Educational Status and Risk of HIV in Young Gay Men

MARC JANSSEN & JOHN DE WIT
Division of Public Health, Amsterdam Municipal Health Service, Amsterdam, the Netherlands

WOLFGANG STROEBE & FRITS VAN GRIENSVEN
Department of Social and Organizational Psychology, Utrecht University, Utrecht, the Netherlands

MARC JANSSEN At the time of submission of this paper, a researcher at the Department of Behavioral Studies concerning HIV and AIDS at the Amsterdam Municipal Health Service. He currently holds a position as E-commerce consultant at Motivaction, a research-based consultancy firm in Amsterdam.

JOHN DE WIT is a project director at the Department of Behavioral Studies concerning HIV and AIDS, at the Amsterdam Municipal Health Service. He is also an associate professor of social psychology and health at the Department of Social, Organizational and Health Psychology, Utrecht University.

WOLFGANG STROEBE is a professor of social, organizational and health psychology at Utrecht University.

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ADDRESS. Correspondence should be directed to: MARC JANSSEN, Subdivision of Behavioral Studies concerning HIV and AIDS, Division of Public Health, Amsterdam Municipal Health Service, PO Box 2200, 1000 CE Amsterdam, the Netherlands. [Tel. +31 20 5555 411; Fax +31 20 5555 533; email mjanssen@gggd.amsterdam.nl]

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Abstract

Lower socioeconomic status (SES) has been associated with higher rates of HIV infection as well as higher rates of unsafe sex. The behavioral determinants that might mediate the effect of SES on risky sex have not been studied thus far. We investigated the involvement of social cognitions in the link between educational status and unprotected anal sex in 292 participants of the Amsterdam Young Gay Men Study. We found that poorly educated men had poorer knowledge about HIV and preventive behavior, perceived social norms to be less favorable towards condom usage with casual partners, and had lower perceived control over that behavior than the better educated men. Poorly educated men were also more likely to have engaged in unprotected anal sex with casual partners in the six-month period that followed the assessment of the social cognitions. However, the education-related behavioral difference could not be explained by social cognitions. We concluded that cognitive models of behavior might not explain all of the risk behavior in gay men with lower SES. These men's risk-taking behavior might result from specific psychological characteristics of men with lower SES that interfere with traditional cognition–behavior correlations as posited in prevailing models of behavior.

Keywords

gay men, HIV/AIDS, sexual risk behavior, social cognitions, socioeconomic status

THE ACQUIRED immune deficiency syndrome (AIDS) poses a major health threat to gay men. The human immunodeficiency virus (HIV), its causal agent, is primarily contracted via unprotected anal sex (van Griensven et al., 1987). Younger age might be a risk factor for HIV (e.g. de Wit, van den Hoek, Sandfort, & van Griensven, 1993; de Wit & van Griensven, 1994; Greenland, Lieb, Simon, Ford, & Kerndt, 1996). Recent findings suggest that lower socioeconomic status (SES, a multivariate construct defined by education, occupation, and income) may further increase young gay men's risk: the HIV prevalence in groups with lower SES appears to be higher (e.g. de Wit, 1996; Osmond et al., 1994) as well as the rates of risky sex (e.g. Diaz, Stall, Hoff, Daigle, & Coates, 1996; Hogg et al., 1993; Kippax, Crawford, Rodden, & Noble, 1995; Montgomery et al., 1989). An understanding of the factors that mediate the link between SES and risk behavior may support the design of interventions that reduce the risk disparities between the socioeconomic strata. However, studies that shed light on these mediating behavioral determinants are lacking.

There are nevertheless several hypotheses about the link between SES and health behavior. Some hypotheses stress the psychological make-up that results from having an economically less fortunate position in society. Individuals with lower SES are thought to be consumed by a struggle to supply themselves with the most basic requirements for daily living (income, food, and housing) and to lack the motivation to strive for higher-end goals, such as protecting one's health by changing risky behaviors (Williams, 1990). Individuals with lower SES are also expected to suffer from feelings of powerlessness (Mirowsky & Ross, 1986). It has been suggested that this lack of perceived control keeps them from trying to change risky behaviors (Williams, 1990). An alternative hypothesis emphasizes the unequal distribution of resources in society. It holds that individuals with lower SES benefit less from health interventions (Williams, 1990). Some support for this assumption in the HIV/AIDS domain comes from studies that linked less adequate knowledge of both HIV transmission and preventive behavior with decreasing SES (e.g. LeBlanc, 1993; Macintyre & West, 1993; VanLindingham, Grandjean, Suprasert, & Sittitrai, 1997).

