

Condom Use Among South African Adolescents: Developing and Testing Theoretical Models of Intentions and Behavior

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Abstract We developed and tested models of intentions and behavior among adolescents from Cape Town, South Africa. Data from 261 participants who completed an initial measure of attitudes, beliefs, and prior behavior were used to develop a model of intentions to use condoms based on the Theory of Planned Behavior (TPB) and additional constructs found to be important in previous research with adolescents. Of the initial sample, 227 (87%) completed a behavioral follow-up 4 months later, and approximately one-third of those ($n=72$; 44 boys and 30 girls) reported having had sex in the prior 4 months. Data from this smaller sample were used to develop a model of condom use behavior based on intentions (as per the TPB) and the additional sub-population relevant constructs. Analyses generally supported the validity of the TPB in this context for predicting intentions and behavior. HIV knowledge and positive outlook (self-esteem and future optimism) were significantly related to TPB predictors of intentions. Intentions, acceptance of sexuality, and gender were significant predictors of behavior. Implications for the status of the TPB and the design of interventions for South African adolescents are discussed.

Keywords South Africa · Adolescents · Condoms · Sexually transmitted diseases · HIV/AIDS · Theory of planned behavior

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Introduction

Sub-Saharan Africa is the area of the world with the highest rate of HIV infection [38]. Issues such as poverty, lack of education and resources, and gender inequalities make it difficult to implement successful behavior change, especially in South Africa, where heterosexual contact has become the most common mode of transmission of the AIDS virus [34, 39]. Young people are particularly at risk, with the fastest-growing infection rate. It was estimated that in 2002, approximately 15.5% of South Africans between the ages of 15 and 49 were infected with HIV, and 6% of youths 15 to 19 years old were estimated to be infected [35].

Despite increases in knowledge of the risks of unprotected sex, South African youth often does not report using condoms. A recent survey showed that only one-half of rural sexually active adolescent participants reported using condoms in the past 30 days [37]. Karim *et al.* [31] showed that availability and cost of condoms as well as the distance required to travel to acquire condoms might be prohibitive in South Africa, especially for rural youth. Eaton *et al.* [22] reviewed 75 studies conducted between 1990 and 2000 in South Africa. These studies suggest that 50% of youth are sexually active by age 16, boys debut earlier than girls, and most young people use condoms inconsistently, if at all. While most young people knew the consequences of AIDS, there was a gap in knowledge about exactly how HIV is transmitted, and how it is related to AIDS, as well as misunderstanding of the effectiveness and practical use of condoms. Finally, the Eaton *et al.* [22] review concluded that low self-esteem is related to risky sexual behavior, specifically because these young people may depend on the approval of their romantic and sexual partners to affirm their self-concepts.

Madu and Petlzer [33] developed a measure concerning condom use based on focus groups conducted with South African university students. Factor analysis of the measure yielded five components related to lack of condom use: poor relationship (condoms imply mistrust or unfaithfulness), misleading beliefs or myths (condoms don't work, only foreigners get AIDS), inconvenience of condom use, socially negative attitudes (shame surrounding having condoms), and non-availability. Some of these components reflect attitudes (poor relationship, social attitudes), while others might be more appropriately described as issues of self-efficacy (inconvenience and non-availability) and information (misleading beliefs).

Despite the increase in research on condom use among young people in Sub-Saharan Africa, the use of theory to guide research efforts is lacking, and the findings read more as a list rather than a coherent guiding framework upon which to base intervention efforts. Previous research with sub-Saharan African youth demonstrates that attitudes regarding condom use such as perceptions of condoms as a nuisance [4], normative support from peers and important others [22], and self-efficacy with regard to the acquisition, negotiation, and use of condoms [31, 33] are important correlates of condom use. This set of predictors is closely aligned with the framework of the Theory of Planned Behavior (TPB; [3]), upon which much many successful HIV/STD prevention research efforts and interventions have been partially or completely based [5]. According to the TPB, attitudes towards the behavior, normative support for the behavior, and perceived behavioral control over the behavior (similar to Bandura's [7]) notion of self-efficacy) are predictors of intentions. Intentions, in turn, are the most proximal predictor of actual behavior.

A meta-analysis of the TPB and its precursor the Theory of Reasoned Action (TRA) shows the robustness of these theories in predicting condom use intentions and behavior [5]. In a path analysis estimated with the combined averaged correlations across 96 studies, the TPB accounted for an average of 28% of the variance in behavior, and 50% of the variance in intentions. A more recent meta-analysis examined possible moderators of the model's effectiveness [6]. Specifically of interest are the findings on the impact of social power, wherein relationships in the model were as strong and in some cases stronger in samples of lower power, such as participants who were younger and less educated, and in samples where the percentage of women was higher. This suggests that the model may be appropriate for South African youth, who are young and likely in situations of low social power.

A recent review of school-based HIV interventions in Sub-Saharan Africa also points to the potential for the TPB in this context. Gallant and Maticka-Tyndale [27] reviewed 11 programs predominantly designed to increase

HIV knowledge, and to greater or lesser degrees designed to influence attitudes, self-efficacy, intentions, and/or behavior. One successful study conducted in Tanzania showed increases in attitudes and knowledge as well as communication and intentions to use condoms, and was based on the TRA plus self-efficacy from social cognitive theory (essentially, then, the TPB). Another study showed that increases in condom use as a result of their intervention were correlated with increases in positive attitudes towards condoms.

A primary goal of this study is thus to provide a rigorous test of the ability of TPB predictors to account for variability in condom use intentions among South African adolescents and determine the extent to which, consistent with the TPB, intentions prospectively predict condom use behavior. In addition to traditional TPB predictors, work with Sub-Saharan African adolescents demonstrates that there may be additional predictors relevant to this population: self-esteem, a sense of hope about the future, different standards for the sexual behavior of young men versus young women, perceptions of control over sexual encounters, and possessing accurate HIV and condom information. We have combined these predictors into a theoretical model of intentions based on the TPB, but with the addition of sub-population relevant constructs that might help to explain how the more proximal precursors of intentions (attitudes, norms, and self-efficacy) accrue. Our hypothesized theoretical model is comprised of the solid paths in Fig. 1.

