



Research Report

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among Black South African
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ABSTRACT

Using longitudinal data collected in KwaZulu-Natal in 1999-2001, we examined how gender may influence black South African young people's perceptions of sexual risk, barriers they perceive to using condoms, characteristics of the relationships they form, and their condom use. Net of sociodemographic characteristics, young women with greater perceived susceptibility to AIDS were less likely to use condoms, as were young men with low confidence in their knowledge of condom use and young people who agreed that using condoms signals mistrust of one's partner. Age discordant relationships, relationship concurrency, and more frequent sex were associated with lower condom use among young men and women, while longer relationship durations were associated with lower use among women only. We discuss the implications of these findings for theory and intervention.

INTRODUCTION

Young people in contemporary South Africa face high rates of heterosexually-transmitted HIV/AIDS (South Africa Department of Health 2003), and about one third will experience a pregnancy before they turn 20 (South Africa Demographic and Health Survey 2000), both outcomes with major implications for the life chances of young women and men. While condoms are a widely available contraceptive choice that can reduce transmission of sexually transmitted infections as well as unwanted pregnancies, the percentage of South Africans who used a condom the last time they had sex ranges from only about 44 to 48% of young women to about 53 to 57% of young men (MacPhail et al. 2007; Pettifor et al. 2005). Studies of consistency of condom use suggest even lower rates; data from a nationally representative sample of 15 to 24 year old South Africans in 2003 showed that about 39% of young men and 29% of young women reported always using a condom with most recent partner (Pettifor et al. 2005). These rates of condom use and consistency of use represent an increase over rates in the past (South Africa Department of Health 2002), but clearly are not high enough to prevent transmission of sexually transmitted infections or undesired pregnancies.

Given the risks involved in unprotected sex, the determinants of these rates of condom use in South Africa and the substantially lower rates reported by women have received considerable research attention from health and social scientists. Varying conceptual approaches have been applied; for example, many public health studies have focused on individual's characteristics and particularly have considered their health beliefs as determinants of behavior. These beliefs include an individual's perceptions of their susceptibility to a risky outcome like HIV, and perceived barriers to taking action to reduce their risk by using condoms. However, while individual characteristics and perceptions are undoubtedly important predictors of behavior, the decision to use condoms is one that is made in the context of a romantic or other sexual relationship. Importantly, a male partner must actively participate in the use of a condom, whereas other forms of contraception can be controlled or even hidden by a woman. Accordingly, some social and health scientists have concentrated on the risky nature of some South African sexual relationships that involve large gender power disparities, such as so-called "sugar daddy" relationships between a young woman and a much older, wealthier man (Luke 2005). However, we know less about other relationship characteristics such as relationship duration or the frequency of sex, and how the whole range of relationship characteristics are related to condom use behaviors.

Moving beyond individuals and relationships to take an even broader societal view, some researchers have pointed toward differential socialization of boys and girls that could lead to gender disparities in individual resources and perceptions, as well as in relative power within all kinds of romantic and sexual relationships (Varga 1997; Wood, Lambert and Jewkes 2008). Numerous studies of South Africans suggest that while negotiations within relationships are complex (Leclerc-Madlala 2008), an entrenched male advantage often compels women to comply with the desires of their partner and restricts their latitude to control their sexual health (MacPhail and Campbell 2001; Pettifor et al. 2004). In this paper, then, we propose that condom use in South Africa and gender differences therein are influenced by factors at multiple levels: individual characteristics, relationship-level conditions, and overarching societal constructions of gender and power.

In our analyses we focus on black young people, also known in South Africa as Africans, the largest and historically most socioeconomically-disadvantaged population group. Focusing on the black population allows us to more deeply examine gendered disparities in condom use and the potential contribution of individual and relationship characteristics while avoiding the confounding of drastic differences in socioeconomic standing that complicate comparisons with the white, Coloured, or Indian population groups. Additionally, 12 percent of blacks aged 15-24 are infected with HIV, compared to less than 2 percent of other groups (Shisana et al. 2005), and since about four out of five young South Africans are black, this represents a large group at high risk. Moreover, large gender power disparities among black South African have been linked to stark disparities in the risk of contracting HIV; young black women are infected at two to three times the rate of young black men (Pettifor et al. 2008b).

In this paper we explore the predictors of unprotected sex and of the substantial gender difference in condom use among young black South Africans. We examine how gendered expectations may be evident in young people's perceptions of sexual risk and the barriers they perceive to using condoms, in the types of relationships they form, and in their condom use at last sex and the consistency with which they use condoms. We build on previous literature by linking individual characteristics and perceptions to the relationships young people are involved in two years later, and by examining the relative contributions of individual and relationship factors to condom use. We also employ detailed longitudinal data and models that allow us to better examine the temporal ordering of these predictors, moving beyond the largely cross-sectional evidence available to date.

Condom Use in South Africa

Young Black South Africans' health beliefs, relationship characteristics and condom use have been shaped by the country's long history of institutionalized racially discriminatory policies. Some of the most dramatic and far-reaching population policies were enacted under the Apartheid system, in place from 1948 until 1994. During Apartheid, South Africans were officially assigned to population groups: black/African, Coloured, Indian/Asian, or white, and we use the same labels here because these categories still index groups' relative rankings within the social structure (Kaufman and Stavrou 2002). All life chances were determined on the basis of membership in one of these groups, with the majority black population afforded the fewest educational and occupational opportunities, the minority white population controlling most resources and political power, and the Indian/Asian and Coloured populations falling between these extremes (Treiman, McKeever and Fodor 1996). Black South Africans were also constrained residentially into segregated, under-resourced geographical areas, and some were even forcibly relocated to marginalized "homeland" areas formally outside the Republic of South Africa in the 1960s and 1970s (Kaufman 1998; Platzky and Walker 1985).

This social and political history has influenced condom use and shapes the romantic and other sexual relationships of black young people. Racial residential restrictions and the system of migrant labor that emerged still shape potential sexual networks among youth (Lurie et al. 1997). Population policy under Apartheid strongly encouraged contraceptive use among black women in response to fears about the "swamping" of the relatively small white population, which may have led to higher condom use.

However, injectable contraceptives were strongly promoted by the South African family planning system for black women at least in part because they were easier to administer and supply to the disadvantaged and in some cases remote and rural areas to which blacks were restricted (Burgard 2004). While injectable methods can be more easily hidden from partners and can limit unintended pregnancy, they do not protect women from HIV/AIDS or other sexually transmitted infections, and their use may displace the use of condoms, which can prevent both pregnancy and STIs.

Individual Characteristics and Condom Use

While the socio-historical context prevailing in South Africa structures choices about condom use, using a condom or insisting that a partner do so is ultimately an expression of agency on the part of an individual. Thus many studies of decision-making about sexual activity have focused on individual characteristics that predict risky behavior. Public health studies of condom use often have drawn on the Health Belief Model, which in its most basic form emphasizes a set of perceptions that are thought to influence health behaviors (Eaton, Flisher and Aarø 2003). These fall under the domains of the perceived seriousness of an outcome, the individual's perception of his or her susceptibility, the perceived benefits of a health behavior, and perceived barriers to that behavior.

