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Variables That Moderate the Attitude–Behavior Relation: Results of a Longitudinal Survey

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The following factors were hypothesized to moderate the attitude–behavior relation: (a) the behavioral sequence that must be successfully completed prior to the occurrence of the behavior, (b) the time interval between the measurement of attitudes and behavior, (c) attitude change, (d) the respondent's educational level, and (e) the degree of correspondence between attitudinal and behavioral variables. The behaviors investigated were having a child and using oral contraceptives. A stratified random sample of 244 married women in a midwestern urban area was studied during a three-wave, 2-year longitudinal study. Selection of attitudinal and belief measures was guided by the Fishbein model of behavioral intentions. Consistent with the hypotheses, the relations between behavior and both intention and the model's attitudinal and normative components were substantially attenuated by (a) events in the behavioral sequence not under the volitional control of the actor, (b) an increase in the time interval between the measurement of attitudes and behavior from 1 to 2 years, and (c) changes in the model's attitudinal and normative components during the first year. The respondent's educational level did not affect attitude–behavior consistency. Finally, the attitude–behavior correlation increased significantly as the degree of correspondence between the two variables increased.

Wicker (1969) concluded his comprehensive review of the attitude–behavior relation with the suggestion, "It is considerably more likely that attitudes will be unrelated or only slightly related to overt behaviors than that attitudes will be closely related to actions" (p. 76). Rather than signaling a decrease in research on this topic, pessimistic reviews by Wicker and others (e.g., Deutscher, 1966, 1969; Ehrlich, 1969; McGuire, 1969) appear to have prompted a renewal of interest in the relationship between attitude and action. One encouraging line of inquiry has focused on methodological refinements in the attitudinal and behavioral measures. By assessing both variables at corresponding levels of specificity, that is, measuring attitude toward the act for the prediction of a specific behavior or measuring a global attitude toward an object for the prediction of a multiple-act behavioral criterion, a reasonable degree of predictive accuracy can be obtained (Ajzen & Fishbein, 1973, 1977; Fishbein & Ajzen, 1974; Heberlein & Black, 1976; Weigel & Newman, 1976; Weigel, Vernon, & Tognacci, 1974; Weinstein, 1972; Wicker & Pomazal, 1971).

A second line of inquiry, encouraged by Kelman (1974), has attempted to specify the personal and situational variables influencing the extent to which people act in accord with their stated attitudes and beliefs. Individual difference variables that have been found to moderate attitude–behavior correspondence include the degree of affective-cognitive consistency (Norman, 1975), the tendency to ascribe responsibility to the self (Schwartz, 1973), and the degree of self-monitoring

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(Snyder & Tanke, 1976). Similarly, a number of situational variables appear to moderate the attitude–behavior relation. For example, Warner and DeFleur (1969) found that the public versus private nature of the behavior interacts with attitude in influencing attitude–behavior consistency, and Snyder and Swann (1976) demonstrated that situations that increase the relevance of salient attitudes as guides to actions increase the correspondence between attitude and action. A recent series of studies (Fazio & Zanna, 1978; Fazio, Zanna, & Cooper, 1978; Regan & Fazio, 1977) provide support for the notion that attitudes formed through direct behavioral experience with the attitude object are more predictive of later behavior toward that object than are attitudes based upon indirect, nonbehavioral experience. In summary, several personal and situational factors have been found to affect the attitude–behavior relation. As Regan and Fazio (1977) commented, "The question facing researchers is, therefore, no longer *whether* an individual's attitudes can be used to predict his overt behavior, but *when*" (p. 30, italics in the original).

The present research continues the study of factors that moderate the degree of attitude–behavior consistency and investigates the following variables:

1. Sequence of prior events. As Fishbein and Jaccard (1973) have observed, the occurrence of a behavior under investigation is frequently dependent upon the successful completion of a sequence of prior events. For example, in order to have a child a woman must (a) have intercourse, (b) not use birth control, (c) conceive, and (d) not have a spontaneous or induced abortion. While some of the sequences are potentially under the control of the actor (e.g., not using birth control), others are not (e.g., conception). If performance of the final behavior requires the successful completion of sequences not under the volitional control of the actor, it is hypothesized that attitude toward the behavior will provide a better estimate of the likelihood that the actor will initiate the sequence than that the actor will complete the sequence and perform the behavior in question.

