

**Condom Use among Black Youth in South Africa: Do Relationship Characteristics Matter?\***

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**ABSTRACT**

The predictors of condom use have been a focus in South African research addressing the relatively high rates of HIV/AIDS and adolescent pregnancy there. Extant studies have focused mainly on individual- and family-level predictors, but generally have not focused on characteristics of relationships, even though romantic and other sexual relationships are a central context in which sexual activity and decisions about condom use occur. We use two representative samples of youths with detailed relationship-specific information about recent and lifetime sexual relationships. With logistic and multilevel models we explore youths' multiple relationship experiences and investigate the importance of a broad set of relationship characteristics for condom use at last sex and consistency of condom use in two different South African contexts, KwaZulu Natal and Cape Town. Preliminary findings suggest that heterogamy and commitment influence condom use, but findings differ across samples and from findings obtained from U.S. youths.

## Condom Use among Black Youth in South Africa: Do Relationship Characteristics Matter?

### 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 serious implications for the life chances of young women and men. These risks are highest among black or African South Africans, the largest and historically most socioeconomically disadvantaged population group in the country. A large literature has emerged that examines the predictors of condom use in South Africa among blacks and others, because condoms are a contraceptive choice that can reduce transmission of sexually transmitted infections as well as unwanted pregnancies. Extant studies have focused mainly on individual- and family-level characteristics as predictors of condom use, but generally have not focused on characteristics of relationships, even though romantic and other sexual relationships are a central context in which sexual activity and decisions about contraceptive use occur. A growing body of research has begun to explore characteristics of young people's relationships as predictors of contraceptive choices (Ford, Sohn and Lepkowski 2001; Howard et al. 1999; Katz et al. 2000; Ku, Sonenstein and Pleck 1994; Kusunoki and Upchurch 2008; Manlove, Ryan and Franzetta 2007; Manning, Longmore and Giordano 2000), but this work largely has been restricted to the United States context. The present study examines how the characteristics of black young people's sexual relationships in South Africa add to our understanding of the social and interpersonal landscape that shapes condom use in this very different societal context.

Extant studies of condom use in South Africa have focused on the importance of individual and household factors including perceived HIV risk, self-efficacy, knowledge regarding STI transmission (Eaton, Flisher and Aarø 2003; Sayles et al. 2006) and characteristics like household economic resources, parental views on contraception and peer norms (MacPhail and Campbell 2001). Two topics have also been addressed that bear on characteristics of sexual relationships in the black community in South Africa. First, researchers have focused on the way that gender disparities in power in South Africa lead to high levels of violence against women. While this is a crucial and unfortunately relatively common relationship issue in South Africa, it is important to recognize that many sexual relationships are not characterized by violence, and characteristics of nonviolent relationships have not been adequately explored. Nonetheless, the importance of examining condom use while taking gender disparities in power into account is clear in the South African context (Luke 2003). A second set of focal issues for South Africa researchers has been the prevalence and consequences of "sugar daddy" relationships, in which young women become involved with older men in exchanges of money or gifts for sexual favors (Luke 2003). These relationships are characterized by large disparities in power between partners, and condom use is much lower than in relationships not characterized by such age and economic asymmetries (Luke 2006). While sugar daddy relationships appear to be associated with high risk sexual practices, recent research has noted that the actual number of such relationships is much lower than commonly supposed (Luke 2005). Research on South African sexual relationships thus may benefit from the examination of more common relationship characteristics and sources of couple heterogamy, such as smaller age differences between partners.

While studies of black South African young people's relationships are still focused on relatively extreme risk factors or relationship patterns, studies of young people's relationships in the United States have begun to examine the characteristics of more normative romantic and sexual relationships, such as relationship type, duration, frequency of sex, and smaller age differences (Ford, Sohn and Lepkowski 2001; Katz et al. 2000; Ku, Sonenstein and Pleck 1994; Manlove, Ryan and Franzetta 2007; Manning,

Longmore and Giordano 2000; Sayegh et al. 2006). While they provide important insight into the typical relationship characteristics that could affect condom use, these studies have been limited by simplistic measures of the relationship context, a focus on a single relationship (i.e., first or recent), and insufficient data on young people's multiple relationship experiences.

The present study addresses the limitations of the extant literature by bringing a new focus to other characteristics of black South African young people's relationships. Introducing these aspects of relationships also allows us to examine whether the U.S. model of youths' relationship characteristics applies in other societal contexts in order to improve our general understanding of romantic and sexual relationships. On the one hand, we may expect that similar patterns of certain characteristics like relationship type could occur across social contexts and have similar implications for condom use, such as the difference in contraceptive behaviors of married couples versus those in casual, short term relationships. On the other hand, context-specific conditions like the more traditional gender norms in South Africa may mean that a given relationship characteristic, such as the age difference between partners, may have very different effects on condom use than in a context like the United States. We use two representative South African data sets that include detailed relationship-specific information about recent and lifetime sexual relationships. This enables us to explore youths' multiple relationship experiences and investigate a broader set of relationship factors within two different South African contexts, KwaZulu Natal and Cape Town. Additionally, we examine two important contraceptive behaviors, condom use at last sex and consistency of condom use with a given partner. Further, we acknowledge that individuals may behave differently in different relationships, and account for this within-person variability by conceptualizing relationships as nested within individuals through the use of multilevel modeling techniques.