In our analysis we focus on two of these elements: a young person's perception of his or her personal risk for contracting HIV, and perceived barriers to using condoms, one of the most widely promoted risk reduction behaviors in South Africa. We do not focus on perceptions of the seriousness of HIV/AIDS, assuming that most South African young people are aware of the disease and its consequences. Neither do we directly examine perceptions of the benefits of using condoms, because other studies of South African young people have found widespread knowledge that consistent use of condoms prevents HIV, STIs and unwanted pregnancies (Hendriksen et al. 2007). We examine perceived personal susceptibility to HIV because high perceived risk is expected to increase motivation to take protective action. Some past studies in South Africa have shown a positive association between perceived risk and condom use, other studies have not (Moyo et al. 2008), and at least one found a reverse association, with young women who perceive high risk being less likely to use condoms consistently (Pettifor et al. 2004). Importantly, prior studies have used cross-sectional data, limiting the power to establish temporal ordering of perceptions of risk and health behaviors. While evidence for a link with condom use is mixed, the evidence is clear that perceived susceptibility to HIV infection is very low among South African young people (Eaton, Flisher and Aarø 2003; MacPhail and Campbell 2001), despite awareness of high levels of HIV/AIDS.

Barriers to condom use could include knowledge barriers or perceptions that using condoms is inappropriate or unacceptable. Past studies have shown relatively high levels of knowledge about what condoms are, that they are available, and that they can prevent transmission of HIV and unwanted pregnancies (Eaton, Flisher and Aarø 2003). However, simply knowing that condoms are available and effective is not enough. Young people who do not know how to use condoms effectively face a practical barrier to condom use. Another potential barrier is the belief that condoms are inappropriate for committed or love relationships (Tavory and Swidler 2009), a common perception in South Africa (Varga

2000). Belief that condom use signals mistrust of one's partner has been linked to low condom use efficacy in a recent study of South African young people (Sayles et al. 2006). Other studies have shown the importance of the link between condom use and perceptions of infidelity: concerns about HIV exposure are overridden by the fear of sexual violence from a partner if a woman insists on condom use because it suggests that she has other partners (Harrison, Lurie and Wilkinson 1997; Hoffman et al. 2006; Varga 1997). Young people who believe that condom use signals mistrust of one's partner will face a barrier to condom use, perhaps especially young women, if they fear intimate partner violence.

Individual perceptions about susceptibility and barriers to health practices are expected to influence health behavior regardless of social context, according to the Health Belief Model. As others have noted, however, social identities central to a particular societal context could strongly shape these perceptions and limit individual agency (Sayles et al. 2006). Gender inequality is a major structural factor that could strongly differentiate women's sense of barriers to condom use relative to men's perceptions. Gender shapes most aspects of relationships and sexual behavior in South Africa; the patriarchal social structure in many black communities disenfranchises women (Varga 1997; Wojcicki and Malala 2001). For example, while many men subscribe to norms about manliness and virility by pursuing multiple sexual relationships, women generally are expected to be dutiful to one man, and those who are not are viewed as promiscuous and less desirable (Eaton, Flisher and Aarø 2003). Given this double standard and the real threat of intimate partner violence mentioned above, many women do not insist on condom use as a way of demonstrating their fidelity (Varga 1997). Such gendered norms could strongly differentiate men's and women's perceptions of barriers to condom use, and gender could moderate the actions taken by young men and women even if they hold the same perceptions.

Relationship Characteristics and Condom Use

Individual's health beliefs could affect condom use by influencing the romantic and other sexual relationships that young people form, within which condom use is negotiated. Researchers have not ignored the relationship context in South Africa, but have focused primarily on particularly "risky" relationships including concurrent partnerships and large age and power disparities between partners (e.g., Kaufman and Stavrou 2004; Leclerc-Madlala 2008; Luke 2005). Concurrent relationships have been a focus because even more than multiple serial relationships, they can dramatically amplify the spread of HIV (Morris and Kretzschmar 1997). While South African men and women tend to have fewer partners overall than do heterosexual people in many Western countries or in middle-income countries like Thailand and Brazil, they are more likely to have concurrent partnerships that can overlap for months to years (Halperin and Epstein 2004). While mixed, the limited evidence available suggests that despite the risks, condom use is not higher, and may be lower, among those engaged in concurrent partnerships (Kelley et al. 2003; Senn et al. 2009).

Age discordance between partners is relatively common among South African men and women. Age discordance likely affects the power distribution within the relationship and consequently, decisions regarding sex and the use of contraception. Young people involved with an older partner, especially young women, are less likely to report using contraception and less likely to use contraception

consistently (Abma, Driscoll and Moore 1998; Ford, Sohn and Lepkowski 2001; Kusunoki and Upchurch 2008; Luke 2005; Manning, Longmore and Giordano 2000). Power disparities in age-discordant relationships are most pronounced in so-called “sugar daddy” relationships, in which young women become involved with substantially older men in exchange of money or gifts for sexual favors (Luke 2003). “Sugar daddy” relationships are associated with lower condom use (Luke 2006), possibly because younger female partners perceive limited agency or do not want to jeopardize the economic exchange aspect of the relationship, or because older male partners perceive lower risk of disease transmission from a younger female partner (Leclerc-Madlala 2008).

While sugar daddy relationships are associated with high risk sexual practices, recent studies have noted that the actual number of such relationships is lower than commonly supposed (Luke 2005). Other aspects that characterize all partnerships – like relationship duration and frequency of sex – are also influential for condom use (Harrison, Cleland and Frohlich 2008; Pettifor et al. 2008a). Condom use becomes less consistent with increased relationship duration and is frequently entirely stopped after some period of time (Kaufman and Stavrou 2004; Ku, Sonenstein and Pleck 1994; Maharaj 2006), and individuals in relationships involving more frequent sex are less likely to use condoms (Katz et al. 2000; Sayegh et al. 2006). More committed relationships may rely on other non-barrier contraceptive methods because concern turns to prevention of pregnancy instead of disease (Eaton, Flisher and Aarø 2003; Ku, Sonenstein and Pleck 1994). In addition, the suggestion to use condoms in the context of long-term relationships could be perceived to signal infidelity, as discussed above (Hynie et al. 1998; Wingood and DiClemente 1998). We propose to provide a more comprehensive view of the way that multiple relationship characteristics influence condom use, as well as how they may contribute to an association between individual perceptions and condom use.

The Present Study

Figure 1 presents the conceptual model guiding our analysis. We examine two measures of condom use; use at last sex is the most common measure in the literature, while condom use consistency is a critical indicator of the efficacy of disease and pregnancy prevention and captures behavior over the course of a relationship.

Our research questions ask: (1) how do individual characteristics, perceptions of risk and barriers, and/or relationship characteristics influence contraceptive use among Black South African young people; and (2) does gender shape sociodemographic characteristics, perceptions of risk and barriers to condom use, and/or relationship characteristics, and does it moderate their associations with condom use? We expect that young women will have characteristics associated with lower condom use, and that even given gendered distributions of these characteristics, young women may still show lower use of condoms than young men with similar characteristics. For example, even given the same perceived susceptibility to AIDS, young women are more likely than young men to be constrained by low power within a relationship or fear of intimate partner violence that could arise if condom use is proposed.

