

Community norms for HIV risk behaviors among men in a South African township

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Abstract We investigated alcohol-related sexual risk behavior from the perspective of social norms theory. Adults ($N = 895$, 62% men) residing in a South African township completed street-intercept surveys that assessed risk and protective behaviors (e.g., multiple partners, drinking before sex, meeting sex partners in shebeens, condom use) and corresponding norms. Men consistently overestimated the actual frequency of risky behaviors, as reported by the sample, and underestimated the frequency of condom use. Relative to actual attitudes, men believed that other men were more approving of risk behavior and less approving of condom use. Both behavioral and attitudinal norms predicted the respondents' self-reported risk behavior. These findings indicate that correcting inaccurate norms in HIV-risk reduction efforts is worthwhile.

Keywords Social norms · Condom use · HIV · South Africa · Sexual risk

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Introduction

Sub-Saharan Africa is in the midst of an HIV/AIDS epidemic. Southern Africa is home to two-thirds of people living with HIV/AIDS in the world; although only 10% of the world's population lives in southern Africa, more than 85% of the world's AIDS-related deaths have occurred in this region (UNAIDS 2006). In the Republic of South Africa, 7.9% of men and 13.6% of women are infected with HIV (Shisana et al. 2009). Like elsewhere in the world, the AIDS epidemic in South Africa is linked, in part, to substance use. Alcohol serving establishments are often the very places that link drinking with risks for HIV infection. Informal alcohol serving establishments, such as small bars and private homes where alcoholic beverages are sold and served, popularly known as shebeens, are often places where sex partners meet (Morojele et al. 2004). Research conducted in South Africa suggests a close association between patronizing shebeens and engaging in HIV risk behaviors such as unprotected sex and sex with concurrent partners (Kalichman et al. 2008; Morojele et al. 2006). Shebeens sometimes provide venues for sex between new or casual partners (Morojele et al. 2006). The co-occurrence of these behavioral risk factors suggests the importance of social determinants of health behaviors, including social norms.

Social norms play an explanatory role in theories of health behavior in general (Godin and Kok 1996) and HIV risk behavior in particular (Albarracin et al. 2001; Auerbach et al. 2009). Perceived norms are a form of internalized social influence (Oostveen et al. 1996). Norms predict behavioral intentions and behavior in part because they signal what will be accepted and/or approved by the group; failure to conform to social norms invites disapproval and/or social sanction (Cialdini and Trost 1998).

Distinction has been made between behavioral (descriptive) and attitudinal (injunctive) norms (Cialdini et al. 1990). Behavioral norms refer to perceptions of how the group behaves, and attitudinal norms refer to perceptions of what the group finds acceptable. Although conceptually similar, these two types of norms are only moderately correlated to one another and contribute independent variance to predictive models (Larimer and Neighbors 2003; Ravis and Sheeran 2003). Longitudinal research suggests that these two types of norms are differentially predictive of behavior (Larimer et al. 2004; Schultz et al. 2007).

Individuals systematically misperceive the norms held by their peer groups. Estimates of the prevalence and frequency of risk behaviors such as drinking, drug use, and sexual activity are often inflated (Davey-Rothwell and Latkin 2007; Dunnagan et al. 2007; Martens et al. 2006; Wild 2002). Perceived attitudinal norms also tend to err on the side of greater perceived approval for risky behavior, so that the perceived norm is often more permissive than the actual norm (Armitage et al. 2002; Wild 2002). Pluralistic ignorance (Miller and Prentice 1994) describes the belief that the larger group holds more permissive attitudes despite more conservative attitudes held privately by individuals. Overestimation of risky norms has been widely replicated within the US and also with international samples (e.g., Kypri and Langley 2003; Perkins 2007). Interventions designed to “correct” exaggerated norms have been efficacious in reducing health risk behaviors (e.g., Lewis and Neighbors 2006).

Theory suggests that the predictive power of norms increases when individuals identify strongly with a peer group (Rimal and Real 2005). However, rarely have normative perceptions been assessed at the level of the local community or neighborhood. In communities with high rates of HIV infection, a better understanding of the normative perceptions of community attitudes and behaviors could inform prevention efforts.

An important factor in understanding the influence of social norms on risk behavior is gender. In many parts of the world, the traditional male gender role encourages some forms of risky health behaviors including drinking and unprotected sex (Mahalik et al. 2007). Relative to female drinkers, male drinkers report more social pressure to drink and expect that expression of concern about drinking would result in social sanctions from male peers (Suls and Green 2003). Sexual risk behaviors are also subject to social and cultural influences. South African men possess greater control and power in their sexual relationships (Kalichman et al. 2005, 2007), and such a power imbalance increases women’s risks for sexual assault and sexually transmitted infections (Farmer et al. 1996). Social values foster maintaining sexual relationships with multiple women (Morrell 2002), and South African men are more likely than women

to have multiple sex partners (Shisana et al. 2009). Taken together, these data suggest that men are the key agents of change for reducing sexual risks associated with the spread of HIV. Thus, we focus on perceived norms regarding men’s behavior in the South African township setting.