## **BACKGROUND**

### *The South African Context*

The use of condoms is a politically contested issue in South Africa, a country with a long history of institutionalized racially discriminatory policy. 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 one of four population groups: black/African, Coloured, Indian/Asian, or white. Although apartheid ended in 1994, we use the same labels here because these categories still index groups' relative rankings within the social structure (Kaufman and Stavrou 2002). All life changes were determined on the basis of membership in one of these groups, with the majority black population afforded the fewest opportunities and resources, 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). All of these restrictions and limitations have led to dramatic socioeconomic disadvantage for blacks relative to whites and other population groups and created enormous disparities in health. For example, 12 percent of blacks aged 15-24 are infected with HIV, compared to less than 2 percent of whites, Coloureds, or Indians/Asians (Shisana et al. 2005). Since about four out of five young South Africans are black, this represents a large group at high risk.

These social and historical conditions have influenced condom use and may have shaped the relationship characteristics of black youth. For example, even in the post-Apartheid era a history of stringent racial residential restrictions has led to uneven placement of infrastructure including family planning service providers (Kaufman 1998) and has strongly influenced possible sexual networks among

youth. At the same time, population policy under apartheid strongly emphasized contraceptive use among black women in response to fears about the “swamping” of the relatively small white ruling population, which may have increased the use of condoms above that which would have otherwise prevailed, given the very high poverty rates of the black population. However, data from the Apartheid and post-Apartheid eras shows that among contracepting women, black and Coloured women have very high rates of use of injectable contraceptives compared to white or Indian/Asian women (Burgard 2004). These injectable methods were strongly promoted by the South African family planning system for black and Coloured 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 these groups were restricted. In addition, women may have preferred injectables to other forms of contraception if they were engaged in transactional sexual relationships to obtain economic support from male partners who did not want to use condoms (Burgard 2004). Injectable methods are not evident to partners and can limit unintended pregnancy, but do not protect women from HIV/AIDS or other sexually transmitted infections.

#### *Relationships Characteristics and Condom Use*

Two major themes can be used to organize existing findings about relationship characteristics that may be linked to condom use among young people. The first is heterogamy, or differences in key social characteristics between partners, and the second is commitment, which captures the type, duration and other characteristics of relationships. A common finding in the United States is that young people who are involved with an older partner, particularly when they are 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; Glei 1999; Kusunoki and Upchurch 2008; Manlove, Ryan and Franzetta 2003; Manning, Longmore and Giordano 2000). A similar result is found among South African youth. For instance, one study of South African young people aged 15-24 shows that as the age of the male partner increases there is a lower likelihood of condom use within that relationship (Moyo et al. 2008). In general, people tend to become involved in relationships with partners who have similar characteristics (Ford, Sohn and Lepkowski 2003). Similarities reflect shared knowledge and experiences (McPherson, Smith-Lovin and Cook 2001), which may make communication about sex and contraception easier. Although most adolescent relationships in the United States are homogamous with respect to race and ethnicity, age differences of up to two years between partners are common (Ford, Sohn and Lepkowski 2001) and may have implications for contraceptive behavior. A difference in partner age likely affects the power distribution within the relationship and subsequently, decisions regarding sex and the use of contraception (Abma, Driscoll and Moore 1998; Weisman et al. 1991; Wingood and DiClemente 1998).

The level of commitment in a particular relationship also influences the use of condoms. Despite difficulties in achieving a standardized definition for commitment, most studies indicate that relationships that are new or casual are more likely to engage in condom use, while relationships that are established or serious are less likely to do so. In addition, individuals who have both “main” and “side” partners are more likely to use condoms with their “side” partners (Lansky, Thomas and Earp 1998; Macaluso et al. 2000; Santelli et al. 1996). This type of concurrency may be particularly salient in South Africa. As noted by one South African study, men are more likely to report having one primary companion, as well as additional partnerships, whereas exclusive relationships are more commonly reported by women (Harrison, Lurie and Wilkinson 1997). Other indicators often used to capture features of commitment, such as duration of the relationship and frequency of sex, have also been shown to be important. Contraceptive use, specifically condom use, becomes less consistent with increased duration of a relationship and is entirely stopped after a period of time (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). In a new or casual relationship, the partners may know little about each other and therefore may be unable to assess the risk associated with engaging in unprotected sexual intercourse. As a relationship progresses and becomes steady or committed, however, the partners may know more about each other and therefore may find it less important to use condoms because these relationships are believed to be of lower risk. Moreover, relationships that are more committed may rely on other non-barrier contraceptive methods because concern turns to prevention of pregnancy rather than sexually transmitted infections (STIs) (Ku, Sonenstein and Pleck 1994). Research also suggests that condom use may not be adequately integrated into relational scripts in serious relationships. In intimate relationships, individuals may not consider using condoms because of normative beliefs about what should occur in such relationships or because either partner may be hesitant to introduce the use of condoms because it is perceived to imply infidelity, signify distrust, or symbolize casual sex (Gilmore, DeLamater and Wagstaff 1996; Hynie et al. 1998; Wingood and DiClemente 1998). This may also be quite salient in the South African context given the gender disparities in the prevalence of concurrency mentioned above.

#### *Individual Characteristics and Condom Use*

Young people's individual characteristics also influence condom use, as well as the types of relationships they form. For example, gender is a major stratifying factor that shapes most aspects of relationships and sexual behavior in South Africa. In particular, the highly patriarchal social structure in many low-income, black neighborhoods continually disenfranchises women (Varga 1997; Wojcicki and Malala 2001). Men are seen as the authority figures while the ideal female is seen to be submissive and compliant with the desires of the opposite sex. Such a pronounced gender gap in social influence and power frequently leaves women with little control over their lives or choices. This lack of power transcends various aspects of life and is seen to be particularly evident in the realm of romantic or sexual relationships. The power imbalance present in most relationships forces women to comply with the desires of their partner and leaves them little latitude to protect their sexual health (MacPhail and Campbell 2001). Many men feel the need to prove their manliness and virility through multiple sexual relations, while 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). With this double standard in mind, many women do not insist on condom use as a means of proving fidelity to their singular partner (Varga 1997). Considering the relatively frequent concurrent relationships of men, failure to use condoms may be very problematic in the era of HIV/AIDS.

