

Generalizing Behavioral Findings Across Times, Samples, and Measures: A Study of Condom Use¹

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Data from a Knowledge, Attitude, Belief, and Practices (KABP) Survey, administered to a sample of residents of Saint Vincent and the Grenadines, were used to replicate a previous study (Fishbein, Trafimow, Francis, et al., 1995) that investigated the relative importance, as predictors of condom use, of selected theoretical variables from the theory of reasoned action (Fishbein & Ajzen, 1975), and the theory of planned behavior (Ajzen & Madden, 1986). Besides addressing generalization problems, the study tested a more internally valid formulation of the role of past behavior that supported the argument that past condom use is better viewed as a predictor of current intention than as a criterion variable. Perhaps more important, the influence of past behavior was found to be partially mediated by its effect on attitudes and norms.

In the present AIDS epidemic, reducing the likelihood that a person will engage in high-risk behaviors can significantly influence HIV transmission. To better understand the factors that underlie the performance of risky and safer behaviors and guide the development of behavior change interventions, investigators have turned to theories of behavioral prediction and behavior change (e.g., Fishbein, Bandura, et al., 1992; Fishbein, Guenther-Grey, et al., 1995; Fisher & Fisher, 1992). In particular, the theory of reasoned action (TRA; Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975), as well as the theory of planned behavior (TPB; Ajzen & Madden, 1986) along with social cognitive theory (SCT; Bandura, 1977, 1989) have frequently been applied to AIDS research. Each of

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these theories suggests a limited number of variables that can influence behavioral performance.

The TRA (see also applications to AIDS research in Boyd & Wandersman, 1991; Davidson & Morrison, 1983; Fishbein, Chan, et al., 1992; Fishbein & Middlestadt, 1989; Fishbein, Middlestadt, & Trafimow, 1992; Fisher, 1984; Jemmott & Jemmott, 1991; McCarty, 1981; Middlestadt & Fishbein, 1990) states that the primary determinant of any behavior is the person's intention to perform the behavior. Intentions are, in turn, determined by attitudes and norms toward performing the behavior in question, which are themselves based on outcome and normative beliefs.

SCT (Bandura, 1977, 1989) proposes that in addition to beliefs about the expected outcomes of performing the behavior, behavioral performance also depends upon one's self-efficacy, which is, the person's belief that he or she has the skills and abilities necessary to perform the behavior under a number of circumstances (Bandura, 1989; for applications, see McKusick, Hortsman, & Coates, 1985; Strecher, DeVellis, Becker, & Rosenstock, 1986).

The TPB (Ajzen & Madden, 1986) adds the construct, *perceived control*, which is similar to self-efficacy, to the TRA model. In this regard, perceived control is assumed to influence intention formation, but can also have a direct impact on behavior because it accounts for uncontrolled or automatic aspects of behavior. In a way that is analogous to the formation of norms and attitudes, perceived control is informed by control beliefs.

Theoretical Research on the Behavioral Models Based on Knowledge, Attitude, Belief, and Practices (KABP) Surveys

Much of the early theory-based research in the AIDS area utilized key constructs from one or more of these theories. For example, the CDC's AIDS Community Demonstration Project (Centers for Disease Control and Prevention, 1996; Fishbein, Guenther-Grey, et al., 1995; O'Reilly & Higgins, 1991) incorporated variables from all three theories. Perhaps equally important, many studies that are not typically viewed as "theory based" use KABP surveys to provide descriptive baseline information about a given population (e.g., DiClemente, Zorn, & Temoshok, 1987). As Fishbein and his associates have pointed out (Fishbein, Middlestadt, et al., 1992; Fishbein, Trafimow, Middlestadt, Helquist, & Francis, 1993; Fishbein, Trafimow, Middlestadt, et al., 1995), data from these KABP surveys can also provide evidence concerning the utility of various theories and theoretical constructs.