The purpose of the study is to test whether predictions from social norms perspectives with regard to HIV risk and protective behaviors apply to communities in a South African township, where the base rates for both alcohol use and sexual risk behavior are high. To assess normative perceptions of community residents, we used “street-intercept” survey methods, which involve placing field-workers in highly trafficked areas of the township and soliciting survey participation from passers-by. In this way, we gathered data from both men and women to determine if they overestimate the prevalence of risk behaviors and underestimate prevalence of protective behavior engaged in by men in their community.

Hypothesis 1 Men will (a) overestimate the proportion of their peers engaging in risk behaviors (e.g., having more than one sex partner, having sex when intoxicated, meeting sex partners in shebeens) and (b) underestimate the proportion of their peers engaging in protective behaviors (condom use). Specifically, we predict that the average of self-reported risk behaviors among the male survey respondents will be less than the estimated behavioral norm whereas the average self-reported use of protective behaviors will be greater than estimated for peers.

Hypothesis 2 Consistent with the notion of pluralistic ignorance, we expect that (a) personal attitudes will reflect greater disapproval of risk behavior than is ascribed to other men in the community and (b) men will report that their male peers are less approving of engaging in protective behavior than the respondents are themselves.

Hypothesis 3 In light of social and cultural factors supporting risk behaviors among men, we expect that male and female respondents will differ in their personal attitudes about risk behaviors. Specifically, men will endorse more positive personal attitudes about risky behaviors than will women.

Hypothesis 4 Based on their greater vulnerability to sexually transmitted infections and pregnancy, we predict that women will report more positive personal attitudes about protective behavior than will men.

Hypothesis 5 Perceived norms about the behavior and attitudes of male peers in the community will predict risk behaviors in male respondents. Analyses will also test

whether attitudinal norms moderate the association between behavioral norms and personal behavior. As suggested by the theory of normative social behavior (Rimal and Real 2005), behavioral norms should have the strongest influence on personal behavior in the context of supportive attitudinal norms.

Methods

Participants and procedure

Participants were 895 residents of Gugelethu township, a primarily Xhosa-speaking African community just outside Cape Town, South Africa. Field workers used street intercept methods to sample from four non-contiguous neighborhoods within the township. Two neighborhoods were surveyed from June 3 to June 29, 2008 and two were surveyed from November 2 to December 7, 2008. Field workers consisted of 12 ethnically matched residents of the communities who spoke both Xhosa and English. Surveys were administered in participants' preferred language. Field workers approached passers-by and requested their participation in a survey, described as "research regarding HIV/AIDS... that may benefit your community." If individuals were interested, they provided verbal consent and then completed a nine-page anonymous survey in exchange for a small non-monetary gift (keychain). The norms items were administered orally to allow for checks on comprehension, and the rest of the survey was self-administered. The Institutional Review Boards of the Human Sciences Research Council, University of Connecticut and Syracuse University approved all procedures.

Of the 895 participants, 552 men (62%) and 343 women (38%) provided survey data. Age ranged from 18 to 72 ($M = 31.22$, $SD = 8.31$); ethnicity was 98% Black African, 0.5% white, 0.1% Indian, 1.2% coloured, and 0.3% other. In this context, coloured denotes mixed race. Most were unemployed (55%) and 42% had completed the equivalent of high school, and 12% had attended at least some college. Most (94%) knew someone with HIV or AIDS and of the 62% who had been tested, 11% knew they were HIV positive. With regard to alcohol use, 82% drank at least once in the last month and 77% reported heavy drinking (5 or more drinks on an occasion) in the last month.

Measures

Attitudes and corresponding norms were assessed using a parallel set of items: (a) How do you personally feel about <target behavior>, and (b) How do the men in your community feel about <target behavior>. Specific target

behaviors followed each of the stems, including (a) having more than one sex partner, (b) having sex when drunk, (c) meeting sex partners in shebeens, and (d) having sex with a condom. Response options ranged from 1 = strongly disapprove to 4 = strongly approve.

Perceived behavioral norms were obtained for each of the four target behaviors. Items were introduced with "Now think about the men in your community. How many men in your community regularly have sex with more than one partner." Separate items assessed each of the four target risk behaviors listed above. Response options were 1 = none, 2 = a few, 3 = about half, 4 = most, and 5 = all.

Four target behaviors were derived from survey items assessing HIV-related risk behaviors in the last month. Two of the target behaviors were assessed as counts: (a) number of sexual partners and (b) number of times the respondent drank alcohol before sex. The third target behavior, (c) meeting sex partners in shebeens, was a categorical variable with three response options corresponding to never; yes, but not in the past 30 days; and in the past 30 days. The fourth target behavior, (d) condom-protected sex was operationalized as a proportion (i.e., the count of vaginal and anal sex with a condom divided by the count of all instances of vaginal and anal sex).

Analysis plan

Summary statistics (means, standard deviations, frequencies) describe sociodemographic characteristics and alcohol use for the overall sample and separately by gender. Because the count variables (number of sexual partners, number of times alcohol preceded sex, condom use) were skewed and clustered at zero, we transformed these variables with a logarithmic function by adding a constant (1) and taking the natural log (Tabachnick and Fidell 2007). Behavioral differences between men and women were examined using independent *t*-tests (for continuous measures) or chi-square analysis (for dichotomous or polytomous measures).

