

## Attitudes About Condom Use as an AIDS-Relevant Behavior: Their Factor Structure and Relation to Condom Use

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Two studies investigated the domain of attitudes about condom use as an AIDS-relevant behavior and their relation to self-reported condom use, past and intended. In so doing, the Condom Attitude Scale (CAS) was developed. Subjects for both studies ( $n = 248$ ,  $n = 528$ ) were undergraduates, primarily heterosexual. Factor analysis of the initial item pool indicated 8 attitude factors (subscales). The total CAS, its subscales, and measures of condom use had high internal consistency. The total CAS and the majority of subscales explained a substantial amount of variance in condom use and in carrying and keeping condoms at home. Gender was unrelated to past and intended condom use. However, despite having generally more positive attitudes about condoms, women were more inhibited about buying and keeping condoms and were less likely to do so. Test-retest and cross-validation analyses revealed, for the most part, consistent findings.

Acquired immune deficiency syndrome (AIDS), now recognized as the most serious health epidemic of our time, is primarily spread by the exchange of bodily fluids during sexual intercourse (Allen & Curran, 1988). Both unprotected anal (e.g., Kingsley et al., 1987) and vaginal (Fischl et al., 1987) intercourse can result in transmission of the AIDS virus. Despite the lethality of this disease, many heterosexuals and homosexuals have not adopted safer sexual practices (Baldwin & Baldwin, 1988; Kegeles, Adler, & Irwin, 1988; Valdiserri et al., 1988). Knowledge of risk appears to have little effect on altering sexual behavior; rather, more complex psychological factors appear to be involved (e.g., Coates, 1990; Kelley & St. Lawrence, 1988; Stall, Coates, & Hoff, 1988). Unfortunately, very little empirical evidence exists pertaining to factors related to the adoption of safer sexual practices (Becker & Joseph, 1988).

Use of condoms during sexual intercourse is one of the most effective means of preventing transmission or contraction of the AIDS virus (U.S. Department of Health and Human Services, 1986). Past research on condom use as a form of contraception (e.g., Byrne & Fisher, 1983), although suggestive, is limited in applicability to the present crisis, which involves the spread of a lethal sexually transmitted disease. In contrast, recent studies of gay and bisexual men provide information about factors predictive of condom use exclusively for prevention of AIDS (and other sexually transmitted diseases). These studies suggest that attitudes about condoms are highly related to condom use. One

excellent example comes from the work of Valdiserri et al. (1988), who examined demographic, situational, and person variables related to condom use. The largest difference between those gay and bisexual men who never used condoms and those who always used condoms occurred on responses to a single question asking the extent to which subjects believed condoms "spoiled sex." Responses to this single attitudinal question discriminated condom users from noncondom users to a greater extent than did questions addressing knowledge about AIDS risk factors, seropositive status, knowing someone with AIDS, or whether the subject was "high" on alcohol or drugs during sex. Unsafe sexual practices among gay and bisexual men have also been related to the belief that "safe sex cannot be satisfying," and to the presence of a global negative attitude about condom use (see Stall et al., 1988).

These studies on attitudinal variables, however, have two important limitations. First, the reliability and validity of the instruments used to assess these attitudes are unknown. Second, they have examined only a limited scope of the attitudes relevant to condom use. A complete description of the domain of attitudes and their corresponding factor structure seems necessary to facilitate understanding of the role of attitudes in affecting condom use and the interrelationships among these attitudes.

The present investigation used factor analysis to explore the domain of attitudes related to use of condoms as an AIDS-relevant behavior. In so doing, a scale designed to assess these attitude factors was developed. In addition, the relationship between responses to the attitude scale and past and intended condom use was examined. These data simultaneously address the hypothesis that attitudes are related to condom use and the validity of the attitude scale itself.

The subjects of this study were primarily heterosexual. Heterosexual persons represent in and of themselves an important population for studying condom use for AIDS prevention. Although the attitude scale items were written to be equally appli-

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This research was supported, in part, by the University of South Florida Research and Creative Scholarship Grant Program, Grant 3136942 RO.

We thank Madeline Altabe, Steven Shealy, and Nancy McKendree for their assistance in conducting this research.

The instruments described in this study may be used for research purposes and can be obtained by writing to William P. Sacco.