Economic circumstances influence the use of condoms in sexual relationships. Because economic opportunities tend to be greater for men, women may take on sexual partners for the economic support they can provide (Varga 1997). In one qualitative study, men reported engaging in sexual relationships primarily to fulfill sexual desires while women cited monetary support as the central reason for their relationships (MacPhail and Campbell 2001). In the context of severe economic strain facing many black communities in South Africa, women often forego condom use to maintain financial support and continued aid from their partner. The decision to forego condoms is also common among women who engage in sex work as their main source of income, as customers will pay a premium when condoms are not used (Wojcicki and Malala 2001).

Violence is also an everyday part of life for women living in the most impoverished areas of South Africa, with romantic and sexual relationships a common context in which it takes place. Forced or coerced sex is commonplace and characterizes many women's first sexual experiences (Rutenberg et al. 2003). In one study, over 70% of South African young women reported that attempts to refuse sex were unsuccessful and that an attempted rejection almost always resulted in threats or physical abuse (Varga

1997). Fear of sexual violence reduces condom use because women are reluctant to risk accusations of infidelity when they suggest using a barrier method. Concerns about HIV or STI exposure are thus overridden by the more obvious and imminent threat of sexual violence (Harrison, Lurie and Wilkinson 1997; Varga 1997).

There are also notable differences in condom use by age among young people. Condom use at last sex and the consistency with which condoms are used decreases with increasing age (Abma et al. 2004; Ku, Sonenstein and Pleck 1994; Sheeran, Abraham and Orbell 1999). As individuals age, they are more likely to become emotionally involved with their partners and subsequently expand the types of behavior that are acceptable in more committed relationships (Furman, Brown and Feiring 1999), such as increased frequency of sex and the diminished use of barrier methods (Howard et al. 1999; Ku, Sonenstein and Pleck 1994; Sheeran, Abraham and Orbell 1999).

### *Research Questions*

Our study investigates the role of relationship context for condom use and consistency of use in two representative samples of South African young people, with a particular focus on relationship characteristics highlighted by U.S. researchers – heterogamy and commitment. We ask two related research questions. First, are the characteristics of youths' most recent sexual relationships associated with condom use and consistency of use, net of key individual and household characteristics? To address this question, we focus on respondents' most recent relationship. Second, is there variation in condom use and consistency of use across relationships and can this variation be explained by relationship characteristics? To address this question, we will investigate multiple recent relationships and relationship histories.

## **DATA AND METHODS**

### **Data**

We use two representative South African data sets, the "Transitions to Adulthood in the Context of HIV/AIDS" study (hereafter, the Transitions study) and the "Cape Area Panel Study" (hereafter, CAPS). 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). Blacks comprise the vast majority of the population (82%), with Asians making up another 9 percent, and Whites and Coloureds together comprising the remaining 9 percent. A stratified, multi-stage cluster sampling method was used in sample selection for the Transitions study, with enumeration areas from the 1996 census serving as the primary sampling units. 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). Respondents were re-interviewed in 2001, along with new youths from the same sampling frame; 2,223 Wave 1 youth were re-interviewed, along with 993 additional young people. The overall attrition rate between the Wave 1 and 2 surveys among youth was 27 %, mainly due to migration out of the area (Hallman and Grant 2004). We use all respondents available in the 2001 study wave to obtain the largest possible analytic sample. Respondents who ever had sexual intercourse (N = 2355) were asked how many partners they had sex with in the past 12 months, and those who reported at least one partner were asked a series of questions about the three most recent partners they had in the last 12 months.

CAPS is an ongoing longitudinal study of young adults, their families, and households in Cape Town, South Africa. There are three predominant population groups in Cape Town: Coloureds (about 50%), blacks/Africans (26%), and whites (22%). The sample is a two-stage clustered sample drawn from 440

enumeration areas, with oversamples of African and white households. CAPS was designed to be representative of the Cape Town metropolitan area and thus the majority of all of sampled households are urban. Wave 1 was conducted in 2002 and includes 4,752 young adults aged 14-22. Wave 2 was conducted in 2002 (with one-third of the Wave 1 sample) and 2003 (the remaining two-thirds of Wave 1 sample) and provides follow-up information on school, work, and living arrangements. Wave 3 was conducted in 2005 and follows all Wave 1 respondents who were still living in Cape Town. Attrition between the first and third waves was about 20% and was mostly due to migration out of the area.<sup>1</sup> Questions regarding respondents' sexual and relationship experiences were asked differently across survey waves of CAPS. In Wave 3 only, detailed information about all lifetime sexual relationships (up to ten) was obtained. In order to use measures that were most comparable to those collected in the Transitions study, this analysis uses the Wave 3 CAPS data. Respondents who ever had sexual intercourse were asked about all relationships they had ever had that involved sex, starting with the first and including up to ten partners.