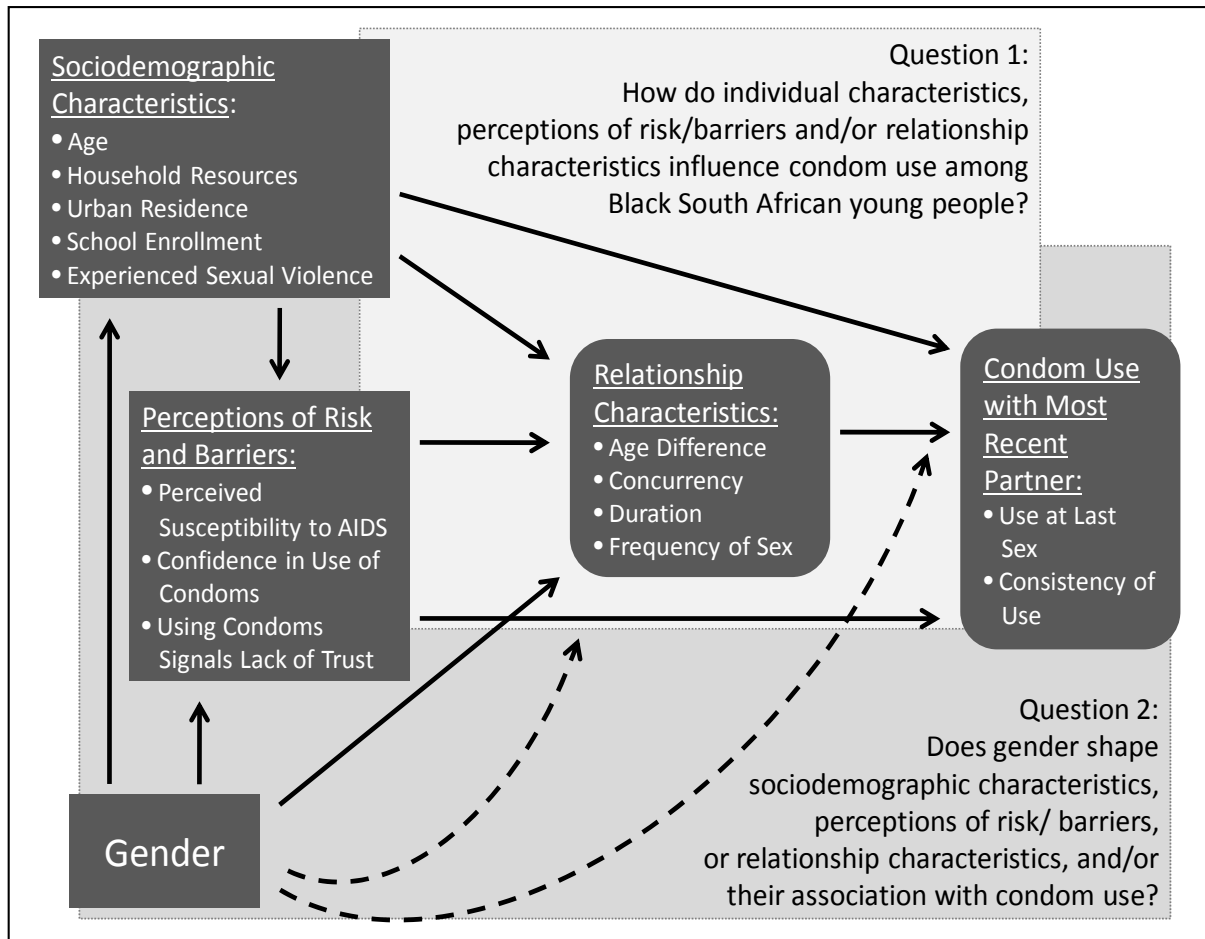


Figure 1. Conceptual framework and research questions

DATA AND METHODS

Data

We use data from the Transitions to Adulthood in the Context of HIV/AIDS study (hereafter, the Transitions study). The Transitions study was conducted in the Durban metropolitan area of KwaZulu-Natal, South Africa between 1999 and 2001 (Rutenberg et al. 2001). KwaZulu-Natal is the most populous province in South Africa and about half the residents live in urban areas (as classified by the South African Census Bureau). Rural areas in KwaZulu-Natal are among the most economically disadvantaged areas in South Africa, and the province has the highest HIV prevalence among youth aged 15-24 years in the country (Harrison 2008; Shisana et al. 2005). A stratified, multi-stage cluster sampling method was used in sample selection, with enumeration areas from the 1996 census serving as the primary sampling units. The population group distribution prevailing in the Durban area is reflected in the Transitions sample, which is comprised of 77% Black, 14% Indian, 7% white, and 2% Coloured respondents. Interviews were first conducted in 1999 with all willing young people aged 14–24 years within each

enumeration area and with the head of the young person's household (N = 3052). In 2001, 2,223 Wave 1 youth were re-interviewed, along with 993 new respondents. The attrition rate between the Wave 1 and 2 surveys was 27%, mainly due to migration out of the area (Hallman and Grant 2004). Respondents who ever had sexual intercourse were asked how many sexual partners they had in the past year, and those who reported at least one partner were asked a series of questions about up to three partners in the past 12 months. About half the respondents in 1999 had ever had sex, and about 70% of the re-interviewed respondents had been sexually active by the second wave in 2001.

We use all eligible respondents in the 1999 wave who were re-interviewed in 2001 to observe the prospective relationship between individuals' characteristics and beliefs and their subsequent relationship characteristics and condom use. After retaining respondents who were interviewed in 1999 (N = 3052), had a household interview (N = 3013), and were re-interviewed in 2001 (N = 2197), keeping those who reported sex in the past 12 months in the 2001 interview (N = 1327), restricting our sample to African respondents (N= 1139), and eliminating respondents with missing data on covariates, we arrive at an analytic sample of 975 respondents. Most reported only a single relationship in the past 12 months (75%), so our analyses focus on the most recent relationship.

Measures

Condom use and relationship characteristics in 2001

Unprotected last sex is coded so that 0 = used a condom and 1 = did not use a condom. Consistency of condom use is measured using an item that asked: "How often do/did you use a condom with this partner: always, usually, sometimes, rarely, or never?" We distinguished respondents who always used a condom (the reference category) from those who intermittently used a condom (usually, sometimes, or rarely), and those who never did so. Respondents were asked for their partner's age in years, and we created a dichotomous indicator of age difference between the respondent and his or her partner, coded so that 0 = respondent's partner is less than five years older or younger than the respondent, and 1 = partner is at least five years older or younger than the respondent. Other studies (e.g., Harrison, Cleland and Frohlich 2008) have used a five year or more age difference as an indicator of somewhat greater than normative age-discordance in Southern African contexts, where the average age difference is often about four years. Concurrency was measured by identifying respondents who reported that their second and/or third most recent partner in the past year was still their sexual partner, in addition to reporting a current relationship with their most recent partner; 1 = in concurrent relationships, 0 = monogamous relationship.

