original Fishbein and Ajzen model (with no hypothesized choice process) works adequately in choice situations.

The Intention and Estimation of Goals and Behavior

Fishbein and Ajzen have not distinguished between individuals' estimates of their own future behavior and individuals' intentions to perform such behavior. As a consequence, two different types of measures have been used interchangeably in past research utilizing the Fishbein and Ajzen model. As our review shows, use of each is quite common.

The distinction between intention and estimation was expected and found to have implications for the prediction of individuals' intentions as well as performance utilizing the Fishbein and Ajzen model. The A+SN-I relation was stronger when an intention measure rather than an estimation measure was employed. The I-B relation was marginally stronger when an estimation measure was used. (In the case of goals, this difference also was strong.) Thus, intention and estimation apparently are distinct concepts in people's minds, and meaningful differences in the determinants and uses of such concepts also are indeed likely. The distinction can be further highlighted through a more detailed but brief discussion of two cases.

Goals and Behavior. An intention measure, the measure intended in Fishbein and Ajzen's original model, was expected and found to be more accurate in the prediction of individuals' behavior but less accurate in the prediction of their goal attainment. In contrast, an estimation measure was expected and

found to be a better predictor of goal attainment than the intention measure. It appears that individuals do well when they try to estimate their own future performance of various goals, because intervening factors are taken into account as they attempt to estimate whether they will achieve their goals. For example, an individual could reason, "I intend to buy a house. However, in today's market, it's unlikely that I'll be able to secure a mortgage. I guess I have only a small chance of actually being able to buy one."

An additional implication of this analysis concerns the relationship between individuals' attitudes and subjects norms and their intentions and estimates of future performance. Attitudes and subjective norms were expected and found to provide a very good prediction of individuals' intentions to perform both goals and behaviors. However, as we have just discussed, individuals are likely to take into account many more factors when forming their estimates of whether they will perform such actions. Consequently, a much smaller relationship between attitudes, subjective norms, and such estimates can be expected. Moreover, this is especially likely in the case of goals, where the additional factors are strongest, and therefore have the greatest influence on individuals' estimates. Once again, the meta-analysis supported such contentions.

The Choice Among Alternatives

In the meta-analysis, some rather unexpected results occurred when the I-B and A+SN-I relationships were examined in choice and no choice situations. In each case, a stronger prediction was found for those studies involving choice among alternatives. Within this overall context, however, comparing the predictions obtained with measures of intention and estimation is still possible. It is through this comparison that differences in the measurement factors and choice processes that underlie the development of such responses can be discovered.

For the I-B relationship, individuals' intentions were found to have a lower correlation with their performance of nonchoice activities than with their performance of choice activities. Individuals' estimates provided a superior prediction in each case; however, the magnitude of increase from no choice to choice activities was remarkably similar. Thus, a very similar process seems to underly the intention-performance and estimation-performance relationships (or at least, we have no basis in our results for expecting or predicting any different kind of process).

For the A+SN-I relationship, individuals' attitudes and subjective norms were found to have a lower correlation with their intentions to perform nonchoice activities than with their intentions to perform choice activities. In contrast, attitudes and subjective norms had a higher correlation with individuals' estimates

of whether they would perform nonchoice activities than with their estimates of whether they would perform choice activities. Thus, it is only here that the expected attenuation in the prediction of choice activities occurred. That is, given that individuals consider the attitudes and subjective norms toward each of the alternatives present in a situation when forming their intentions or estimates, a prediction based solely on the attitude and subjective norm toward one alternative is apt to be somewhat inaccurate. It seems, then, that individuals do consider alternatives when forming their estimates of performance. However, there is no evidence for a choice process being involved when individuals form their intentions to perform a given activity.

The Fishbein and Ajzen model, with its attendant lack of consideration of choice, and two extensions to the model into the choice domain were identified in this article. From the results of the meta-analyses, Fishbein and Ajzen's model seems to perform best when one is attempting to model the determinants and effects of individuals' intentions. Fishbein and Ajzen (Fishbein 1980; Fishbein and Ajzen 1980; Fishbein, Bowman, Thomas, Jaccard, and Ajzen 1980; Sperber et al. 1980) have modified their own position in recent years, suggesting that individuals compare their intentions toward various alternatives present in a given situation, choose one, and perform that activity. There is little support for the intention comparison choice process in the results of the meta-analyses. Finally, we have suggested that individuals consider their attitudes and subjective norms toward each of the alternatives in a situation when forming their intentions (Hartwick 1983; Warshaw et al. forthcoming). Once again, there is little support for the attitude comparison choice process in the present results. However, it does appear that the attitude comparison choice process does underlie the formation of individuals' estimates of whether they will perform various activities.

Conclusion

In 1975, Fishbein and Ajzen placed a compelling and coherent structure on the field of attitudes, which was in relative disarray before their work. That accomplishment should mark the starting point for important empirical and theoretical work in the field, not its end. In particular, appropriate modification of the original Fishbein and Ajzen model to account for goal intentions, choice situations, and differences between intention and estimation measures should be investigated further.

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The Fishbein Extended Model and Consumer Behavior

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Paul R. Warshaw

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