We extended these hypotheses to the realm of safer sex and planned to examine whether being less motivated to protect one's health by using condoms, perceiving less control over engaging in safer sex, or being less knowledgeable of the hazards involved in unsafe sex explains why young gay men with lower SES are less likely to engage in protected anal sex. We set out to collect information about the rates of condom use in contacts with steady and casual partners separately since level of risk taking and its determinants differ according to type of partner (Misovich, Fisher, & Fisher, 1997). To guide our analyses of these risk behavior outcomes, we used a theoretical framework that describes the causal links between SES, condom use, and the mediating social cognitions that are of interest in this study (motivation, perceived control, and knowledge). This framework mainly drew on the Theory of Planned Behavior (TPB; Ajzen, 1988), a model that is assumed to explain all goal-directed behavior. We selected the TPB because it has been shown to adequately predict safer sex (see Conner & Sparks, 1996).

Applied to using protection during intercourse, the TPB holds that the individual's motivation or 'intention' to use condoms is the most proximal behavioral determinant of condom use. In turn, intention depends on the individual's attitude, subjective social norm, and perception of behavioral control. The attitude construct embodies the evaluation of the salient beliefs about the consequences of using condoms, whereas the subjective social norm is defined as the combined effect of injunctive normative beliefs ('Do significant others want me to use condoms?') and motivation to comply ('Do I care about their opinion?'). Perceived behavioral control refers to the evaluation of one's abilities and opportunities to engage in protected anal sex. This particular behavioral determinant is assumed to affect condom use indirectly via intention (the TPB assumes that people take into account their abilities and opportunities when planning behavior), as well as directly (given that perceived control accurately reflects actual control). The TPB assumes that variables that are external to the model (such as SES) affect condom use via their impact on the individual's attitude, social norm, and perception of control.

Our theoretical framework contained a

slightly modified version of the TPB that better met the requirements of this specific study. Since gay peers have been shown to be an important source of social norms that give rise to condom use (Kelly et al., 1990b, 1995; Ross & McLaws, 1992), we decided to assess the social norm with specific reference to gay friends. In addition, since poorer knowledge of HIV and preventive behavior may keep men with lower SES from using condoms, although the TPB does not specify this construct explicitly, we extended our TPB-like framework with the concept of HIV-related knowledge. Based on the Information Motivation Behavioral skills-model (IMB; Fisher & Fisher, 1992), a model that has been specifically designed to predict HIV risk behavior, we assumed that knowledge or 'information' about HIV and preventive behavior affects condom use directly, as well as indirectly via intention. Furthermore, since the concept of knowledge essentially refers to cognitions that link sexual behaviors and their consequences in terms of risk of HIV contraction, we reasoned that knowledge might also be thought of as a set of beliefs about behavioral outcomes that, according to the TPB, affect behavior via their impact on attitude.An illustration of our theoretical framework is presented in Figure 1. Briefly, the model assumes that SES-related differences in HIV risk behavior are mediated by differences in knowledge, attitude, social norm, perception of control, and intention. This article addresses the explanatory value of this model for SES-related differences in rates of condom use with steady and casual sex partners.

Method

Procedure

Data were obtained from participants of the Young Gay Men Study (YGMS). The goal of the YGMS is to monitor HIV infection, risk behavior and its determinants in young gay men in Amsterdam, the Netherlands. Men entering the study had to meet several criteria: maximum age of 30; residence in the Amsterdam metropolitan area or regular visits to gay clubs in that area; and sex with a male partner in the previous six

