

Young Urban Adults' Heterosexual Risk Encounters and Perceived Risk and Safety: A Structured Diary Study

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Using diary methods, we explored characteristics of young adults' sexual risk interactions over a 2-week period and the framing effects indicate in associations between the perceived risk and safety of these sexual risk behaviors. We screened all participants to ensure moderate to high scores on an HIV knowledge measure. Men (n = 44) and women (n = 48) enrolled at an inner-city college collected diary data, generating reports of 440 sex occasions over a 2-week period (1,278 person-days). Despite participation in sexual risk activities, including highly inconsistent condom use during intercourse, participants uniformly reported high safety and little to no risk. Only women's perceptions of safety (not risk) were associated with condom use, men's perceptions of both safety and risk were unrelated. Ratings of safety and risk appeared to operate independently for the most part. Sex with new partners and new sexual activity were associated with both judgments of greater risk and lower safety were associated for men only. These results add to the growing evidence that young people fail to integrate their general knowledge regarding HIV risk into their personal interactions. This study has implications for the development of cognitive models around sexual decision-making for young adults at risk for HIV and may provide insight into the contextual features of sexual interactions associated with young people's perceptions of risk and safety.

A confounding paradox that has been the focus of much research attention in recent years is that young people in the United States and elsewhere continue to engage in unsafe sexual practices despite relatively high levels of awareness of HIV infection risks, interest in avoiding these risks, and knowledge about best prevention strategies. Current statistics indicate that young people under the age of 25 acquire HIV primarily through heterosexual transmission (CDC, 2005a). In particular, the burden of the HIV epidemic is increasing among young urban people and disproportionately to women and members of ethnic minority groups (CDC, 2004), making the need to find ways to reduce these rates an urgent health issue for our society.

Despite years of widespread proliferation of informational and educational materials, there has been little change overall in young adults' HIV risk-taking behaviors (CDC, 2005a). This pattern indicates that information and educational campaigns, although necessary, are not sufficient to produce changes in risk-taking behaviors. Failure to adopt less risky practices may be related to differences in how young adults perceive risk that is not immediately

and personally relevant (Dudley, O'Sullivan, & Moreau, 2002). Because perceptions of risk are key to determining preventive actions (Raghubir & Menon, 2001), we explored how perceptions of risk (and perceptions of safety) vary as a function of actual risk activity among young, ethnically diverse, heterosexual adults who have a moderate to high level of HIV knowledge.

Research indicates that different cognitive mechanisms are at play when people make judgments in domains that are general (objective) versus personal (subjective), specifically in studies of risk perception (Byrnes, Miller, & Reynolds, 1999; Slovic, 1998). When referring to general risk, individuals tend to rely on objective information. When referring to personal risk, they rely on others source of information, such as interpersonal or situational cues (Kershaw, Ethier, Niccolai, Lewis & Ickovics., 2003). General knowledge and personal knowledge are acquired through different types of experiences and are processed in distinctly different ways (Patel, Arocha & Kaufman, 1999). Despite possessing adequate knowledge of HIV transmission and its consequences for health, young adults' perceptions regarding the risk associated with a sexual event may vary depending on the personal relevance of the scenario. Yet individuals need to be able to integrate their general knowledge with their personal knowledge to enact safer practices.

Perceptions of risk and safety may not necessarily be closely related. Reasoning is influenced by framing effects in which preferences change when a problem is posed differently in terms of either potential gain or potential loss

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(Tversky & Kahneman, 1981). Framing effects occur when logically equivalent descriptions of events (safety and risk) lead to differential judgments (McKenzie, 2003). Individuals do not choose randomly among logically equivalent frames; they are instead systematically influenced by contextual features (McKenzie, 2003). This is a well-documented phenomenon in medicine as well as in other domains (Levin, Gaeth, Schreiber & Lauriola, 2002). For instance, physicians and patients revealed different preferred treatments for lung cancer (e.g., radiation or surgery) depending on whether they were described in terms of survival rates or mortality rates (McNeil, Pauker, Sox, & Tversky, 1982). One possible explanation is that the positive framing (e.g., survival rates) leads to more risk-averse choices, whereas the negative framing (e.g., mortality rates) increases risk-tolerant decision-making (Chapman & Elstein, 2000). This is a phenomenon of considerable importance in characterizing the risky choices made by young adults with regard to HIV/AIDS. However, research has not provided an adequate characterization of the circumstances in which framing may influence HIV-related decisions.