More specifically, Fishbein and his collaborators (Fishbein, Trafimow, Middlestadt, et al., 1993; Fishbein, Trafimow, Middlestadt, et al., 1995) argued that many items in a KABP survey can be viewed as indicants of theoretical

variables. Based on this argument, they used items from a KABP survey conducted in Saint Vincent and the Grenadines to develop measures of perceived (locus of) control, behavioral norms, and outcome beliefs, and they investigated the relationships between these variables and self-reported frequency of condom use in a sample of 428 sexually active residents of Saint Vincent between the ages of 15 and 60 years. Generally speaking, they found that all three variables were significantly related to reported condom use ($r = .15, p < .01$; $r = .25, p < .01$; and $r = .57, p < .01$, respectively). Perhaps more important, they found that, within this population, almost all of the explained variance in reported condom use could be accounted for by a single variable; namely, behavioral norms. Based on this finding, they recommended that the most effective intervention to increase condom use in Saint Vincent and the Grenadines, would be one that focused on changing perceived norms.

One purpose of the present study is to replicate the Fishbein, Trafimow, Middlestadt, et al.'s (1995) study with a new sample of residents of Saint Vincent and the Grenadines. In particular, the present paper will attempt to replicate the finding that, at least for this population, norms are the most important determinants of condom use behavior. In addition, the paper will focus on two methodological issues.

The Absence of Traditional Measures

It should be clear that there are many problems involved with using items, developed primarily for descriptive purposes, as indicators of key theoretical constructs. Clearly, if one wished to adequately test the applicability of a given behavioral theory in this content domain, one should use traditional measures of the theory's constructs. Thus, for example, if one truly wanted to test the utility of key constructs from Bandura's (1989) SCT, one should use traditional measures of self-efficacy and outcome expectancies. Similarly, if one truly wanted to test the utility of the TRA, one should not rely on a few outcome beliefs and what Nucifora, Gallois, and Kashima (1993) have called *behavioral norms*, but instead, one should use more traditional measures of attitude toward the act, subjective norm, and intention.

Although rigorous theory testing was not the purpose of the Fishbein, Trafimow, Middlestadt, et al. (1995) study, it is important to note that their conclusions and recommendations might have been different had they in fact used more traditional measures of at least some of the variables they considered. For example, it seems reasonable to ask whether Fishbein, Trafimow, Middlestadt, et al. would have found that norms were the most important determinants of condom use behavior if the KABP survey had also contained items that allowed for the construction of a more traditional and direct measure of attitudes toward condom

use. Thus, a second purpose of the present study is to see if the findings concerning the relative importance of attitudinal and normative considerations can be replicated when more appropriate measures of these two constructs are utilized.

Prediction Versus Postdiction

The absence of traditional measures also creates another type of problem. According to the TRA, attitudes and norms are the immediate determinants of intentions, which are, in turn, the immediate determinants of behavior. As pointed out elsewhere (e.g., Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975), one should not attempt to predict behavior directly from attitudes and norms unless one has first established the validity of the intention-behavior link. Given anything other than a perfect relation between intention and behavior, attitudes and norms are expected to account for more variance in (i.e., be better predictors of) intention than in behavior. Unfortunately, just as none of the items on the KABP survey permitted the development of a direct measure of attitude, there were also no items that assessed behavioral intention to use (or to get one's partner to use) a condom. Thus, self-reported behavior served as the dependent variable in the study.

It is important to note, however, that the behavior predicted was not future behavior, but self-reported past behavior. Thus, rather than predicting, Fishbein, Trafimow, Middlestadt, et al. (1995) actually postdicted reports of past behavior. Although such postdiction is often encountered in the literature (see Albarracin & Fishbein, 1994, for a review), this practice seriously compromises the internal validity of a study since it assumes that past behavior is a consequence of attitudes and norms observed in the present. Postdiction is further confounded by the possibility that past condom use, which is treated as the dependent variable, may, in actuality, be a determinant or a predictor of intention and/or future behavior. Indeed, there is considerable evidence that past behavior is a very good predictor of current or future behavior. For example, habit (often defined in terms of frequency of past behavior) has been shown to be an important determinant of human actions (Triandis, 1980).

