A Social Cognitive-Based Model for Condom Use Among College Students

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Abstract:

Background: Social cognitive theory has been used extensively to explain health behaviors. Although the influence of one construct in this model—self-efficacy—has been well established, the role of other social cognitive constructs has not received as much attention in human immunodeficiency virus (HIV) prevention research. More complete understanding of how social cognitive constructs operate together to explain condom use behaviors would be useful in developing HIV and sexually transmitted disease (STD) prevention programs for college students.

Objective: The primary aim of this study was to test a social cognitive–based model of condom use behaviors among college students.

Methods: Data were collected from a sample of college students attending six different colleges and universities. Participants were 18 to 25 years of age, single, and sexually active. For the sample of 1,380 participants, the mean age was 20.6 years (SD = 1.76). Most participants reported having had vaginal intercourse (95.8%) and oral sex (86.5%); 16% reported anal sex.

Findings: Self-efficacy was related directly to condom use behaviors and indirectly through its effect on outcome expectancies. As predicted, self-efficacy was related to anxiety, but anxiety was not related to condom use. Substance use during sexual encounters was related to outcome expectancies but not to condom use as predicted.

Conclusions: Overall, the findings lend support to a condom use model based on social cognitive theory and provide implications for HIV interventions. Interventions that focus on self-efficacy are more likely to reduce anxiety related to condom use, increase positive perceptions about condoms, and increase the likelihood of adopting condom use behaviors.

Key Words: social cognitive theory, self-efficacy, college students, condom use, sexual behavior

Article:

Consistent condom use has been strongly promoted by health care professionals as an effective means to prevent human immunodeficiency virus (HIV) transmission, and scientific evidence supports this claim (Padian et al., 1987; Padian, Shiboski, Glass & Vittinghoff, 1997). Although using condoms every time one has sexual intercourse is fairly simple and highly effective, it is not always easy to do. Consider the college student who wants to have sexual intercourse with a new partner but has no condom available, or the student who lacks confidence or is embarrassed

to request the use of a condom. Based on decades of behavioral research, we know that relatively simple acts such as using a condom are influenced by a complex array of factors. Because serious health outcomes are associated with unprotected sex outside mutually monogamous relationships, the quest for understanding why people forego protection and place themselves at risk for contracting HIV and other sexually transmitted diseases (STDs) has become more urgent.

A model that has gained considerable popularity in explaining health behaviors is social cognitive theory (Bandura, 1986, 1997). Although the influence of one construct in this model—self-efficacy—has been well established, the role of other social cognitive constructs has not received as much attention in HIV prevention research. More complete understanding of how social cognitive constructs operate together to explain condom use behaviors would be useful in developing HIV and STD prevention programs for college students. The intent of this study was to examine the role of self-efficacy, outcome expectancy, anxiety, and substance use in explaining condom use for a sample of college students. Using both theory and empirical work, a model of condom use was constructed and tested through the use of structural equation modeling techniques.

Theoretical Basis

Relationship Between Self-Efficacy and Condom Use: Social cognitive theory provides a useful framework for understanding how determinants of behavior operate together to explain actions (Bandura, 1986, 1997). According to the theory, self-efficacy, one's beliefs in capabilities to meet specific performance attainments, is part of the self-regulatory aspect of behavior. Behavior is dependent on one's efficacy beliefs, which determine which behaviors one chooses to perform, the degree of perseverance, and the quality of the performance (Bandura, 1986, 1997). The role of self-efficacy in the initiation and maintenance of health behaviors such as smoking, exercise, weight control, and diabetes, epilepsy, and arthritis self-management appears to have been firmly established (DiIorio, Faherty, & Manteuffel, 1992; Floyd et al., 1993; Gecht, Connell, Sinacore, Prohaska, 1996; Grembowski et al., 1993; King, Marcus, Pinto, Emmons, & Abrams, 1996; Strecher, DeVellis, Becker, & Rosenstock, 1986). In regard to HIV prevention, current trends in the literature support the utility of social cognitive theory in HIV prevention research (Bandura, 1992; Kasen, Vaughan, & Walter, 1992). In particular, a strong sense of efficacy has been shown to be an important variable in the prediction of condom use among college students (Basen-Engquist, 1994; Goldman & Harlow, 1993; 0' Leary, Goodhart, Jemmott, & Boccher-Lattimore, 1992; Wulfert & Wan, 1993). Given the strong theoretical and empirical support for the relationship between self-efficacy and behavior, for the current study, it was hypothesized that college students who express high levels of condom use self-efficacy would also report more frequent condom use behaviors.