Not shown in the Figure is the final link in the TPB; that between intentions and behavior. Due to the nature of our sample (only one-third were sexually active during our follow-up interval) we chose to split our study into two key questions. First, to what degree do TPB predictors of attitudes, norms, and self-efficacy account for variability in intentions and do the sub-population relevant constructs help to determine how these TPB predictors may accrue? This question can be answered using the full sample, since all adolescents can have valid data for intentions regardless of their sexual experience/activity status. Second, and also consistent with the TPB, to what degree do intentions (and perhaps self-efficacy) account for variability in condom use behavior prospectively? According to the TPB, the influence of attitudes, norms, and self-efficacy on behavior is indirect, and occurs through their association with intentions. For this question we were limited to the sub-sample who reporting being sexually active in our follow-up interval, and thus had valid outcome data for condom use behavior.

The overall models of intentions and behavior are derived from recent work with U.S. adolescents, which suggest constructs that in many ways mirror the important findings of descriptive work with African adolescents. For example,

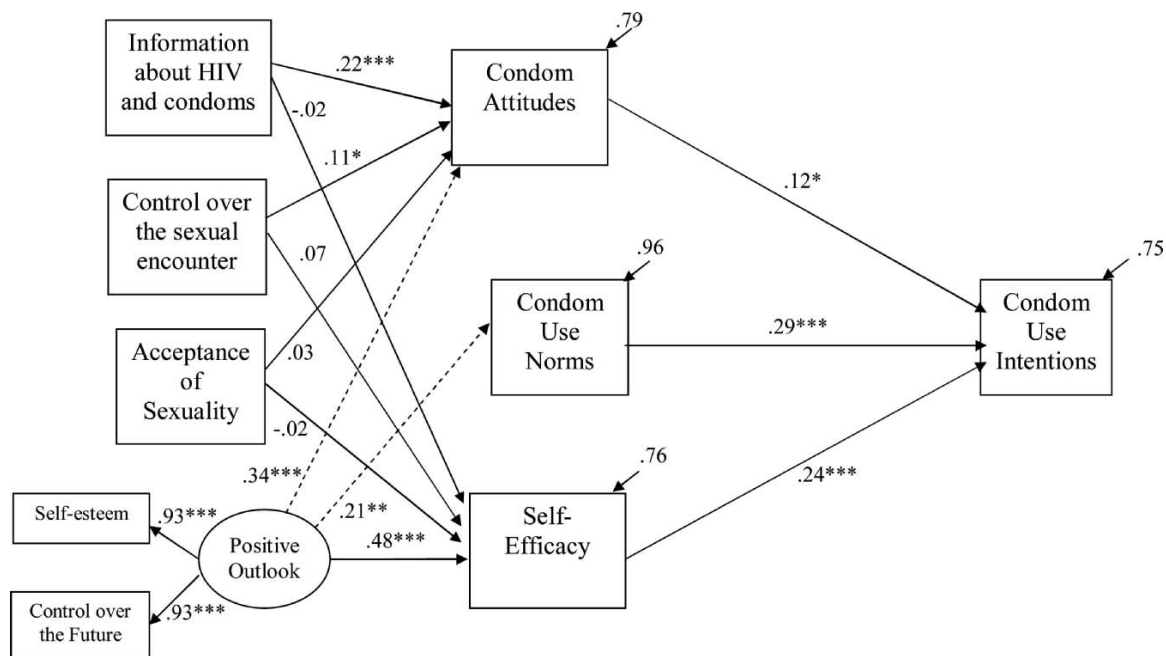


Fig. 1 Model of condom use intentions among the full sample of South African high school students. Coefficients are standardized path coefficients. All exogenous correlations are estimated and all correlations among attitudes, norms, and self-efficacy are estimated, though for

simplicity these correlations are not shown. Overall model fit: $\chi^2(13, n = 261) = 10.09, p = .69, CFI = 1.00, RMSEA = .00, 90\%$ confidence intervals (CI) of the RMSEA [.00–.05], SRMR = .02. Significance levels for paths: * $p < .05$, ** $p < .01$, *** $p < .001$

our research [9, 10, 15] has shown that control over the sexual encounter and acceptance of sexuality proved to be important precursors of condom use self-efficacy, particularly for women. Work with high risk adolescents [12, 13] suggests that a sense of self-esteem and a positive orientation towards the future are important precursors of condom use self-efficacy in a largely male, criminally involved, high risk adolescent population. Thus we include control over the sexual encounter and acceptance of sexuality as precursors of self-efficacy and condom attitudes, while we include self-esteem and positive future orientation as precursors of self-efficacy in the model of intentions. Another important potential factor in the South African context is deficits in HIV and condom use information [33]. Some theorists explicitly include an information component in their models of HIV preventive behavior [23, 24]. Fisher and Fisher [25] have found evidence in some populations for a relationship between information and attitudes towards, as well as self-efficacy for, the use of condoms. We therefore included information in our theoretical model of intentions, as a putative correlate of attitudes and of self-efficacy.

The importance of the role of gender in the sexual relationships, HIV risk behavior, and condom use of South African adolescents cannot be overstated [29]. Thus, a second goal of this study is to examine gender differences in the relation of TPB constructs to the population-specific precursors of those constructs, and the relation of all of these

variables to condom use intentions and behavior. It may be that some constructs are more important to the development of positive attitudes, norms, intentions and behavior for girls (e.g., control over the sexual encounter, acceptance of sexuality) while others (e.g., self-esteem, optimism about the future) may be more important to boys. We also examine the extent to which sexual activity status moderates the relations in the model of intentions, as there is some evidence to suggest that this is an important distinction to make when designing intervention content [26, 28].

There is a rich body of research on the correlates of condom use among South African youth. However, very few if any of these studies are theory-based, and even fewer include a prospective design to test the relationship of theoretical constructs to condom use behavior in the future. The present paper represents an effort to specifically examine the TPB in the South African context, to attempt to augment the basic model with additional constructs shown to be important for adolescents in other countries, to use this set of predictors in a prospective evaluation, and to examine the role of gender and sexual activity status in the prediction of condom use intentions and behavior among South African adolescents. We believe that theory-based evaluations of this nature lay the groundwork for the design of future theory-based, empirically supported HIV prevention interventions.