2. Attitude change. In a recent review of the attitude–behavior literature, Schuman and Johnson (1976) noted that little attention has been paid to the possibility that attitude change may occur between the measurement of attitude and behavior. They commented, "The extent to which A–B correlations are reduced because of real changes in underlying attitude needs to be identified as far as possible" (p. 178). Such identification is impossible in most studies because attitude is assessed at only one time. In the present research, attitude was measured twice prior to the performance of behavior in order to detect attenuation attributable to attitude change. Respondents whose attitudes remain stable are hypothesized to exhibit greater attitude–behavior consistency than respondents who experience attitude change.

3. Time interval. A third variable hypothesized to influence the degree of relation between attitude and behavior is the time interval between the measurement of attitude and the performance of behavior. As Fishbein and Jaccard (1973) noted, it is probably the processes occurring during that time interval —most notably exposure to new information —and not the passage of time per se that moderate the relation. This hypothesis is conceptually similar to the one above; the longer the time interval between the measurement of attitude and behavior, the higher the probability of exposure to new information and, in turn, attitude change.

Three previous investigations have reported data relevant to the influence of temporal instability on attitude–behavior consistency. Norman (1975) regressed behavior (volunteering to be a subject) on attitudes toward acting as a subject, assessed both 3 and 6 weeks prior to the measurement of behavior. For each of three attitudinal measures, the second administration was more highly correlated with behavior than the first, but the differences were not statistically significant. It has been suggested (Schwartz, 1978) that for this behavior the 3-week interval between attitude assessments was too brief for an unambiguous effect to be detected. In studies of voting behavior, Kelley and Mirer (1974)

have reported that for some subgroups the time interval between the measurement of voting behavior and attitudes can moderate the attitude–behavior correlation. Analyses of data from the 28% of the subjects judged most likely to change their minds found that a substantial proportion of variance in errors of prediction was accounted for by the number of days that intervened between the interview and the election. In the final and most recent investigation, Schwartz (1978) regressed stated willingness to tutor blind children on perceived moral obligation to tutor blind children, measured both 3 and 6 months prior to the criterion measure. The correlation with the criterion was significantly higher over the shorter time interval. However, as Schwartz noted, it is uncertain whether the results obtained with perceived moral obligation can be generalized to more traditional attitude scales measuring evaluation. In sum, although specific aspects of each of these studies—interval between attitude assessments, nature of the subsample investigated, nature of the predictive variable—have precluded a clear demonstration of the influence of time interval on the consistency between behavior and the evaluation of the behavior, these studies together provide a sound basis for positing the present hypothesis.

4. Respondent's education. Consistent with formulations proposed by Peak (1955), Rosenberg (1956), and Fishbein (1963), attitude toward a behavior is viewed as the sum of one's beliefs about the consequences of performing the behavior multiplied by the evaluation of those consequences. Such formulations, with their emphasis on cognitive-affective consistency, are frequently criticized as having greater validity for college students and intellectuals than for the majority of the population (cf. Bem, 1970). If such critiques are correct, education should interact with attitudes in the prediction of behavior, and degree of attitude–behavior consistency should correlate positively with the respondent's educational level. The findings of Rokeach (1973) also lead to the hypothesis that greater consistency will be observed for respondents with more education. In a national sample of American adults, the instrumental value *logical* defined as *consistent, rational* was more positively valued by highly educated respondents than by those with less education.

5. Correspondence between attitudinal and behavioral variables. As noted earlier, if attitude and behavior are both measured at a similar level of specificity, a reasonable relation is generally observed. In an extension of the specificity hypothesis, Ajzen and Fishbein (1977) maintain that attitudinal and behavioral variables are defined by four elements: an *action,* the *target* the action is directed toward, the *context* in which the action is to be performed, and the *time* at which the action occurs. They argue that the correlation between attitude and behavior is determined in part by the degree of correspondence or match between the elements comprising the two variables. They classified past studies in terms of the correspondence between attitude and behavior on two of the four elements, target and action. Consistently significant attitude–behavior correlations were obtained only if there was high correspondence between target and action elements. Their investigation, however, examined the moderating effects of target and action correspondence by comparing attitude–behavior correlations obtained from different studies. In the present research, the effects of target, action and, in addition, time correspondence on attitude–behavior consistency are tested within one study. It is hypothesized that as the degree of correspondence increases, the obtained attitude–behavior correlation will increase.