Hypotheses 1a and b were tested using the nonparametric sign test, which compares self-reported behaviors in the current sample to ordinal judgments of the frequency of each target behavior. So that the behavioral estimates corresponded as closely as possible to language used to assess behavioral norms, (a) we dichotomized the number of sex partners into one or fewer versus two or more; (b) drinking before sex was operationalized as the proportion of drinking before sex events in the past month (<.50 vs. $\geq .50$); and (c) meeting sex partners in shebeens was recoded as never or not in the last 30 days versus in the past 30 days. For protective behavior, regularly having sex with a condom was operationalized as the proportion of protected sex events in the last month (<.50 vs. $\geq .50$). We

used paired *t*-tests to examine differences between men’s attitudes and their perceptions of their peers’ risk and protective behaviors (Hypotheses 2a and b), and independent *t*-tests to evaluate gender differences in personal attitudes (Hypotheses 3 and 4).

We tested Hypothesis 5 using a series of hierarchical multiple (for continuous dependent variables) or logistic (for ordinal dependent variables) regression models. For all hierarchical multiple regression models, perceived community men’s behavior was entered in Step 1 and perceived community men’s attitude was entered in Step 2. In Step 3, the two-way interaction term (perceived behavior × perceived attitudes) was entered. For all models, perceived behavioral and attitudinal norms were mean centered to minimize multicollinearity among predictors (Aiken and West 1991). All variables were examined for skewness; the count variables (i.e., number of sexual partners, number of times alcohol preceded sex) were skewed and clustered at zero. The variance surrounding the means for each count variable indicated overdispersion, so negative binomial regression analyses were used to model the count data.

Results

Summary statistics

Table 1 provides the summary statistics for the overall sample and by gender. Overall, participants reported an average of 2 (SD = 2.93) sex partners in the past 30 days. Most participants reported having sex with a partner of the opposite sex (83%), 3% reported sex with a same sex partner, 2% reported having sex with both men and women (data not tabled); 11% of the sample did not have a sexual partner in the past 30 days. Participants reported drinking alcohol before sex five times on average (SD = 7.41); 18% reported meeting a sex partner in a shebeen in the past 30 days. Participants reported using condoms during vaginal or anal sex nearly 6 times (SD = 8.61) in the past 30 days; on average, 47% of sex events were

condom-protected. When we examined gender differences in risk behaviors, differences emerged between men and women for number of sexual partners, frequency of drinking alcohol before sex, and meeting sex partners in shebeens. Condom use did not differ by gender.

Consistent with previous research, estimates of behavioral and attitudinal norms were positively correlated in the current sample. We observed moderate relationships for risk behaviors (having sex with more than 1 partner: $r = .26, P < .001$; having sex when drunk: $r = .31, P < .001$; meeting sex partners in shebeens: $r = .34, P < .001$) and protective behavior (condom use: $r = .27, P < .001$).

Perceived behavioral norms versus self-reported behavior

Table 2 displays the distribution of perceived behavioral norms reported by men in the sample. Wilcoxon sign tests indicated that perceived behavioral norms were greater than men’s self-reported behavior for having more than one sexual partner ($P < .001$), drinking before sex ($P < .001$), and meeting sex partners in shebeens ($P < .001$). As expected, perceptions of the prevalence of condom-protected sex were lower than self-reported condom use ($P < .001$).

Perceived attitudinal norms versus self-reported attitudes

Table 3 illustrates men’s mean personal approval ratings for the three risk behaviors and the sole protective behavior (condom use). Comparing the columns representing men’s own attitudes and men’s estimates of attitudinal norms, perceived attitudinal norms were more positive for having more than one sex partner ($t [532] = -12.56, P < .001$), having sex when intoxicated ($t [522] = -9.27, P < .001$), and meeting sex partners in shebeens ($t [526] = -11.92, P < .001$) and more negative for condom use ($t [528] = 9.09, P < .001$). Response patterns demonstrate that most men disapprove of having more than one sex partner and meeting sex partners in shebeens, whereas a majority

Table 1 Summary statistics for sexual risk behaviors in the last 30 days, by gender

Behavior	Overall <i>N</i> = 895	Men <i>n</i> = 552	Women <i>n</i> = 343	Test statistic
Sexual partners	2.07 (2.93)	2.30 (3.24)	1.70 (2.29)	$t (893) = 3.27^*$
Drinking before sex	5.05 (7.41)	6.20 (8.28)	3.31 (5.41)	$t (837) = 6.41^*$
Met partner in shebeens (%)	18%	22%	12%	$\chi^2(1) = 14.59^*$
Condom use—proportion	.47 (.39)	.49 (.39)	.47 (.39)	$t (697) = -0.77$
Condom use—count	5.95 (8.61)	5.83 (8.55)	6.15 (8.73)	$t (893) = -1.07$

Numbers represent unadjusted means (and standard deviations) unless otherwise noted

* $P < .01$

Table 2 Men's estimates of the behavioral norms for risk and protective behaviors compared to reported behavior