To calculate relationship duration, we subtracted the month and year reported as the start of the sexual relationship from the month and year of the Wave 2 interview; the range was 0 to 132 months. For relationships that were ongoing at the time of interview, this calculated duration is accurate. However, because respondents did not report the date the relationship ended, we do not know the exact duration of about 7 percent of relationships that had ended by Wave 2. Results were substantively very similar when we omitted these relationships, so we leave the measure unchanged. To measure the frequency of sex, respondents were asked: "How many times did you have sex with (partner) in the last month?" The range

was 0 to 30 times. We also include a dichotomous indicator of whether the relationship began after the 1999 interview; the causal directionality between individual characteristics/perceptions and relationship characteristics and condom use is clearest for these relationships.

Perceptions of HIV Risk and Barriers to Condom Use in 1999

Perceived susceptibility to HIV was measured with an item that asked: “Do you think you have no risk, a small risk, a moderate risk or a great risk of getting the AIDS virus in the next 12 months?” We collapsed the final two categories because of small numbers to generate three categories: no risk (the reference), a small risk, or a moderate to great risk. Our first measure of barriers to condom use is lack of knowledge about proper use; respondents who reported that they were “very” confident that they know how to use a condom effectively were coded as 0, while those who reported being “somewhat” or “not” confident were coded 1. A second perceived barrier to condom use is the belief that condom use signals a lack of trust or one’s own untrustworthiness. Respondents who agreed that using a condom is a sign of not trusting their partner were coded 1, and those who disagreed were coded 0.

Individual Sociodemographic Characteristics in 1999

Age is measured in years and used to assess whether condom use decreases as young people grow older, as found in other studies. Sex is coded so that 0 = female and 1 = male. Greater household assets could indicate greater ability to purchase condoms and/or a decreased likelihood of participating in relationships for economic gain. Indicators of home construction materials for walls and roof, type of toilet facilities and water supply, access to electricity, and telephone ownership were used to create an index, with the value for each standardized and summed. The Cronbach’s alpha value for the asset index is 0.87, and the range is -2.22 to 0.759, with a higher score indicating greater assets. Respondents are coded 1 if they were currently enrolled in school or attending classes at the time of the interview and 0 otherwise. Those enrolled in school may have greater access to freely distributed condoms or may have greater incentive to avoid pregnancy than those who have left school. Place of residence could influence accessibility of condoms or expectations about relationship characteristics and conduct; those living in urban areas are coded 1 and others are coded 0. We also include an indicator of any lifetime experience with forced sex (0 = no, 1 = yes), based on the question: “Have you ever had sexual intercourse when someone was physically forcing you, hurting you, or threatening you?”

Methods

We first examined gender differences in respondents’ sociodemographic characteristics, perceptions, relationship characteristics, and condom use. We then estimated a series of multivariate logistic and multinomial logistic regression models to predict condom use at last sex and consistency of condom use with the respondent’s most recent partner, respectively. We generated figures using predicted values from models that included sex interactions to demonstrate gender modification of associations. All analyses were conducted using Stata/SE 10.0 (StataCorp 2007), and use the survey weight constructed for the 1999 baseline sample.

RESULTS

Table 1 presents the weighted distributions of respondents' characteristics for the sample overall and by sex, with tests for differences obtained from weighted ordinary least squares, logistic, or multinomial logistic regression models using sex as the sole predictor.

Table 1. Condom use and relationship characteristics with most recent partner in past 12 months (in 2001) and individual characteristics (in 1999) by sex, Black South African Transitions sample.				
<i>Condom Use in 2001</i>	Overall	Male	Female	p-val.
% Did Not Use Condom at Last Sex	40.6	33.6	47.1	0.002
<i>Condom Use Consistency</i>				
% Always	42.5	55.1	30.9	--
% Intermittent	34.9	26.0	43.2	<.001
% Never	22.5	18.9	25.9	<.001
<i>Relationship Characteristics with Most Recent Partner in 2001</i>				
% Partner 5+ years Older/Younger	25.4	13.5	36.3	<.001
% Most Recent Relationship Concurrent with Other(s)	15.5	30.5	1.6	<.001
Duration of Relationship in months	25.0 (22.4)	16.4 (17.3)	33.0 (23.6)	<.001
Frequency of Sex with Partner in past month	1.74 (2.46)	1.60 (2.07)	1.87 (2.76)	0.094
% Relationship Began After 1999 Interview	60.9	80.3	43.0	<.001
<i>Beliefs About Risk and Condom Use in 1999</i>				
Perceived Risk of Contracting AIDS Virus in Next 12 Months				
% No Risk	69.9	71.6	68.3	--
% Small Risk	14.6	11.7	17.3	0.113
% Moderate/Great Risk	15.5	16.7	14.4	0.673
% Somewhat/Not Confident in Knowledge of Condom Use	54.7	36.9	71.1	<.001
% Believe Using Condom Means Not Trusting Partner	32.7	32.2	33.2	0.803
<i>Sociodemographic Characteristics in 1999</i>				
Age	18.1 (2.37)	18.0 (2.36)	18.3 (2.37)	0.024
Household Asset Score	-0.304 (0.649)	-0.262 (0.640)	-0.343 (0.654)	0.052
% Enrolled in School	68.3	78.2	59.2	<.001
% Urban Resident	63.8	60.4	66.9	0.170
% Ever Experienced Forced Sex	5.6	1.6	9.2	0.009
N	975	466	509	

Note: Figures shown are weighted using wave one weight; p-values for difference by sex were obtained from OLS, logistic, or multinomial logistic regressions with male sex as the sole predictor.

As in earlier studies, we find substantial gender differences in condom use; 34 percent of men compared to 47 percent of women in this sample report not using a condom at last sex, a statistically significant difference. About 55 percent of men compared to just under one third of young women report always using a condom with their partner, while about 26 percent of men and 43 percent of women only use a condom intermittently and 19 percent of men and 26 percent of women never use condoms with their most recent partner. The gender difference in consistency of use is also statistically significant. These figures are slightly higher than those reported for South African young people overall in recent epidemiologic studies (Pettifor et al. 2005), but are reasonably close and show similar gender disparities. However, reports of consistent use by young men are somewhat higher than other published figures.

Turning to relationship characteristics, we find substantial and statistically significant gender differences. About 14 percent of young men compared to 36 percent of young women reported a partner at least five years older or younger, and while almost a third of young men reported concurrent relationships, only 2 percent of young women reported concurrency. Average relationship durations were almost twice as long for young women (33 versus 16 months), and they had marginally higher average frequencies of sex in the past month (1.9 versus 1.6 times), compared to their male counterparts. Young men's relationships were significantly more likely to have begun after the 1999 interview than young women's. We find fewer gender differences in beliefs about risk and condom use. As in prior studies, most young men and women felt they had no risk of contracting AIDS in the next year (68 to 72 percent), and about a third of respondents agreed that using a condom signaled mistrust of one's partner. However, young women were significantly more likely to report a lack of confidence in their knowledge of how to use a condom (71 versus 37 percent). The young women in this sample are slightly older than the young men (18.3 versus 18.0 years), and are substantially less likely to be enrolled in school (59 versus 78 percent) and more likely to have ever experienced forced sex (9 versus 2 percent).