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cable to both sexual orientations, the extent to which heterosexuals and homosexuals show similar attitude factor structures and attitude–condom use relationships is not directly addressed in this study.

## Study 1. Initial Test Construction and Validation

### Method

#### Subjects

*Phase 1.* A group of 45 volunteers, composed of both men and women, were recruited from introductory and advanced psychology classes. Subjects responded to open-ended questions on a questionnaire, and their answers provided the basis for writing the initial pool of items for the Condom Attitude Scale (CAS).

*Phase 2.* A second group of 248 undergraduates from introductory and advanced psychology courses was administered the initial items of the CAS. The sample was primarily female (65%) and heterosexual (96%), with 87% of the subjects being White, 4.5% Black, 4.1% Hispanic, and 4.5% of other race or ethnicity. The average age was 22.77 years ( $SD = 6.44$ ). In this group, 71% reported engaging in sexual intercourse (vaginal or anal) at least once in the last 2 years, and 64% reported condom use at least once during sexual intercourse in the last 2 years.<sup>1</sup>

#### Procedure

*Attitude scale construction.* Phase 1 subjects responded anonymously to extensive open-ended questions on a questionnaire designed to elicit an exhaustive range of attitude statements related to condom use. The open-ended items were based primarily on the theoretical and research literature on attitude–behavior relationships, especially health-related behaviors (e.g., Ajzen & Fishbein, 1980; Maiman & Becker, 1974; Rotter, Chance, & Phares, 1972; Triandis, 1974). This procedure yielded 237 attitude statements. Items with identical meanings were eliminated. Additional items were then written to represent attitude factors suggested by the literature on health-protective behaviors but absent on the initial list, resulting in 143 items. Subjects responded using a 7-point Likert scale ranging from *strongly disagree* to *strongly agree*.

*Assessment of condom use.* A review of the literature found no published measures of condom use. Therefore, a 52-item questionnaire (The Condom Use Questionnaire; CUQ) was developed. One half of the CUQ items asked about past condom use, the other half asked about intended condom use. Data indicate that intentions to engage in future behavior may be the best single predictor of engaging in that behavior (Ajzen & Fishbein, 1980). Because the AIDS crisis is a recent phenomenon, and most subjects were entering their most sexually active years, assessing intentions to use condoms in the future is as important as assessing past condom use.

The CUQ items were further divided into those that asked about preliminary condom use behaviors (i.e., whether subjects carry or keep condoms in their homes) and those that asked about condom use during sexual situations that pose some risk of contracting or spreading AIDS.

*Carrying and keeping condoms at home.* The first four CUQ items asked subjects if they carried condoms, if they kept condoms in their homes, and if they intended to do so in the future. Subjects responded using a 7-point Likert scale ranging from *never* to *always*.

*Intended condom use (Intended-CUQ).* These items specified the actual conditions under which condom use could occur, rather than simply asking about general intentions to use condoms. It was necessary to assess specific situations because condom use is not always

warranted (e.g., intercourse involving two people without prior sexual partners, or two people who have tested negative for the AIDS virus). Assessing only the general intentions of these subjects would produce error in the prediction of condom use in situations that pose risk for spreading AIDS.

Therefore, the Intended-CUQ consisted of 24 items depicting situations that posed varying degrees of risk, yet the level of situational pull (e.g., sexual attraction, intoxication) was such that the subject might be induced to have sex with the person. The items tapped into varying combinations of factors that ranged in (a) degree of risk that the partner was HIV-positive (e.g., *partner has used intravenous drugs* vs. *partner has had 1 to 3 sexual partners in the last year*); (b) knowledge of the partner's sexual history or HIV-status (e.g., *do not know partner's sexual history* vs. *know partner is HIV-positive*); (c) level of attraction to the partner (e.g., *someone you love* vs. *someone you are beginning to feel attracted to*); and (d) other situational factors (e.g., *being intoxicated*; *partner insists on having sex without a condom*). An example item is, *someone you are in a romantic relationship with, but you do not know their sexual history*. Subjects substituted the items into the following sentence: "In the future, do you intend to use a condom if you engage in sexual activity with \_\_\_\_\_?" Subjects responded using a 7-point Likert scale ranging from *never* to *always*. An eighth option, *would not have sex*, was available if subjects felt certain they would never engage in sexual activity under the circumstances described.