How many men in your community regularly...	None (%)	A few (%)	About half (%)	Most (%)	All (%)	Self-reported behavior
Have more than one sex partner	5	23	23	42	7	48% ^a
Have sex when drunk	4	12	25	52	8	41% ^b
Meet sex partners in shebeens	5	18	31	42	5	22% ^c
Have sex with a condom	9	42	29	16	5	51% ^d

^a Percentage of men surveyed who report 2 or more sex partners in the last month

^b Percentage of men surveyed who reported drinking alcohol before sex at least half the time

^c Percentage of men surveyed who reported meeting a sex partner in a shebeen in the last month

^d Percentage of men surveyed who report using a condom during sex at least half the time

Table 3 Approval ratings for the four target behaviors for self and others by gender

Target behavior	Personal attitude		Perceived attitudinal norm	
	Men <i>M</i> (SD)	Women <i>M</i> (SD)	Men <i>M</i> (SD)	Women <i>M</i> (SD)
Having more than one sex partner	2.15 (1.05)	1.79 (0.93)	2.80 (0.99)	2.76 (0.94)
Having sex when intoxicated	2.49 (0.98)	2.07 (0.88)	2.92 (0.85)	2.96 (0.92)
Meeting sex partners in shebeens	2.17 (0.94)	1.85 (0.84)	2.74 (0.83)	2.76 (0.87)
Having sex with a condom	3.05 (0.94)	3.24 (0.84)	2.60 (0.87)	2.54 (0.88)

Men and women differed significantly on personal attitudes towards all four target behaviors (all P s < .01). Men and women did not differ on their estimates of the attitudes held by men in their community (perceived attitudinal norms, all P s > .10)

approves of using condoms (see electronic supplemental figure).

Gender differences for personal attitudes regarding risk and protected behaviors

Table 3 also compares men and women's attitudes towards the four target behaviors. Consistent with a priori hypotheses, independent *t*-tests showed that men endorsed more positive personal attitudes regarding having more than one sex partner (t [880] = 5.19, P < .001), having sex when intoxicated (t [875] = 6.48, P < .001), and meeting sex partners in shebeens (t [873] = 5.08, P < .001) than did women. Women reported have more positive personal attitudes about having sex with a condom than did men, t (880) = -3.08, P = .002. However, men's and women's perceptions of the attitudinal norms held by the men in their community did not differ (all P s > .10).

Predicting men's behavior from perceived behavioral and attitudinal norms

To examine whether attitudinal norms moderate the association between behavioral norms and personal behavior, we conducted four hierarchical regressions with men's self-reported behavior as the criterion and perceived behavioral norms, perceived attitudinal norms, and perceived behavioral norms \times perceived attitudinal norms as predictor

variables. As shown in Tables 4 and 5, perceived behavioral norms were significant predictors of risk behavior (number of sexual partners, frequency of drinking before sex, and meeting partners in shebeens), but were not related to protective behavior (proportion of condom-protected sex). Attitudinal norms predicted both risk and protective behavior.

Tests evaluating whether perceived attitudes moderated the perceived behavior-self reported behavior association appear as Step 3 in the models. The moderation effect was observed for only two of the four target behaviors: number of sexual partners and meeting partners in shebeens (see Tables 4 and 5). The negative binomial regression model predicting number of sexual partners from perceived behavior and perceived attitudes was statistically significant; the overall Wald's χ^2 = 31.21, P < .001 for the final model (with robust variance estimation). Figure 1 shows the simple regression lines of the regression of number of sexual partners on perceived behavioral norms as a function of low (-2 SD), mean, and high (+2 SD) perceived behavioral attitudes (Aiken and West 1991). Attitudinal norms add to prediction of behavior only when behavioral norms are permissive; men had significantly more sexual partners if they perceived community men regularly had more than one partner but they perceived that community men disapproved of having more than one sexual partner (incidence rate ratio = 0.88, 95% CI = 0.79–0.99).

Table 4 Hierarchical regression analyses examining moderating effects of men’s perceived attitudes on men’s behavior

Step	Variable	Number of sex partners			Frequency of sex after drinking			Proportion of protected sex		
		B(SE)	z	$\chi^2(1)$	B(SE)	z	$\chi^2(1)$	B(SE)	β	R ²
Step 1	Perceived behavior	0.22 (0.05)	4.38***	19.15***	0.19 (0.07)	2.71**	7.37**	.03 (.02)	.08	.01
Step 2	Perceived behavior	0.25 (0.06)	4.56***	4.44*	0.15 (0.07)	2.13*	2.71†	.02 (.02)	.05	.02
	Perceived attitudes	-0.17 (0.08)	-2.11***		0.11 (0.07)	1.65†		.05 (.02)	.10*	
Step 3	Perceived behavior	0.26 (0.05)	4.86***	4.45*	0.16 (0.07)	2.25*	0.24	.02 (.02)	.05	.02
	Perceived attitudes	-0.20 (0.06)	-3.36**		0.12 (0.07)	1.69†		.05 (.02)	.10*	
	Behavior × attitudes	-0.12 (0.06)	-2.11**		0.04 (0.07)	0.49		-.01 (.02)	-.01	
Overdispersion parameter										
Alpha		0.54 (95% CI = 0.39, 0.73)			2.05 (95% CI = 1.74, 2.41)					