Multivariate Results

Table 2 presents the results of models predicting unprotected last sex. Odds ratios are presented with 95% confidence intervals, and Wald Chi-square tests and their associated p-values are presented for comparison across nested models.

The first model includes only male sex; the second model adds sociodemographic characteristics, the third model adds perceptions of risk and barriers to condom use and the fourth model adds relationship characteristics. We also estimated a series of models that tested each perception and relationship characteristic one at a time, and results were unchanged from those presented here. The fifth model adds interaction terms between male sex and perceptions about risk and condom use and relationship characteristics. We were unable to include an interaction term between sex and relationship concurrency because so few women reported concurrency. Table 3 presents results for the same series of models, but predicting condom use consistency.

Table 2. Odds Ratios and 95% Confidence Intervals from Logistic Regression Models Predicting Not Using a Condom at Last Sex with Most Recent Partner in Past 12 Months, Black South African Transitions Sample.

	Model 1	Model 2	Model 3	Model 4	Model 5
Male	0.57 **	0.73	0.83	0.87	0.46 +
	0.397,0.812	0.496,1.073	0.544,1.267	0.562,1.359	0.208,1.010
Age in years	--	1.09 +	1.13 *	1.10 +	1.11 *
		0.993,1.201	1.019,1.242	0.994,1.211	1.004,1.225
Household Asset Score	--	0.64 **	0.69 *	0.71 *	0.69 *
		0.488,0.837	0.516,0.916	0.534,0.938	0.524,0.919
Enrolled in School	--	0.80	0.88	0.96	0.97
		0.525,1.220	0.564,1.388	0.609,1.500	0.619,1.521
Urban Resident	--	0.85	0.91	0.88	0.91
		0.537,1.355	0.562,1.463	0.554,1.405	0.572,1.435
Ever Forced Sex	--	2.62 *	2.45 *	2.51 *	2.08 +
		1.186,5.803	1.097,5.465	1.151,5.483	0.987,4.375
Relationship Began After 1999	--	0.74	0.75	1.12	1.19
		0.504,1.090	0.499,1.132	0.594,2.113	0.640,2.209
Perceived Risk of AIDS	--	--	1.32 *	1.31 *	1.63 **
			1.038,1.685	1.024,1.666	1.193,2.224
Not Confident in Condom Use	--	--	1.61 *	1.62 *	0.90
			1.082,2.382	1.096,2.395	0.543,1.481
Condom Means Not Trusting Partner	--	--	1.51 *	1.51 *	1.20
			1.012,2.259	1.009,2.258	0.710,2.023
Partner 5+ years Older/ Younger	--	--	--	1.66 *	1.82 *
				1.061,2.592	1.104,3.009
Relationship Concurrent	--	--	--	1.36	1.27
				0.745,2.473	0.699,2.287
Duration of Relationship in months	--	--	--	1.01 +	1.01 +
				0.998,1.025	1.000,1.029
Frequency of Sex in Past Month	--	--	--	1.09 *	1.05
				1.011,1.177	0.961,1.154
Interactions with Male Sex					
* Perceived Risk of AIDS	--	--	--	--	0.63 +
					0.390,1.005
* Not Confident in Condom Use	--	--	--	--	3.57 ***
					1.688,7.565
* Condom Means Not Trusting Partner	--	--	--	--	1.68
					0.781,3.601
* Partner 5+ years Older/ Younger	--	--	--	--	1.01
					0.361,2.825
* Duration of Relationship in months	--	--	--	--	0.99
					0.975,1.010
* Frequency of Sex in Past Month	--	--	--	--	1.10
					0.962,1.262
Wald Chi2	9.62 **	49.06 ***	65.38 ***	86.45 ***	113.69 **

Note: N = 975 for all models. Models estimated using wave one weight. ***p<.001, **p<.01, *p<.01, †p<.10.

The results of Model 1 in Table 2 show that the odds of unprotected last sex are only about 0.6 times as great for young men as for young women (OR = 0.57, 95% CI = 0.4-0.8). However, net of age, household assets, school enrollment, place of residence, and lifetime experience with forced sex, Model 2 shows that young men have odds of unprotected sex about 0.7 times as great as those of young women, and the sex differences is no longer significant. Unprotected sex is less likely for those living in households with greater assets, and more likely if the respondent ever experienced forced sex. Older respondents are also marginally more likely to report not using a condom at last sex. The associations between these sociodemographic characteristics and condom use at last sex are substantively unchanged in subsequent models. Adjustment for perceptions in Model 3 and for relationship characteristics in Model 4 decreases the gender difference in the risk of unprotected last sex only by a small amount, but perceptions and relationship characteristics are significant predictors of unprotected sex. Respondents who perceived any risk of AIDS in 1999 were more likely to report unprotected last sex in 2001. Those who lacked confidence in condom use and those who agreed that using a condom signals a lack of trust were significantly more likely to report unprotected last sex. Respondents with a partner at least five years older or younger were significantly more likely to report unprotected last sex. The odds of reporting unprotected sex were also greater for those reporting more frequent sex in the past month, and marginally greater for those with longer relationship duration.

The results of Model 5 in Table 2 also show a gender difference in the association between health beliefs and unprotected last sex. Moreover, net of these interactions, males are marginally less likely to report unprotected sex (OR = 0.46, 95% CI = 0.2-1.0). While the risk of unprotected sex is similar for women regardless of their condom use confidence, young men who were not or only somewhat confident in their knowledge were much more likely to report not using a condom at last sex, relative to young men who were very confident. The association is plotted in Figure 2, which presents the predicted percentage of young men and women who would report unprotected sex at varying levels of confidence about knowledge of condom use, leaving all other predictors at their actual values. Figure 2 shows that the percentage of women reporting unprotected sex ranges from 46 to 48 percent, while among young men the figures are 23 and 50 percent, respectively.