We restrict our analytic samples to African/black respondents only for the main analyses, and include Coloured respondents in supplementary analyses using the CAPS data only.<sup>2</sup> Because population group differences in individual socioeconomic resources and health outcomes are well-documented (Eaton, Flisher and Aarø 2003; Kaufman et al. 2004), we focus mainly on the relatively understudied issue of inequality within the Black and economically marginalized populations. The crumbling of official racial residential restrictions and introduction of policies to improve the well-being of non-Whites after the end of apartheid in 1994 have contributed to slowly rising within-group disparities as some families have been able to take advantage of new economic opportunities while others have been unable to do so (Adato, Carter and May 2006). Rising within-group inequality in resources and community contexts may contribute to stratified profiles of risk for young black South Africans. Restricting to the single largest population group in South Africa allows us to investigate condom use and relationships among young people at greatest risk of HIV/AIDs and adolescent pregnancy. After eliminating respondents with missing data on covariates, this leaves 1,562 African/black respondents in the Transitions sample and 804 black respondents in the CAPS sample.

## Measures

### *Condom Use*

We use two measures of condom use. For Transitions respondents, we measure condom use the last time the respondent had sex with a given partner in the last 12 months ("The last time you had sex with him/her, did you or your partner use a condom?"), coded so that 1 = used a condom and 0 = did not use a condom.<sup>3</sup> For both Transitions and CAPS respondents, we measure the consistency of condom use with a given partner with an item that asked "How often do/did you use a condom with this partner?"

<sup>1</sup> A fourth wave of CAPS data was collected in 2006, but no information on relationships was collected, so this wave is not used here.

<sup>2</sup> There were very few white or Coloured respondents to the Transitions sample, due to the small numbers who live in the Durban areas. There are 232 Indian/Asian respondents who have ever had sex in the sample, but the number is too small to provide adequate power for comparison with the African/black population in multivariate analysis.

<sup>3</sup> Due to the structure of the CAPS interview, if a respondent had multiple, and especially concurrent partners, it is not possible to determine which partner the respondent had sex with in reference to the use of a condom at the last sexual encounter. We will conduct sensitivity analysis examining condom use at last sex for those respondents for whom the most recent partner is clear, and for those who have had only one partner.



(Transitions)” or “When you had sex with (partner), how often if ever did you use a condom (CAPS)?” Response choices for both surveys were: always, usually, sometimes, rarely, or never, and we created a dichotomous measure so that 1 = always used a condom, and 0 = never, rarely, sometimes, or usually did so.

#### *Relationship Characteristics*

We measure couple heterogamy with an indicator of age difference between partners. In the Transitions study, respondents were asked for their partner’s age in years, while in the CAPS study respondents were asked how many years older or younger their partner was, and both of these items were used to generate a continuous measure of age difference, with years older reflected by positive values and years younger reflected by negative values. We also created a dichotomous indicator of potential “sugar daddy” relationships, coded so that 0 = respondent’s partner is younger or less than 10 years older, and 1 = partner is at least 10 years older than the respondent.

Relationship commitment is indexed with measures of relationship type, duration, frequency of sex, and concurrency with other relationships. Type of relationship was ascertained for the Transitions sample with an item distinguishing the following possible categories: spouse, casual acquaintance, friend, girlfriend/boyfriend, fiancé(e), relative, teacher, sex worker, or other type. We collapsed these categories to create four main substantive types, given the very small numbers in some categories: 0 = girlfriend/boyfriend, 1 = spouse/fiancé(e), and 2 = casual acquaintance/friend. Among CAPS respondents, the categories used to describe relationship type were different from those used for the Transitions study; they were asked: “At the time when you first had sex with (partner), what was your relationship with him/her – spouse/married, someone you loved but were not married to, someone you knew well but did not love, someone you knew but not well, someone you just met, or someone else (specify)?” To generate a categorical indicator as similar as possible to the Transitions measure, and to reflect the “seriousness” of the relationship, we created a measure with the following categories: 0 = loved but not married to, 1 = spouse/married, 2 = knew well but did not love/knew but not well/just met. For the purposes of multivariate analyses, a category for respondents reporting other types of relationships (e.g. relative, teacher, or “other”) was too small to include ( $N < 5$  in each study).

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 interview. For respondents reporting that the relationship was still ongoing, and for Transitions respondents (who did not directly report the duration of the relationship) this measure was used as the relationship duration. For those relationships that CAPS respondents reported were no longer ongoing, their direct report of duration was used. We converted the categorical measure that was collected (less than one month, 1 to 4 months, 5 to 12 months, or more than one year) to a continuous measure by using midpoints of these categories, and a value of 18 months for those relationships that lasted more than one year. These choices for coding relationship duration probably slightly overestimate the length of the average relationship in the Transition data and underestimate the length of relationships lasting more than one year in the CAPS data, but better solutions to the relevant data limitations are not obvious.

Frequency of sex was measured differently across studies; Transitions respondents were asked the open-ended question: “How many times did you have sex with (partner) in the last month,” while CAPS respondents were asked about pre-determined categories of frequency: “How many times did you have sex with (partner) – only once, 2 to 10 times, or more than ten times?” We leave each of these variables coded as they were collected and include them as continuous measures in multivariate models. Finally, concurrency was measured for the Transitions sample by identifying respondents with multiple partners

in the past 12 months who reported that their second and/or third most recent partner was still their sexual partner as well as their most recent partner, so that 1 = in concurrent relationships, 0 = not in concurrent relationships in past 12 months. For each sexual partner they reported on, CAPS respondents were asked “Did you have any other sexual partners during the time that you and (partner) were having a sexual relationship – definitely yes, not sure, or definitely no?” We recoded this variable for each relationship so that 1 = in concurrent relationships (definitely yes), 0 = not in concurrent relationships in past 12 months (not sure/definitely no).