A number of factors may be related to perceptions of personal risk or safety. Condom use is most apparent, given the attention paid to it in educational campaigns as the primary means of HIV prevention available to sexually active women and men yet in a diary study involving college students, 38% reported at least one instance of late application of a condom (de Visser & Smith, 2000). "Novel" sexual situations may also trigger concerns about safety. There is a strong association in the psychology literature between novelty and anxiety, but also between novelty and greater risk-taking (Bevins, 2001; Butler & Montgomery, 2004; Donohew, Bardo, & Zimmerman, 2004; Laviola, Macri, Morley-Fletcher, & Adriani, 2003). Thus, it was unclear what the nature of the association would be in this respect. Another key factor is the relationship context. Researchers have argued that condom use declines early in established relationships (as compared to casual encounters) because risk of infection is commonly perceived as being low or nonexistent once trust and security are established (Afifi, 1999; Sobo, 1995; St. Lawrence et al., 1998). Finally, sexual activity with new partners (i.e., a partner with whom the individual engages in sexual activity for the first time), secondary partners (i.e., a regular partner who is not considered a primary partner), or unfamiliar partners (i.e., someone not known to the participant immediately prior to or during a sexual encounter) are also likely to be factors influencing perceptions of risk and safety. Casual sexual encounters with individuals outside of the context of a monogamous relationship are a key factor in HIV risk, but often overlooked in favor of risk associated with consistency of condom use (Morris & Kretzschmar, 1997).

Ethnically diverse college students residing in inner-city neighborhoods were the focus of the study because

they represent both a high-risk group (Hoffman, O'Sullivan, Harrison, Dolezal & Monroe-Wise, 2006) and a group that has been a common target of HIV education campaigns in the past. Those who demonstrated moderate to high levels of HIV knowledge were recruited as participants. We screened all participants on this basis to control for differences in level of explicit, general HIV knowledge.

This study incorporated the following research questions:

1. To what extent do young women and men with moderate to high level of knowledge relating to HIV risk transmission engage in risk activity and perceive themselves to be at risk for HIV infection on the basis of their sexual activity?
2. Are perceptions of risk (or safety) consistent with risk behavior?
3. How do contextual features of their sexual encounters, including condom use, novelty of sexual activity, and type of partnership (primary vs. new or other type of partner), influence young women's and men's perceptions of risk and safety?
4. Do these factors have differential effects for risk versus safety; that is, are these constructs inversely related; and, are these effects similar for women and men?

Although many methodological advances have been made to help individuals recall their participation accurately in sexual risk activity (e.g., using calendars, contextual cues), most methods typically require long-term recall (Coxon, 1999; Gillmore et al., 2001; Morrison, Leigh, & Gillmore, 1999). There is growing evidence to suggest that prospective diary methods may capture socially-sensitive information, such as occasions of unprotected sexual activity, more effectively than traditional interview modes requiring long-term recall (DeLongis, Hemphill, & Lehman, 1992; Hays, Irsula, McMullen & Feldblum, 2001; Ramjee, Weber, & Morar, 1999). In addition, "event near" methods may constitute a useful means of attenuating self-presentation or impression management effects inherent in traditional interview scenarios as they effectively remove the individual from the interview situation and allow some independence in the reporting process. Moreover, with repeated neutral exposure to the questions, use of diary methods may desensitize participants particularly to some of the sexual items, thereby possibly improving the validity of their reports.