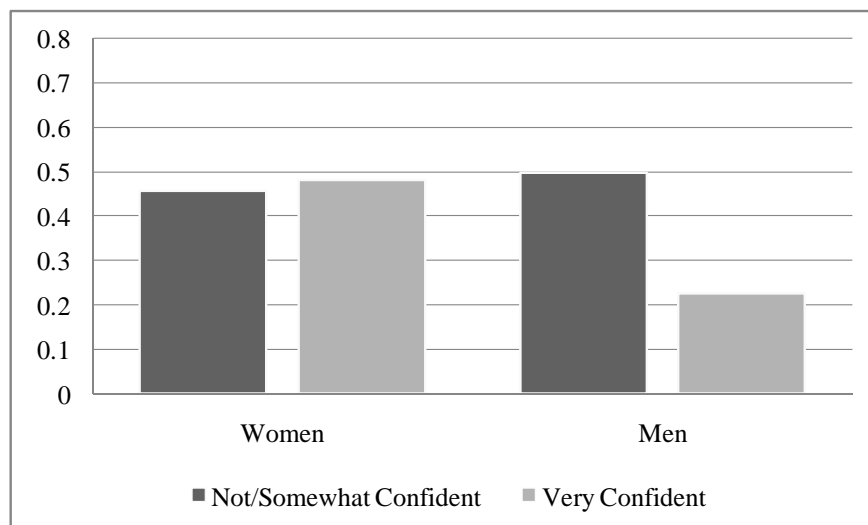


Figure 2. Predicted probability of not using a condom at last sex by gender and confidence in condom use knowledge

Similarly, we plot the marginally significant interaction between gender and perceived susceptibility to AIDS in Figure 3. The likelihood of unprotected last sex ranges from about 29 to 35 percent among men as perceived susceptibility rises, while among women the risk rises much more substantially, from about 39 percent those who perceive no risk to about 70 percent among the 14 percent of the sample who perceive moderate or great risk.

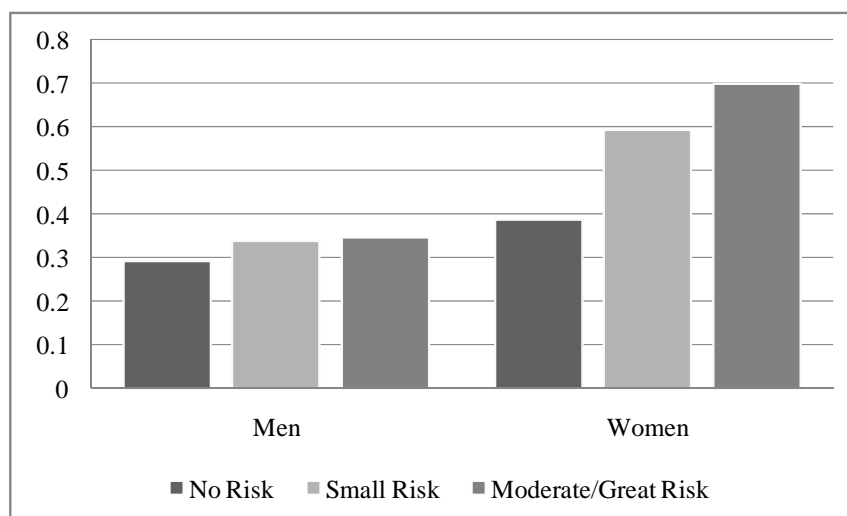


Figure 3. Predicted probability of not using a condom at last sex by gender and perceived susceptibility to AIDS

Table 3 presents results from multinomial logistic regression models predicting consistency of condom use with the respondent's most recent partner. The upper panel A presents results for the comparison of using a condom intermittently as compared to always using a condom, while the lower panel B presents results for the comparison of never versus always using a condom.

Results from Model 1 in Panel A show that compared with consistent use, young men have odds of intermittent condom use only about 0.3 times as great as those of young women, a statistically significant difference (RR = 0.34, 95% CI = 0.2-0.5). Adjusting for sociodemographic characteristics in Model 2 decreases the gender gap only slightly, while adding indicators of perceptions and relationship characteristics in Models 3 and 4 does not explain the greater likelihood of women to report using condoms intermittently. However, Models 3 and 4 in Panel A show that respondents who were not confident that they knew how to use condoms in 1999 were marginally more likely to report intermittent condom use, as compared to always using condoms. Those who agreed that using a condom means not trusting one's partner were significantly more likely to report intermittent use, as were those in concurrent relationships and respondents with longer relationship durations and more frequent sex.

Table 3. Risk Ratios and 95% Confidence Intervals from Multinomial Logistic Regression Models Predicting Consistency of Condom Use with Most Recent Partner in Past 12 Months, Black South African Transitions Sample.

	Model 1	Model 2	Model 3	Model 4	Model 5
Panel A: Intermittently Uses Condom versus Always					
Male	0.34 *** 0.225,0.507	0.37 *** 0.239,0.575	0.42 *** 0.269,0.651	0.33 *** 0.206,0.517	0.44 + 0.178,1.086
Age in years	--	1.08 0.968,1.201	1.13 * 1.008,1.255	1.10 0.982,1.222	1.08 0.970,1.211
Household Asset Score	--	0.99 0.724,1.352	1.07 0.771,1.476	1.11 0.803,1.545	1.10 0.790,1.530
Enrolled in School	--	0.97 0.577,1.617	1.02 0.607,1.709	1.08 0.638,1.822	1.08 0.641,1.834
Urban Resident	--	0.85 0.491,1.483	0.93 0.535,1.629	0.93 0.540,1.610	0.92 0.530,1.589
Ever Forced Sex	--	1.61 0.649,3.982	1.63 0.663,3.997	1.61 0.654,3.953	1.36 0.557,3.337
Relationship Began After 1999	--	0.84 0.531,1.320	0.83 0.525,1.315	1.79 0.850,3.756	1.96 + 0.898,4.254
Perceived Risk of AIDS	--	--	0.92 0.699,1.200	0.90 0.684,1.170	1.04 0.705,1.522
Not Confident in Condom Use	--	--	1.45 + 0.954,2.211	1.42 + 0.939,2.155	1.39 0.771,2.513
Condom Means Not Trusting Partner	--	--	1.68 * 1.076,2.617	1.71 * 1.092,2.674	1.30 0.672,2.498
Partner 5+ years Older/ Younger	--	--	--	0.97 0.576,1.643	0.89 0.476,1.663
Relationship Concurrent	--	--	--	2.57 ** 1.402,4.694	2.39 ** 1.347,4.238
Duration of Relationship in months	--	--	--	1.02 ** 1.007,1.041	1.04 *** 1.015,1.060
Frequency of Sex in Past Month	--	--	--	1.10 * 1.005,1.198	1.07 0.946,1.209
Interactions with Male Sex					
* Perceived Risk of AID	--	--	--	--	0.79 0.463,1.358
* Not Confident in Condom Use	--	--	--	--	0.93 0.402,2.137
* Condom Means Not Trusting Partner	--	--	--	--	1.85 0.768,4.459
* Partner 5+ years Older/ Younger	--	--	--	--	1.38 0.459,4.176
* Duration of Relationship in months	--	--	--	--	0.97 * 0.953,0.996
* Frequency of Sex in Past Month	--	--	--	--	1.07 0.908,1.261

(Table 3 continued below.)

Table 3, con't. Risk Ratios and 95% Confidence Intervals from Multinomial Logistic Regression Models Predicting Consistency of Condom Use with Most Recent Partner in Past 12 Months , Black South African Transitions Sample.