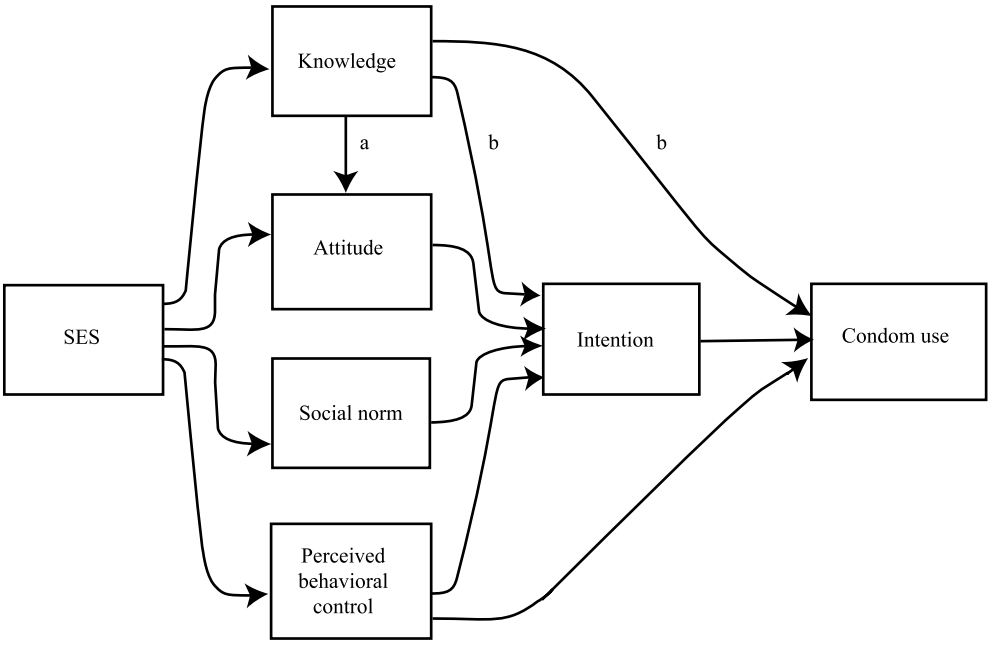

Figure 1. Theoretical framework. Pathways adapted from [a]the TPB (Ajzen, 1988) and [b]the IMB (Fisher & Fisher, 1992).

months. As of May 1995, men have been recruited via advertisements, during gay events, and via referral by acquaintances who participate in the study. Men visited the Municipal Health Service for intake assessment and, after they gave informed consent, donated blood or saliva samples for HIV antibody testing. At their own request, men who gave blood were informed about the test results approximately two weeks afterwards. Men who gave saliva were not informed since saliva testing does not meet the criteria for individual diagnostics. At intake assessment, men also completed a self-administered written questionnaire that assessed the cognitive-behavioral determinants of interest in the present article. Men who volunteered for longitudinal follow-up enrolled in the cohort section of the YGMS. The cohort participants visit the research site every six months for assessment of HIV status, risk behavior with steady and casual sex partners in the previous six months, and psychosocial factors that might be associated with risk taking.

Measurement

Socioeconomic status Following elementary school, students in the Netherlands receive either vocational or professional/academic training. In each of these types of training, students can achieve three levels of competence that reflect the load and complexity of their study. In the questionnaire administered at intake, participants were asked to indicate their highest level of training. We used the information to classify men as having low, medium, or high educational status. Compared to US standards, these three levels roughly reflect completed vocational training only, completed high school only, and completed college up to and including masters degree, respectively. We reasoned that educational status would be the most appropriate indicator for SES in this particular study because the other dimensions of SES (occupational status and income) might not be reflective of socioeconomic differences in our study sample of young men who are only beginning their professional careers. Some support for this line of reasoning was found in the fact that educational status was not related to monthly income in the YGMS. Also, income was not related to the safer sex cognitions and behaviors under study in this article, and income did not explain the education-related differences on which we are about to report in the rest of this article. Another consideration to rely on educational status as a relevant indicator of SES was that educational achievement has been shown to be the most powerful predictor of health differences in other studies (e.g. Fein, 1995; Marmot, Ryff, Bumpass, Shipley, & Marks, 1997).

Knowledge about HIV transmission and preventive behavior The questionnaire contained eight true/false questions that tapped knowledge about HIV transmission and preventive behavior (e.g. 'HIV cannot penetrate intact skin tissue' and 'Anal sex without ejaculation is safe'). Prior to data analyses, the number of correct responses was summarized in a single variable that represented the level of accurate knowledge (range 0–8).

Intention to use condoms For steady and casual partners separately, participants completed the item 'Do you intend to use condoms with this type of partner during the next six months?' (1 = 'I most certainly do not', 7 = 'I most certainly do'). Due to an error during questionnaire design, the intention to use condoms with casual partners was assessed with a 5-point response scale. This does not affect the outcomes of the present study, however, since we will concern ourselves with correlations between variables and not with absolute differences between items.

Attitude towards using condoms For steady and casual partners separately, participants answered the question 'What do you think about using condoms with this type of partner during the next six months?' (1 = 'I think it is very unimportant', 7 = 'very important').

Social norm regarding using condoms For steady and casual partners separately, we asked participants 'How would most of your gay friends feel if you were to use condoms with this type of partner during the next six months?' (–3 = 'They would disapprove', +3 = 'They would approve') to assess the injunctive normative beliefs about condom use. We also asked them 'In general, how much do you value the opinion of your gay

friends?' (1 = 'not at all', 7 = 'very much') to measure the motivation to comply. As was suggested by Ajzen (1988), we computed the two indicators for the social norm by multiplying the scores on the injunctive normative beliefs by the motivation to comply (which resulted in variables that ranged from –21 to +21).