Relationship Between Self-Efficacy—Outcome Expectancy—Condom Use: Bandura (1986, 1997) proposes that although self-efficacy is a central construct in understanding behavior, other factors work in conjunction with self- efficacy to moderate behavior. Outcome expectancy, which is defined as the anticipated result of performing a specified behavior, is one such variable. According to Bandura (1997), people who are highly efficacious tend to have more positive beliefs about their performance outcomes, which in turn influence actual behavior. For example, self- efficacious condom users are likely both to focus on positive outcomes such as

STD and pregnancy prevention and to be successful in using condoms. In contrast, people who doubt their condom use abilities tend to focus on negative outcomes such as embarrassment and lack of spontaneity; these beliefs in turn undermine their attempts to use condoms. Although considered a major variable, outcome expectancy has not received the attention or scientific scrutiny within the context of social cognitive theory that self-efficacy has. And because of lack of attention to outcome expectancy in HIV prevention research, empirical support for the role of expectancy in explaining condom use is often derived from studies in which positive and negative aspects of condom use have been found to predict condom use (Caron, Davis, Halteman, & Stickle, 1993; Helweg-Larsen & Collins, 1994; Jemmott & Jemmott, 1991; 0' Leary et al., 1992; Orr & Langefeld, 1993). Using the above theoretical perspective and empirical findings, we hypothesized that college students expressing high levels of self-efficacy would express more positive outcomes related to condom use behaviors and that college students reporting more positive outcome expectancies would also report more frequent condom use behaviors.

Relationships Between Self-Efficacy—Anxiety—Condom Use: In addition to the cognitive aspects of behavior, Bandura (1997) addresses affective processes associated with behavior. One such process—anxiety—has been explored to a limited extent in the social cognitive and HIV prevention literature (Ozer & Bandura, 1990; Ross, Caudle, & Taylor, 1989). Although it is intuitively appealing to suggest that individuals who express anxiety associated with condom use would be less likely to use condoms, Bandura (1997) argues that self-efficacy and not anxiety directly influences behavior (p. 324). Contrary to some explanations of avoidant behavior, Bandura proposes that people avoid aversive activities because they lack belief in their ability to control the risky aspects of the activities and not because they are anxious about the performance of the behavior. A study of self-protective behavior supports these propositions (Ozer & Bandura, 1990). In this study, avoidant behavior was predicted by the women's perceived behavioral self-efficacy and their confidence in controlling negative thoughts and not by their anxiety. That is, women who avoided activities because of safety concerns felt less confident in their ability to control potential threats to their safety. And although these women also expressed greater anxiety than the more self-efficacious participants, anxiety was not directly related to avoidant behavior. Using social cognitive theory as a guiding framework, we proposed that college students with high levels of condom self-efficacy would express low levels of anxiety related to condom use, and that self-efficacy, but not anxiety, would be directly related to condom use.

Relationship Between Substance Use During Sexual Encounters and Condom Use: Substance use, particularly alcohol consumption, is a common practice among college students (Wechsler, Davenport, Dowdall, Moeykens & Castillo, 1994). Although substance use is not a social cognitive construct, its predominance on college campuses and its influence on sexual practices make it an important variable to include in the model. It is well known that mixing of alcohol with sex compromises sexual decision-making (Wechsler et al., 1994) and that a significant percent of college students engage in alcohol-associated sexual activity and abandon safer sex practices as a result (Meilman, 1993; 0' Leary et al., 1992; Wechsler et al., 1994). For the current study, it was hypothesized that college students who report combining alcohol or drugs with sexual encounters would report less frequent condom use behaviors.

Proposed Structural Model

The structural model presented in Figure 1 depicts the proposed causal relationships among the constructs. To summarize the model, self-efficacy related to condom use is expected to influence outcome expectancies and anxiety such that highly self-efficacious college students will report more positive beliefs about outcomes associated with condom use behaviors and will express less anxiety about condom use behaviors. Self-efficacy, outcome expectancies, and substance use during sexual encounters all have a direct influence on condom use such that those with high levels of self-efficacy, more positive beliefs about outcomes associated with condom use, and less reliance on substance use during sexual encounters will report more frequent condom use behaviors.