Method

Participants

Time 1 data were collected from 261 predominantly “colored” (96%) adolescents¹ (151 female, 110 male) who were ninth and tenth graders attending a secondary school located in a low-income township southeast of Cape Town, South Africa. The township is located on the Cape Flats and was established three decades ago to provide housing for South Africans classified as “colored” under the system of apartheid and presently has a high proportion of unemployed residents. Due to South Africa’s policy of racial discrimination that ended in 1994, most schools in the area are poorly resourced. Many of the parents of these adolescents are unemployed, while some work in blue- or white-collar jobs. The mean age of participants was 16.2, and participants ranged in age from 14 to 19.

Of the 245 participants who answered the question, 53 (21%) reported having had intercourse. Of these, 15 (28%) were female and 38 (72%) were male. Average age at first intercourse was 14.9 years (range 11–17). We note that this is considerably younger than average age at first intercourse in two recent reports [22, 36]. In terms of frequency of intercourse, 40% of participants reported having sex a few times a year, 18% had sex once a month, 22% had sex once a week, 15% had sex 2–3 times a week, and 5% had sex 4–5 times a week. Among those who reported having had sexual intercourse at least once, the median number of lifetime sexual partners was 1 (range 1–17), and less than half (41%) reported consistent condom use.

Design and procedures

Adolescents in 10th and 11th grade at the school were informed of the nature of the study and were asked to take home passive consent forms to be reviewed by a parent or guardian. We asked parents or guardians to notify either the school or the research team if they preferred that the adolescent not participate in the study. Few parents or guardians (< 1%) disallowed their child’s participation. Lack of notification from a parent or guardian in conjunction with the adolescent’s own agreement to participate served as consent. All questionnaires were distributed and completed in class. Adolescents were asked to complete the questionnaires honestly and were informed that their answers would be

kept confidential. Approximately 4 months after the initial questionnaire administration, the adolescents completed a follow-up questionnaire. All participants were informed that their involvement in both surveys was completely voluntary, that they could choose not to answer any questions that made them uncomfortable, and that they could withdraw from the study at any time. Of the adolescents eligible to participate (i.e., those who had given consent and who were in class on the days the questionnaires were distributed), a small number (<2%) declined to participate.

Time 1 measures

Participants were given self-administered, paper-and-pencil questionnaires assessing a range of psychological, behavioral, and socio-demographic variables. Each of the model constructs in Fig. 1 was also assessed, as was previous sexual history. Descriptions of the measures of model constructs can be found in Table 1.

Previous condom use

Previous condom use was assessed with 1 question, “How much of the time have you used condoms when you’ve had sexual intercourse?” and a 5-point likert scale ranging from “never” to “always” was used to score responses.

Time 2 procedures and measures

Participants were contacted 4 months after they completed the first questionnaire to complete the time 2 measure of sexual and condom use behavior in the preceding 4 months. An 87% retention rate was obtained at time 2; 227 of the original 261 participants completed the time 2 assessment. Of those 227 participants who completed the follow-up assessment, 72 (32%; 42 boys and 30 girls) reported having had sex in the past 4 months. Asking participants how much of the time they used condoms during intercourse in the last 4 months on a 5-point Likert scale ranging from “never” to “always” assessed follow-up condom use. Of the 72 participants, who reported having had sexual intercourse in the previous 6 months and had valid data for the condom use items, 24% reported “always” using condoms in the past 4 months, 60% said they “never” used condoms, and the rest used condoms inconsistently.

Results

The means and standard deviations for all intention model variables, along with the correlations among intention model constructs for the full sample, appear in Table 2. In line with the TPB, there were significant bivariate relationships

¹ The system of apartheid, which ended in 1994, legally required that South Africans be identified by race and reside in areas or townships reserved only for members of their specific race. In the post apartheid era most South Africans continue to live in racially homogeneous areas. The term “colored” refers to persons of mixed race and Khoisan descent, who during the apartheid era were classified as neither White nor Black.

Table 1 Measured constructs, source of items, coefficient alpha (α), and sample items

Construct name	Items	Source	α	Sample items
Information about HIV and condoms	19	Fisher <i>et al.</i> [26]	.64	You can tell whether someone has HIV or AIDS by the way they look Using latex condoms during sex can protect you from getting HIV
Self-esteem	8	Rosenberg (1965)	.72	I feel that I have a number of good qualities
Control over the future	7	Whitaker <i>et al.</i> , (2000)	.65	My future is what I make of it
Acceptance of sexuality	5	Bryan <i>et al.</i> [10, 15]	.65	I believe my sexuality is a part of my personality
Control over the sexual encounter	4	Bryan <i>et al.</i> [10, 15]	.37	I believe I could make decisions about what goes on when I have sex
Attitudes towards condom use	4	Bryan <i>et al.</i> [12]	.59	Condoms can ruin the sexual mood (reversed)
Subjective norms for condom use	8	Fisher <i>et al.</i> [26]	.79	Friends that I respect think I should use condoms every time, if I have sex, during the next 4 months
Condom use self-efficacy	16	Brien <i>et al.</i> (1994)	.72	I am confident that I could get condoms without feeling embarrassed I could suggest using condoms even to a new partner
Safer sex intentions	4	Bryan <i>et al.</i> [12]	.86	How likely is it that you will use a condom every time you have sexual intercourse in the next 4 months?

between intentions and attitudes, norms, and self-efficacy. There was also a significant correlation, as expected, between information and attitudes. As with our prior work [13, 15] there was a high correlation between self-esteem and optimism about the future. For this reason these variables were specified as indicators of a latent construct called “positive outlook” for the structural equation modeling analyses. In Table 3, we present tests for mean differences on model constructs by gender, sexual activity status, and their interaction. There were significant gender differences on self-esteem and control over the sexual encounter, such that boys had *higher* self-esteem than girls, and girls had *higher* perceived control over the sexual encounter than boys. Virgins had significantly higher self-esteem and control over the future, while non-virgins had, not surprisingly, higher intentions to use

condoms in the future. There were no gender X sexual activity status interactions.