Perceived behavioral control over using condoms For steady and casual partners separately, participants answered the question 'Do you feel able to use condoms with this type of partner during the next six months?' (1 = 'I most certainly do not', 7 = 'I most certainly do').

Risk behavior outcomes On every follow-up visit, participants in the cohort reported rates of anal sex and condom use for the sexual contacts that they had with steady and casual partners during the previous six months. We used the data that were collected during the first follow-up visit to compute the risk behavior outcome variables for the present article. Men who had anal sex during the six-month period that followed the intake assessment were either classified as consistent or inconsistent condom users (the latter category had unprotected intercourse at least once).

Participants

By May 1997, 436 men had visited the Municipal Health Service for intake assessment; 12 percent had low, 29 percent had medium, and 51 percent had high educational status. Their mean age was 25 years (SD = 3, range = 17–30). Age did not correlate with education. Prevalence of HIV antibodies was 5 percent. Poorly and medium educated men were almost twice as likely to test HIV positive (6.4 percent and 7.3 percent, respectively) as highly educated men (3.6 percent). However, a χ^2 test revealed that these differences were not statistically significant. Three hundred and seventeen (73 percent) of the men in the sample volunteered for longitudinal follow-up. By August 1998 (the cut-off date for data collection in the present article), 292 men had paid their first follow-up visit. We compared this subsample of cohort participants with the men who had only completed intake assessment. No differences were found in age at intake, knowledge about HIV and preventive behavior, or social cognitions about using condoms with steady and casual partners. However, fewer poorly educated men had enrolled in the cohort (49 percent of the number that had completed intake assessment) than medium (69 percent) and highly educated men (71 percent; $\chi^2[2] = 9.8$, $p < .05$). As a result, the proportion of poorly educated men had dropped to 9 percent in the subsample of 292 cohort participants, whereas the relative group sizes of medium and highly educated men had slightly increased to 30 percent and 62 percent, respectively. We nevertheless restricted ourselves to this subsample since we planned to test the predictive value of the social cognitions for risk behavior in a prospective study design.

Results

SES-related differences in social cognitions

We used multivariate analysis of variance (MANOVA) to test for educational differences in knowledge and the eight cognitions about using condoms with steady and casual partners (intention, attitude, social norm, and perceived control). We found that the effect of educational status on the multivariate set of cognitions was statistically significant (Pillais = .13, F [18, 544] = 2.1, $p < .01$). Subsequent univariate tests of the effect of educational status on each of the dependent variables showed that poorly educated participants had significantly poorer knowledge about HIV transmission and risk behavior in comparison with highly educated participants (see Table 1). These tests also showed that less educated men perceived less social pressure to use condoms with casual partners than medium and highly educated men. Poorly educated men also had lower perceived control over condom use with casual partners. However, no education-related differences were found in intention and attitude towards condom use with casual partners, or in cognitions about condom use with steady partners.

We used two separate multivariate linear regression analyses to examine the cognitive structures underlying the intention to use condoms with steady and casual partners. As predictors, we entered the measures of knowledge, attitude, social norm, and perceived control. Previous inspection of the correlations between the social cognitions had shown that

Table 1. Mean scores social cognitions and summary of univariate *F*-tests (N = 282)

	Educational status						
	Low (n = 22)		*Medium (n = 79)*		*High (n = 181)*		
	M	*SD*	*M*	*SD*	*M*	*SD*	*F(2, 279)*
Steady partners							
Intention	6.0	1.5	5.5	1.9	5.6	1.8	.9
Attitude	4.7	1.9	4.8	1.8	5.2	1.9	1.6
Social norm[a]	6.1	5.1	6.9	5.2	6.8	5.7	.2
Perceived behavioral control	5.4	2.0	4.9	2.1	5.4	1.9	1.7
Casual partners							
Intention[b]	4.9	.4	4.9	.4	4.9	.4	.1
Attitude	6.5	1.4	6.6	1.1	6.6	1.3	.0
Social norm[a]	7.1[de]	7.1	9.6[e]	5.1	10.6[d]	4.5	5.2**
Perceived behavioral control	5.9[de]	1.8	6.4[e]	1.0	6.6[d]	.9	4.7*
Knowledge[c]	7.1[d]	1.1	7.4	.8	7.6[d]	.6	5.7**