One implication of the research on past behavior is that, rather than serving as the criterion or dependent variable, past condom use should be treated as an independent variable, and intentions or future behavior should serve as dependent variables. Thus, another purpose of the present study is to test whether the inclusion of past behavior (i.e., condom use) will increase the amount of explained variance in intention.

According to the TRA, however, the influence of past behavior should be largely mediated through attitude and subjective norm. Thus, a fourth goal of the present study is to test whether past behavior has a direct or indirect influence

on intention (i.e., to determine whether the influence of past behavior is mediated through attitudes and subjective norms).

Method

Based on formative research, including Fishbein, Trafimow, Middlestadt, et al.'s (1995) analyses of the Saint Vincent KABP survey, a 2-month radio campaign was implemented in Saint Vincent. The campaign had the objectives of (a) overcoming barriers (such as perceived parental disapproval) to condom use among young adults; (b) enlisting parental support and encouragement of safer sexual practices among young adults; and (c) making it more acceptable for parents to discuss sexual responsibility with their children. The central message of the campaign was, "When you can't protect them anymore . . . condoms can." In order to assess the impact of this campaign, a follow-up survey was conducted 1 month after the campaign.³ The analyses to be reported are based on portions of this follow-up survey.

Procedure

Locally trained interviewers reached the subjects in their own households. Respondents were selected via a multi-stage sampling plan. For purposes of the survey, Saint Vincent was divided into 10 geographical areas, and interviewers were instructed to obtain 30 interviews from each area. The starting points were randomly selected, and the interviewers went to every third house from that starting point. A quota sample with interlocking controls for age, gender, and status (teens, parents of teens, other adults) was developed to regulate the selection of respondents. If a respondent meeting sample specifications was found in the household, a private interview was conducted.

Subjects

The multi-stage sampling process resulted in 307 completed interviews, with approximately 100 subjects in each status group. Also consistent with the original quota, equal numbers of males and females were sampled. Although there were age quotas for teens and "other adults," no such quota was used for parents of teens. Thus, in the obtained sample, respondents between 25 and 29 years of age were underrepresented, while those between 30 and 49 were overrepresented. In addition, although the original sampling plan called for respondents between 15 and 60 years of age, very few respondents aged 55 to

³For an analysis of the impact of the campaign, see Middlestadt et al. (1995).

59 were interviewed. Therefore, a weighting model to make the data projectable to the 15-to-54-year-old population of Saint Vincent was developed and tested for validity (Middlestadt et al., 1995). For the purpose of the present study, the sample was restricted to the weighted sample of 178 respondents who reported having had vaginal intercourse in the last 6 months and had complete data for all of the variables of interest.

Among the 178 sexually active subjects, 54% were males and 46% were females. The mean age of the sample was approximately 30 years ($M = 29.65$). All of the respondents were either Black or of mixed ethnic backgrounds, with 42% being parents of teenagers, 33% other adults, and 25% teenagers. Regarding educational level, 13% had less than a primary school education, 36% had completed primary school, 19% had some secondary school, 21% had completed secondary school, 8% had some university education, and 4% had completed university or professional school. The vast majority of subjects (81%) reported practicing a religion, and 60% of the subjects were employed.

Materials

The KABP Tracking Questionnaire was designed, developed, and implemented through the Academy for Educational Development's AIDSCOM project in collaboration with Family Health International and the Caribbean Epidemiology Center (CAREC). Among its items, several were identified as indicants of theoretical variables in a way consistent with Fishbein, Trafimow, Middlestadt, et al. (1995). More specifically, a number of items were identified as possible indicators of four replication variables: (a) frequency of condom use, (b) outcome beliefs, (c) behavioral norms, and (d) perceived control. In addition, eight new questions allowed us to assess subjective norm, normative beliefs, attitude toward condom use, and intention.