Model of condom use intentions

The model in Fig. 1 (less the paths with the dotted arrows) was estimated in the full sample from the Time 1 data using the EQS 6.1 structural equation modeling program and exhibited adequate fit to the data, $\chi^2(15, n = 261) = 43.68, p < .001, CFI = .95, RMSEA = .09, 90\%$ confidence intervals (CI) of the RMSEA [.06–.12], SRMR = .09. However, there were two large modification indices suggesting additional paths we had not originally hypothesized. One was a direct path from positive outlook to condom attitudes, and a second was a direct path from positive outlook to norms

Table 2 Correlations among model variable and means and standard deviations for full sample ($n = 261$)

Variable	1	2	3	4	5	6	7	8	9
1. Information	–								
2. Self-esteem	.14*	–							
3. Control over the future	.15*	.58***	–						
4. Acceptance of sexuality	.06	.03	.11	–					
5. Control over the sexual encounter	.13*	.05	.10	–.06	–				
6. Condom use attitudes	.26***	.11	.20**	.07	.17**	–			
7. Condom use norms	.07	–.02	.05	.05	.03	.25***	–		
8. Condom use self-efficacy	.04	.11	.05	–.02	.13*	.15*	.32*	–	
9. Condom use intentions	.09	.02	.02	–.04	.01	.22***	.40***	.34***	–
Mean	12.78	3.29	3.38	2.71	3.17	3.92	3.59	2.67	2.51
Standard deviation	2.87	.48	.46	.60	.63	.87	.84	.44	.97

* $p < .05$

** $p < .01$

*** $p < .001$

Table 3 Means and standard deviations for model constructs overall and by gender and sexual activity status (SAS)

Variable	Mean (SD) by gender and SAS				Tests for difference ^a		
	Male virgins (<i>n</i> = 62)	Female virgins (<i>n</i> = 129)	Male non-virgins (<i>n</i> = 38)	Female non-virgins (<i>n</i> = 15)	Gender	SAS	Gender X SAS
Information	12.90 (2.88)	12.75 (2.81)	12.16 (2.84)	13.47 (3.00)	<i>F</i> = 1.42	<i>F</i> = .00	<i>F</i> = 2.25
Self-esteem	3.36 (.52)	3.32 (.43)	3.21 (.46)	2.91 (.58)	<i>F</i> = 4.55*	<i>F</i> = 12.14***	<i>F</i> = 2.63
Control over the future	3.44 (.51)	3.40 (.42)	3.30 (.40)	3.08 (.56)	<i>F</i> = 2.91	<i>F</i> = 9.01**	<i>F</i> = 1.30
Acceptance of sexuality	2.68 (.63)	2.66 (.62)	2.88 (.49)	2.76 (.57)	<i>F</i> = .48	<i>F</i> = 2.25	<i>F</i> = .23
Control of sexual encounter	2.94 (.66)	3.29 (.65)	3.03 (.44)	3.52 (.32)	<i>F</i> = 16.61***	<i>F</i> = 2.34	<i>F</i> = .37
Condom attitudes	3.80 (.85)	4.08 (.81)	3.63 (.88)	3.87 (1.10)	<i>F</i> = 3.12	<i>F</i> = 1.71	<i>F</i> = .02
Condom use subjective norms	3.59 (.83)	3.56 (.87)	3.86 (.83)	3.55 (.72)	<i>F</i> = 1.33	<i>F</i> = .79	<i>F</i> = .93
Condom use self-efficacy	2.66 (.63)	2.63 (.47)	2.83 (.34)	2.69 (.45)	<i>F</i> = 1.34	<i>F</i> = 2.38	<i>F</i> = .61
Condom use intentions	2.41 (.93)	2.41 (1.01)	3.05 (.75)	2.57 (1.03)	<i>F</i> = 2.16	<i>F</i> = 5.84*	<i>F</i> = 2.17

^aDue to sporadic missing data on some items, the degrees of freedom differ slightly for some tests. Degrees of freedom range from (1, 239) to (1, 241)

**p* < .05,

***p* < .01

****p* < .001

for condom use. It appears that having optimism about the future and high self-esteem had more pervasive relationships with the predictors of condom use intentions than originally thought. With the inclusion of these two paths (dotted in the figure), the fit of the intentions model was improved, $\chi^2(13, n = 261) = 10.09, p = .69, CFI = 1.00, RMSEA = .00, 90\%CI [.00-.05], SRMR = .02$. Standardized parameter estimates and significance levels for the final intentions model appear in Fig. 1. Consistent with previous research and with the bivariate correlations, higher levels of information about HIV and condoms were related to more positive condom attitudes. Positive outlook was strongly related to all of the TPB variables. There were significant associations from attitudes, norms, and self-efficacy to intentions, supporting the validity of the basic TPB in this context. In addition, information and positive outlook emerged as significant precursors of TPB constructs that may in part explain how these more proximal constructs accrue. This model accounted for 22% of the variability in condom use intentions. According to Cohen [17], this represents a medium to large effect size for multivariate models in the social sciences.

We next examined whether gender and sexual activity status moderated any of the relationships in the intentions model. First, we estimated the intentions model in girls (*n* = 151) versus boys (*n* = 110) to examine its consistency across gender. A cross-groups model [1, 8] was estimated in EQS such that the exact model in Fig. 1 was simultaneously estimated in girls versus boys. Standardized parameter estimates and significance levels from the cross-groups analysis by gender appear in Fig. 2, with coefficients for girls appearing before the “/” and those for boys appearing after the “/”.

The initial estimation constrained all structural paths, loadings on the latent variable of positive outlook, and covariances to be equal in the two groups. Lagrange multiplier statistics [32] suggested two structural paths upon which the two groups significantly differed (paths and coefficients shown in bold). One was the relationship of information to attitudes, and the second was the relationship of positive outlook to self-efficacy. These two parameters were freely estimated in a second model, and the results indicated only a minor difference in the positive outlook to self-efficacy relationship, but both relationships were still strong and significant. However, the relationship between information and attitudes, significant in the full model, was *not* significant for boys and *was* significant for girls. This suggests that for girls, attitudes regarding condoms are significantly correlated with their level of correct information about HIV transmission and the use of condoms to prevent it.