#### *Other Independent Variables*

Control variables include individual and household characteristics shown to influence condom use, relationship characteristics, or both. Age is measured in years, and sex is coded so that 0 = female and 1 = male. We 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?” Household assets are measured with indicators of home construction materials, type of toilet facilities and water supply, access to electricity, and telephone ownership. We created an index of these items, with value for each standardized and summed; the Cronbach’s alpha values are 0.79 for the Transitions sample and 0.78 for CAPS, and the range is -2.05 to 0.995 for the Transitions sample and -3.26 to 0.492 for CAPS, with a higher score indicating greater assets.

#### **Analytic Strategy**

We begin by providing descriptive statistics of the two samples of South African youth and their sexual relationships. Descriptive analysis is conducted using Stata/SE 10.0 (StataCorp 2007), and all analyses use appropriate study-specific weights. The first set of multivariate analyses focuses on the most recent sexual relationship. We estimate simple logistic regression models for each of the two outcomes of interest, condom use at last sex and consistency of condom use. These models are also estimated using Stata/SE 10.0.

The second set of multivariate analyses examines the same contraceptive behaviors but for up to three of the most recent sexual relationships, and then extends this to include all lifetime sexual relationships (the latter for CAPS only). For these analyses, relationships and individuals are conceptualized at distinct levels, and multilevel modeling techniques are applied in order to investigate variation in condom use and consistency of use attributable to differences in the characteristics of relationships, while also examining the effects of individual characteristics. This type of clustering (i.e., relationships nested within individuals) creates dependence within individuals. In other words, relationships for the same individuals are more likely to be similar than are relationships for different individuals. At the same time, however, it is likely that individuals may behave differently in different relationships depending on the unique features of a given relationship. Ignoring the correlation created by such clustering may lead to biased coefficient estimates and associated standard errors that are too small (Mason 2001). Furthermore, failing to account for the nesting of relationships within individuals may conceal potentially important between-individual heterogeneity and therefore lead to erroneous conclusions regarding the effects of relationship characteristics. Multilevel models will be estimated using HLM 6.0 (Raudenbush, Bryk and Congdon 2004).

#### **PRELIMINARY RESULTS**

Preliminary analysis was conducted for the most recent sexual relationship as well as up to three recent sexual relationships and examines both condom use at last sex and consistency of condom use for Transitions respondents, while focusing on consistency of condom use for CAPS respondents.

### Descriptive Results

Table 1 (Transitions) and Table 2 (CAPS) present the weighted distributions of individual characteristics (Panel A) and the characteristics of individuals' most recent sexual relationship in the past 12 months (Panel B), as well as the characteristics of up to three of their most recent sexual relationships in the past 12 months (Panel C). The average age of respondents in the Transitions data is about 19 to 20 years old. CAPS respondents are slightly older, at an average of 21 years old. Overall, about 7% of Transitions respondents report having been forced to have sex, with much higher percentages reported among women (2% for men compared to 12% for women). Overall, CAPS respondents report similar levels of forced sex as do Transitions respondents (9%), but somewhat unexpectedly, there are no sex differences in this sample. On average, respondents in both data sets report 1.3 to 1.5 sexual partners in the past 12 months, with men reporting somewhat higher numbers of sexual partners than women.

Turning to relationship characteristics with the respondent's most recent partner (Panel B in Tables 1 and 2), about 60% of Transitions respondents report condom use at last sex with their most recent sexual partner; men have somewhat higher percentages (63%) than women (56%) (recall that this measure is not available in the CAPS data). About 42% of respondents in the Transitions sample report always using a condom with their most recent sexual partner, but the sex difference is dramatic: more than half of men report always using a condom, compared to less than one in three women. Compared to the Transitions sample, a higher percentage of respondents in the CAPS sample overall report always using a condom in their most recent sexual relationship (52% versus 42%), but the sex difference is apparent for these respondents as well (62% of men versus 42% of women).

With regard to heterogamy, we find that on average, respondents' partners are about 1.2 years older in the Transitions sample and two years older in the CAPS sample, but there are large gender differences in both samples. Young men's partners average 1.8 years younger in the Transitions sample, but only about one-quarter of a year younger in the CAPS sample. By contrast, female respondents' partners average about 4 years older in both samples. Having a partner who is 10 or more years older is almost solely reported by young women, with 4% of female respondents in the Transitions sample and 8% in CAPS reporting a much older partner.

There is very little variation in relationship type among respondents in the Transitions sample, with 96% describing their most recent sexual partner as a girl/boyfriend. Only about 3% of respondents are married or engaged to their most recent sexual partner and about 1% of relationships are described as friendships or casual; the latter type is much more common among men than women. Somewhat more variation in relationship type is evident among the CAPS respondents, but the categories are different from those used for the Transitions respondents. About 80% of the most recent sexual relationships are with someone the respondent loved but was not married to. Almost 7% of respondents are married to their recent partners with large sex differences in this figure (3.2% for men and 9.6% for women). About 10% of recent relationships are with someone the respondent knew well but did not love, knew but not well, or just met, with much higher percentages of such relationships reported by men than women (14.1% for men and 6% for women). Relationship duration in both data sets averages about 24 to 27 months; young men's relationships average 17 (Transitions) to 22 months (CAPS), while young women's relationships average about 31 months in both samples. About one in five Transitions respondents and closer to one in four CAPS respondents reports concurrent relationships, with much higher figures among young men (35 to 38%) than among young women (2 to 12%).