*Past condom use (Past-CUQ).* As just noted, assessment of overall past condom use could include situations that posed no risk of AIDS. Therefore, the Past-CUQ used the same specific sexual situations described in the Intended-CUQ to assess condom use during the previous 2 years. Subjects substituted each item into the following sentence: "In the past two years, a condom was used when I engaged in sexual activity with \_\_\_\_\_." The Past-CUQ was answered using a 7-point Likert scale ranging from *0% of the time* to *100% of the time*. An eighth response option, *never had sex with anyone like this person*, was also available.

*Scale administration.* In groups, subjects completed the Intended and Past-CUQ, followed by the CAS, to avoid the possibility that subjects would answer the dependent measures in a manner consistent with their CAS responses. The CAS items were presented in two different orders to control for fatigue effects. The entire session lasted approximately 1 hr. Anonymity was ensured.

## Results

### CAS Factor Analysis and Reliability

An iterated principal-axis factor analysis with squared multiple correlations as initial communality estimates was performed on all subjects' responses to the 143 CAS items, followed by an oblique rotation (SAS Promax, 1982). Eight factors were retained. All eigenvalues exceeded 1.<sup>2</sup>

The 143 CAS items were then reduced to a smaller subset of 57 items on the basis of the following criteria for exclusion: (a) the item loaded less than .40 on any factor; (b) the item loaded .30 or more on a second factor; (c) the item's meaning did not fit well with the factor or was redundant with another item on the

<sup>1</sup> The data from all subjects, regardless of sexual history, were used in developing the CAS because it was assumed that all subjects held attitudes about condoms that would influence future condom use, including during the first incident of sexual intercourse.

<sup>2</sup> Although disagreements about the number of subjects necessary for a stable factor solution exist, recent work by Guadagnoli and Velicer (1988) indicates that the present study's sample size was sufficient.

same factor. The reduced set was again factor analyzed and rotated. Internal consistency reliability (coefficient alpha) was computed for the eight subscales (defined by the eight CAS factors) and the total scale. Table 1 presents the results of the item analyses. Table 2 presents correlations among the subscales and the total scale score. The meaning of the items of the eight attitudinal factors, the high coefficient alphas, and the moderate to low interscale correlations suggest that each subscale can be viewed as measuring distinct aspects of condom attitudes.

### *Attitudes and Condom Use*

Depending on the research or treatment context, both the individual subscales and the total scale score are potentially useful. The total score may be useful when a single measure of overall attitude toward condoms is desired. Subscale scores should be useful in delineating the role of different attitude factors. For example, some subscales may prove better than others for predicting condom use within different subgroups or for predicting different condom use behaviors (e.g., carrying vs. using condoms). Therefore, both the total CAS score and the

CAS subscales were analyzed. Because of the large number of correlations computed, alpha was set at .01. For all analyses, higher scores reflect more favorable attitudes toward condoms.

The relationships between the CAS subscales and the condom use measures were also analyzed with stepwise multiple regression to control for shared variance among the subscales. For these analyses, only subscales that explained at least 4% unique variance are reported.

*Carrying and keeping condoms at home.* Stepwise regression analyses were significant for each of the four items assessing carrying and keeping condoms at home (all  $F_s > 11.00$ , all  $p_s < .0001$ ; see Table 3, Study 1). As expected, the subscale Inhibition explained the largest amount of variance in these measures. The CAS total score ( $r = .28$ ,  $p < .0001$ ), Interpersonal Impact ( $r = .20$ ,  $p < .01$ ), and Promiscuity ( $r = .18$ ,  $p < .01$ ) also correlated significantly with the intention to keep condoms at home, although neither entered the regression equation. No other subscales were significantly correlated with these measures.