In terms of gender differences in the correlations among model variables, the Lagrange multiplier statistics suggested one correlation that was significantly different for girls versus boys. We re-estimated the model, allowing the correlation between control over the sexual encounter and positive outlook (as well as the path from information to attitudes) to freely vary in the two groups. The correlation between positive outlook and control over the sexual encounter was significant for boys but not girls. To summarize, we believe the important gender differences to be the information to attitude relationship and the positive outlook to control correlation. Our final cross-groups intentions model allowed only those two paths to vary. The fit was adequate, $\chi^2(43, n = 261) = 44.24, p = .42, CFI = 1.00, RMSEA = .01, 90\%CI [.00-.04], SRMR = .06$, and the constructs accounted for

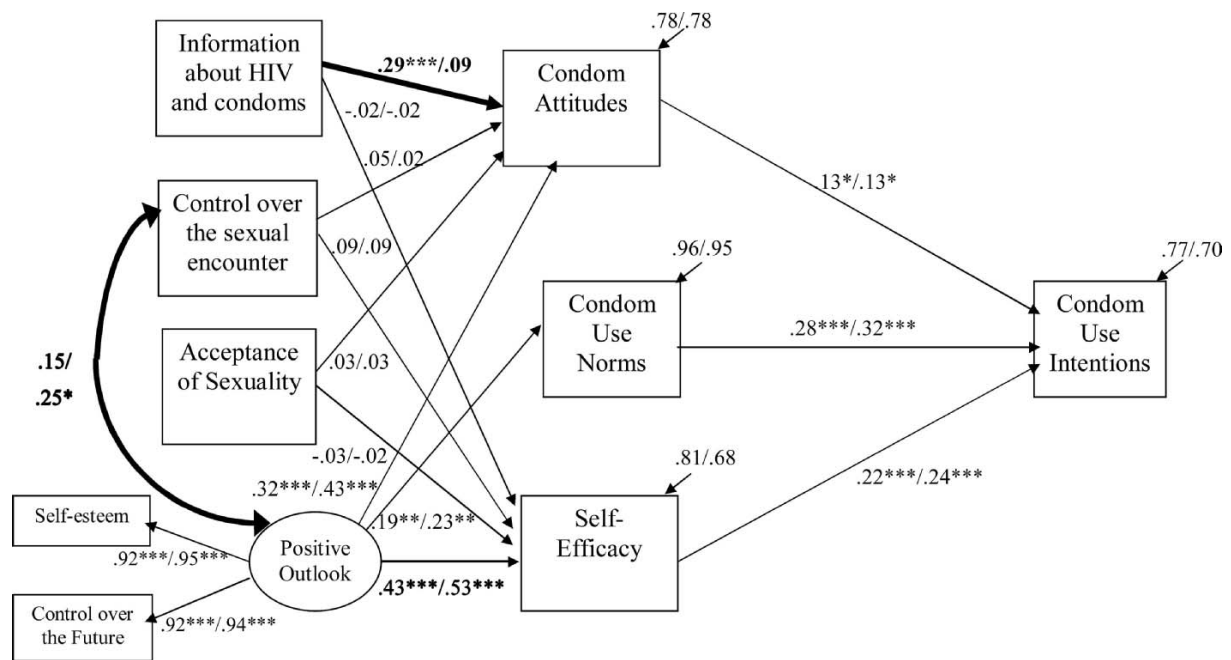


Fig. 2 Model of condom use intentions estimated as a cross-groups comparison between South African high school girls (first parameter estimate) and boys (second parameter estimate after “/”). Coefficients are standardized path coefficients. All exogenous correlations are estimated and all correlations among attitudes, norms, and self-efficacy are estimated, though for simplicity only those that differ by

sex are shown. All significance levels for paths are equivalent across groups with the exception of the two boldface paths. Overall model fit: $\chi^2(43, n = 261) = 44.24, p = .42, CFI = 1.00, RMSEA = .01, 90\% CI [0.00-.04], SRMR = .06$. Significance levels for paths: * $p < .05$, ** $p < .01$, *** $p < .001$

23% of the variance in intentions for girls, and 30% of the variance in intentions for boys.

We also estimated a cross-groups comparison where models for sexually active adolescents versus virgins were simultaneously estimated. The modification indices suggested no paths or correlations on which the two groups differed, so the results of this estimation are not presented. Unfortunately, sample characteristics did not permit the estimation of a 4-group model that would compare male virgin, male sexually active, female virgin, and female sexually active participants. The sample sizes (see Table 3) were simply inadequate for this purpose.

Prediction of condom use behavior among sexually active adolescents

Only a small percentage of the sample ($n = 72$; 30 girls, 42 boys) reported sexual activity in the 4 months between the baseline assessment and the behavioral follow-up. Because of the reduction in sample size (and thus, power) for analyses of behavior, we adopted an alpha of .10 to determine the statistical significance of our findings. Consistent with the TPB, we regressed time 2 condom-use behavior on the most proximal determinants of behavior – attitudes, norms, self-efficacy, and intentions. As would be expected by the TPB, only intentions was a significant predictor of behavior 4 months later, $B = .28, p < .05, pr^2 = .06$. This model

accounted for 14% of the variance in behavior, a medium effect size. We then regressed behavior on all time 1 measures of model constructs (information, positive outlook, acceptance of sexuality, control over the sexual encounter, attitudes, norms, self-efficacy scale, and intentions) to assure that, as would be expected by the TPB, any relationship of the endogenous variables in the intentions model to behavior were indeed indirect, and occurring through their relationship with other TPB variables. Unexpectedly, a relationship between acceptance of sexuality and condom use emerged, $B = .24, p < .05, pr^2 = .05$. This was interesting, as we did not see the predicted indirect relationship of acceptance of sexuality to behavior mediated by self-efficacy for condom use. This main effect version of the model of behavior accounted for 24% of the variance in condom use behavior, a large effect size.