METHOD

Participants

The sample comprised 44 men and 48 women enrolled at a city college in New York City. Participants were recruited by distributing fliers in classrooms across campus (specifically, two computer science, two anthropology, and two social work courses to gather a range of students across disciplines). Those who wanted to participate were asked either to telephone a study number or to approach

the study staff at the site study office in order to be screened for eligibility. To be eligible for participation, individuals had to be between the ages of 18 and 24 and heterosexually active within the three weeks preceding the study. To establish that participants had a moderate to high level of HIV knowledge, they had to answer correctly at least 9 of 12 items on a HIV knowledge measure that assesses general knowledge about HIV transmission risks (e.g., A woman cannot get HIV if she has sex during her period, A person can get HIV through contact with saliva, tears, sweat, or urine; Koopman & Reid, 1998).

Participants' mean age was 20.8 (range 18-24 years). Their race/ethnicities were Black/African American (45.7%), White (25.0%), Hispanic/Latino (15.2%), Asian (3.3%), and Other/Mixed Race/Ethnicity (10.8%). The majority (68.1%) reported a monthly income of less than \$1,000 after considering all sources of income. However, many lived with their parents and came from what could be considered working-class and lower middle-class families. Most students lived in the college neighborhood, which is impoverished economically: 22.7% of all households and 18.5% of all families in this zip code have a total income and benefits of less than \$15,000 a year. Approximately 35.6% of the households in these zip codes receive public assistance income or government non-cash benefits. Surveillance data collected prior to data collection indicated that the college zip code had an AIDS case rate of 201-400 (per 100,000 people), and three of its four neighboring zip codes had some of the highest rates in the United States of 401-800 (per 100,000 people; NYC Department of Health, 2001). Overall, the college is situated in a cluster of neighborhoods with extremely high rates of AIDS.

Most participants indicated that they had a romantic partner, but were never married and were not cohabiting (80.4%) with a sexual or romantic partner. The remaining participants reported that they had no romantic relationship at the time of the study (15.2%) or were cohabiting (3.3%). Only one participant was married (1.1%). Most had no children (94.6%), but four respondents reported having one child (4.3%) and one reported two children (1.1%). All resided in high HIV-prevalence neighborhoods of New York City.

Measures

Demographic information. Participants were asked to provide some background information. This included information about age, race, ethnicity, monthly household income, current relationship status, and number of children (if any).

Sexual history. A measure of participants' sexual histories assessed the frequency of oral, anal, and vaginal intercourse in the preceding two months, as well as condom use during these encounters, total number of sexual encounters, and lifetime number of sexual partners.

Structured daily diary. The daily diary consisted of a brief, highly structured, one-page form on which respondents described their sexual interactions. Respondents first

indicated whether sexual activity occurred on that day. If sexual activity had occurred, respondents were asked to indicate for the first encounter that day (a) the type of sexual activities in which they had engaged (from a checklist of kissing/hugging, genital touch, oral sex, penile-vaginal intercourse, anal intercourse, and other), (b) whether a condom was used from the beginning to end of genital contact (if applicable; yes or no), (c) whether they ever engaged in any sexual activity with that partner on another occasion (and number of times, if applicable; yes or no), (d) whether they had ever engaged in the reported sexual activities with that partner on another occasion (yes or no; to establish the novelty of the sexual activity to that participant), (e) how safe they felt from infection during the sexual encounter (on a scale ranging from 0—*not safe* to 7—*very safe*), (f) the type of relationship that they had with the partner (i.e., don't know partner well, casual friend, good friend, boyfriend/girlfriend, fiancé/e or spouse, other), (g) their perception of the level of risk of infection associated with the sexual encounter (from 0 - *no risk* to 7—*high risk*), and (h) how long they had known the partner (i.e., less than 1 month, 1-6 months, 6-12 months, more than 12 months).

Procedure

Those who met all eligibility requirements were scheduled to meet with an interviewer at a convenient time in a private study office located at the site. After providing consent, participants completed the background questionnaire and the sexual history measure and then were trained to complete the structured one-page daily diary forms. Two procedures were incorporated into the study to help ensure privacy. First, the sex-related content of the daily diaries was coded so that the purpose and content of the diaries would not be deciphered easily by anyone outside of the study. All participants were taught to recognize and use the codes in the training session and tested on their ability to do so using short hypothetical scenarios. Second, participants were instructed to return the forms on a daily basis and were given stamped addressed envelopes in which to enclose their completed form and send to the study offices. Forms were identified only by a code number that was assigned at the beginning of the study. Participants were reimbursed for taking part in the training and at the end of the two-week period. The study protocol was reviewed and approved by the institutional review board for protection of human subjects in research.