Attitude Model

The selection of attitudinal measures was guided by the Fishbein (1967) model of behavioral intention. The model is predicated on the assumption that most human behavior of concern to social scientists is to some degree volitional in nature and hence guided by the behavioral intent of the individual. Algebraically, the model is expressed as follows:

$$B \sim BI = [\sum_{i=1}^{n} B_i E_i] W_1 + [\sum_{i=1}^{m} NB_i MC_i] W_2, \quad (1)$$

where B = overt behavior, BI = the behavioral intention to perform the behavior, B_i = the belief (perceived probability) that performing the behavior will lead to consequence X_i, E_i = the evaluation of X_i, NB_i = the perceived expectation of Referent i, MC_i = the motivation to comply with Referent i, n = the number of salient consequences, m = the number of salient normative beliefs, and W_1 and W_2 = empirically determined regression weights.

As Peak (1955), Rosenberg (1956), and Fishbein (1963) have theorized, the ΣB_iE_i component is viewed as an index of the person's attitude toward performing the behavior (*Aact*). Fishbein and Ajzen (1975) maintain that the second predictive component (ΣNB_i-MC_i) assesses the influence of the social environment or the general subjective norm (*SN*) on behavior. Empirical support for the equivalence of ΣB_iE_i and *Aact* and of ΣNB_i-MC_i and *SN* is discussed in Fishbein and Ajzen (1975).

According to the model, any variable other than the attitudinal and normative components can influence *BI* only indirectly. Social, demographic, and personality characteristics of the respondent can affect intentions only if they influence ΣB_iE_i or ΣNB_iMC_i or their relative weights. Thus if this framework is correct, such variables as education should not have a direct effect on the magnitude of the relation between the components of the model and intention, and hence behavior.

Fishbein and Ajzen (1975) argue that the relation between *BI* and *B* should be very strong, provided that intention and behavior are measured at correspondent levels of specificity and that nothing intervenes to alter intention. Whenever a strong intention–behavior relation is observed, the behavior in question should also be predictable from the attitudinal and normative components. Assuming a significant *BI–B* correlation, it is hypothesized that behavior can be predicted from a linear combination of the attitudinal and normative components. In addition, it is hypothesized that the variables moderating the intention–behavior relation will also moderate the relation between attitudes, subjective norms, and behavior.

Behavioral Domain

The behaviors chosen for study were childbearing and contraceptive use. While social scientists have met with success in documenting fertility differentials on the basis of social and demographic variables, (cf. Rindfuss & Sweet, 1977) there has been a marked lack of success in explaining fertility behavior with psychological constructs. Two major fertility surveys, the Indianapolis study (Whelpton & Kiser, 1946–1958) and the Princeton study (Westoff, Potter, Sagi, & Mishler, 1961) failed to find any noteworthy relationships between psychological variables (primarily personality measures) and fertility and family planning behaviors.

Recently, research findings have indicated that a few psychological models that can be categorized as expectancy models are of some utility in the prediction of fertility decision making (see, for example, Beach, Townes, Campbell, & Keating, 1976; Davidson & Jaccard, 1975; Werner, Middlestadt-Carter, & Crawford, 1975). Working with the Fishbein model, Davidson and Jaccard (1975) investigated attitudes concerning three family planning behaviors in a sample of married women. In support of the model, ΣB_iE_i and ΣNB_iMC_i explained an average of 60% of the variance in behavioral intentions.

The data reported in Davidson and Jaccard (1975) were obtained during the first wave of a three-wave longitudinal survey. The sample was reinterviewed both 1 year and 2 years after the initial interview. The present study examines the relation between intentions, at the first interview, of having a child during the next 2 years and using oral contraceptives during the next 2 years and the corresponding self-reports of behavior during the 2-year period.

Method

Sample

Respondents in the initial survey were 270 white married women, age 18–38 years, residing in a mid-

western urban area. The sample was stratified by three levels of socioeconomic status and two levels of religious affiliation (Catholic and Protestant). The sampling procedure was designed to select randomly 45 women for each cell of the 2×3 design. For a detailed description of the sampling strategy, see Davidson and Jaccard (1975).

Loss to Follow-Up

The respondents were reinterviewed both 1 and 2 years after the initial survey. Of the original 270 respondents, 244 completed all three interviews.[1] Approximately one half of the respondents lost to follow-up refused to be reinterviewed and the other half could not be located. Loss to follow-up did not significantly vary among the six cells of the sampling design.

Interviews

Approximately 1 hour was required for the respondent to complete each questionnaire. Although the interviews were self-administered, the interviewer remained in the house while the questionnaire was being completed to answer any questions the respondent might have. The respondent received $10 for each interview.

Measurement Procedures

To insure that relevant beliefs and referents for the attitudinal and normative components of the model were included in the precoded questionnaire, initial elicitation interviews were conducted with an independent sample of 55 women. These women were selected from the same population as the women in the longitudinal sample. The interviews identified four referents (e.g., husband, close friends) and nine beliefs (e.g., the effect of having a child on the husband–wife relationship, the woman's freedom to pursue other activities, the family budget, etc.) salient to the population. A list of the referents and beliefs included in the questionnaire is presented in Davidson and Jaccard (1976).