We next examined the role of gender in predicting condom use. We had specific hypotheses, based on previous work [11] that the influence of acceptance of sexuality and control over the sexual encounter might differ for boys versus girls. These hypotheses were not borne out in our analysis of intentions, but we felt it important to test this question with regard to the prediction of behavior. So, our next step was to regress condom use on gender, intentions (the only significant TPB predictor of behavior), acceptance and control. In this equation, intentions, $B = .24, p < .05, pr^2 = .06$, acceptance of sexuality, $B = .20, p < .10, pr^2 = .04$, and

gender, $B = .28$, $p = .01$, $pr^2 = .07$, were significant predictors of condom use. Boys, adolescents with higher acceptance of sexuality at time 1, and those with more positive condom use intentions at time 1, were more likely to use condoms 4 months later. In order to test whether gender moderated the relation of intentions, acceptance and control to condom use, we estimated a final regression model. All the main effects in the previous equation (gender, intentions, acceptance of sexuality, control over the sexual encounter) and the interactions of gender \times intentions, gender \times acceptance, and gender \times control were entered into the equation. Because of the unequal distribution on the dichotomous predictor of gender, we utilized a weighted effects code for gender in the construction of the interaction terms [2]. The continuous predictors of acceptance, intentions, and control were centered prior to the formation of interaction terms [2]. So the full model included the weighted effect code for gender, the centered main effects of acceptance, control, and intentions, and the gender \times acceptance, gender \times control, and gender \times intentions interaction terms. The only significant interaction term was gender \times control over the sexual encounter, $B = -.26$, $p = .01$, $pr^2 = .06$. The form of this interaction appears in Fig. 3. As can be seen in the figure, the relation between control and condom use, while in the expected direction (positive), is not reliable for girls ($B = .14$, $p = .38$). In contrast, the relation is strong and in the negative direction for boys, $B = -.40$, $p < .01$, $pr^2 = .08$. In other words, boys who feel less control over the sexual situation are more likely to actually use condoms. This final model of behavior accounted for 37% of the variance in condom use behavior, a large effect size [17].

Discussion

Our data show that the TPB may have potential utility in predicting behavioral intentions and behavior among a sample

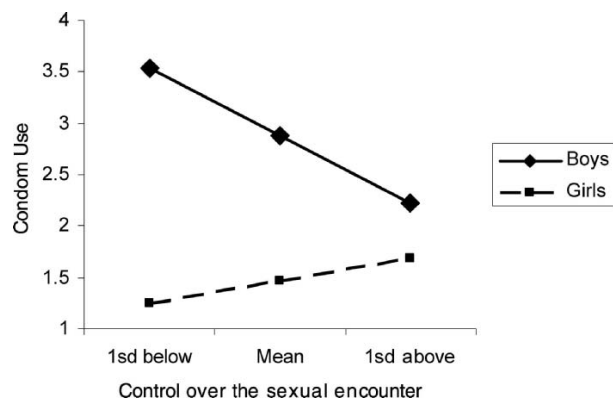


Fig. 3 Relationship between control over the sexual encounter and condom use by gender

drawn from a developing country context. The inclusion in the intentions model of positive outlook as a latent variable, comprising the observed variables of self-esteem and control over the future, is an addition that extends the TPB beyond its original form. The addition of this variable represents an attempt to modify the model to suit the context of a socially marginalized group represented by our sample. In addition to being significantly associated with self-efficacy, a positive outlook was also associated with a positive attitude towards condoms and perceptions regarding norms of condom use, all of which in turn were significantly related to condom use intentions. In the context of a historically disadvantaged population from which this sample was drawn, the question of a positive outlook that includes being able to determine the course of one's future is of considerable consequence.

The longitudinal design employed in this study enabled us to describe the relationship between behavioral intentions and actual behavior. In many previous studies where attitudes and behavior have been tested simultaneously, claims about the prediction of behavior have been untenable as temporal precedence was not established (e.g., [14, 18]). To this extent, the present study represents a unique contribution to understanding the determinants of actual condom use, as our final regression model accounted for 37% of the variance in condom use behavior—more than the average amount of variance explained by TPB predictors (28%; cf. [5]).

For girls, attitudes regarding condoms were significantly correlated with the level of correct information they had about HIV transmission and the use of condoms to prevent it. The same relationship was not significant for boys in the sample. One possible explanation is that the risk of both unwanted pregnancy and HIV/STD infection is more salient for girls than for boys. The high rate of teenage pregnancies in the Western Cape from which this sample was drawn is a visible indicator of the prevalence of unprotected sex [19]. Possibly for girls the use of condoms is seen as a means to reduce both the possibility of pregnancy and the likelihood of HIV infection. Having a correct understanding of the effectiveness of condoms is thus more likely to be associated with positive attitudes about their use among girls.

In general, boys were more likely than girls to use condoms, and this is consistent with prior research in both Western and non-Western samples, though is somewhat at odds with the TPB. A strict TPB interpretation would require that effects of demographic variables on behavior should be mediated by attitudes, norms, self-efficacy, and intentions. As we alluded to in the introduction, the role of gender in South Africa cannot be overstated, and our data suggest that gender indeed explains a unique proportion of variance in condom use behavior over and above the constructs posited in the theoretical model. But there was a moderation of this gender difference by perceptions of control over the sexual encounter.