*Past condom use.* As expected, the proportion of subjects who reported having had sex with someone under the circumstances described in the Past-CUQ items varied considerably. Proportions ranged from less than 7% (e.g., sex with a prostitute)

Table 1  
*Attitude Factors With Sample Items, Mean and Range of Factor Loadings, Variance Accounted for by Factors, Alphas, and Test-Retest Correlations*

Condom Attitude Scale (CAS) factor	Factor loadings		Proportion of variance accounted for (cumulative)	Alpha study 1	Alpha study 2	Test-retest correlations
	<i>M</i>	Range				
Interpersonal Impact (11 items) (e.g., If partner suggested, I'd feel relieved; If partner suggested, I would respect him/her.)	.62	.41-.78	.37	.88	.90	.81
Effect on Sexual Experience (10 items) (e.g., Condoms are a hassle to use; Condoms take the "wonder" out of sex.)	.64	.52-.78	.49	.89	.89	.83
Self-Control (9 items) (e.g., I'm concerned about AIDS, but in the heat of the moment it wouldn't stop me from having sex without a condom.)	.65	.50-.87	.58	.88	.87	.84
Global Attitude (9 items) (e.g., Condoms protect against sexually transmitted diseases; People who use condoms are wimps.)	.51	.44-.64	.65	.79	.62	.52
Perceived Risk (6 items) (e.g., If I'm not careful, I could definitely catch AIDS.)	.66	.53-.78	.71	.82	.84	.76
Inhibition (4 items) (e.g., I'd be embarrassed to buy condoms.)	.67	.49-.85	.77	.75	.76	.82
Promiscuity (3 items) (e.g., People who carry condoms are just looking for sex.)	.75	.68-.80	.81	.80	.81	.73
Relationship Safety (5 items) (e.g., A condom is not necessary when you are with the same person for a long time.)	.57	.46-.70	.85	.73	.79	.77
Total scale (57 items)				.92	.91	.86

*Note.* For all CAS items, higher scores reflect more positive attitudes toward condoms. For Study 1, factor analysis and alphas,  $n = 248$ . For Study 2,  $n = 528$  for alphas and  $n = 322$  for test-retest reliabilities.

Table 2  
Correlations Among Condom Attitude Scale (CAS) Subscales and Total Scale Score

Scale	1	2	3	4	5	6	7	8	
1. Total CAS Score	—								
2. Effect on Sexual Experience	.75**	—							
3. Global Attitude	.68**	.39**	—						
4. Interpersonal Impact	.74**	.44**	.51**	—					
5. Promiscuity	.45**	.32**	.26**	.25**	—				
6. Self-Control	.69**	.44**	.35**	.37**	.18**	—			
7. Perceived Risk	.46**	.11	.31**	.37**	.10	.15*	—		
8. Inhibition	.30**	.15*	.12	.06	.25**	.08	.04	—	
9. Relationship Safety	.57**	.41**	.32**	.30**	.19**	.41**	.09	.06	—

Note. From Study 1,  $n = 248$ .

\*  $p < .01$ . \*\*  $p < .001$ .

to over 50% (e.g., sex with someone for whom attraction was felt but whose sexual history was unknown). Because we wanted to predict condom use instead of abstinence, it was necessary to identify subsets of items representing circumstances in which a substantial proportion of subjects indicated having had sex.

The first subset consisted of seven items on which 40% or more of the sample reported having had sex (referred to as the CUQ-Past High Frequency subscale; CUQ-PHF). These items tapped into a variety of sexual partners and situations (e.g., *someone you are quite attracted to, but whose sexual history you don't know; someone you love, even though he or she has had many sexual partners*). Analysis of internal consistency reliability ( $\alpha = .94$ ) and item-total correlations (all item-total correlations  $\geq .55$ ) allowed summing and analyzing these items as a total score.<sup>3</sup>

A second subset of five items on which 30% to 40% of the subjects reported having had sex were also analyzed (referred to as the CUQ-Past Moderate Frequency subscale; CUQ-PMF). Compared with the CUQ-PHF, this set of items contained proportionally more items (4 out of 5) describing sexual partners who could be considered at somewhat greater risk for transmitting AIDS (e.g., *someone who has had many sexual partners, someone who has had eight or more sexual partners in the previous year*). Coefficient alpha and item-total correlations were sufficiently high ( $\alpha = .97$ ; all item-total  $r_s \geq .87$ ) to permit the summation of responses.

Regression analyses (see Table 4, Study 1) revealed that Self-Control entered the equation for CUQ-PHF,  $F(1, 54) = 12.72$ ,  $p < .0008$ , accounting for 19% of the variance in the CUQ-PHF. Perceived Risk and Self-Control entered the equation for CUQ-PMF,  $F(2, 43) = 11.40$ ,  $p < .0001$ , and accounted for 35% of the variance.