All predictive components were measured on 7-point adjective scales. Examples of the measures are

1. Behavioral intention (*BI*) (*I intend to have a child within the next 2 years*) was measured on a *likely–unlikely* scale.

2. Belief about the act (B_i) (*For me, having a child within the next two years would make my marriage stronger*) was measured on a *likely–unlikely* scale.

3. Evaluation of the consequence (E_i) (*Making my marriage stronger would be . . .*) was measured on a *good–bad* scale.

4. Attitude toward the act (*Aact*) (*For me, having a child within the next two years would be . . .*) was obtained by summing the responses to three evaluative scales: *good–bad, nice–awful, pleasant–unpleasant.*

5. Normative belief (NB_i) (*My parents think I should have a child within the next two years*) was measured on a *likely–unlikely* scale.

6. Motivation to comply (MC_i) was measured on a scale anchored by *generally speaking, I want to do what Referent* i *thinks I should do* and *generally speaking, I do not want to do what Referent* i *thinks I should do.*

7. General subjective norm (*SN*) (*People who are important to me and whose opinions I value think I should have a child within the next two years*) was measured on a *likely–unlikely* scale.

Scales assessing evaluations of consequences and attitude toward the act were scored −3 (bad) to +3 (good). All other scales were scored from 1 (unlikely; not motivated to comply) to 7 (likely; motivated to comply).[2] ΣB_iE_i and ΣNB_iMC_i were obtained by multiplying the score on each belief statement by the score on the corresponding evaluation or motivation to comply and then summing these products for all beliefs. In addition to the above items, the questionnaire assessed a number of fertility-related attitudes and contained measures of education, scored from 1 (sixth-grade education or less) to 8 (PhD or other professional degree), and other demographic variables.

A dichotomous criterion variable was created for each behavior. For childbearing, women reporting a birth between the first and third interviews were assigned a score of 1, and the remainder of respondents were assigned a score of 0. In families reporting a birth, the child was typically observed by the interviewer. For oral contraceptive use, women reporting that they used oral contraceptives at any time during the 2-year interval were scored 1, and women never using the pill were scored 0.

The ΣB_iE_i and ΣNB_iMC_i measures were obtained for only one of the behaviors—having a child. Due to time constraints, only the direct measures of the attitudinal and normative components, *Aact* and *SN*, respectively, were obtained for the second behavior—using oral contraceptives. In the first of the three

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[1] Due to missing data and failure to follow instructions, the sample sizes in the following analyses range from 242 to 244.

[2] In our previous studies all scales were scored −3 to +3. However, we now recognize that with the exception of the evaluation measures, the remainder of scales are assessing variables that are theoretically unipolar (e.g., subjective probability). Hence, the unipolar scales are scored 1 to 7 in the present analysis. A comparison of variables formed from both the present and previous scoring rules indicated that the two were substantially intercorrelated; for ΣB_iE_i, $r = .93$, and for ΣNB_iMC_i, $r = .76$. For a discussion of unipolar versus bipolar scoring of attitude and belief measures, see Fishbein and Ajzen (1975, pp. 82–86).

interviews, questions referred to performing each behavior during the next 2 years. In the second interview, the questionnaire was adjusted to query the respondents about having a child and using oral contraceptives during the next year.

Results

The first half of this section focuses on intention–behavior consistency and the factors hypothesized to influence the degree of consistency. The second half investigates the prediction of behavior from the model's attitudinal and normative components and examines the variables that moderate that relation.

Prediction of Behavior from Behavioral Intention

The intention–behavior relation. For each behavior a point-biserial correlation was computed between behavioral intention, measured during the initial interview, and behavior during the 2-year period. The *BI–B* correlation was .526 ($p < .01$) for childbearing and .678 ($p < .01$) for contraceptive use. The relative magnitude of these two correlations is probably influenced by the extent to which each behavior is under volitional control. While contraceptive use–nonuse is to a large degree under the control of the actor, childbearing is determined by an interaction of biological and volitional events.