	Model 1	Model 2	Model 3	Model 4	Model 5
Panel B: Never Uses Condom versus Always					
Male	0.41 *** 0.259,0.647	0.62 * 0.388,0.996	0.80 0.470,1.363	0.89 0.500,1.591	0.74 0.262,2.080
Age in years	--	1.01 0.893,1.143	1.06 0.931,1.210	1.04 0.910,1.190	1.05 0.920,1.189
Household Asset Score	--	0.58 ** 0.410,0.806	0.64 * 0.453,0.905	0.66 * 0.470,0.929	0.64 * 0.460,0.900
Enrolled in School	--	0.61 + 0.346,1.076	0.66 0.365,1.193	0.70 0.390,1.273	0.70 0.389,1.265
Urban Resident	--	0.96 0.530,1.722	1.03 0.557,1.895	1.00 0.548,1.841	1.07 0.596,1.913
Ever Forced Sex	--	3.61 * 1.227,10.619	3.32 * 1.131,9.748	3.33 * 1.161,9.575	2.85 * 1.034,7.853
Relationship Began After 1999	--	0.58 * 0.363,0.931	0.60 * 0.366,0.985	0.97 0.446,2.100	1.06 0.485,2.314
Perceived Risk of AIDS	--	--	1.38 * 1.011,1.886	1.36 + 0.996,1.855	1.61 * 1.076,2.410
Confident in Condom Use	--	--	2.49 *** 1.472,4.210	2.51 *** 1.472,4.293	1.34 0.685,2.603
Condom Means Not Trusting Partner	--	--	1.51 0.909,2.505	1.49 0.898,2.486	1.44 0.712,2.894
Partner 5+ years Older/ Younger	--	--	--	1.61 0.903,2.879	1.60 0.840,3.046
Relationship Concurrent	--	--	--	1.15 0.506,2.606	1.08 0.487,2.379
Duration of Relationship in months	--	--	--	1.01 0.996,1.033	1.03 * 1.003,1.049
Frequency of Sex in Past Month	--	--	--	1.09 + 0.992,1.186	1.07 0.949,1.206
Interactions with Male Sex					
* Perceived Risk of AIDS	--	--	--	--	0.71 0.396,1.261
* Not Confident in Condom Use	--	--	--	--	3.58 ** 1.400,9.166
* Condom Means Not Trusting Partner	--	--	--	--	1.02 0.388,2.677
* Partner 5+ years Older/ Younger	--	--	--	--	1.23 0.347,4.335
* Duration of Relationship in months	--	--	--	--	0.98 + 0.957,1.002
* Frequency of Sex in Past Month	--	--	--	--	1.02 0.851,1.218
Wald Chi2	31.38 ***	75.95 ***	97.63 ***	134.25 ***	158.14 ***

Note: N = 975 for all models. Models estimated using wave one weight. ***p<.001, **p<.01, *p<.01, †p<.10.

Turning to Panel B in Table 3, Model 1 shows that young men are less than half as likely as young women to report never using condoms (OR = 0.41, 95% CI = 0.3-0.6), compared to always using them, but this difference narrows and is no longer statistically significant after we adjust for sociodemographic characteristics and perceptions in Model 3. Results from Model 2 in Panel B show that household assets and school enrollment reduce the likelihood of never using condoms, while ever experiencing forced sex is associated with substantially higher risk. Except for the protective effect of enrollment, these associations decrease slightly but remain significant after we control for other predictors. Results for Model 3 in Panel B show that respondents who perceived any risk of AIDS and those who were not confident in their knowledge of condom use were more likely to report never using condoms, compared to always using them. These associations are relatively stable when we adjust for relationship characteristics in Model 4, which also shows that respondents reporting more frequent sex were marginally more likely to report never using condoms.

Results for Model 5 in Panels A and B show that the association between relationship duration and condom use consistency varies by gender; as relationship duration increases among young women their likelihood of reporting intermittent or no use of condoms rises, while this is not the case for young men. Figure 4 illustrates this interaction using predicted percentages based on Model 5; while about 53 to 56 percent of men always use condoms at varying relationship durations, the percentage falls from about 45% to 27% among young women as relationship duration extends beyond a year. The percentage of women reporting intermittent use and those reporting never using condoms is also higher for relationships lasting more than a year, relative to shorter relationships.

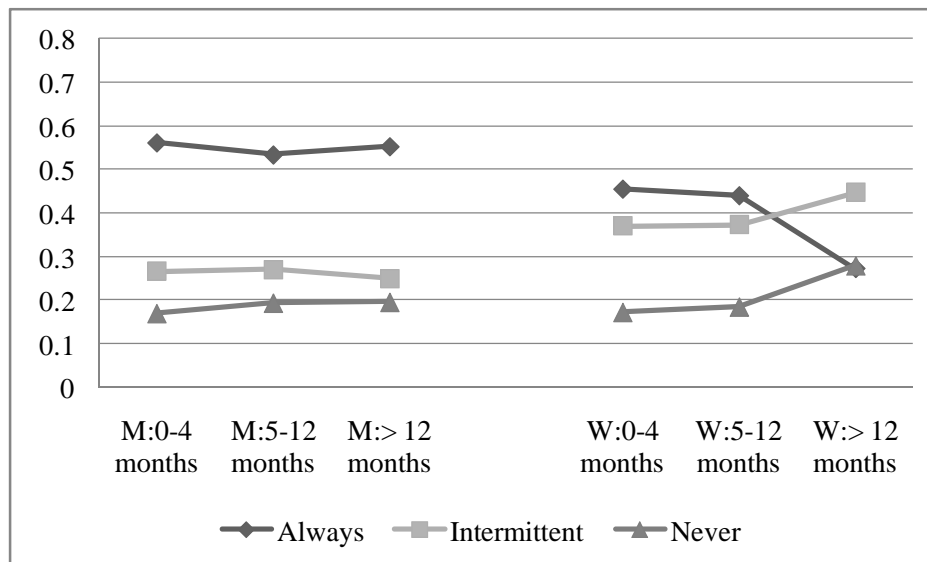


Figure 4. Predicted probability of always, intermittently, or never using a condom by gender and relationship duration

Model 5 in Table 3 also shows that a lack of confidence in condom use knowledge is associated with a significantly higher risk of reporting never using condoms only for males, mirroring the finding shown for unprotected last sex in Figure 2.

Sensitivity Analyses

We examined whether these findings were robust if we focused only on relationships that began after the baseline interview, so that the temporal ordering of predictors was clearer. When we dropped the 367 relationships that were ongoing in 1999, there were no longer significant gender differences in unprotected last sex or intermittent condom use, and the risk of unprotected last sex and of never using condoms did not increase with relationship duration. These changes were not surprising, given that the dropped relationships were overwhelmingly those of women respondents. Other findings were substantively unchanged, even given the large loss of sample size. We also estimated models that examined a ten year or more age discordance between partners, to better capture “sugar daddy” relationships. Such relationships are rare in our sample ($N = 33$), but show even stronger negative associations with condom use than those presented here for age differences of five years or more (not shown).

DISCUSSION

We proposed that a better understanding of condom use in South Africa and gender differences therein must consider multiple levels of influence: individual characteristics, relationship-level conditions, and societal constructions of gender and power that shape these. We moved beyond the extant literature that focuses on these components individually, without considering the whole system of associations, and by employing longitudinal data and models with a large sample of young Black South Africans. This study thus provides novel prospective evidence that takes into account the temporal ordering of individual perceptions and resources, the relationships that young people form, and the condom use that takes place within those relationships. We ask two main questions: first, how do individual characteristics, perceptions of risk and of barriers to condom use, and relationship characteristics influence condom use at last sex and consistency of condom use? Second, how are these characteristics and associations shaped by gender in the context of South Africa?