For girls there was no reliable relationship between control over the sexual encounter and condom use, while for boys we found an unexpected negative relationship between control and condom use. Boys who reported less control over sexual encounters were more likely to use condoms than boys who reported more control. At the same time, girls in the sample perceived significantly higher control over the sexual encounter than boys. This phenomenon may be explained by the likelihood that, other than in cases of forced sex, girls are often the ones who decide whether or not sexual activity will take place, and due to this “gate keeper” role perceive higher control over the sexual encounter than boys (cf. [15]). Work by Jewkes *et al.* [30] on the prevalence of forced sex in South Africa, however, makes our findings even more unexpected in this context. In a matched case-control study of pregnant and non-pregnant adolescent girls, 31.9% of cases and 18.1% of controls reported being forced or raped at first intercourse. Yet Jewkes *et al.* [29] found that South African women who had been financially or physically abused by their partners in the past year were *more* likely to suggest using condoms. In yet a different examination of control, Dunkle *et al.* [21] found that pregnant South African women who perceived that their partner had high control over them were more likely to be HIV +, more likely to say they had never used a condom, and more likely to report recent and previous partner violence. It may be that the various studies are capturing different phenomena. The Dunkle *et al.* [21] scale “measures a woman’s subjective experience of being controlled within a relationship, irrespective of the occurrence of overt types of violence” (p. 1419), the Jewkes *et al.* [29, 30] studies focus explicitly on number of episodes of forced sex, and our study asks specifically about control in the context of the sexual encounter as opposed to in the relationship generally. It appears that these are distinct measures of relationship quality, and each may thus have a distinct relation to condom use and therefore HIV risk. In the empirical literature we are only beginning to understand the complex and multidimensional nature of the role of power in relationships, and its impact on violence, safer sexual behavior, and HIV risk.

The *use* of control in relationships may also differ by gender. Our data suggest that boys who perceive they have more control over what happens in the sexual encounter are more likely *not* to use condoms. Exercising this decision-making power in the direction of not using condoms might have any number of explanations, e.g., the social context among South African youth, interpersonal factors such as the spontaneous nature of many sexual encounters among adolescents, and intra-personal factors such as reduced sensation and the idea that planning for sex is in some manner morally problematic. Alternatively, our version of the construct may be capturing different underlying dimensions of control for girls versus boys. In the final analysis, however, we hesitate to speculate

too widely on this finding without replication, due to the low reliability of the control measure.

For boys a positive outlook was associated with control over the sexual encounter, while for girls it was not. One interpretation of this finding is that boys who have a positive outlook may also feel more empowered to take charge of their lives and thus assert greater control over their sexual encounters. On the other hand, greater control over sexual encounters may also result in a positive outlook as sexually active male (but not female) adolescents often enjoy an elevated status among their peers in many South African communities.

Overall, the results of the study suggest that the TPB is appropriately used among samples in developing countries such as South Africa, despite the misgivings of some theorists that social cognitive theories are at variance with the cultural and contextual realities that characterize these populations (e.g., [16]). Our findings suggest that TPB predictors of attitudes, norms, and self-efficacy are appropriate in explaining condom use intentions, and that intentions is appropriate for at least partially explaining condom use behavior among youth living on the Cape Flats in South Africa, despite the unique cultural, social, and historical circumstances that characterize this population. In terms of interventions, the findings of the study suggest that providing adolescents with greater information regarding safer sex practices and engaging in discussions regarding acceptance of sexuality may increase the likelihood that they will develop a positive attitude towards condom use, which may, through increased behavioral intentions, enhance the likelihood of actual use of condoms. At a more general level, interventions directed at instilling a positive outlook among adolescents have significant social implications. Research by Diener and Seligman [20] suggests that while income has diminishing returns on optimism in wealthy nations, it is still an important determinant of well-being among developing nations. Stable and trustworthy governance also appears integral to the development of overall well-being. In the context of unemployment, poverty, and racism, all of which comprise the legacy of South Africa’s history of legalized racial discrimination, developing a positive outlook will likely require social and economic development as well as psychological and interpersonal interventions.

An important limitation of the study is that the data concerning condom use were based on only 72 participants, less than 1/3 of the follow-up sample, who reported being sexually active. This limitation may have significant consequences for the external validity of the study. A second limitation of the study is that some of our measures had suboptimal reliability. In particular, control over the sexual encounter had low internal consistency $\alpha = .37$. Interestingly, control over the sexual encounter was a significant correlate of other variables in the study

including, through its interaction with gender, actual condom use. So the extent to which the measure was unreliable suggests that we are actually *underestimating* the importance of this construct. A possible reason for the low internal consistency of this measure is that this construct as written may be culturally inappropriate to the population of South African adolescents, given the collectivist nature of the social context. In societies such as South Africa, where individual volition may be less salient than the degree of marginalization experienced by individuals and communities in determining behavior, perceptions of control over sexual activity may require reconceptualization. It is clear from prior research and this study that the relational, cultural, and contextual aspects of control in the sexual situation and its influence on condom use behavior are in need of further investigation.