Data Analyses

Only those participants who returned at least 12 of the 14 forms were retained for analyses. A total of 22 men and 4 women were dropped from an original sample of 66 men and 52 women. Thus, the retention rate was 78% which is comparable to that obtained in other samples with similar populations (O'Sullivan, Beckford, Hoffman, & Dolezal, 2006). Those who reported 11 or fewer days were not different from the sample retained for the analyses in terms of key background and sexual variables (age, number of sex-

ual partners, consistency of condom use, length of primary relationship). Therefore, the final sample consisted of 44 men and 48 women.

We used chi-square and one-way analysis of variance (for dichotomous and continuous variables, respectively) to compare women and men on sexual histories and, over the two-week period, sexual encounters, condom use, new sexual interactions, and relationship context. Following this, we conducted generalized estimating equation (GEE) regression models with a log-link function in which condom use, type of sexual partnership (primary versus new or other), and type of sexual activity (regular versus new) predicted perceived risk and safety over the course of the two weeks. This regression method, appropriate for longitudinal data where observations for each subject are correlated (Xie & Yang, 2003), controls for interdependence between variables across diary days. Because of the skewed nature of the participants' risk and safety scores, we transformed them using an inverse transformation procedure. There were no differences in reports across racial/ethnic groups, so we included participants of all ethnicities together in subsequent analyses. In assessing the relationship between perceptions of risk and safety and the hypothesized predictors, the analyses treat each diary day ($N = 1,278$), rather than each participant, as the unit of analysis. We conducted separate GEE analyses predicting perceptions of safety and risk among the men and women.

RESULTS

Sexual Histories

The majority of participants ($n = 83$; 90.2%) reported being in a sexual relationship at the time of the study. Of these participants, the average length of their primary relationship was 20.9 months ($SD = 18.4$) with a range of 1-84 months. They reported a mean of 9.0 ($SD = 10.3$; range 1-50) lifetime sexual partners. Men and women did not differ in the proportions who reported being in a sexual relationship (86% and 94%, respectively), $X^2(1) = 1.42$, *ns*. However, women reported a longer duration of their primary relationship compared to men ($M_s = 25.5$ and 15.4 months, respectively), $t(1, 2092) = 6.60$, $p < .05$, and fewer lifetime sexual partners overall ($M_s = 5.7$ and 12.5, respectively), $t(1, 1042) = 11.03$, $p < .001$. It is important to note that the participants were not recruited as couples. As such, the women and men may represent different sexual/dating samples.

Participants' reports of their sexual behavior in the two months preceding the study are shown in Table 1. All participants reported having engaged in vaginal intercourse over this period, although only half of these occasions involved condom use. No men and three women reported anal intercourse, and two of these three women reported anal intercourse without condoms (i.e., unprotected anal intercourse, the highest HIV/STI risk activity). Oral sex was relatively common among participants and, as expected, most did not report using condoms during this activity. Participants typically reported having had one sexual part-

ner in the preceding two months, although 17 men and 2 women (20.7% of the total sample) reported two or more, with an average of 3.5 ($SD = 2.7$) encounters with secondary partners during this period. In the analysis of gender differences in reports of sexual activity, we excluded anal sex because of the low cell frequencies. Only one gender difference emerged from these analyses: men reported a higher number of sexual partners over the prior two months, $F(1, 91) = 8.51$, $p < .01$.

Sexual Interactions Over Two-Week Period of Diary Collection

Diary records were completed for 1,278 of 1,288 person-days (99.2% response rate; $M = 13.9$ records per participant, $SD = 0.38$, range 12-14). There were no differences in completion rates across gender ($M = 13.9$ for both women and men), $F(1, 91) = 0.45$, *ns*.