Methods

Procedures: Six colleges and universities in a large southeastern city participated in the study. After approval for the study was obtained from the institutional review boards at the six institutions, a request for a random sample of students currently enrolled in a degree-seeking program and younger than age 25 years was made to each registrar's office. On obtaining the lists of students, those without a complete address were deleted from the sample. Survey packets that included the study questionnaire, a cover letter containing the elements of informed consent, and a card with a study number on it were mailed to students, who were asked to complete the questionnaire and return it to a central location on campus, where they were given the choice of a bookstore coupon for $5.00 or a chance to win up to $100.00. Survey packets were sent first class mail; a reminder postcard was sent 1 week after the first mailing; and a second survey packet was sent to the non- responders 3 weeks after the first mailing. Telephone follow-up was conducted at four schools that granted approval. A total of 8,529 questionnaires were sent; 4.8% were returned unopened because of wrong or insufficient addresses. Of the remaining 8,118 questionnaires mailed, 2,044 questionnaires were returned, representing a 25.2% adjusted response rate.

Sample: Analysis was limited to participants who were 18 to 25 years of age and single and who reported initiation of sexual intercourse. The mean age for the sample of 1,380 participants who provided complete data on all study variables was 20.6 years (SD = 1.76). Slightly more than half (63%) were female, 42.5% were black, 50.0% were white, 3.9% were Asian-American, 2.9% were Hispanic, and 0.7% selected other. The participants were about equally divided across academic status, with 22.7% freshmen, 20.4% sophomores, 28.1% juniors, and 28.8% senior's. Most participants (95.8%) reported having had vaginal intercourse; 86.S%, oral sex; and 16.0%, anal sex. The mean age at first intercourse was 16.6 years for vaginal sex, 17.2 years for oral sex, and 18.4 years for anal sex. The median number of lifetime sexual partners was 3, and the median number for the previous month was 2. Only 27.5% of participants noted that they used a condom every time they had sexual intercourse.

Measures: Self-efficacy for condom use was assessed using a four-item scale that measures confidence in one's ability to use a condom in a variety of situations. These four items are part of a 21-item scale measuring self-efficacy for safer sex practices. The longer scale consists of four subscales— self-efficacy for refusal to have sex, self-efficacy for condom use, self-efficacy to say no to sex when under the influence of drugs/alcohol, and self-efficacy for discussion with partners about sex. A total of 45 items were developed for the scale, based on the definition of self-efficacy presented by Bandura (1986). Items were reviewed by a panel of judges familiar

with social cognitive theory, and based on their recommendations, slight changes were made in the wording of several items. Internal consistency for the original scale was good (alpha 0.91). Data collection for the current sample of college students was limited to 21 of the original 4S items and assessed only the four subscales noted. To determine whether the subscales were distinct, a confirmatory factor analysis was conducted. The results indicated that the items loaded on the predetermined factors as expected. The current analysis was limited to the self-efficacy for condom use subscale. Each of the four items in this subscale is rated on a 10-point scale, ranging from 1, not at all sure, to 10, completely sure I can do. An example of an item is: "I can put a condom on (myself/my partner) so that it will not slip or break." Total possible scores for the condom use self-efficacy subscale range from 4 to 40, with higher scores indicating higher self-efficacy for condom use. Cronbach's alpha for responses of the current sample for the four-item condom use subscale was 0.89.

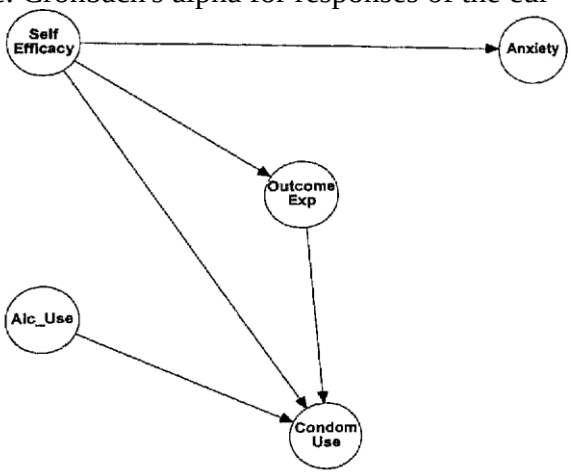

FIGURE 1. Social cognitive theory-based model of condom use.