† $P < .10$; * $P < .05$; ** $P < .01$; *** $P < .001$

Negative binomial regression with robust variance estimation was used for count dependent variables (more than one sex partner, sex after drinking). $\chi^2 =$ Wald’s χ^2

Table 5 Ordinal logistic regression analyses examining the effects men’s perceived norms regarding meeting partners in Shebeens on men’s behavior

Model	Variable	OR (95% CI)	$\chi^2(1)$
1	Perceived behavior	1.48 (1.24, 1.77)	19.76***
2	Perceived behavior	1.34 (1.11, 1.62)	28.74***
	Perceived attitudes	1.39 (1.12, 1.72)	
3	Perceived behavior	1.31 (1.08, 1.59)	49.67***
	Perceived attitudes	1.47 (1.18, 1.85)	
	Behavior x Attitudes	0.60 (0.47, 0.76)	

The test for the proportion odds assumption (i.e., proportionality of odds across response categories) of Model 3 was met, $\chi^2 = 7.05$, $P = .07$; OR odds ratio, CI confidence interval, $\chi^2 =$ Likelihood ratio χ^2

*** $P < .001$; ** $P < .01$; * $P < .05$

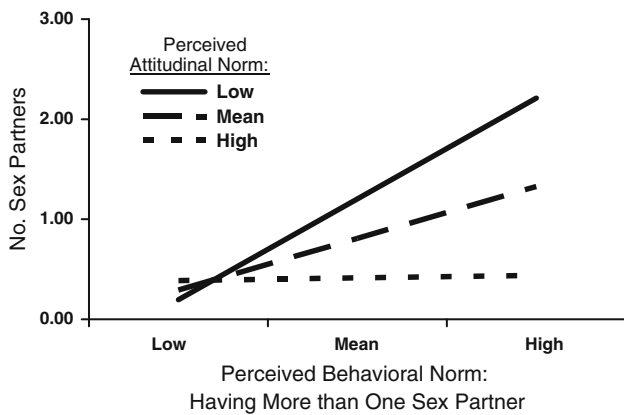


Fig. 1 Illustration of the significant interaction between men’s perceived behavioral and attitudinal norms for having more than one sexual partner predicting actual behavior. Both the predictor (perceived behavior) and moderator (perceived attitudes) are mean centered; low and high refers to values -2 and +2 SD from the mean, respectively

Meeting sex partners in shebeens was recoded to reflect an ordinal increase in risk behavior (0 = never, 1 = yes, but not in past 30 days, and 2 = yes, in past 30 days). As

shown in Table 5, the ordinal logistic regression model predicting meeting sex partners in shebeens from perceived behavior and perceived attitudes was statistically significant, $\chi^2 = 49.67$, $P < .001$, with both perceived behavioral and attitudinal norms as significant predictors. To illustrate the significant interaction between perceived behavior and perceived attitudes we calculated and displayed predictive probabilities for meeting sexual partners in shebeens when perceived behavior and attitudinal norms were at low (-2 SD), mean, and high (+2 SD) levels in Fig. 2. Figure 2 suggests that the likelihood of meeting sex partners in shebeens increases if either norm is high in the context of the other being low.

Discussion

In this township in South Africa, a country with one of the highest HIV infection rates in the world, men overestimate the prevalence and approval for HIV-related risk behaviors, and underestimate the prevalence and approval of protective behavior. The findings of this study provide support for

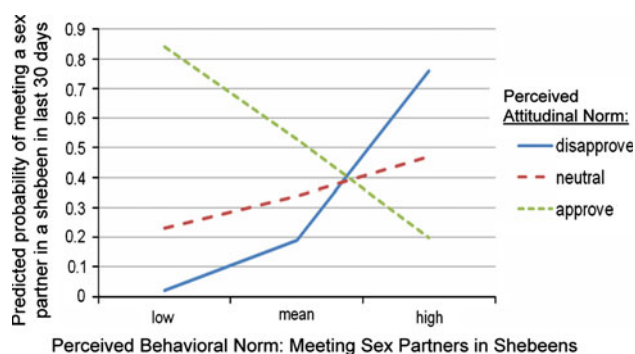


Fig. 2 Illustration of the significant interaction between men's perceived behavioral and attitudinal norms on the likelihood of meeting sexual partners in shebeens (illustrated as the predicted probabilities of reporting this behavior in the last 30 days). Both the predictor (perceived behavior) and moderator (perceived attitudes) are mean centered; low and high refers to values -2 and $+2$ SD from the mean, respectively

greater attention to perceived norms and their potential for influencing behavior in the development of individual and social-structural interventions to prevent HIV transmission (cf. Auerbach et al. 2009).

All of the study hypotheses received at least partial support. First, we attempted to replicate the commonly reported finding (in the West) that individuals overestimate the prevalence of risky behaviors among their peers (e.g., Borsari and Carey 2003). The findings provide support for the generalizability of these patterns in South Africa. As predicted, perceived frequency of having multiple sex partners, meeting sex partners in shebeens, and having sex after drinking exceeded the self-reported frequency of the men in the sample. Also as predicted, men tended to underestimate the prevalence of using a condom during sex (protective behavior). Thus, the men who responded to this street intercept survey were under the impression that men in their community engaged in more risk behavior and less protective behavior than was actually the case.