Correlations between the CUQ-PHF and CUQ-PMF with the CAS subscales and total score are presented in Table 5. The pattern of significant correlations with the subscales mirror the results of the regression equation.

*Intended condom use.* As with the Past-CUQ items, the proportion of subjects who reported they would have sex under the circumstances described in the various Intended-CUQ items varied considerably. Items on which at least 80% of the subjects said they would have sex with the person were identified for analysis (referred to as the CUQ-Intended High Frequency subscale; CUQ-IHF). The three items that met this criterion asked

about intentions to have sex with *someone you have known for a pretty long time, are attracted to, but whose sexual history is not known; someone you are in a romantic relationship with, but do not know their sexual history; and someone you love, even though he or she has had many sexual partners*. Coefficient alpha (.92) and item-total correlations (all  $r_s \geq .77$ ) allowed for summation.

A second analysis was conducted on items on which 60% to 80% of the subjects indicated they would have sex with the person (referred to as the CUQ-Intended Moderate Frequency subscale; CUQ-IMF). The 10 items meeting this criterion varied considerably in the type of sexual partners and situations described (e.g., *someone you are sexually attracted to, but who has had many sexual partners, and you are intoxicated; someone you like a lot, don't know very well, and who says they don't have AIDS*). The coefficient alpha (.95) and item-total correlations (all  $r_s \geq .66$ ) justified summation.

Six CAS subscales significantly correlated with the CUQ-IHF, and three significantly correlated with the CUQ-IMF (see Table 5). However, only Self-Control and Effect on Sexual Experience entered the significant regression equation for CUQ-IHF,  $F(2, 192) = 60.29$ ,  $p < .0001$ , accounting for 39% of the variance (see Table 4, Study 1). Self-Control and Perceived Risk entered the significant regression equation for CUQ-IMF,  $F(2, 78) = 15.38$ ,  $p < .0001$ , accounting for 27% of the variance.<sup>4</sup>

*Prediction of self-control.* Of the eight CAS subscales, Self-Control most often explained a significant and large proportion of variance in condom use. This finding suggests that modifica-

<sup>3</sup> In analyzing the CUQ-PHF, subjects were omitted if they indicated on any item of the subset that they did not have sex with a person like the one described in the item. This listwise deletion was necessary to compute internal consistency and item-total correlations that would be interpretable. In addition, this procedure results in an analysis of subjects who have been the most sexually active among this group of subjects. The same procedure was followed when analyzing all subsequent CUQ subsets.

<sup>4</sup> Regression analyses excluding subjects who reported no sexual intercourse in the last 2 years were repeated on the CUQ-IHF, the CUQ-IMF, and the four items assessing carrying and keeping condoms, past and intended. All regressions remained significant, and the same variables entered the equations except Perceived Risk, which did not enter the equation for CUQ-IMF.

Table 3  
*Stepwise Multiple Regression Analyses of Carrying Condoms and Keeping Condoms at Home (Past and Intended) for Study 1 (n = 233) and Study 2 (n = 528)*

Criterion variable	Predictor variable	Beta <sup>a</sup>	Total R <sup>2</sup>	t	p
Study 1					
Past					
Carry Condoms	Inhibition	.29	.08	4.58	.0001
Keep Condoms	Inhibition	.43	.18	7.35	.0001
Intended					
Carry Condoms	Inhibition	.23	.05	3.81	.0002
	Perceived Risk	.24	.10	3.93	.0001
Keep Condoms	Inhibition	.33	.12	5.75	.0001
	Perceived Risk	.28	.20	4.80	.0001
Study 2					
Past					
Carry Condoms	Inhibition	.28	.08	6.23	.0001
Keep Condoms	Inhibition	.38	.16	9.08	.0001
Intended					
Carry Condoms	Inhibition	.28	.08	6.41	.0001
	Interpersonal Impact	.19	.12	4.41	.0001
Keep Condoms	Inhibition	.35	.12	8.20	.0001
	Interpersonal Impact	.19	.16	4.41	.0001

Note. Only variables that explain at least 4% unique variance are presented.