Note. All scores ranged between 1 and 7, except for [a]range –21– +21, [b]range 1–5 and [c]range 0–8
F-test significant at the $^{*}p < .05$, $^{**}p < .01$ level
T-tests indicated significant differences at the $^{d}p < .01$ or $^{e}p < .05$ level between the groups that share the same superscript

colinearity between predictor variables was unlikely to affect the results (see Table 2 for the correlation matrix). The results of the regression analyses (see Table 3) revealed that a stronger intention to use condoms with steady partners was related to a more positive attitude, higher perceived behavioral control, and a social norm that more strongly favored the use of condoms with steady partners. In contrast, the intention to have protected anal sex with casual partners was only associated with perceived control over using condoms with casual partners.

Education-related differences in condom use and mediating social cognitions

We examined the rates of condom use during the six-month period following the assessment of social cognitions. The data revealed that 25 percent (39/154) of the men who had anal sex with steady partners had used condoms consistently. Consistent condom use with casual partners was reported by 70 percent (93/133) of the men who had anal intercourse with casual partners. We used two separate logistic regression analyses to test whether the cognitive variables predict these risk behavior outcomes. Since some participants may have altered their behavior based on the result of their HIV-antibody test which was notified shortly after intake assessment, we decided to control for the effect of test notification by entering a variable that distinguished between the men who chose not to be informed (15 percent), the men who were informed about their HIV-negative test (81 percent) and the men who were told that they were HIV positive (4 percent). We used simple contrasts to compare the three levels of this notification variable. The other predictors that we included in the statistical model were knowledge, attitude, social norm, perceived control, and intention. Predictors were entered simultaneously to test the overall model. The results indicated that having been consistently safe with steady partners was predicted by the intention to use condoms with steady partners; none of the other variables made significant contribution to this prediction (see Table 4). In contrast, consistent condom use with casual partners was not related to intention. Higher perceived behavioral control was the predictor significantly related to consistent condom use with casual partners.

We then examined whether rates of protective behavior were related to educational status. χ^2 tests showed that consistent condom use with steady partners was not associated with educational status. However, we did find a

Table 2. Correlations between social cognitions (N = 292)

	Steady partners				*Casual partners*			
	Intention	*Attitude*	*Social norm*	*Perceived behavioral control*	*Intention*	*Attitude*	*Social norm*	*Perceived behavioral control*
Steady partners								
Attitude	.60***							
Social norm	.32***	.32***						
Perceived behavioral control	.58***	.53***	.18**					
Casual partners								
Intention	.20***	.16**	.13*	.27***				
Attitude	.14*	.28***	.14*	.19**	.13*			
Social norm	.00	.03	.48***	.04	.04	.12*		
Perceived behavioral control	.12*	.11	.04	.34***	.32***	.12*	.15*	
Knowledge	–.07	.00	–.07	–.05	.02	.04	.12*	.08

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

Table 3. Summary of multivariate linear regression analyses (method enter) for variables predicting the intentions to use condoms with steady or casual partners

Criterion	*Predictor*	*B*	*SE B*	*β*
Steady partners[a]	Knowledge	–.09	.10	–.04
	Attitude	.36	.05	.38**
	Social norm	.04	.02	.13*
	Perceived behavioral control	.32	.05	.35**
Casual partners[b]	Knowledge	–.01	.03	–.02
	Attitude	.02	.02	.07
	Social norm	.00	.01	.02
	Perceived behavioral control	.12	.02	.31**

Note. [a]$N = 286$; $R^2 = .48$ ($p < .001$)
[b]$N = 285$; $R^2 = .11$ ($p < .001$)
*$p < .01$, **$p < .001$

Table 4. Summary of logistic regression analyses (method enter) for variables predicting consistent condom use with steady or casual partners in the six-month period following intake assessment

Criterion	*Predictor*	*OR*	*95% CI*
Steady partners[a]	Notification		
	Not informed versus informed HIV– or HIV+	.9	.08–9.3
	Informed HIV– versus not informed or informed HIV+	.5	.06–4.4
	Knowledge	1.0	.6–1.8
	Attitude	1.2	.9–1.6
	Social norm	1.0	.9–1.1
	Perceived behavioral control	.9	.7–1.2
	Intention	1.8**	1.2–2.7
Casual partners[b]	Notification		
	Not informed versus informed HIV– or HIV+	1.9	.3–14.3
	Informed HIV– versus not informed or informed HIV+	1.6	.3–9.8
	Knowledge	.8	.4–1.4
	Attitude	1.2	.8–1.7
	Social norm	1.0	.9–1.0
	Perceived behavioral control	1.6*	1.0–2.6
	Intention	2.2	.4–12.7