The sequence of prior events. As discussed above, in order to bear a child a woman must have intercourse without using contraception, conceive, and not have a spontaneous or induced abortion. It was hypothesized that intention would provide a better estimate of the probability that the person would initiate the sequence than of the likelihood that the person would complete the sequence and perform the behavior in question (bear a child). Women were classified as initiating the sequence if, in the final survey, they responded that by having intercourse while not using contraception they had been attempting for at least 9 months to become pregnant or if they actually gave birth during the 2-year period. The point-biserial correlation of intention with birth or attempted conception was .615 ($p < .01$). As hypothesized, this correlation was significantly larger than the correlation of intention with birth, .615 versus .526, $t(241) = 4.45$, $p < .01$.

The time interval between the assessment of intention and behavior. It was hypothesized that as the time interval between the measurement of intention and behavior increases, the *BI–B* correlation decreases. This hypothesis was tested by comparing the *BI–B* correlation for the 2-year period (Year 1 to Year 3) with the correlation for the 1-year period (Year 2 to Year 3). In support of the hypothesis, for both behaviors, the correlation for the 1-year period was significantly higher than for the 2-year period (oral contraceptive use: .853 versus .678, $z = 5.21$, $p < .01$; birth or attempted conception: .829 vs. .615, $z = 4.95$, $p < .01$).[3]

Change in intention. The effect of time interval on intention–behavior consistency can be attributed to processes occurring during the time interval (e.g., exposure to new information and attitude change). To demonstrate directly the effect of change on the *BI–B* correlation it was necessary to identify respondents who changed intentions between the first two waves of the three-wave survey. However, as Kiesler (1977) has shown, a respondent might change her intention to make it consistent with her behavior during the prior year. For example, if a woman did not intend to have a child at the first interview but became pregnant during the first year of the study, she would probably indicate an intention to have a child at the second interview. Such a case would more accurately be classified as a missed prediction rather than as a change in intention. Hence, only respondents *not performing* the behavior (*becoming* pregnant, bearing a child, using oral contracep-

[3] As these correlations are themselves intercorrelated, it is incorrect to use the traditional Fisher's *z* transformation (Hayes, 1963, pp. 529–532) to test for the significance of differences between them. Rather, the correlations were appropriately compared using a test initially suggested by Pearson and Filon and reported in Peters and Van Voorhis (1940, p. 185).

tives) during the first year were eligible for the classification of change in intention.

Eligible respondents were classified into one of three groups based on their responses at the first and second interviews to the relevant intention items. They were classified as intenders if they indicated it was slightly, moderately, or very likely that they would perform the behavior. Respondents indicating that performance of the behavior was slightly, moderately, or very unlikely were classified as nonintenders. Women checking the midpoint of the scale (neither likely nor unlikely) were classified as uncertain. Any eligible respondent who changed classification from Time 1 to Time 2 was identified as having changed her intention.

Based on this procedure, 30 women were identified as having changed their childbearing intentions, and the remaining 214 women were classified as nonchangers. For oral contraceptive intentions, 36 women were classified as changers and 206 as nonchangers. Each *BI–B* correlation was then computed separately for the change and nonchange respondents. For both childbearing and contraceptive use, the intention–behavior correlation was substantially lower for women who changed intentions than for nonchangers (birth or attempted conception: $-.015$ vs. .742, $z = 4.65$, $p < .01$; oral contraceptive use: $-.397$ vs. .880, $z = 9.57$, $p < .01$). Thus, in support of the hypothesis, change in intention attenuated the intention–behavior relation over the 2-year period.

Respondent's educational level. It was hypothesized that the respondent's educational level would be positively related to the degree of intention–behavior consistency. Hence intention should interact with education in the prediction of behavior. To test this hypothesis, behavior was regressed hierarchically (Allison, 1977; Cohen, 1978) against intention, education and the multiplicative interaction term of Intention × Education. For neither behavior did the inclusion of the interaction term lead to a significant increment in R^2; both Fs < 1. Therefore the hypothesis that educational level moderates the intention–behavior relation was not supported.

In summary, there was a reasonably strong correlation between intentions and behavior during the subsequent 2 years. Consistent with the hypotheses, however, this relation was attenuated by (a) events in the behavioral sequence not under the volitional control of the actor, (b) changes in intention, and (c) the time interval between the assessment of intention and behavior. The respondent's education level did not moderate the intention–behavior relation.

A demonstrated relation between what people say they are going to do (intention) and what they actually do (behavior) is probably of greater applied than theoretical significance. Once strong intention–behavior consistency has been observed, however, the relation between the attitudinal and normative components of the model and behavior is of considerable theoretical interest. The subsequent analyses examine this relation.