Beliefs about the physical outcomes associated with using condoms was assessed using a subscale of the condom outcome expectancy scale. Using social cognitive theory as the basis for scale development, items were selected from a review of the literature and discussions with investigators familiar with social cognitive theory. Items were written to reflect three dimensions of outcome expectancies: self-evaluative, social, and physical as proposed by Bandura (1986, 1997) and were reviewed by a panel of experts in social cognitive theory and instrument development. The total condom outcome expectancy scale consisted of 12 items, each rated on a 5-point scale from 1, strongly disagree, to 5, strongly agree. Factor analysis, conducted to determine the underlying structure of the scale, indicated that three dimensions existed, as anticipated. The physical outcome expectancy subscale used in the current analysis consists of four items, each beginning with the stem, "If I use condoms...." An example of an item is: "If I use condoms, sex will be less exciting." Total scores are found for each subscale by summing responses to each item. Items are recoded so that higher scores correspond to more positive attitudes toward condom use. Cronbach's alpha for responses on the four-item subscale for the current sample of participants was 0.86.

Anxiety about condom use was measured by the AIDS Social Assertiveness Scale (ASAS). This scale, developed by Ross, Caudle, and Taylor (1989) is designed to measure how tense or anxious a person feels in a particular situation or in the performance of a particular behavior

associated with safer sex. The ASAS is a 33-item scale, with each item rated on a 5-point Likert scale from not at all tense/anxious to extremely tense/anxious. Validity assessment was limited to factor analysis, which indicated five underlying factors consistent with the underlying theory and supportive of construct validity of the scale. The alpha coefficients for the sums of items for each factor ranged from 0.74 to 0.88 (Ross et al., 1991). Four items from the condom interaction subscale were used in this analysis. An example item is: "How anxious do you feel about carrying condoms in your wallet or purse?" In the final analysis, one item was deleted because of redundancy. Cronbach's alpha for responses on the three-item subscale for this sample was 0.80.

Substance use during sexual encounters was measured using a four-item scale developed for this study. The original scale consisted of eight items designed to measure the perception of the role of drugs and alcohol in the sexual experience. An example of an item is: "I prefer to have sex when I have had a drink or have gotten high." Each item is rated on a 5-point scale from 1, never, to 5, always. Scores range from 4 to 40, with higher scores corresponding to a greater tendency to use substances during sexual encounters. Initial item-to-total correlations and factor loadings indicated redundancy of some items. Therefore, four of the eight items were deleted to yield a more parsimonious scale. Additional analysis indicated that the four- item scale correlated appreciably and in the predicted direction with use of alcohol and drugs and a measure of general risk taking, thus providing evidence for the con struct validity of the scale. Cronbach's alpha for responses for this sample of participants was 0.94.

Condom use behaviors was measured by four items from the Safer Sex Behavioral Questionnaire. This scale was developed by DiIorio, Parsons, Lehr, Adame, and Car- lone (1992) to measure frequency of use of safe sex behaviors. The items were derived from the booklet Understanding AIDS sent to all US households by the Surgeon General in 1988 (U.S. Department of Health & Human Services, 1988). Factor analysis indicated that five subscales existed. The scale also correlated in the predicted directions with measures of general risk taking and assertiveness, providing evidence for construct validity ()Norio, Parsons, et al., 1992). The current analysis used only the condom use behaviors subscale because the intent of the analysis was to predict condom use. The four items are rated on a 4-point scale from never to always, with higher scores corresponding to more frequent condom use. Cronbach's alpha for the responses of this sample of participants was 0.79.

Data Analysis: Initial descriptive data analysis was conducted using SPSS 7.S (SPSS, 1996). The main analyses were based on respondents who contributed complete data on all questions used in the study. Post hoc analysis indicated that those with missing data were no different in age ($t(1482) = 0.201$, NS), race (x^2 (4) = 0.625, NS), or gender x^2 (1) = 0.01, NS). Because items were measured on three different scales (1-4, 1-5, and 1-10), we chose to base the model testing on a polyserial correlation matrix. Items measured on a 10-point scale were treated as continuous, and polyserial correlations were computed using PRELIS 2.12 (Joreskog & Sorbom, 1995).

The "two-step" approach to model testing proposed by Anderson and Gerbling (1988) was used. In this approach, the measurement model is estimated first (and perhaps modified to address lack of fit) followed by estimation of the structural model. Judgment of fit in structural equation modeling with large samples such as this is complex, and the use of several indicators is

recommended (Bollen, 1989). In this process, we report the)(2 statistic (even though it is overly sensitive to trivial discrepancies in fit with large samples), the root mean square of approximation (RMSEA values less than or equal to 0.05 indicate excellent fit) (Browne & Cudeck, 1992), Standardized root mean residual (SRMR values less than 0.05 indicate a good fit), and the comparative fit index (CFI values greater than 0.95 indicate good fit) (Stanley Mulaik, personal communication, 1996). In addition to these fit indices, a variety of diagnostic indicators were used to evaluate the model. These included the size and pattern of standardized residuals, square multiple correlations of the indicators, modification indices, and the size of standard errors.