Note. [a]$N = 151$; –2 *log likelihood* = 170.4 for initial model including constant; Δ –2 *log likelihood* (χ^2) = 27.9 ($p < .001$) for model presented here
[b]$N = 130$; –2 *log likelihood* = 157.1 for initial model including constant; Δ –2 *log likelihood* (χ^2) = 14.3 ($p < .05$) for model presented here
*$p < .05$, **$p < .01$

significant education-related effect on safer sex with casual partners: 25 percent (2/8) of the poorly educated men had used condoms consistently compared to 68 percent (26/38) of the medium and 75 percent (65/87) of the highly educated men (χ^2 [2, $n = 133$] = 8.7, $p < .05$).

We planned to examine whether social cognitions mediate this association between educational status and risky sex. Since the previous analyses had shown that perceived behavioral control was significantly related to both educational status and risk behavior with casual partners, we assumed that this cognition might be the mediating behavioral determinant in the link between educational status and risk behavior. To test that assumption, we followed the instructions of Baron and Kenny (1986) as to the statistical identification of mediator variables. Applying their logic to our case, we reasoned that if perceived control acts as a variable that

completely mediates the effect of educational status on risk behavior, then the size of the effect of educational status on risk behavior will approach zero in a regression equation if perceived control is entered as an additional covariate. We checked for such a change in regression coefficients in a final logistic regression analysis. This time we started out with entering educational status as a predictor of consistent condom use with casual partners (using simple contrasts to compare the three levels of educational status). The OR for less educated men to use condoms compared with medium and highly educated men was .055 (95% CI = .0062–.48; Wald [1, n = 131] = 6.9, p = .009). We then entered perceived control. Perceived control did contribute significantly to the prediction of condom use (OR = 1.8, 95% CI = 1.2–2.8; Wald [1] = 7.9, p = .005) but only modestly reduced the effect of low educational status which remained statistically significant (OR = .066, 95% CI = .0073–.62; Wald [1] = 5.7, p = .02). These findings suggest that perceived control only partially mediated the effect of educational status on risk behavior with casual partners. We subsequently entered the intention, attitude, social norm, and knowledge measures to determine whether these variables would further reduce the effect of low educational status. None of these variables had significant effect on risk behavior with casual partners, however, whereas the effect of low educational status remained statistically significant (OR = .046, 95% CI = .0039–.53; Wald [1] = 6.1, p = .01).

Discussion

Recent studies have found higher rates of HIV infection (e.g. de Wit, 1996; Osmond et al., 1994) and risky sex in young gay men with lower SES (e.g. Diaz et al., 1996; Hogg et al., 1993; Kippax et al., 1995; Montgomery et al., 1989). We investigated behavioral determinants that may mediate the link between SES and risk behavior. We used data from participants of the cohort section of the YGMS. These men gave information about their risk behavior during the six-month period that followed the assessment of social cognitions that have been associated with safer sex, both theoretically and empirically. Although the data allowed us to examine the mediating role of social cognitions in a prospective study design, they also had several limitations. First, the chances of detecting SES-related differences were limited since participants in the YGMS (and those in the cohort in particular) are predominantly highly educated. Second, participants had been recruited via advertisements and friends. The fact that enrollment was self-selected may have led to biased estimates. For example, if men who put themselves at risk were inclined to join the research program, the observed rate of risky sex may overstate the actual rate in the population. Unknown external validity is by no means a specific problem of the YGMS. It is a reality constraint for most studies that concern gay men: since the parameters of that population are unknown, random samples cannot be readily drawn. It should be noted though that even if estimates were biased in the YGMS, the biased estimates would not automatically have an impact on the internal validity of the present study. We focused on education-related differences; by looking at the relative differences in rates of HIV risk behavior instead of the overall rate, we controlled for the bias that may have existed in the overall estimate. Third, most of the participants were notified of the results of their HIV-antibody test shortly after the assessment of social cognitions. This may have led to a shift in cognitions that was not recorded. The correlations between risk behavior and social cognitions may have been underestimated as a result. We note, however, that we controlled for such an effect by including antibody test notification as a covariate during the analyses of the risk behavior outcomes. A final limitation to our study is that, although we had a prospective study design, it was still correlational. The associations that we found may not represent causal relationships.