In sum, the present questionnaire had more appropriate measures of the theoretical constructs of interest than Fishbein, Trafimow, Middlestadt, et al.'s (1995) study. However, limitations of the use of survey methods still constrained the number of items to be included. For example, motivation to comply and outcome evaluations were not measured. In addition, ideal measures of some of these constructs (e.g., perceived control, outcome beliefs, and attitudes) should include more items.

Replication Variables

(Past) condom use (frequency of condom use). A three-level condom use variable that exactly replicated the one used in the previous study was constructed from two of the items on the KABP survey. More specifically, respondents

who had been sexually active in the past 6 months were asked whether they had *always*, *sometimes*, *seldom*, or *never* used condoms during that time period. In addition, the respondents were asked to indicate the number of times they (or their partners) had used condoms during their last five sexual experiences. Based on their responses to both questions, subjects were classified as being an always, sometimes or never user of condoms. For analytic purposes, this variable was coded from 1 (*never*) to 3 (*always*).

PERCEIVED CONTROL. In the original study, locus of control was assessed by 11 items from Rotter's (1954) original scale. In addition, a single item was used to assess perceived AIDS control. Only the single AIDS control item was carried through to the present survey. In addition, a new item that appears to capture some of the meaning of self-efficacy was introduced.

Perceived AIDS control. Consistent with the previous study, perceived AIDS control was measured by a dichotomous item that asked "Do you think persons can do anything to protect themselves from getting infected with the virus that causes AIDS?" Those who said "No" (or who were uncertain) received a score of 0, whereas those who said "Yes" received a score of 1.

Self-efficacy. As indicated previously, self-efficacy refers to a person's belief that he or she has the skills and abilities necessary to carry out a given course of action. A respondent has self-efficacy if he or she believes that he or she can perform the behavior in question. As noted elsewhere (Fishbein, Trafimow, Middlestadt, et al., 1993), an important component of condom use efficacy is the respondent's belief that he or she could avoid (or delay) having intercourse if a condom was not available. One of the new questions on the KABP tracking survey asked respondents to indicate, on a 4-point *likely-unlikely* scale, "How likely is it that you would say 'yes' to having sex . . . if . . . you both want to have sex, but neither of you has a condom?" The item was scored from -2 (*very likely*) to +2 (*very unlikely*), with those saying "Don't know" receiving a score of 0.

In order to compute an overall perceived control score, responses to these two items were standardized and summed. Although, once again, we recognize that this is a weak measure of perceived control, it does seem to capture at least some of the key elements associated with this construct.

OUTCOME BELIEFS. Consistent with the original study, three items were used to assess outcome beliefs.

Condoms' efficacy I. The more one believes that taking a given course of action will protect one from a given disease, the more likely one should be to take that protective action. Recall that all respondents were asked if they believed that there was anything one could do to achieve protection against AIDS. Those answering "Yes" were further asked "What can one do to protect oneself from AIDS?" If a subject spontaneously responded "use condoms" or "use condoms all the time," he or she received a score of 1. All other respondents received a score of 0.

Condoms' efficacy II. Condoms' efficacy was also measured more directly. That is, respondents were asked to indicate their degree of agreement or disagreement with the statement, "Condoms can protect you from the AIDS virus" on a 4-point *agree-disagree* scale. The item was scored from -2 to +2, with those responding "Don't know" receiving a score of 0.

Perceived nonembarrassment. Respondents were asked "Would you be embarrassed to go somewhere and ask for condoms?" Those saying "Yes" received a score of -1, those saying "No" received a score of +1, and those who "Don't know," or who said "It depends," received a score of 0.