Measurement Model. Although the initial fit of the measurement model was acceptable: x2 (142) = 1004.86, p 0.001, RMSEA = 0.066, SRMR = 0.047, and CFI = 0.96, modification indices and standardized residuals indicated lack of fit among several items. Previous experience with these items indicated that they share some unexplained variance (perhaps because of wording similarities or social

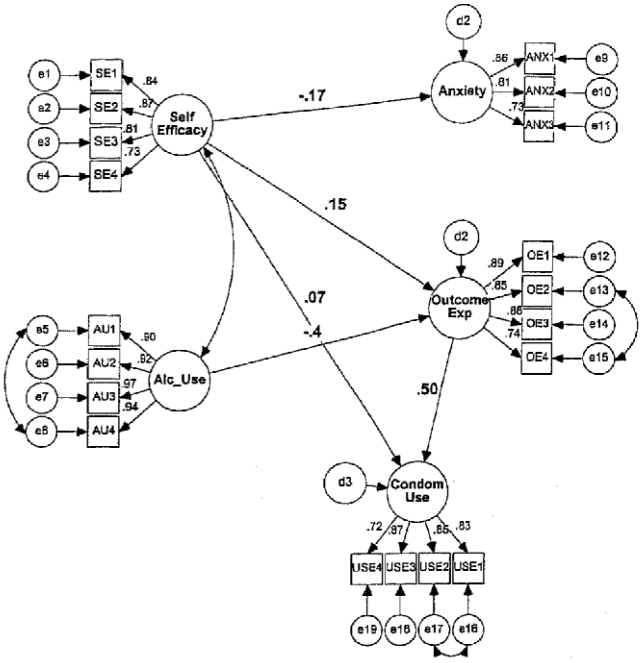

FIGURE 2. Estimated structural model of condom use behavior.

desirability), and we chose to allow the error terms in three pairs of items to covary. Aside from a significant x2 , the fit indices for this modified model indicated excellent fit: x2 (139) = 728.98, RMSEA = 0.055, SRMR = 0.041, and CFI = 0.97. Inspection of diagnostics did not indicate any special problems with this estimation. Squared multiple correlations were all greater than 0.40, error variances were small and consistent across measures, all factor loadings were moderate to high, and the standardized residuals were normally distributed.

Structural Model. The conceptual model under investigation is presented in Figure 1. This model was estimated using LISREL 8.12 (Joreskog & Sorbom, 1993). The results indicated an excellent fit to the data, with x2 (143) = 704.78, RMSEA 0.055, SRMR = 0.043, and CFI = 0.97. As above, careful inspection of diagnostic statistics indicated no special problems with specification or fit. The estimated model is represented in Figure 2, with only significant paths shown.

Discussion

The purpose of this study was to assess the degree of fit between data on HIV risk-reduction practices obtained from college students and a structural model derived from social cognitive theory. The results indicate that the system of equations that define the model provide adequate fit to the data. When examining specific relationships within the model, we found that the relationship between self-efficacy and condom use behaviors was significant and in the predicted direction. This finding lends support to the findings of O'Leary et al. (1992) and Wulfert and Wan (1993), who observed that college student participants expressing confidence in using condoms were more likely to do so than the less self-efficacious participants. This finding also contributes to the growing body of literature supporting the proposition that belief in one's capabilities has a significant influence on the adoption of health promotion practices.

Although the relationship between self-efficacy and condom use behaviors was not a new finding, we did find that the effect of self-efficacy on condom use behaviors was also transmitted through its effect on outcome expectancies. In discussing these findings, it is important to note the current thinking about the conditions under which outcome expectancies contribute to understanding behavior and the controversy regarding the direction of the relationship between self-efficacy and outcome expectancies. In regard to outcome expectancies' contribution to behavior, Bandura (1997) notes that there are situations in which outcome expectancies add little to the prediction of behavioral performance. If the outcome of a behavior depends solely on the quality of the performance (e.g., winning an Olympic gold medal), than a person's self-efficacy may be sufficient to explain behavior. However, if the outcome of a behavior cannot be solely determined by quality of performance, the outcomes one expects are likely to play a significant role in explaining behavior. In the current study, it is likely that the perceived outcome expectancies (e.g., decreased pleasure) cannot be attributed solely to skill in donning a condom. Thus, we might expect that one's anticipation of outcomes could help explain why the participants used or did not use condoms. Indeed, we found that participants professing more positive outcomes were more likely to report behaviors associated with condom use.