Despite the low power for statistical analyses, we found several significant education-related differences in social cognitions. The poorly educated men had significantly poorer knowledge about HIV transmission and preventive behavior than the highly educated men. This result replicated earlier findings of less accurate prevention information in groups with lower SES (e.g. LeBlanc, 1993; Macintyre & West, 1993; VanLindingham et al., 1997). It may indicate that gay men with lower SES have not benefited equally from HIV information campaigns. We

also found that the poorly educated men perceived social norms to be less favorable towards using with casual partners than the medium and highly educated men. However, men's attitudes and intentions did not differ between educational groups. This may suggest that poorly educated men perceive a larger gap between their personal motivation and the social support for using condoms with casual partners. This is in line with other studies that suggest that individuals with lower SES feel deprived of social support (Mirowsky & Ross, 1986; Williams, 1990). We also found that poorly educated men felt less in control of using condoms with casual partners than medium and highly educated men. This finding corresponds with our hypothesis that general feelings of powerlessness in individuals with lower SES might affect their perceived ability to engage in specific behaviors such as safer sex. Our finding is also consistent with studies that approached SES-related differences in health risk behavior from theoretical perspectives that differed from our social cognitions approach. These studies have indicated that individuals with lower SES have high external locus of control (they feel that their lives are controlled by factors that are beyond their personal control), and that this disposition underlies some of the unhealthy behaviors in individuals with lower SES (e.g. Droomers, Schrijvers, van de Mheen, & Mackenbach, 1998; Stronks, van de Mheen, Looman, & Mackenbach, 1997).

In addition to the examination of education-related differences in social cognitions, we investigated the rates of risky sexual behavior during the six-month period that followed the assessment of the social cognitions. We also examined whether our theoretical framework predicted the risk behavior outcomes. We found that 25 percent of the men who had anal sex with steady partners had used condoms consistently. This behavior was predicted by the intention to use condoms, which in turn was associated with a positive attitude towards using condoms with steady partners, a social norm that favored the use of condoms with such partners and the perception of having control over using condoms with steady partners. The level of protection with casual partners was considerably higher: 70 percent of the men engaging in anal sex with casual partners had used condoms consistently. Safer anal sex with casual partners was not associated with intention (this cognition was almost invariably favorable towards using condoms), but rather with having high perceived control over using condoms with casual partners.

Based on these findings, it can be concluded that HIV risk behavior is preceded by social cognitions. Safer sex with steady partners seems to be a planned behavior based on the processing of information about the outcomes of using condoms, the opinions of gay friends, and the ability and opportunity to engage in protected anal sex. As to protective behavior with casual sex partners, the high intention to use condoms seems to indicate that gay men are currently persuaded of the need to use condoms with casual partners. However, there still appears to be a considerable number of men engaging in risky sex with casual partners. Our findings suggest that the remaining number of men engaging in risky sex with casual partners do so out of perceived inability to engage in safer sexual conduct.

These conclusions have implications for the primary prevention of HIV infection. Rates of protected anal sex with steady partners might be increased by prevention programs that persuade young men of the positive consequences of condom use with their steady partner. An increase in safer sex with steady partners may also be achieved by persuading young men that significant others are in favor of using condoms in relationships. To reduce rates of unsafe sex with both steady and casual partners, it seems crucial to convince young men of their ability to engage in safer sex. Skills training programs may be used as a tool to provide men with a sense of mastery. This type of intervention has been shown to effectively reduce rates of risky sex in other studies (e.g. Fisher, Fisher, Misovich, Kimble, & Malloy, 1996; Kelly et al., 1990a).

Since the primary goal of our study was to identify the social cognitions that may mediate the link between HIV risk behavior and SES, we also examined the risk behavior outcomes by levels of educational achievement. We were particularly interested to investigate whether our theoretical framework would explain education-related differences in risk behavior. We found that educational status had an effect on consistent condom use with casual partners: poorly

educated men were significantly less likely to have been consistently safe. Since perceived control was related to both participant's educational status and his risk behavior with casual partners, we assumed that perceived control might have acted as a mediator in the link between educational status and risk behavior. However, the critical test of perceived control's mediating role revealed that perceived control only slightly reduced the effect of educational status. As a matter of fact, the regression analysis showed that low educational status and low perceived control had independent predictive value for not using condoms with casual partners. We further found that none of the other social cognitions proposed in our TPB-like framework of HIV risk behavior (knowledge, intention, attitude, and social norm) removed the effect of low educational status on risk behavior with casual partners. These findings suggests that SES may have an effect on gay men's risk behavior that is not mediated by perceived control or any of the other cognitions put forward in the TPB.