Panel C in Tables 1 and 2 displays relationship characteristics based on a pooled sample of up to three relationships in the past 12 months. Overall, and in both data sets, the observed pattern of relationship

characteristics is similar whether considering the pooled set of all relationship or the most recent relationship (Panel B). These broad similarities are likely due to the fact that most respondents report only a single relationship in the past year. However, we do observe some differences when comparing Panels B and C; the average age difference between partners is reduced somewhat (more for Transitions respondents than for CAPS respondents), spouse/fiancé(e) relationships are less frequent for men, and the friend/casual relationship type is slightly more frequent. Figures for concurrency are higher in this sample of relationships than when considering only the most recent relationship, and particularly for young men in both samples, as would be expected for those who have had multiple partners in the past 12 months.

### **Multivariate Results**

Table 3 presents the results of a series of simple logistic regression models investigating condom use at last sex (Transitions only) and consistency in condom use (Transitions and CAPS), focusing on the most recent sexual relationship. Unstandardized coefficients representing log-odds are presented with standard errors in parentheses, and log likelihoods are presented at the bottom of each column for comparison across nested models. For both outcome measures, the first model in each set (Models 1, 3, and 5) includes individual characteristics only and the second model in each set (Models 2, 4, and 6) adds relationship characteristics. As shown in Model 1, although age and gender are not significantly associated with condom use at last sex, household assets are significantly positively associated and ever having been forced to have sex is significantly negatively associated with condom use at last sex. Household assets and experience with forced sex remain significantly associated with condom use at last sex net of relationship characteristics (Model 2). Of the relationship characteristics, both age difference and frequency of sex are significantly associated with condom use at last sex. With each additional year by which the partner's age exceeds the respondent's age, the log-odds of condom use declines significantly by 0.07. As the frequency of sex increases, the log-odds of condom use also decreases significantly.

The results for models predicting the consistency of condom use in the most recent sexual relationship are presented in the right panel of Table 3, first for the Transitions sample (Models 3 and 4) and then for the CAPS sample (Models 5 and 6). Results for Model 3 show that young men have higher log-odds of always using a condom with their partners than do young women. Household assets are also positively associated with consistency of condom use. Counter to the findings for condom use at last sex (Model 2), a history of forced sex is not significantly associated with consistency of use. After including relationship characteristics in Model 4, males no longer show significantly higher log-odds of always using a condom with their most recent partner. This may be explained by sex differences in relationship duration, frequency of sex, or likelihood of concurrency, all of which are associated with significantly lower log-odds of consistent condom use. Turning to the findings for the CAPS sample, Models 5 and 6 show that all individual characteristics are significantly associated with consistency of condom use, even after adjusting for differences in relationship characteristics. Older respondents are significantly less likely to always use a condom, while males and those with more household assets are more likely to do so. A history of forced sex is significantly negatively associated with always using a condom. As was found for Transitions respondents, duration and frequency of sex are also negatively associated with always using a condom among CAPS respondents. However, unlike in the Transitions sample, concurrent relationships do not differ significantly from non-concurrent relationships in terms of consistency of condom use.

The findings in Table 3 provide at least a provisional answer to our first research question, which asked whether the characteristics of youths' most recent sexual relationships are associated with condom use

and consistency of use. We find evidence that relationship heterogamy, here measured with an indicator of age difference between partners, is an important predictor of condom use for Transitions respondents from KwaZulu Natal, though we find no such association for CAPS respondents from Cape Town. Relationship commitment, as indicated by the frequency of sex, influences condom use at last sex and the consistency of use, while relationship duration is associated with consistency of use only. These associations are net of important individual and household characteristics, and show some consistency and some difference across samples of South African young people from very different regions of the country.

Our second research question asked whether there is variation in condom use and consistency of use across relationships and whether this variation can be explained by relationship characteristics. To begin to answer this question, Table 4 presents the results for condom use at last sex and consistency of condom use for up to three of the respondents' most recent sexual relationships. These findings are based on population averaged models, which account for the clustering of relationships within individuals. The results of these models are comparable to those presented in Table 3, with only two exceptions. When accounting for additional relationship experiences, Transitions sample men have significantly higher log-odds of always using a condom than women in the full Model 4, and concurrency is no longer significantly associated with consistency of their use of condoms. The similarity in findings when considering only the most recent partner (Table 3) versus up to three relationships in the past year (Table 4) is likely due to the relatively small number of respondents who report two or three relationships in this relatively brief time span. Moreover, multiple relationships are reported almost solely by men, so their relationship characteristics dominate this sample of relationships to a greater degree than when considering the most recent relationship. Nonetheless, it also suggests that behaviors may not vary dramatically across relationships, a question we can better explore with multilevel models that include a full history of relationships in CAPS respondents' lifetimes.

#### **FURTHER PLANS**

These preliminary results highlight the importance of examining the characteristics of young people's relationships. One objective we will continue to pursue is a better understanding of variation in young people's multiple relationship experiences, as we recognize that individuals may behave differently in different relationships. With the population averaged models presented, we have included multiple relationships but have merely accounted for the clustering of these experiences. In order to assess variation in contraceptive behaviors associated with relationship characteristics for a given individual, we need to apply the appropriate multilevel techniques discussed previously. This will be completed for the final paper to be presented at the PAA conference. Preliminary results suggest that there is very little variation in the types of relationships identified among these South African youth. Nonetheless, relationship type only captures a portion of the overall character of youths' sexual relationship experiences, thereby masking potentially meaningful variability that could have implications for condom use (Kusunoki and Upchurch 2008). Therefore, we will explore the extent to which relationships classified as a particular type (e.g., boyfriend/girlfriend) may substantively differ in terms of frequency of sex, duration, and concurrency. We will test for interactions between relationship type and these other characteristics as well as investigate the use of a multidimensional typology that incorporates all four (or some subset) of these indicators. Further, we expect the associations between relationship characteristics and contraceptive behaviors to vary as a function of the characteristics of the individual. For instance, the negative effect of having an older partner on condom use in a relationship may be greater when the respondent is female. To explore this possibility we will also test for cross-level interactions in our multilevel models. Sensitivity analyses will also be conducted to examine our measurement choices (i.e., dichotomization of consistency of condom use, use of continuous measures

of age difference between partners versus a dichotomous indicator of a much older partner), the importance of selecting only black respondents (i.e., by incorporating Coloured respondents from the CAPS sample), and other analyses.