A second issue raised in regard to outcome expectancy is the direction of the relationship between self-efficacy and outcome expectancies. Bandura (1997, p. 21) proposes that "....the outcomes people anticipate depend largely on their judgments of how well they will be able to perform in a given situation." He argues that self-efficacy beliefs logically cannot be derived from anticipated outcomes. For example, he notes "people do not judge that they will drown if they jump in deep water and then infer that they must be poor swimmers. Rather, people who judge themselves to be poor swimmers will visualize themselves drowning if they jump in deep water" (Bandura, 1997, p. 21). This conceptualization of the relationship between these constructs led us to suggest a path from self- efficacy to outcome expectancies and not the reverse. Wulfert and Wan (1993), however, proposed a social cognitive—based condom use model in which outcome expectancies were proposed to precede self-efficacy. Yet, both Wulfert and Wan's model and the current model were supported by empirical data. Perhaps self-efficacy and outcome expectancies influence each other over time in complex ways that are difficult to model with cross-sectional, correlational data. Moreover, although structural equation modeling is a useful tool for testing the structure of relationships, it does not give researchers the ability to confirm models; it only provides information to indicate that one has failed to reject a proposed

model. Indeed, equivalent models may exist (Stelzl, 1986). This is likely the case in the current examples, in which self-efficacy was empirically demonstrated both to predict and to be predicted by outcome expectancies. Because more than one model may fit the data, researchers must rely on theorists to provide direction regarding relationships among theoretical constructs. Replication studies and longitudinal analyses will also help to more fully understand the nature of the relationships among these constructs.

The current study also explicated the role of anxiety in condom use behaviors. As suggested by social cognitive theory, people who have a strong self-efficacy for using condoms tend to display less anxiety about condom use, but anxiety itself does not explain behavior. This finding supports that of Ozer and Bandura (1990), who found that efficacy to control negative thoughts and not anxiety explained avoidant behavior in a study of self-protective behaviors of women. Because little work has been conducted on the affective component of condom use behaviors—which is surprising given the emotional laden context of sexual relationships—additional research should be considered.

The last variable explored in this model was sex-related substance use. Substance use during sexual encounters had an indirect effect on condom use behaviors through its effect on outcome expectancies. Although we originally proposed a direct path from substance use to condom use, it appears that individuals who get high before sex may be doing so to induce or enhance pleasure. Using condoms may be perceived as interference with pleasure. This factor, which might explain the link between substance use during sexual encounters and outcome expectancies, was not captured in the current study.

A limitation of this study was the 25% response rate, which brings the generalizability of the findings into question. To address this issue, we conducted several additional analyses in an attempt to determine whether the sample was biased. We found that samples from the individual schools matched the population of the school in age, race, and academic status fairly well. We did, however, have a greater percentage of female respondents in the sample then enrolled in the individual schools. In comparing our sample with national samples of college students surveyed in the National College Health Risk Behavior Survey (Douglas et al., 1997) and the National Survey of Family Growth (Abma, Chandra, Mosher, Peterson, & Piccinino, 1997), we found that our rates of sexual activity for both males and females were comparable to rates published in these studies.

The purpose of this study was to test a model of condom use behaviors derived from social cognitive theory. For the most part, the expected relationships were supported. Self-efficacy, the central variable in the theory, was related both directly and indirectly to condom use behaviors. Thus, participants expressing strong beliefs in abilities to use condoms were likely to do so, and these beliefs were instrumental in supporting more positive attitudes toward condom use. As predicted, self-efficacy was related to anxiety, but anxiety was not related to condom use. Overall, the findings lend support to social cognitive theory and provide implications for HIV interventions. Because anxiety was not directly associated with condom use behaviors, interventions that seek to reduce anxiety in purchasing condoms, using condoms, and discussing safer sex with one's partner may be ineffective in eliciting behavioral change. Interventions that

focus on self-efficacy are more likely to not only reduce anxiety and increase positive perceptions about condoms but also to increase the likelihood of adopting condom use behaviors.

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