Following Fishbein, Trafimow, Middlestadt, et al. (1995), responses to these three items were standardized and summed to create an overall outcome beliefs measure. In contrast to the measure of perceived control, the overall belief about condom use measure is almost an exact replication of the measure used in the initial study.⁴

BEHAVIORAL NORM (perceived normative pressure to use condoms). In the previous KABP survey, behavioral norm was measured by three dichotomous items. These same three items were carried through to the tracking survey.

Discussions with others. Respondents were asked "Do you and your friends talk about using condoms?" Those responding "Yes" received a score of 1, while those responding "No" received a score of -1. Subjects who said "Don't know" or did not answer received a score of 0.

Friends' behavior. In addition, respondents were asked "Do your friends use condoms?" The subjects received a score of 1 for a "Yes" answer, and a score of -1 for a "No" answer. Subjects who said "Don't know" or did not answer received a score of 0.

Partner asked. Finally, respondents were also asked "Has a sex partner ever suggested using a condom?" Once again, respondents answering "Yes" were given a score of 1, while those responding "No" received a score of -1. Subjects who said "Don't know" or did not answer received a score of 0.

In order to replicate the behavioral norm measure used by Fishbein, Trafimow, Middlestadt, et al. (1995), responses to these three items were standardized and summed.

Improved Variables

INTENTION. Intention to use condoms was assessed by a 4-point *agree-disagree* item that stated "I will use a condom the next time I have sex."

⁴In the original study, Condom Use Efficacy II was asked in a dichotomous "Yes-No" format (i.e., "Do you believe that condoms can protect you from the AIDS virus?").

The item was scored from -2 to +2, with responses of "Don't know" receiving a score of 0.

ATTITUDE. Three items were used to develop a direct measure of attitude toward condom use. One item utilized a 4-point *agree-disagree* scale, while the other two were asked in a "Yes-No" format.

Good idea I. The 4-point *agree-disagree* item assessed respondent's belief that "It is a good idea for me to use condoms." Consistent with the scoring of intention, respondents received scores from -2 to +2.

Good idea II. A very similar question was asked in a dichotomous format. More specifically, respondents were asked "Do you think that your using condoms is a good idea?" Respondents answering "Yes" received a score of 1, while those answering "No" received a score of 0.

Good idea a year ago. A final attitudinal question asked respondents, "A year ago, did you think that the use of condoms by yourself was a good idea?" Once again, those responding "Yes" received a score of 1, while those responding "No" received a score of 0.

In order to create a single, multiple-item measure of attitude toward condom use, responses to these three items were standardized and summed. In addition, since this is a new scale, Cronbach's alpha index of internal consistency was calculated and found to be satisfactory ($\alpha = .82$).

NORMATIVE BELIEFS. Three new items assessed the respondents' normative beliefs about condom use. All were asked in a 4-point *agree-disagree* format, and all were scored from -2 to +2, with responses of "Don't know" receiving scores of 0. The three items are as follows:

Parents. "My parents think I should use condoms";

Potential sex partners. "My potential sex partners think I should use condoms"; and

Three closest friends. "My three closest friends think I should use condoms."

To arrive at a single, multiple-item normative belief score, responses to these three items were standardized and summed. Once again, because this is a new scale, Cronbach's alpha was computed. Results indicated that the internal consistency of this scale was .80.

SUBJECTIVE NORM. In addition to asking respondents to indicate their normative beliefs with respect to specific referents, another 4-point *agree-disagree* item directly assessed the subjective norm. More specifically, respondents were asked to indicate their degree of agreement with the statement "Most people who are important to me think I should use condoms." Once again responses were coded from -2 to +2.

NORMATIVE PRESSURE. Although the TRA has typically focused solely on normative beliefs and the subjective norm, Fishbein, Trafimow, Middlestadt,

et al. (1993) acknowledged that what important others do (behavioral norms) as well as what they say (normative beliefs, subjective norms) may contribute to the perceived normative pressure one feels with respect to a given behavior. Thus, they have suggested that both types of items be used to arrive at an overall normative pressure score.