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Table 1. Characteristics of individuals (Panel A), of relationship with most recent partner in past 12 months (Panel B), and of up to three relationships in past 12 months (Panel C), Transitions African sample 2001.

	Overall		Male		Female	
	Mean/%	S.D.	Mean/%	S.D.	Mean/%	S.D.
<i>A: Individual Characteristics</i>						
Age	19.5	(2.43)	19.4	(2.45)	19.7	(2.41)
Household asset index	-0.216	(0.680)	-0.150	(0.677)	-0.278	(0.678)
Ever forced sex	0.07		0.02		0.12	
Number of partners in past 12 months	1.52	(1.33)	1.96	(1.75)	1.09	(0.44)
<i>B: Characteristics of Most Recent Relationship</i>						
Condom used at last sex	0.59		0.63		0.56	
Consistency (Always versus never-usually)	0.42		0.54		0.31	
<i>Heterogamy</i>						
(Age) # Years younger or older	1.17	(3.93)	-1.83	(1.92)	4.04	(3.14)
(Age) Partner 10+ years older	0.02		0.00		0.04	
<i>Commitment</i>						
Type of relationship						
Girl/boyfriend	96.23		95.51		96.92	
Spouse/Fiancee	2.61		2.45		2.77	
Friend/Casual	1.15		2.04		0.31	
Duration in months	24.06	(21.23)	16.95	(16.44)	30.84	(23.01)
Frequency of sex (times in past month)	1.79	(2.47)	1.70	(2.28)	1.87	(2.64)
Concurrent with 1+ other relationships	0.20		0.38		0.02	
	1562		761		801	
<i>C: Characteristics of Up to 3 Relationships</i>						
Condom used at last sex	0.60		0.64		0.55	
Consistency (Always versus never-usually)	0.44		0.54		0.30	
<i>Heterogamy</i>						
(Age) # Years younger or older	0.53	(3.82)	-1.81	(2.03)	4.01	(3.15)
(Age) Partner 10+ years older	0.02		0.00		0.04	
<i>Commitment</i>						
Type of relationship						
Girl/boyfriend	96.43		96.15		96.83	
Spouse/Fiancee	2.03		1.53		2.78	
Friend/Casual	1.54		2.32		0.39	
Duration in months	23.42	(20.65)	18.34	(16.60)	30.97	(23.56)
Frequency of sex	1.70	(2.38)	1.57	(2.18)	1.88	(2.64)
Concurrent with 1+ other relationships	0.36		0.58		0.04	
N	2017		1184		833	

Table 2. Characteristics of individuals (Panel A), of relationship with most recent partner in past 12 months (Panel B), and of up to three relationships in past 12 months (Panel C), CAPS African sample 2005.

	Overall		Male		Female	
	Mean/%	S.D.	Mean/%	S.D.	Mean/%	S.D.
<i>A: Individual Characteristics</i>						
Age	21.3	(2.50)	21.4	(2.58)	21.2	(2.44)
Household asset index	-0.351	(0.832)	-0.361	(0.867)	-0.343	(0.803)
Ever forced sex	0.09		0.09		0.09	
Number of partners in past 12 months	1.31	(0.80)	1.53	(1.03)	1.12	(0.45)
<i>B: Characteristics of Most Recent Relationship</i>						
Condom used at last sex	n.a.		n.a.		n.a.	
Consistency (Always versus never-usually)	0.52		0.62		0.42	
<i>Heterogamy</i>						
(Age) # Years younger or older	2.05	(4.02)	-0.24	(3.17)	4.00	(3.62)
(Age) Partner 10+ years older	0.05		0.01		0.08	
<i>Commitment</i>						
Type of relationship						
Loved not married	83.6		82.7		84.4	
Spouse	6.7		3.2		9.6	
Just met/knew/not loved	9.8		14.1		6.0	
Duration in months	26.90	(25.73)	22.49	(24.28)	30.65	(26.35)
Frequency of sex (1=once,3 =>10 times)	2.57	(0.63)	2.46	(0.69)	2.66	(0.56)
Concurrent with 1+ other relationships	0.23		0.35		0.12	
	804		352		452	
<i>C: Characteristics of Up to 3 Relationships</i>						
Condom used at last sex	n.a.		n.a.		n.a.	
Consistency (Always versus never-usually)	0.54		0.64		0.43	
<i>Heterogamy</i>						
(Age) # Years younger or older	1.74	(4.01)	-0.29	(3.20)	3.96	(3.60)
(Age) Partner 10+ years older	0.05		0.02		0.08	
<i>Commitment</i>						
Type of relationship						
Loved not married	82.0		81.1		83.0	
Spouse	6.5		3.0		10.3	
Just met/knew/not loved	11.5		15.9		6.7	
Duration in months	26.25	(26.37)	22.35	(25.85)	30.51	(26.29)
Frequency of sex (1=once,3 =>10 times)	2.54	(0.65)	2.43	(0.69)	2.65	(0.58)
Concurrent with 1+ other relationships	0.30		0.43		0.15	
N	967		482		485	

Table 3. Unstandardized coefficients from logistic regression models of condom use at last sex and consistency of condom use with most recent sexual partner in the past 12 months, Transitions and CAPS African respondents.