In short, this study showed that HIV risk behavior with casual partners is related to educational status, but it failed to explain this association by using a social cognitions perspective. This failure may have resulted from a methodological limitation: single-item measures were used to assess the constructs in the TPB. Due to measurement error, the correlations between cognitions and behavior may have appeared to be lower than they are in reality. Since the assessment of educational status is less likely to have been plagued by random error, the correlations between cognitions and behavior may have lacked statistical power when competing with the education–behavior correlation in the multivariate regression analysis that was used to test the mediator hypothesis. However, it seems unlikely that the cognitive measures were seriously flawed since a considerable proportion of variance in intentions could be explained.[1]

This study's failure to explain the higher rates of risky sex in men with low educational status may alternatively suggest that prevailing models of behavior do not explain all of the risk behavior in gay men with lower SES. The basic assumption underlying these models is that people process information about the target behavior, that they form relatively stable cognitions on the basis of that process, and that they engage in behavior that is consistent with the beliefs that were formed during information processing.

One possible explanation for the fact that perceived behavioral control did not explain the higher rates of risk behavior in men with low educational status may be that men's perception of control is not an accurate reflection of their actual control. Men with lower SES may be disproportionally exposed to factors that stand in the way of engaging in safer sex, such as housing conditions that leave little room for privacy and keeping a supply of condoms, or (commercial) sexual contacts in which men's intentions to engage in safer sex are outweighed by the wishes of sex partners. The TPB assumes that the impact of such conditions would be reflected in a person's perception of having little control over engaging in safer sex. In such a situation in which there is high correspondence between actual and perceived control, measures of perceived control may fully account for any SES-related difference in rates of risk behavior that is due to actual control-affecting conditions. However, it may be that actual control-affecting conditions are not equally well anticipated by men with lower SES as by men with higher SES, leaving the predictive power of self-reported measures of control to become increasingly poor with decreasing SES. A way to investigate this hypothesis is to observe men's performance on specific skills that are associated with safer sex (e.g. putting on condoms or persuading a partner to have safer sex) and to test whether preassessed measures of perceived skills are less predictive of successful behavioral performance in men with lower SES than in men with higher SES.

Another explanation for our failure to explain the education-related differences in risk behavior may be that specific states of psychological distress interfere with social cognitions impacting risk behavior in men with lower SES. Lower SES has been associated with higher rates of depression (Adler et al., 1994; Mirowsky & Ross, 1986) and lower self-esteem (Jacques & Chason, 1977). The studies of Gold and Skinner (1992) and Vincke, Mak, Bolton, and Jurica (1993) suggest that depressive disorders are involved in gay men who continue to put themselves at risk for HIV. Martin and Knox (1995)

provide a complete conceptual model of the link between unstable self-esteem and risky sex in gay men. These authors suggest that episodes of low self-esteem lead to non-reciprocal social relationships and loss of social support. They expect gay men to cope with the resulting feelings of loneliness by intensifying their sexual contacts. The authors also assert that other maladaptive coping strategies may be employed, such as alcohol and drug use, which may interfere with the adherence to safer sex guidelines. There is some evidence that these patterns of psychological distress may be rooted in internalized homophobia (Meyer & Dean, 1998; Stokes & Peterson, 1998), a factor that has been identified as carrying risk for unprotected anal sex in gay men (Meyer & Dean, 1995, 1998). Now what exactly is the meaning of these studies in relation to our failure to explain SES-related differences in HIV risk behavior from a social cognitions perspective? It is our opinion that it may be that gay men with lower SES reconsider their cognitions about engaging in safer sex when they suffer from depressive symptoms, episodes of low self-esteem, or internalized homophobia. In such cases, measures of previously formed social cognitions might not be predictive of actual risk behavior. Future studies may want to incorporate measures of depression, self-esteem, and internalized homophobia in order to test whether these psychological states moderate the relationship between social cognitions about safer sex and actual risk behavior in gay men. These studies may further address the question of whether psychosocial conditions overriding the impact of social cognitions on HIV risk behavior prevail in gay men with lower SES.

Note

1. We found a multiple *R* of .69 for variables predicting the intention to use condoms with steady partners, which corresponds with meta-analyses of the TPB that report mean *R*s of .69 and .71 (see Conner & Sparks, 1996). It is true that the intention to use condoms with casual partners was far less well explained, but that cognition hardly varied. We note that the measures of the social cognitions about condom use with casual partners had the same wording as those regarding steady partners. Therefore, measures may be assumed to have had similar psychometric quality.

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