<sup>a</sup> Standardized regression coefficients.

tion of attitudes related to poor self-control may influence condom use. To determine the attitudinal factors predictive of scores on the Self-Control subscale, a stepwise multiple regression was conducted. This analysis,  $F(2, 235) = 37.36, p < .0001$ , entered Effect on Sexual Experience and Relationship Safety, which respectively accounted for 17% and 7% of the variance in Self-Control.

**Gender.** Gender was unrelated to all measures of past and intended condom use during intercourse. Men, however, were more likely than women to report carrying condoms ( $r = .28, p < .0001$ ), keeping condoms at home ( $r = .41, p < .0001$ ), intending to carry condoms ( $r = .29, p < .0001$ ), and intending to keep condoms at home ( $r = .27, p < .0001$ ).

Gender was related to responses on the CAS. Women reported more favorable attitudes on five of the eight subscales, all  $F_s(1, 227) > 7.37, p_s < .007$ , but had lower scores on Inhibition (i.e., more inhibited about buying and keeping condoms),  $F(1, 227) = 14.96, p < .0001$ . Gender was unrelated to only Perceived Risk and Relationship Safety.

## Study 2. Test-Retest Reliability and Cross-Validation

### Method

#### Subjects

An additional 528 subjects were drawn from the same population as in Study 1. The average age was 21.09 years ( $SD = 4.75$ ); 74% were female. A subset of these subjects ( $n = 322$ ) returned 3 to 4 weeks later

for retesting. Their average age was 20.72 years ( $SD = 3.96$ ); 71% were female.

#### Procedure

All subjects completed the CAS and the CUQ subsets in the same manner as described in Study 1.

### Results

#### Reliability

Coefficients alpha for the CAS subscales and the total CAS were generally high and similar to those obtained in Study 1, except for Global Attitude (see Table 1). Test-retest correlations were also generally high, with the exception of the Global Attitude subscale, to which subjects' responses were less consistent.

Test-retest reliabilities for the CUQ subscales were also acceptable (all  $r_s \geq .70, p < .0001$ ) except for the CUQ-IME, which was somewhat lower ( $r = .62, p < .0001$ ). Internal consistency (alpha) was quite high for each CUQ subscale (all alphas  $\geq .90$ ). Test-retest reliability correlations for the four items assessing practices of carrying condoms and keeping condoms at home (past and intended) were acceptable (all  $r_s > .76$ ), except for the item assessing intentions to keep condoms at home, which was somewhat lower ( $r = .57, p < .0001$ ).

#### Condom Use

These analyses used data from the first administration of the measures. Inspection of the correlation matrix (see Table 5)

Table 4  
*Stepwise Multiple Regression Analyses of Past and Intended Condom Use for Studies 1 and 2*

Time of use	Condom Use Questionnaire variable		Predictor variable(s)	Beta <sup>a</sup>	Total R <sup>2</sup>	<i>t</i>	<i>p</i>
	Frequency items	<i>n</i>					
Study 1							
Past	High	61	Self-Control	.44	.19	3.57	.0008
Past	Moderate	50	Perceived Risk	.35	.25	2.54	.01
			Self-Control	.34	.35	2.47	.02
Intended	High	204	Self-Control	.49	.35	7.52	.0001
			Effect on Sex	.22	.39	3.33	.0001
Intended	Moderate	87	Self-Control	.40	.22	3.90	.0002
			Perceived Risk	.22	.27	2.16	.03
Study 2							
Past	High	75	Self-Control	.60	.38	6.33	.0001
			Perceived Risk	.22	.43	2.35	.02
Past	Moderate	59	Self-Control	.49	.24	3.98	.0002
Intended	High	409	Self-Control	.38	.21	7.83	.0001
			Interpersonal Impact	.23	.26	4.80	.0001
Intended	Moderate	172	Self-Control	.37	.16	5.13	.0001
			Promiscuity	.23	.21	3.22	.002

Note. Only variables that explain at least 4% unique variance are presented.