In order to assess the utility of such a measure, the behavioral norm score and the normative belief score were standardized. The correlation between these two measures was .31 ($p \leq .01$), and thus the two indexes were summed to create an index of overall normative pressure.⁵

Results

In order to investigate the relationships of the theoretical variables with condom use intention and behavior, both zero-order correlations and multiple regression analyses were conducted.

Replication of Previous Findings

For purposes of comparison, in Table 1 both the correlations reported by Fishbein, Trafimow, Middlestadt, et al. (1995) as well as those from the present study are shown. Consider first the correlations between the first-order variables and frequency of past condom use. Consistent with the Fishbein et al. study, Table 1 shows that the three items assessing behavioral norms and the single item of perceived control were all significantly related to frequency of past condom use ($p \leq .01$ in all cases). In contrast to the earlier study, however, none of the individual outcome beliefs were significantly correlated with condom use.

Turning to the second-order indexes (i.e., that summed first-order ones), Table 1 shows that the present study closely replicates the original study. Specifically, behavioral norms were strongly associated with past condom use ($r = .43, p \leq .01$), whereas outcome beliefs and perceived control were moderately related to condom use ($r = .17, p \leq .05$ in both cases).

In order to replicate previous analyses, condom use was regressed on outcome beliefs and behavioral norm. Consistent with previous results, the multiple correlation coefficient was statistically significant ($R = .45, R^2 = .20, p \leq .01$),

⁵Subjective norm was not included in this index since it is typically viewed as being at a different level of abstraction. Nevertheless, we did explore the possibility of adding subjective norm to the index and found that it made no difference with respect to correlations and regressions. This further supports the use of only behavioral norms and normative beliefs in the index of normative pressure.

and behavioral norm ($\beta = 0.43, p \leq .01$) carried a higher weight than outcome beliefs ($\beta = 0.14, p \leq .05$). When added to this equation, perceived control did significantly contribute to the amount of explained variance ($\beta = 0.10, p < .05$; $\Delta R^2 = .04, p \leq .05$).

Extension of the Previous Study:

Extension I. Improved Measures of the TRA

Extension Ia. Using Measures of Attitude and Subjective Norm to Predict Condom Use

In order to determine whether similar results would be obtained with more traditional measures of attitude and subjective norm, several analyses were conducted. First, to investigate the relations between condom use and the improved measures of the theoretical variables, zero-order correlations were calculated (Table 1).

Attitude. As predicted from the TRA, the multi-item measure of attitude had a significant positive correlation with condom use ($r = .51, p \leq .01$). Moreover, each of the individual items was also significantly correlated with condom use (Good idea I, $r = .45, p \leq .01$; Good idea II, $r = .44, p \leq .01$; Good idea a year ago, $r = .42, p \leq .01$).

Subjective norm. As predicted from the TRA, subjective norm was related to condom use ($r = .32, p \leq .01$).

Normative beliefs. As expected, the overall measure of normative beliefs had a positive association with condom use ($r = .35, p \leq .01$). The perceptions that parents ($r = .27, p \leq .01$), three closest friends ($r = .31, p \leq .01$), and potential partners ($r = .32, p \leq .01$) thought the subject should use condoms were all significantly associated with condom use.

Normative pressure (norm). As predicted, the new measure combining behavioral norm and normative beliefs was also significantly associated with condom use ($r = .48, p \leq .01$). Perhaps more importantly, consistent with expectations, this measure was a slightly better predictor of past condom use than either the measure of behavioral norms ($r = .43, p \leq .01$) or the measure of normative beliefs ($r = .35, p \leq .01$). Thus, this measure will serve as the measure of norms for the remainder of this paper.