The second set of hypotheses tested predictions regarding attitudinal norms, or perceptions of peer approval or disapproval of risk and protective behaviors. All comparisons between personal attitudes and estimated attitudes of men in the community differed in the predicted direction. Male neighbors were judged to be more approving of having more than one sex partner, having sex when intoxicated, and meeting sex partners in shebeens than were the men making up the sample. In contrast, the male respondents generally approved of using a condom when having sex, despite the perception that condom use was not approved. The data provide evidence consistent with the notion of pluralistic ignorance, wherein privately held values are considered more conservative (in this case, pro-health) than the perception of the values held by other members of the community. In this sample, pro-health

attitudes and behaviors were held privately, whereas riskier attitudes and behaviors were perceived to be characteristic of the community in general. Pluralistic ignorance has served as an explanation for the persistence of risky norms despite the misgivings or discomfort of the individuals making up the community (e.g., Prentice and Miller 1993).

The predictions that, relative to men, women would be more supportive of protective behavior and more disapproving of risk behavior were also supported. These findings are not surprising because women are more vulnerable to sexually transmitted infections (O'Leary 2000; Wingood and DiClemente 2000); thus, they have more to lose when partner concurrency is practiced (Carter et al. 2007) and sexual double-standards apply (Newmann et al. 2000). Our data suggest that risk reduction efforts may find supporters among the township women, and that prevention programs might consider how to leverage support from this segment of the population.

Both behavioral and attitudinal norms, though modestly correlated, were predictive of risk behaviors in this sample, although their relative contributions varied across behaviors. In general, men who believed that risk behaviors were normative and generally approved of by their peers were more likely to engage in those risk behaviors. Attitudinal and behavioral norms interacted to enhance prediction of number of sex partners and meeting sex partners in shebeens, though in an unexpected direction. Although theory would suggest that the two types of norms would potentiate each other in the prediction of behavior (Rimal and Real 2005), in both cases the opposite pattern of interaction was observed. These findings were unexpected but not unprecedented. In a study conducted in Botswana, Carter et al. (2007) reported that respondents who reported sexual partner concurrency were more likely (than those who did not report concurrency) to endorse norms that support multiple partnerships even though a majority of both groups believed that fidelity is important and that they would be looked down upon by family and friends if discovered to have multiple partnerships.

Two preliminary explanations for this effect can be offered. First, that higher levels of risk behavior are observed when attitudinal and behavioral norms are inconsistent with each other (i.e., when community peers are seen as disapproving of the risk behavior but the behavioral norm is to engage in it) may simply reflect mixed signals from the community. In contrast, when community norms are consistently nonsupportive of risky behavior, the likelihood of engaging in risky behavior remains low. Alternatively, men who engage in risky behavior may be more exposed both to (a) other men who also engage in risky behavior and (b) messages about societal disapproval of behaviors that promote risk for HIV. The second interpretation follows from the assumption that normative

perceptions are based on selective flow of information within social networks (Kitts 2003). Both of these explanations require more research to determine the sources of normative perceptions and their predictive validity.

Notably, only attitudinal norms explained the protective behavior we studied (condom use). Perceptions of whether other men used condoms were unrelated to respondents' condom use, whereas others' perceived approval of using condoms was associated with greater proportion of condom-protected sex. This finding is encouraging given that levels of approval for condom use were higher than respondents guessed. In this study, condom use was assessed across both steady and casual partners, so it would be informative for this analysis to be replicated with partner type separated. If replicated, this association suggests that interventions designed to enhance condom use might elicit and publicize pro-condom use attitudes in the target population, or actively shape perceptions of approval for condom use.

The findings of this study must be considered in light of its limitations. First, we relied on self-report data; although field staff emphasized that all data were anonymous to minimize socially desirable responding (Weinhardt et al. 1998), it is impossible to rule out underreporting of stigmatized risk behaviors. Second, the respondents sampled may not be representative of the larger community; however, we used street intercept surveys, a methodology that provides access to the widest range of community members and minimizes the self-selection bias often seen with clinical or other recruitment strategies (Miller et al. 1997). Third, our data are cross-sectional, thus in this case predictive analyses do not imply causality. Longitudinal data can provide strong evidence of directionality of influences between perceived norms and behavior. Fourth, we addressed perceived norms of “men in your community,” but did not specifically address norms pertaining to subgroups of men (coworkers, friends, etc.). It is likely that local norms would have even greater relevance in predicting behavior, given findings that behavior is more highly correlated with proximal rather than distal reference groups (Borsari and Carey 2003).

The fact that perceived norms are systematically related to risk and protective behavior in our sample has implications for HIV prevention interventions. Ample evidence for the mediating effect of norms change on outcomes exists in the brief alcohol intervention literature (Carey et al. 2009; Williams et al. 2009). Thus, one suggestion is to incorporate normative feedback and discussions into existing skills-based interventions; this enhancement would be consistent with the influential Information-Motivation-Skills Model of HIV prevention (Fisher and Fisher 1992). Normative feedback would influence motivation for HIV prevention, a prerequisite to enactment of behavioral skills in this model.