We found that even net of young people’s sociodemographic characteristics, their perceptions of risk and barriers to condom use had significant associations with condom use. Perceiving greater personal susceptibility to AIDS was associated with a greater likelihood of reporting unprotected last sex and of never using condoms, compared to always using them. This counterintuitive association appears stronger for young women, supporting the findings of an earlier cross sectional study of South African young people (Pettifor et al. 2004). A lack of confidence about condom use knowledge was associated with a greater risk of unprotected last sex and of never using condoms, but only for young men. Regardless of gender, young people who believed that using a condom signals a lack of trust in one’s partner were more likely to report unprotected last sex and were more likely to use condoms intermittently than to always use condoms.

Moreover, net of individual perceptions, a variety of relationship characteristics were associated with condom use. Similar to other studies of South Africans, we found that individuals in age discordant partnerships were less likely to use condoms at last sex, while respondents reporting concurrent

partnerships were more likely to report using condoms intermittently with their most recent partner, rather than always. Among young women, the likelihood of unprotected last sex increased with relationship duration, as did the risk of intermittently or never using condoms. Unprotected last sex and intermittently or never using condoms were also greater for young men and women reporting higher frequency of sex. Importantly though, individual perceptions of risk and of barriers to condom use do not appear to influence the characteristics of relationships. The associations between perceptions and condom use were unchanged when we added relationship characteristics to our models, and a subsidiary set of models predicting each relationship characteristic (not shown) confirmed that perceptions of risk and barriers were not significant predictors. Limitations of measures used here could explain why we do not find a direct connection between individual perceptions and relationship characteristics, but the lack of association deserves further investigation and has implications for theories of health behaviors. While health beliefs matter for condom use, it will be important to explore other mechanisms through which they may operate.

Our second priority was to explore how gender shaped the distribution of individual and relationship characteristics and influenced their association with condom use. We found more evidence for gender differences in relationship characteristics than in individual perceptions; young women were substantially more likely to be involved in age discordant relationships and less likely to be engaged in concurrent relationships, and their relationships were twice as long, on average, as young men's partnerships. Only confidence in knowledge of condom use showed a gender gap in this sample, with young women reporting less confidence, while perceived susceptibility to AIDS and the belief that condom use signals mistrust of a partner did not differ by sex. Associations between individual and relationship characteristics and condom use varied by gender in three ways: condom use confidence affected condom use more for men, while perceived susceptibility to HIV and longer relationship duration more substantially influenced condom use among women. Finally, while individual perceptions and relationship characteristics showed significant associations with condom use, they did not fully explain the gender gaps in unprotected last sex or in intermittent versus consistent condom use.

These findings suggest that even if it were possible to reduce risk factors explored in this analysis, gender differences in condom use at last sex and in the likelihood of never using condoms with a partner could persist. While our study did not cover the range of all health beliefs or relationship characteristics, researchers need to consider other factors and the broader underlying forces that lead to durable gender disparities. A small but growing number of interventions to improve women's social standing via economic empowerment are being implemented to explore the ways that reducing broader structural inequalities could increase women's power to implement safer sex practices within their relationships (see Pettifor et al. 2004). Upstream solutions like these will likely greatly increase the efficacy of the many existing interventions to change perceptions or behaviors at the individual level. Current individual-focused interventions based on the "ABC" model – abstinence, be faithful, and condom use – may not show their intended results if entrenched gender power differentials prevail (Pettifor et al. 2004). For example, we found that even if women had high confidence in their knowledge of how to use condoms, this had no association with whether they used a condom the last time they had

sex or with their condom use consistency. Those associations were only evident for young men. Moreover, young women's use of condoms appeared to decline with increasing relationship duration, while young men's did not, perhaps due to women's desire to signal fidelity in more committed, longer-term relationships.

Also important from the perspective of intervention is our finding that a variety of relationship characteristics predict condom use – those considered “risky,” like age discordance, as well as aspects of all relationships, such as duration. Our findings provide new support for arguments of other researchers that the high prevalence of long-term relationships in combination with relatively high levels of concurrent partnering may help to explain the high rates of HIV in Southern Africa (Katz and Low-Beer 2008; Pettifor et al. 2008b). Steady and long term relationships may be associated with very high risk of HIV transmission because of the declines in condom use as partnerships become more “serious” (Moyo et al. 2008), whether due to both partners' preferences or because women fear insisting on condom use because this could signal infidelity.

While we provide novel findings, our analysis has some important limitations that point toward new data needs. Convincing conclusions about many of the issues discussed above will only emerge when dynamic relationships are observed over an extended period of time, because both perceptions and behaviors change over the course of relationships. For example, our measures of condom use consistency are obtained from individuals who engaged in both new and much more established relationships. It is unclear what time period they reference when reporting about their consistency of condom use, and how their reports could systematically change with relationship duration. Similarly, we utilize information about respondents' health beliefs that has been collected in some cases before sexual activity began, but in other cases after sexual relationships have potentially shaped perceptions of susceptibility to AIDS, for example. Larger samples that follow young people and capture their sexual debut and dynamics of changes in their health beliefs as they move through multiple relationships would provide more convincing evidence for the connections between these beliefs, relationship characteristics, and health behaviors. Finally, future studies should explore the impact of potential underreporting of concurrent relationships or other risky sexual relationships. A study of KwaZulu Natal youth showed that some felt compelled to hide their relationships, even young men, for whom multiple partnering was socially much more acceptable. Biases in results of our and other analyses that focus on relationship characteristics could be large if omission of relationships from a survey respondents' history is non-random, either at the person level (i.e., individuals engaged in riskier sexual practices are more likely to omit relationships) or at the relationship level (i.e., casual, one time, or high risk sexual encounters are not viewed as relationships or are purposefully omitted from reported histories).

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ENDNOTES

1. It is important to note that the perceived seriousness of a pregnancy may vary in South Africa. Some young people feel pressure or desire to bear a child or father a child (Eaton, Flisher and Aarø 2003), while others seek to avoid early pregnancies (MacPhail and Campbell 2001). Moreover, some may not view condom use as beneficial because they desire a pregnancy, fear health risks of condom use, or feel that condoms reduce the pleasure of sexual activity (Nicholas 1998; Tavory and Swidler 2009).
2. Predictors of loss to follow up included female sex, older age, higher household assets, not being enrolled in school and living in an urban area. All of these significant predictors are included as controls in our final models, but our results may be somewhat conservative because generally, respondents who are less likely to use condoms are more likely to leave the study. No predictor variable was missing for more than five percent of the sample.
3. We tested interaction terms between this indicator and the key predictors in our multivariate regression models to assess whether the associations with condom use were different for new versus ongoing relationships. Only one of 21 interactions was significant, so we did not include them in the final models.



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