<sup>a</sup> Standardized regression coefficients.

reveals that a similar pattern of significant and nonsignificant relationships occurred for the two studies. Regression analyses on each of the condom use measures were significant, (all  $F$ s > 15.00, all  $p$ s < .001; see Tables 3 and 4, Study 2). As is evident, the overall pattern of results was similar for both studies (i.e., Inhibition again accounted for most of the variation in carrying and keeping condoms, and Self-Control accounted for most of the variation in past and intended condom use during intercourse).<sup>5</sup>

### Prediction of Self-Control

A regression analysis using the CAS subscales to predict Self-Control scores,  $F(3, 466) = 70.95$ ,  $p < .0001$ , revealed findings similar to those of Study 1. As in Study 1, Relationship Safety and Effect on Sexual Experience entered the equation, accounting for 27% of the variance in Self-Control scores. In addition, Global Attitude entered and accounted for an additional 5% of the variance.

### Gender

The same pattern of results found in Study 1 was obtained in Study 2. Gender was unrelated to past and intended condom use. Men were more likely than women to report carrying condoms ( $r = .44$ ,  $p < .001$ ), keeping condoms at home ( $r = .52$ ,  $p < .001$ ), intending to carry condoms ( $r = .32$ ,  $p < .001$ ), and intending to keep condoms at home ( $r = .40$ ,  $p < .001$ ). Women

reported more favorable attitudes on each CAS subscale, all  $F$ s(1, 463) > 5.11,  $p$ s < .02, except Inhibition, on which they scored lower,  $F(1, 463) = 37.35$ ,  $p < .0001$ .

### Discussion

These results extend prior research by providing a more complete description of the domain of attitudes about condom use as an AIDS-relevant behavior and providing data on the ability of condom attitudes to predict condom use. The factor analysis reduced a large array of attitude statements to eight attitudinal factors concerning various aspects of condom use ranging from purchasing condoms to their effect on sexual experience. The CAS, its subscales, and the CUQ subscales had high internal consistency. A majority of these attitude factors and the total CAS predicted past and intended carrying and keeping of condoms at home and condom use in sexual situations that posed (or could pose) some risk for contraction of AIDS or another sexually transmitted disease. Test-retest and cross-validation analyses revealed, for the most part, consistent findings, lending greater confidence in the temporal stability and validity of the scales and the relationships observed.

In both studies, the Self-Control factor explained relatively large amounts of variance in past and intended condom use

<sup>5</sup> Additional details about any aspect of this study can be obtained by writing to William P. Sacco.

Table 5  
*Correlations Between Condom Attitude Scale (CAS) Subscales and CAS Total With Past and Intended Condom Use for Studies 1 and 2*

CAS subscales	Condom Use Questionnaire							
	Past-high frequency		Past-moderate frequency		Intended-high frequency		Intended-moderate frequency	
	Study 1 (n = 61)	Study 2 (n = 75)	Study 1 (n = 50)	Study 2 (n = 59)	Study 1 (n = 204)	Study 2 (n = 409)	Study 1 (n = 87)	Study 2 (n = 172)
Interpersonal Impact	.21	.39**	.28	.35*	.39**	.35**	.29*	.25*
Effect on Sexual Experience	.31	.23	.13	.25	.45**	.25**	.06	.10
Self-Control	.45**	.55**	.50**	.39*	.59**	.44**	.47**	.30**
Global Attitude	.18	.23	.16	.15	.32**	.30**	.24	.29**
Perceived Risk	.23	.29	.46**	.22	.17	.16*	.34*	.15
Inhibition	-.03	.02	.08	.19	.03	.00	-.01	.06
Promiscuity	-.18	.04	-.16	.01	.20*	.18**	.10	.25**
Relationship Safety	.31	.33*	.27	.13	.33**	.32**	.03	.13
CAS total	.36*	.57**	.40*	.49**	.56**	.48**	.34*	.40**

\*  $p < .01$ . \*\*  $p < .001$ .

during intercourse. This finding is consistent with earlier studies of gay and bisexual men that found riskier sexual behavior related to difficulty with sexual impulse control (Joseph, Montgomery, Kessler, et al., 1987), difficulty modifying sexual behavior (Doll, Darrow, O'Malley, Bodecker, & Jaffe, 1987), and less confidence in the ability to make recommended changes (termed *personal efficacy*; McKusick, Coates, Wiley, Morin, & Stall, 1987). However, these findings must be interpreted cautiously, for they may simply reflect that subjects who do not practice safe sex are aware of it and report their failure to do so. A more liberal interpretation suggests that modification of dysfunctional impulse control (cf. Dickman, 1990) would be an important component of interventions designed to increase condom use.