To the extent that individuals want to conform to social norms, elucidating and correcting exaggerated norms in the direction of less risky behavior may help to motivate behavior change. Furthermore, the influence of social norms is generally underestimated; although individuals downplay the influence of norms relative to other factors, they are more influential in predicting behavior than other values and attitudes (Croker et al. 2009; Nolan et al. 2008). Thus, norms influence a wide range of behaviors, often outside of awareness, but they can be modified with relatively brief communications. Considering all the evidence, a strong case can be made for integrating normative feedback into HIV risk reduction interventions.

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References

- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage.
- Albarracín, D., Johnson, B. T., Fishbein, M., & Muellerleile, P. A. (2001). Theories of reasoned action and planned behavior as models of condom use: A meta-analysis. *Psychological Bulletin*, *127*(1), 142–161.
- Armitage, C. J., Norman, P., & Conner, M. (2002). Can the theory of planned behaviour mediate the effects of age, gender and multidimensional health locus of control? *British Journal of Health Psychology*, *7*(Part 3), 299–316.
- Auerbach, J. D., Parkhurst, J. O., Caceres, C. F., & Keller, K. E. (2009). *Addressing social drivers of HIV/AIDS: Some conceptual, methodological, and evidentiary considerations (Working paper #24)*. New York: aids2031.
- Borsari, B., & Carey, K. B. (2003). Descriptive and injunctive norms in college drinking: A meta-analytic integration. *Journal of Studies on Alcohol*, *64*(3), 331–341.
- Carey, K. B., Henson, J. M., Carey, M. P., & Maisto, S. A. (2010). Perceived norms mediate effects of a brief motivational intervention for sanctioned college drinkers. *Clinical Psychology: Science & Practice*, *17*, 59–72.
- Carter, M. W., Kraft, J. M., Kopperhaven, T., Galavotti, C., Roels, T. H., Kilmarx, P. H., et al. (2007). “A bull cannot be contained in a single kraal”: Concurrent sexual partnerships in Botswana. *AIDS and Behavior*, *11*, 822–830.
- Cialdini, R. B., Reno, R. R., & Kallgren, C. A. (1990). A focus theory of normative conduct: Recycling the concept of norms to reduce littering in public places. *Journal of Personality and Social Psychology*, *58*(6), 1015–1026.
- Cialdini, R. B., & Trost, M. R. (1998). Social influence: Social norms, conformity and compliance. In D. T. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (4th ed., pp. 151–192). New York: Oxford University Press.
- Croker, H., Whitaker, K. L., Cooke, L., & Wardle, J. (2009). Do social norms affect intended food choice? *Preventive Medicine*, *49*(2–3), 190–193.
- Davey-Rothwell, M. A., & Latkin, C. A. (2007). HIV-related communication and perceived norms: An analysis of the