References

- Aiken, L. S., Stein, J. A., and Bentler, P. M. (1994). Structural equation analyses of clinical subpopulation differences and comparative treatment outcomes: Characterizing the daily lives of drug addicts. *Journal of Consulting and Clinical Psychology, 62*, 488–499.
- Aiken, L. S., and West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage.
- Ajzen, I., and Madden, T. (1986). Prediction of goal-directed behavior: Attitudes, intentions, and perceived behavioral control. *Journal of Experimental Social Psychology, 22*, 453–474.
- Akande, A. (2001). Risky Business: South African youths and HIV/AIDS prevention. *Educational Studies, 27*, 237–256.
- Albarracin, D., Johnson, B. T., Fishbein, M., and Muellerleile, P. A. (2001). Theories of reasoned action and planned behavior as models of condom use: A meta-analysis. *Psychological Bulletin, 127*, 142–161.
- Albarracin, D., Kumkale, G. T., and Johnson, B. (2004). Influences of social power and normative support on condom use decisions: A Research synthesis. *AIDS Care, 16*, 700–723.
- Bandura, A. (1992). A social cognitive approach to the exercise of control over AIDS infection. In R. J. DiClemente (Ed.), *Adolescents and AIDS: A Generation in Jeopardy*. Newbury Park, CA: Sage.
- Bentler, P. M. (1995). *EQS: Structural Equations Program Manual*. Multivariate Software, Inc.: Encino, CA.
- Bryan, A. D., Aiken, L. S., and West, S. G. (1996). Increasing condom use: Evaluation of a theory-based intervention to decrease sexually transmitted disease in women. *Health Psychology, 15*, 371–382.
- Bryan, A. D., Aiken, L. S., and West, S. G. (1997). Young women's condom use: The influence of responsibility for sexuality, control over the sexual encounter and perceived susceptibility to common STDs. *Health Psychology, 16*, 468–479.
- Bryan, A. D., Aiken, L. S., and West, S. G. (1999). The impact of males' proposing condom use on perceptions of an initial sexual encounter. *Personality and Social Psychology Bulletin, 25*, 268–275.
- Bryan, A., Aiken, L. S., and West, S. G. (2004). HIV/STD risk among incarcerated adolescents: Optimism about the future and self-esteem as predictors of condom use self-efficacy. *Journal of Applied Social Psychology, 34*, 912–936.
- Bryan, A., Rocheleau, C. A., Robbins, R. N., and Hutchison, K. E. (2005). Condom use among high-risk adolescents: Testing the influence of alcohol use on the relationship of cognitive correlates of behavior. *Health Psychology, 24*, 133–142.
- Bryan, A., Ruiz, M. A., and O'Neill, D. (2003). HIV-related behaviors among prison inmates: A Theory of Planned Behavior analysis. *Journal of Applied Social Psychology, 33*, 2565–2586.
- Bryan, A. D., Schindeldecker, M. S., and Aiken, L. S. (2001). Sexual self-control and male condom-use outcome beliefs: Predicting heterosexual men's condom use. *Journal of Applied Social Psychology, 31*, 1911–1938.
- Campbell, C. (2003). *Letting them die: How HIV/AIDS prevention programmes often fail*. Bloomington, IN: Indiana University Press.
- Cohen, J. (1988). *Statistical power analyses for the behavioral sciences*. (2nd Ed.). Hillsdale, NJ: Lawrence Erlbaum.
- Conner, M., Flesch, D. (2001). Having casual sex: Additive and interactive effects of alcohol and condom availability on the determinants of intentions. *Journal of Applied Social Psychology, 31*, 89–112.
- Department of Health (2002), Medical Research Council and Measure DHS + . South Africa Demographic and Health Survey. Department of Health: Pretoria.
- Diener, E., and Seligman, M. E. P. (2004). Beyond money: Toward an economy of well-being. *Psychological Science in the Public Interest, 5*, 1–31.
- Dunkle, K. L., Jewkes, R. K., Brown, H. C., Gray, G. E., McIntyre, J. A., and Harlow, S. D. (2004). Gender-based violence, relationship power, and risk of HIV infection in women attending antenatal clinics in South Africa. *Lancet, 363*, 1415–1421.
- Eaton, L., Flisher, A. J., and Aaro, L. E. (2003). Unsafe sexual behavior in South African youth. *Social Science and Medicine, 56*, 149–165.
- Fisher, J. D., and Fisher, W. A. (1992). Changing AIDS risk behavior. *Psychological Bulletin, 111*, 455–474.
- Fisher, J. D., and Fisher, W. A. (2000). Theoretical approaches to individual-level change. In J. Peterson and R. DiClemente (Eds.), *HIV Prevention Handbook* (pp. 3–55). New York: Kluwer Academic/Plenum Press.
- Fisher, J. D., and Fisher, W. A. (2002). The Information-Motivation-Behavioral Skills Model. In R. DiClemente, R. Crosby and M. Kegler (Eds.), *Emerging Promotion Research and Practice*. San Francisco, CA: Jossey Bass Publishers.
- Fisher, J. D., Fisher, W. A., Bryan, A. D., and Misovich, S. J. (2002). Information-motivation-behavioral skills model-based HIV risk behavior change intervention for inner-city high school youth. *Health Psychology, 21*(2), 177–186.
- Gallant, M., and Maticka-Tyndale, E. (2004). School-based HIV prevention programmes for African youth. *Social Science and Medicine, 58*, 1337–1351.
- Jemmott, J. B., Jemmott, L. S., and Fong, G. T. (1998). Abstinence and safer sex HIV risk-reduction interventions for African American adolescents. *Journal of the American Medical Association, 279*, 1529–1536.
- Jewkes, R. K., Levin, J. B., Penn-Kekana, L. A. (2003). Gender inequalities, intimate partner violence and HIV preventive practices: Findings of a South African cross-sectional study. *Social Science and Medicine, 56*, 125–134.
- Jewkes, R., Vundule, C., Maforah, F., and Joraaan, E. (2001). Relationship dynamics and teenage pregnancy in South Africa. *Social Science and Medicine, 52*, 733–744.
- Karim, A. S. S., Karim, A. Q., Preston-Whyte, E., and Sankar, N. (1992). Reasons for lack of condom use among high school students. *South African Medical Journal, 92*, 107–110.
- MacCallum, R. C. (1995). Model specification: Procedures, strategies and related issues. In R. H. Hoyle (Ed.), *Structural Equation Modeling: Concepts, Issues, and Applications* (pp. 16–36). Thousand Oaks, CA: Sage.

33. Madu, S. N., and Peltzer, K. (2003). Factor structure of condom attitudes among black South African university students. *Social Behavior and Personality*, *31*, 265–274.
34. National Institute of Mental Health (NIMH) Multisite HIV Prevention Trial Group (1998). The NIMH multisite HIV prevention trial: Reducing HIV sexual risk behavior. *Science*, *280*, 1889–d information in our theoretical model of intentions, as a putative correlate of attitudes and of 1894.
35. Shisana, O., and Simbaya, L. (2002). South African national HIV prevalence, behavioral risks and mass media household survey 2002. Cape Town: Human Sciences Researchd information in our theoretical model of intentions, as a putative correlate of attitudes and of Council.
36. Simbayi, L. C., Chauveau, J., and Shisana, O. (2004). Behavioural responses of South African youth to the HIV/AIDS epidemic: A nationwide survey. *AIDS Care*, *16*, 605–618.
37. Taylor, M., Dlamini, S. B., Kagoro, H., Jinabhai, C. C., and de Vries, H., (2003). Understanding high school students' risk behaviors to help reduce the HIV/AIDS epidemic in KwaZulu-Natal, South Africa. *Journal of School Health*, *73*, 97–100.
38. World Bank. (2000). Intensifying action against HIV/AIDS: Responding to the development crisis. Washington, D.C.: World Bank.
39. World Health Organization. (1998). Acquired Immunodeficiency Syndrome (AIDS), *Weekly Epidemiological Record*, *74*, 245–251.