TRA model. In order to test the TRA, several statistical analyses were conducted (Table 2). First, attitude was correlated with the outcome beliefs score and the relation was statistically significant ($r = .30, p \leq .01$). Second, subjective norm was correlated with normative beliefs, and the association was statistically significant ($r = .65, p \leq .01$). Third, frequency of past condom use was predicted from attitudes and norms. Results indicated that both attitude

Table 1

Relations Among Theoretical Variables, Intentions, and Behaviors

	Behavior		Intention
	Original	Replication	Replication
Condom use	—	—	.59**
Perceived control	.15*	.17*	.08
AIDS control	.11	.14	.05
Self-efficacy	—	.09	-.01
Outcome beliefs	.25**	.17*	.19*
Embarrassment	.14	.06	.05
Condoms' efficacy I	.15*	.06	.15*
Condoms' efficacy II	.15*	.14	.18*
Behavioral norms	.57**	.43**	.44**
Friends talk	.41**	.34**	.44**
Friends' behavior	.28**	.22**	.28**
Partner asked	.60**	.30**	.17**
Intention	—	.59**	—
Attitude toward condom use	—	.51**	.70**
Good idea I	—	.45**	.74**
Good idea II	—	.44**	.55**
Good idea year ago	—	.42**	.52**
Normative beliefs	—	.35**	.54**
Parents	—	.27**	.38**
Friends	—	.31**	.57**
Potential sex partners	—	.32**	.41**
Subjective norm	—	.32**	.45**
Normative pressure (norm)	—	.48**	.61**

* $p < .05$. ** $p < .01$.

($\beta = 0.36, p \leq .01$) and norm ($\beta = 0.29, p \leq .01$) had significant beta weights, and the multiple correlation coefficient was statistically significant ($R = .57, p \leq .01$). Adding perceived control to this equation significantly increased the amount of explained variance by 3% ($\Delta R^2 = .03, p \leq .05$).

Table 2

Regression Equations

	β	R	R^2	Δ
Past behavior from original measures				
Equation 1				
Outcome beliefs	0.43**			
Norm	0.14*	.45	.20	—
Equation 2				
Outcome beliefs	0.42**			
Norm	0.14*			
Perceived control	0.10*	.49	.24	.04*
Intention from original measures				
Equation 1				
Outcome beliefs	0.36**			
Norm	0.29**	.57	.32	—
Equation 2				
Outcome beliefs	0.36**			
Norm	0.29**			
Perceived control	0.16*	.59	.35	.03*
Intention from improved measures				
Equation 1				
Attitude	0.52**			
Norm	0.35**	.76	.58	—
Equation 2				
Attitude	0.52**			
Norm	0.35**			
Perceived control	0.03	.76	.58	.00
Equation 3				
Attitude	0.52**			
Norm	0.35**			
Past behavior	0.22**	.70	.62	.04*

Note. β indicates standardized regression coefficients. Δ refers to changes in R^2 .

* $p < .05$. ** $p < .01$.

Extension Ib. Using TRA to Predict Intention

In the TRA, attitude and norm are the direct determinants of intention, but only indirect determinants of behavior. Thus, in this extension, intention was used as the criterion variable.

As predicted by the TRA, intention could be conceptualized as the immediate predictor of behavior ($r = .59, p \leq .01$). Further, when intention to use condoms was regressed on attitude and norm (Table 2), the fitted model was statistically significant ($R = .76, R^2 = .58, p \leq .01$). In this case, attitude had a beta weight of 0.52 ($p \leq .01$), whereas norm had a beta weight of 0.35 ($p \leq .01$). Adding perceived control ($\Delta R^2 = .00, p \leq .05$) did not significantly improve the prediction of intention.

*Extension of the Previous Study:**Extension II. Past Condom Use as a Predictor of Intention*

Aiming to avoid postdiction, instead of treating past behavior as the criterion variable, past condom use was considered as an antecedent of intention.