	Used Condom Last Time Had Sex				Always Used Condom with this Partner							
	Transitions KZN African Sample				Transitions KZN African Sample				CAPS Cape Town African Sample			
	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	b	se	b	se	b	se	b	se	b	se	b	se
Age	-0.034	(0.040)	-0.010	(0.044)	-0.051	(0.040)	-0.009	(0.042)	-0.169	(0.032) ***	-0.085	(0.035) *
Male	0.179	(0.179)	-0.200	(0.281)	0.878	(0.181) ***	0.512	(0.274)	0.900	(0.157) ***	0.589	(0.188) **
HH asset index	0.491	(0.110) ***	0.516	(0.108) ***	0.427	(0.114) ***	0.465	(0.114) ***	0.276	(0.102) **	0.237	(0.102) *
Ever forced sex	-0.773	(0.314) *	-0.712	(0.310) *	-0.560	(0.362)	-0.571	(0.377)	-0.547	(0.279) *	-0.619	(0.297) *
Age diff/partner	--		-0.068	(0.031) *	--		-0.059	(0.033)	--		-0.028	(0.022)
Relationship Type <sup>a</sup>												
Spouse/Fiancee	--		0.034	(0.389)	--		0.165	(0.408)	--		-0.054	(0.331)
Friend/Casual	--		0.060	(0.631)	--		0.386	(0.631)	--		0.014	(0.276)
Duration (months)	--		-0.008	(0.005)	--		-0.018	(0.005) ***	--		-0.014	(0.004) ***
Frequency of sex <sup>b</sup>	--		-0.119	(0.040) **	--		-0.098	(0.042) *	--		-0.541	(0.147) ***
Concurrency	--		-0.361	(0.268)	--		-0.502	(0.252) *	--		-0.015	(0.198)
Constant	1.121	(0.804)	1.413	(0.827)	0.329	(0.799)	0.448	(0.806)	3.384	(0.672) ***	3.563	(0.760) ***
N	1562		1562		1562		1562		804		804	
Log Likelihood	-1019.2		-990.2		-996.9		-959.5		-518.1		-493.3	

Note : \*\*\*p<.001, \*\*p<.01, \*p<.05.

a. Omitted category is girlfriend/boyfriend (Transitions sample) or loved, not married (CAPS sample).

b. For Transitions sample coded as times had sex in the past month, for CAPS sample 1 = only once, 2 = 2-10 times, 3 = >10 times.

Table 4. Unstandardized coefficients from logistic regression models of condom use at last sex and consistency of condom use with up to three partners in the past 12 months, Transitions and CAPS African respondents.

	Used Condom Last Time Had Sex				Always Used Condom with this Partner							
	Transitions KZN African Sample				Transitions KZN African Sample				CAPS Cape Town African Sample			
	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	b	se	b	se	b	se	b	se	b	se	b	se
Age	-0.010	(0.040)	0.007	(0.043)	-0.024	(0.039)	0.005	(0.041)	-0.157	(0.030) ***	-0.069	(0.033) *
Male	0.225	(0.175)	-0.155	(0.258)	0.901	(0.177) ***	0.516	(0.253) *	0.929	(0.148) ***	0.662	(0.176) ***
HH asset index	0.496	(0.108) ***	0.509	(0.109) ***	0.430	(0.111) ***	0.472	(0.114) ***	0.327	(0.098) ***	0.297	(0.099) **
Ever forced sex	-0.758	(0.307) *	-0.664	(0.310) *	-0.579	(0.356)	-0.490	(0.369)	-0.613	(0.265) *	-0.635	(0.282) *
Age diff/partner	--		-0.067	(0.027) *	--		-0.069	(0.029) *	--		-0.015	(0.021)
Relationship Type <sup>a</sup>												
Spouse/Fiancee	--		-0.134	(0.385)	--		-0.037	(0.392)	--		0.022	(0.312)
Friend/Casual	--		0.237	(0.378)	--		0.521	(0.344)	--		0.094	(0.268)
Duration (months)	--		-0.006	(0.004)	--		-0.012	(0.004) ***	--		-0.016	(0.003) ***
Frequency of sex <sup>b</sup>	--		-0.129	(0.044) **	--		-0.116	(0.052) *	--		-0.532	(0.131) ***
Concurrency	--		-0.244	(0.256)	--		-0.340	(0.242)	--		0.056	(0.178)
Constant	0.652	(0.811)	0.991	(0.811)	-0.189	(0.789)	0.057	(0.790)	3.153	(0.645) ***	3.213	(0.720) ***
N (obs)	2017		2017		2017		2017		967		967	
N (respondents)	1562		1562		1562		1562		803		803	
Wald Chi-square	27.8	***	56.4	***	46.9	***	78.8	***	68.0	***	115.2	***

Note : \*\*\*p<.001, \*\*p<.01, \*p<.05.

a. Omitted category is girlfriend/boyfriend (Transitions sample) or loved, not married (CAPS sample).

b. For Transitions sample coded as times had sex in the past month, for CAPS sample 1 = only once, 2 = 2-10 times, 3 = >10 times.