Prediction of Behavior From the Model's Attitudinal and Normative Components

The regression of behavior on attitudes and norms. For both contraceptive use and childbearing, the dichotomous index of behavior during the 2-year period was regressed on attitudes and norms, measured during the initial interview. As indicated in Rows 1 and 3 of Table 1, for each behavior both of the model's components received significant regression weights in the prediction of behavior. For the prediction of birth the multiple correlation was .508 ($p < .01$), and R^2 adjusted for shrinkage was .252. For the prediction of oral contraceptive use, the multiple correlation was .606 ($p < .01$) and R^2 adjusted for shrinkage was .362.

The sequence of prior events. It was hypothesized that events in the behavioral sequence not under the volitional control of the actor would attenuate the prediction of behavior from the model's components. The data presented in row 2 of Table 1 support this hypothesis. The multiple correlation with birth or attempted conception is significantly higher than the correlation with birth, .595 versus .508; $t(241) = 4.33$, $p < .01$.

Table 1
Regression of Fertility and Contraceptive Behavior on Attitudes and Norms

Behavior	Standardized regression coefficients		R	R^2	R^2 adjusted for shrinkage
	$\sum B_iE_i$	$\sum NB_iMC_i$			
Birth[a,b]	.187	.361	.508	.258	.252
Birth or attempted conception[a,c]	.203	.438	.595	.354	.349
	Aact	*SN*			
Use of oral contraceptives[d,e]	.392	.268	.606	.367	.362

Note. All regression coefficients and multiple correlations are significant ($p < .01$). Abbreviations are as follows: $\sum B_iE_i$ = one's beliefs about the consequences of performing the behavior multiplied by the evaluation of those consequences; $\sum NB_iMC_i$ = one's normative beliefs about performing the behavior multiplied by one's motivation to comply with those perceived norms; *Aact* = one's attitude toward performing the behavior; *SN* = one's subjective norm (generalized normative belief) about performing the behavior.

[a] $N = 244$.

[b] Coded: birth during the 2-year period = 1; no birth = 0.

[c] Coded: birth or attempted conception during the 2-year period = 1; no birth or attempted conception = 0.

[d] $N = 242$.

[e] Coded: use of oral contraceptives during the 2-year period = 1; nonuse = 0.

Time interval between the assessment of the model's predictive components and behavior. For both behaviors, the multiple correlation with the model's predictive components was higher for the 1-year period (Year 2 to Year 3) than for the 2-year period (Year 1 to Year 3). However, for birth or attempted conception the difference between the *R*s failed to achieve the traditional significance level (oral contraceptive use: .704 vs. .606, $z = 2.48$, $p < .01$; birth or attempted conception: .649 vs. .595, $z = 1.39$, $p < .09$).

Attitudinal and normative change. As previously noted, the effect of time interval on attitude–behavior consistency is attributable, in part, to attitude and belief change occurring during the interval. To demonstrate the effect of change on the correlation between behavior and the model's components, it was necessary to identify respondents whose attitudes or norms changed from Interview 1 to Interview 2. The procedure used here is similar to the one described above for assessing change in *BI*. First, to differentiate norm and attitude change from post hoc justification of prior behavior, only respondents not performing the behavior (becoming pregnant, bearing a child, using oral contraceptives) during the first year were eligible for the classification of change in attitudes or norms. Next, separately for each behavior and each of the model's two predictive components, eligible respondents who changed from Time 1 to Time 2 were identified as changers, and the remaining respondents were classified as nonchangers. The correlation between the relevant component and behavior was then computed separately in each group. Consistent with the hypothesis, lower correlations were expected in the change than in the nonchange group.

Attitude toward the act of using oral contraceptives (*Aact*) was assessed by summing the responses to three evaluative scales, each scored +3 to −3. A score of 0 was categorized as a neutral attitude, a score greater than 0 was a positive attitude, and less than 0 constituted a negative attitude. Sixty-three eligible respondents changed attitude categories between Interview 1 and Interview 2. As predicted, the *Aact–B* correlation was substantially higher in the nonchange than in the change group (.733 vs. −.238; $z = 7.88$, $p < .01$).

Responses to the general subjective norm concerning the use of oral contraceptives

(SN) were also divided into three categories: uncertain (a score of 4, the midpoint of the scale), positive norm (a score greater than 4), and negative norm (a score less than 4). Seventy-four eligible respondents changed categories from Interview 1 to Interview 2. In support of the hypothesis, the SN–B correlation was significantly higher in the nonchange than in the change group (.682 vs. −.039; $z = 6.14$, $p < .01$).