First, a hierarchical regression analysis was conducted to test whether treating past condom use as a predictor increased the prediction of intention to use condoms. Again, regressing intention on attitude and norm explained 58% of variance. This prediction was improved by 4% when past condom use was included ($\Delta R^2 = .04, p \leq .01$). Further, once attitude and norm are controlled for, the relation between past behavior and intentions significantly decreased from a beta of 0.59 ($p < .01$) to a beta of 0.22 ($p < .01$).

To observe whether past behavior could be conceptualized as having an impact on attitude and norm, two simple regression equations were conducted. For predicting attitude, past condom use behavior ($\beta = 0.51, p \leq .01$) accounted for 26% of the explained variance. For predicting norm, past condom use ($\beta = 0.47, p \leq .01$) accounted for 22% of the variance.

Discussion

Consistent with our expectations, using measures similar to those used by Fishbein, Trafimow, Middlestadt, et al. (1995), a very good replication of several previous findings was achieved. As predicted, the higher the level of perceived control respondents had, and the more they believed that using a condom would lead to positive outcomes, the more likely they were to have used condoms. Perhaps most important, behavioral norms were again found to be strongly associated with past condom use. Thus, those subjects who had talked with friends about condoms, perceived that their friends used condoms,

or had a partner who had ever suggested using condoms were much more likely to have used condoms themselves. Multivariate analysis showed that behavioral norm carried the maximum weight among the predictors, while perceived control contributed to the behavioral prediction by only 4%.

It is important to note, however, that when better measures of TRA variables were available, the role of attitudinal factors became evident. A fairly traditional measure of attitude and a measure of norm (combining both behavioral norm and subjective norm) were used to predict past condom use. As predicted, attitude had a statistically significant relation with condom use. Furthermore, attitude contributed to the prediction of behavior over and above the contribution of the norms. Adding perceived control again produced a small, but significant 4% change in the amount of explained variance.

When intention to use condoms was treated as the dependent variable, the results kept the same pattern. Attitude and norm explained 58% of the variance in intention, whereas perceived control did not improve the prediction.

The last part of the study aimed to avoid postdicting behavior, and to keep the correct temporal order of causes and consequences. Treating past behavior as a predictor provided support for Triandis' (1980) model because adding condom use to the equation including attitude and norm led to a 6% increase in the explained variance of intention. Finally, this study showed that the influence of past condom use on the intention to use condoms is at least partially mediated by attitudes and norms. Past condom use explained 26% of the variance in attitude toward condom use and 22% of the variance in norm.

In conclusion, this work suggests that previous patterns of behavioral findings are generalizable across times and populations. That is, we replicated the findings obtained at a previous point in time on a sample obtained with a slightly different sampling procedure. We concluded that the same structure of condom use determinants held under these specific alternative testing conditions. Furthermore, some light was shed on the instances in which having a new measure of the same construct does make a difference for the conclusions we are able to reach. In particular, having a good attitudinal measure did strongly influence the findings. Indeed, attitude was found to be the major factor influencing both intention and behavior. This supports Fishbein and Ajzen's (1975) argument that belief-based measures should not be used as a substitute for attitudes, unless one first demonstrates that the expectancy-value measure is highly correlated with an independent measure of attitude.

In addition, this piece of research highlights the importance of a careful analysis of the direction of the causal inference when selecting predictors and response variables. Thus, past behaviors should be used as independent rather than as dependent variables, given that intentions or future actions are the theoretically meaningful criterion variables in a behavioral prediction study.

Finally, the findings in this study clearly indicate that had a direct measure of attitude been available in the Fishbein, Trafimow, Middlestadt, et al. (1995) study, the importance of attitudinal considerations would have become evident. Although findings from the original study pointed primarily to a normative campaign, it is important to note that the final decision to conduct a normative campaign was not based solely on the role of normative factors as associates of condom use among young adults. Qualitative data from other formative research also pointed to a normative campaign. Perhaps most important, these qualitative data indicated the importance of addressing parental concerns when dealing with the sexual behavior of their children, particularly when one is developing messages to be delivered through mass-media channels.

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