Both studies revealed that the Effect on Sexual Experience factor accounted for substantial variance in Self-Control scores, suggesting that individuals who have difficulty controlling their sexual impulses are those who experience (and perhaps are more adversely affected by) greater loss of sexual pleasure from using condoms. This finding is consistent with the work of Valdiserri et al. (1988), who found that responses to the attitude statement "condoms ruin sex" best predicted condom use among gay and bisexual men. Interventions may benefit from focusing on attitudes regarding reduced pleasure from condom use among those who are prone to exhibit poor self-control. A similar case can be made for Relationship Safety, which also accounted for significant variance in Self-Control scores in both studies. This result suggests that people who exhibit poor self-control may lull themselves into complacency by believing they know their partner well enough or that monogamy provides protection against AIDS. In fact, repeated unprotected intercourse with the same infected partner is the most likely way to contract AIDS (Hearst & Hulley, 1988). A similar result is reported by Bauman and Siegel (1987), who found that gay men with one sexual partner or regular partners tended to underestimate their actual risk of contracting AIDS relative to those who more often had sex with anonymous partners.

The Perceived Risk factor explained significant amounts of variance in carrying and keeping condoms and past and intended condom use, although the pattern of these relationships was inconsistent across the two studies. These results conflict with Joseph, Montgomery, Emmons, et al. (1987), who found that perceived risk was generally unrelated to risky sexual activity in gay men. Also, Weinstein (1988) reports that perceived risk is often *not* associated with health protective behaviors such as seat belt use, reducing sugar consumption to prevent tooth decay, and so forth. Thus, the role of perceived risk in condom use requires further scrutiny.

As expected, both studies found that the Inhibition factor accounted for substantial amounts of variance in both past and intended carrying and keeping of condoms at home. The finding that Inhibition explained the largest amount of variance in carrying and keeping of condoms, but was unrelated to use of condoms, appears at first glance inconsistent. That is, it suggests the counterintuitive conclusion that altering inhibitions about carrying and keeping condoms would not affect their use. However, the analysis of gender differences clarifies the picture somewhat.

Gender was unrelated to all measures of condom use during intercourse. In contrast, women reported more negative attitudes than did men about buying and keeping condoms and were less likely to do so. Otherwise, women had more favorable attitudes about condom use (cf. Kegeles, Adler, & Irwin, 1988). The finding that women had more positive attitudes about condoms but were not more likely to use them suggests that condom use may involve complex interpersonal processes (e.g., assertiveness). The existence of the Interpersonal Impact attitude factor and its relationship with various condom use measures supports the importance of interpersonal factors in condom use. In addition, because women are less likely to have a condom with them, they are more dependent on their male partner to provide one. Thus, their positive attitudes are less likely to result in condom use. To extrapolate further, these results suggest that decreasing women's inhibitions about buying and

keeping condoms and increasing their influence in the sexual situation would increase condom use.

The following caveats must be noted in interpreting the results of this study: First, test-retest correlations for the Global Attitude subscale, the CUQ-IMF, and intentions to keep condoms at home were a bit low, suggesting that the temporal stability of these scales may be questionable. Second, condom use was, out of necessity, assessed by self-report measures; thus, correspondence with actual use is unknown. Third, the subject population of primarily heterosexual college students, although at some risk for contracting AIDS, is still largely free of the disease. As more cases of AIDS appear, attitudes about condoms and their relation to actual use may change. Fourth, although it is noteworthy that several of this study's results were similar to those found using gay and bisexual samples, generalization to noncollege heterosexuals, intravenous drug users, and gay and bisexual populations must be made cautiously. Finally, heterosexuals may use condoms both for prevention of disease and for contraception. Although this study focused on AIDS-related condom use, some CAS attitude factors may contribute to condom use for contraception. Future research with heterosexuals should examine whether the factors responsible for condom use to prevent pregnancy are different from those to prevent sexually transmitted diseases.

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Received July 16, 1990

Revision received September 25, 1990

Accepted October 12, 1990 ■