For childbearing behavior, the midpoints of the scales for the $\Sigma B_i E_i$ and $\Sigma NB_i MC_i$ components had to be empirically identified. Using data from the first interview, the mean scores on $\Sigma B_i E_i$ and $\Sigma NB_i MC_i$ were determined separately for those intending and not intending to have a child. The score midway between the means was designated the neutral point on the scale. In the interval between Interview 1 and Interview 2, 34 eligible respondents moved across the neutral point of the $\Sigma B_i E_i$ measure, and 25 eligible respondents moved across the neutral point of the $\Sigma NB_i MC_i$ measure. Consistent with the prediction, the correlation of both $\Sigma B_i E_i$ and $\Sigma NB_i MC_i$ with birth or attempted conception was higher in the nonchange than in the change group ($\Sigma B_i E_i$: .580 vs. .011, $z = 3.38$, $p < .01$; $\Sigma NB_i MC_i$: .648 vs. −.061, $z = 3.71$).

Respondent's educational level. It was hypothesized that the respondent's educational level would interact with attitudes and norms in the prediction of behavior. To test this hypothesis, behavior was regressed hierarchically against the model's attitudinal and normative components, education, and the multiplicative interactions of Education × Each Component. For neither behavior did the inclusion of the interaction terms lead to a significant increment in R^2; both Fs < 1. Hence, the hypothesis was not supported.

In summary, there was a reasonably strong correlation between the model's attitudinal and normative components and behavior during the subsequent 2 years. Similar to the results obtained with behavioral intention, the prediction of behavior from attitudes and norms was attenuated by (a) events in the behavioral sequence not under the volitional control of the actor, (b) the time interval between the measurement of the model's predictive components and behavior (for childbearing there was only a trend in the hypothesized direction), and (c) changes in attitudes and norms. The respondent's educational level did not moderate the strength of the relation.

Table 2
Correlations Between Selected Attitudinal Variables and Behavior

Attitudinal variable	r
Use of birth control pills during the 2-year period[a]	
Attitude toward birth control	.083
Attitude toward birth control pills	.323*
Attitude toward using birth control pills	.525*
Attitude toward using birth control pills during the next 2 years	.572*
Birth or attempted conception during the 2-year period[b]	
Attitude toward children	−.007
Attitude toward having children	.187*
Attitude toward having a child in the next 2 years	.535*

[a] $N = 244$.
[b] $N = 242$.
* $p < .01$.

Correspondence Between Attitudinal and Behavioral Variables

It was hypothesized that the degree of correspondence between the elements of the attitudinal and behavioral variables would be positively related to attitude–behavior consistency. The present analysis investigated the effect of three elements on the attitude–behavior correlation: *action*, the *target* the action is directed toward, and the *time* at which the action occurs. As indicated in Table 2, four attitudinal variables, measured during the first interview, were correlated with the dichotomous behavioral measure of birth control pill use during the 2-year period. The attitudinal measures systematically varied with regard to the number of elements they had in correspondence with the behavioral measure, as follows: zero elements in correspondence (attitude toward birth control, $r = .083$, ns); one element in correspondence—target (attitude toward birth control pills, $r = .323$, $p < .01$); two elements in correspondence—target

and action—(attitude toward using birth control pills, $r = .525$, $p < .01$); three elements in correspondence—target, action, and time—(attitude toward using birth control pills during the next 2 years, $r = .572$, $p < .01$). In support of the hypothesis, for each successive increase in correspondence between attitude and behavior variables there was a significant increase (ranging from $p < .01$ to $p < .06$) in the magnitude of the attitude–behavior correlation.

Following a similar pattern, the dichotomous behavioral measure of birth or attempted conception during the 2-year period correlated $-.007$ (*ns*) with attitude toward children, .187 ($p < .01$) with attitude toward having children, and .535 ($p < .01$) with attitude toward having a child in the next 2 years. For each successive increase in correspondence there was a significant increase (all ps $< .01$) in the attitude–behavior correlation.

Discussion

The primary purpose of the present research was to investigate five factors hypothesized to influence the extent to which people act in accord with their stated attitudes. The investigation of the first of these factors, the sequence of prior events, directed attention to the behavioral variable. The majority of previous attitude–behavior research has focused exclusively on problems associated with attitudinal variables during attempts to account for low attitude–behavior correlations. However, the performance of a behavior is often dependent upon the successful completion of a series of behavioral events. As the present research has demonstrated, if all of these steps are not under the volitional control of the actor, intention will provide a better estimate of the probability that the actor will initiate the sequence than of the likelihood that the actor will complete the sequence and perform the behavior in question. These results suggest that future studies of attitude–behavior consistency should seek to identify and quantify the behavioral sequences that must be completed prior to the performance of the behavior of interest. Analyses can then isolate the sequences at which serious disruptions occur between attitudes and actions. From an applied perspective, such knowledge would be of considerable use in the selection of behavior-change strategies. This approach would lead to the identification of situations in which the most appropriate strategy is *not* to change attitudes but rather to institute policy changes making it easier for people to act in accord with their existing attitudes.