- connection among injection drug users. *AIDS Education and Prevention*, 19(4), 298–309.
- Dunnagan, T., Haynes, G., Linkenbach, J., & Summers, H. (2007). Support for social norms programming to reduce alcohol consumption in pregnant women. *Addiction Research & Theory*, 15(4), 383–396.
- Farmer, P., Connors, M., & Simmons, J. (Eds.). (1996). *Women, poverty and AIDS: Sex, drugs and structural violence*. Monroe, Maine: Common Courage Press.
- Fisher, J. D., & Fisher, W. A. (1992). Changing AIDS-risk behavior. *Psychological Bulletin*, 111, 455–474.
- Godin, G., & Kok, G. (1996). The theory of planned behavior: A review of its applications to health-related behaviors. *American Journal of Health Promotion*, 11(2), 87–98.
- Kalichman, S. C., Simbayi, L. C., Cain, D., Cherry, C., Henda, N., & Cloete, A. (2007). Sexual assault, sexual risks and gender attitudes in a community sample of South African men. *AIDS Care*, 19(1), 20–27.
- Kalichman, S. C., Simbayi, L. C., Kaufman, M., Cain, D., Cherry, C., Jooste, S., et al. (2005). Gender attitudes, sexual violence, and HIV/AIDS risks among men and women in Cape Town, South Africa. *Journal of Sex Research*, 42(4), 299–305.
- Kalichman, S. C., Simbayi, L. C., Vermaak, R., Jooste, S., & Cain, D. (2008). HIV/AIDS risks among men and women who drink at informal alcohol serving establishments (Shebeens) in Cape Town, South Africa. *Prevention Science*, 9, 55–62.
- Kitts, J. A. (2003). Egocentric bias or information management? Selective disclosure and the social roots of norm misperception. *Social Psychology Quarterly*, 66(3), 222–237.
- Kypri, K., & Langlely, J. D. (2003). Perceived social norms and their relation to university student drinking. *Journal of Studies on Alcohol*, 64(6), 829–834.
- Larimer, M. E., & Neighbors, C. (2003). Normative misperception and the impact of descriptive and injunctive norms on college student gambling. *Psychology of Addictive Behaviors*, 17(3), 235–243.
- Larimer, M. E., Turner, A. P., Mallett, K. A., & Geisner, I. M. (2004). Predicting drinking behavior and alcohol-related problems among fraternity and sorority members: Examining the role of descriptive and injunctive norms. *Psychology of Addictive Behaviors*, 18(3), 203–212.
- Lewis, M. A., & Neighbors, C. (2006). Social norms approaches using descriptive drinking norms education: A review of the research on personalized normative feedback. *Journal of American College Health*, 54, 213–218.
- Mahalik, J. R., Burns, S. M., & Syzdek, M. (2007). Masculinity and perceived normative health behaviors as predictors of men's health behaviors. *Social Science and Medicine*, 64(11), 2201–2209.
- Martens, M. P., Page, J. C., Mowry, E. S., Damann, K. M., Taylor, K. K., & Cimini, M. D. (2006). Differences between actual and perceived student norms: An examination of alcohol use, drug use, and sexual behavior. *Journal of American College Health*, 54(5), 295–300.
- Miller, D. T., & Prentice, D. A. (1994). Collective errors and errors about the collective. *Personality and Social Psychology Bulletin*, 20(5), 541–550.
- Miller, K. W., Wilder, L. B., Stillman, F. A., & Becker, D. M. (1997). The feasibility of a street-intercept survey method in an African-American community. *American Journal of Public Health*, 87, 655–658.
- Morojele, N. K., Kachieng'a, M. A., Mokoko, E., Nkoko, M. A., Parry, C. D. H., Nkowane, A. M., et al. (2006). Alcohol use and sexual behaviour among risky drinkers and bar and shebeen patrons in Gauteng province, South Africa. *Social Science and Medicine*, 62, 217–227.
- Morojele, N. K., Kachieng'a, M. A., Nkoko, M. A., Moshia, K. M., Mokoko, E., Parry, C. D. H., et al. (2004). Perceived effects of alcohol use on sexual encounters among adults in South Africa. *African Journal of Drug and Alcohol Studies*, 3, 1–20.
- Morrell, R. (2002). *Changing men in South Africa*. Durban: South Africa University of Natal Press.
- Newmann, S., Sarin, P., Kumarasamy, N., Amalraj, E., Rogers, M., Madhivanan, P., et al. (2000). Marriage, monogamy, and HIV: A profile of HIV-infected women in south India. *International Journal of STD and AIDS*, 11, 250–253.
- Nolan, J. M., Schultz, P. W., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2008). Normative social influence is underdetected. *Personality and Social Psychology Bulletin*, 34(7), 913–923.
- O'Leary, A. (2000). Women at risk for HIV from a primary partner: Balancing risk and intimacy. *Annual Review of Sex Research*, 11, 191–234.
- Oostveen, T., Knibbe, R., & de Vries, H. (1996). Social influences on young adults' alcohol consumption: Norms, modeling, pressure, socializing, and conformity. *Addictive Behaviors*, 21(2), 187–197.
- Perkins, H. W. (2007). Misperceptions of peer drinking norms in Canada: Another look at the 'reign of error' and its consequences among college students. *Addictive Behaviors*, 32(11), 2645–2656.
- Prentice, D. A., & Miller, D. T. (1993). Pluralistic ignorance and alcohol use on campus: Some consequences of misperceiving the social norm. *Journal of Personality and Social Psychology*, 64(2), 243–256.
- Rimal, R. N., & Real, K. (2005). How behaviors are influenced by perceived norms: A test of the theory of normative social behavior. *Communication Research*, 32(3), 389–414.
- Rivis, A., & Sheeran, P. (2003). Descriptive norms as an additional predictor in the theory of planned behaviour: A meta-analysis. *Current Psychology*, 22(3), 218–233.
- Schultz, P. W., Nolan, J. M., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2007). The constructive, destructive, and reconstructive power of social norms. *Psychological Science*, 18(5), 429–434.
- Shisana, O., Rehle, T., Simbayi, L. C., Zuma, K., Jooste, S., Pillay-Van Wyk, V., et al. (2009). *South African national HIV prevalence, incidence, behaviour and communication survey 2008: A turning tide among teenagers?* Cape Town. South Africa: Human Sciences Research Council Press.
- Suls, J., & Green, P. (2003). Pluralistic ignorance and college student perceptions of gender-specific alcohol norms. *Health Psychology*, 22(5), 479–486.
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). Boston: Allyn and Bacon.
- UNAIDS (2006). *2006 Report on the Global AIDS Epidemic*: Joint United Nations Programme on HIV/AIDS.
- Weinhardt, L. S., Forsyth, A. D., Carey, M. P., Jaworski, B. C., & Durant, L. E. (1998). Reliability and validity of self-report measures of HIV-related sexual behavior: Progress since 1990 and recommendations for research and practice. *Archives of Sexual Behavior*, 27(2), 155–180.
- Wild, T. C. (2002). Personal drinking and sociocultural drinking norms: A representative population study. *Journal of Studies on Alcohol*, 63(4), 469–475.
- Williams, J., Herman-Stahl, M., Calvin, S. L., Pemberton, M., & Bradshaw, M. (2009). Mediating mechanisms of a military web-based alcohol intervention. *Drug and Alcohol Dependence*, 100(3), 248–257.
- Wingood, G. M., & DiClemente, R. J. (2000). Application of the theory of gender and power to examine HIV-related exposures, risk factors, and effective interventions for women. *Health Education & Behavior*, 27, 539–565.