The second and third factors, attitude change and the time interval between the measurement of attitude and behavior, focused on instability in the attitude and belief variables. As the time interval decreased from 2 years to 1 year, there was a 58.3% increase in the amount of variance in oral contraceptive use accounted for by *BI*. The corresponding increase for childbearing was 81.7%. Substantial improvements in the prediction of behavior were also achieved when analyses were limited to the sample of respondents who did not exhibit attitude change. The magnitude of these effects directs attention to the problem of using static models in the analysis of a dynamic process. When stating attitudes and intentions about future behaviors, a respondent is probably assuming either that the environment will not change or that it will change in an anticipated manner. Unexpected changes (e.g., loss of employment, exposure to new information) can lead to a change in attitude and, if such changes are not monitored, to an apparent lack of consistency between attitudes and behavior. Future research should attempt to specify the personal and situational variables influencing attitudinal stability. From the studies reviewed above, some of the factors that might initially be hypothesized to contribute to stability include the extent to which the attitude was formed through direct behavioral experience with the attitude object (Fazio & Zanna, 1978; Regan & Fazio, 1977) and the individual difference variables of self-monitoring (Snyder & Tanke, 1976) and tendency to ascribe responsibility to the self (Schwartz, 1973).

The fourth factor hypothesized to moderate the attitude–behavior relation was the respondent's educational level. It was hypothesized that as completed years of schooling

increased, so would the magnitude of the attitude–behavior correlation. However, an interaction between education and attitude–behavior consistency was not observed. Hence, these results lend no support to the contention that consistency is especially prevalent among the highly educated. It appears unlikely that nonsupport for this hypothesis is attributable to lack of variance on the education variable; years of education ranged from 8 to 16. In addition, attitudinal models similar to the present one have provided good prediction of behavioral intentions and behavior in cross-cultural samples with considerably lower educational levels than the present sample (Davidson, Jaccard, Triandis, Morales, & Diaz-Guerrero, 1976; Davidson & Thomson, 1980). It should be noted that the present finding provides indirect support for the theoretical framework of Fishbein. As noted above, if the framework is correct, social, demographic, and personality characteristics of the respondent should not have a direct effect on the magnitude of the relation between the components of the model and intentions, and hence behavior.

The fifth factor hypothesized to moderate attitude–behavior consistency is the degree of correspondence between the elements of the attitudinal and behavioral variables. As the attitudinal measures moved along a continuum of correspondence in terms of the number of elements they had in agreement with the behavioral measure (from zero to three elements), their correlations with behavior significantly increased. The present results concerning the impact of action and target correspondence are consistent with the conclusions of Ajzen and Fishbein (1977). In addition, the findings highlight the impact of a third element, not previously investigated, the time during which the action occurs. To obtain reasonable predictions of behavior from attitudinal variables, it appears important to ensure correspondence in target, action, and time elements.

The findings from the present study also provide support for the predictive validity of the components of the model of Fishbein. Even prior to the adjustments made for attitude change and the sequence of events, both intention and the attitudinal and normative components measured at the first interview provided reasonable correlations with behavior during the subsequent 2 years (the lowest validity coefficient was .508).

A weakness in the present research is that the data on oral contraceptive use were obtained solely through self-reports. Hence it is not possible to determine if the respondents misrepresented their behavior in order to make it consistent with their previously stated attitudes and intentions. It appears doubtful that there was extensive misrepresentation, because the findings concerning oral contraceptive use were very similar to those for childbearing in terms of both the percentage of subjects correctly classified and the variables found to moderate the degree of attitude–behavior consistency. There was also a reliance on self-report data concerning the attempt to become pregnant. Respondents might have falsely indicated that they had been unsuccessfully trying for at least 9 months to become pregnant in an attempt to appear consistent with previously stated intentions. However, this rival hypothesis requires that the respondents admit something that is socially undesirable about themselves for the purpose of appearing consistent.

In conclusion, this research indicates that the contraceptive and fertility behavior of married women is quite predictable from behavioral intentions, attitudes, and normative beliefs. However, the degree of the relation is attenuated by events in the behavioral sequence not under the volitional control of the actor, the time interval between the measurement of behavior and the model's predictive components, changes in attitudes and beliefs, and the degree of correspondence between the attitudinal and behavioral variables.

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