Reports of sexual encounters. Over the two-week period of daily diary collection, the 92 participants reported a total of 440 sex occasions, with a mean number of 4.94 ($SD = 2.3$; Median = 5.0) days involving sexual encounters. Only three participants reported no sexual activity during this time. For the rest of the sample, the range was 1 to 13 occasions. No gender differences were found in the number of days involving sex, ($M_s = 4.7$ and 4.9 for men and women, respectively), $F(1, 91) = 0.22$, *ns*. The frequency with which each of the five types of sexual activities was reported can be found in Table 1. Participants commonly reported lower levels of sexual intimacy, especially kissing and hugging. Other more intimate sexual activities involving some level of genital contact were relatively less common than hugging and kissing as might be expected, but were typically not reported in isolation with

Table 1. Sexual Behavior in Two Months Preceding the Study

Sexual Behavior	Number of Occasions			
	Number of Participants Reporting Behavior	<i>M</i>	<i>SD</i>	Range
Two Months Preceding the Study				
Vaginal Intercourse	92	13.2	11.0	1 - 50
% without Condom	53.5			
Anal Intercourse	3	1.0	0.0	—
% without Condom	66.7			
Oral sex (fellatio)	73	12.3	12.7	1 - 50
% without Condom	91.8			
Prospective Diary Collection (Two-Week Period)				
Kissed or Hugged	87	4.4	2.4	1 - 13
Genital Touch	77	3.8	2.0	1 - 9
Oral Sex	68	3.2	2.0	1 - 9
% without Condom	100			
Vaginal Intercourse	80	3.1	1.4	1 - 6
% without Condom	57.5			
Anal Intercourse	4	0.1	0.2	1 - 1
% without Condom	50.5			

Note. $N = 92$ participants.

out less intimate forms as well. Only one gender difference emerged: women reported more intercourse occasions than did men, $M_s = 3.4$ and 2.7 , $F(1, 116) = 8.64$, $p < .01$.

Consistency of condom use. Twelve participants did not report vaginal intercourse during the two-week period. Of the remaining 80 participants, 57.5% of all vaginal intercourse occasions involved condom use. In terms of consistency, 18.9% of people used condoms half of the time or less, 11.4% used them more than half of the time, and 27.2% used them on every occasion. Men and women did not differ in their reports of consistency, $X^2(3) = 1.36$, $p = ns$.

New sexual interactions. Sexual interactions that were reportedly new to participants were relatively uncommon: only 24 participants (26.1%) reported engaging in a sexual activity that they had not previously experienced with anyone on another occasion. For these participants, the mean number of encounters was 1.47 ($SD = 1.28$; range = 1-6). Sexual interactions with a new sexual partner during this two-week period were also relatively infrequent. Most participants ($n = 75$) did not report any new sexual partners during the two-week period. Of the 17 who did report a new partner, the average number of new partners was 1.42 ($SD = 1.10$; range 1-6). Again, no gender differences were found in these reports ($M_s = 0.27$ for both women and men), $F(1,91) = 0.00$, ns .

Relationship context. Sexual partners were usually someone known for more than one year (66.2%) as compared to those known for less than 1 month (3.9%), 1-6 months (19.1%), or 6-12 months (10.8%). Although no differences were found in men's and women's reports of sexual partners known less than 1 month or from 6-12 months, men reported more encounters with partners described as someone known for 1-6 months ($M_s = 1.41$ and 0.44), $F(1,91) = 5.27$, $p < .05$, and women reported more encounters with partners known more than a year ($M_s = 3.98$ and 2.20), $F(1, 19) = 9.86$, $p < .01$. Typically, the partner was described as a boyfriend or girlfriend (71.5% of all occasions), as compared to a good friend (9.4%), fiancé(e) or spouse (6.9%), casual friend (6.2%), someone that the respondent did not know well (2.3%), or "other" (3.8%). No gender differences were found when comparing proportions of partners who were boyfriends or girlfriends versus other types of relationships, $X^2(1) = 2.77$, ns .

Perceptions of Risk and Safety

When asked to record their perception of the level of risk of infection associated with each sexual encounter (from 0—no risk to 7—high risk), participants' mean risk score was 0.94 ($SD = 0.50$). Only 17 occasions (3.9%) received a risk score above the midpoint, with three occasions rated as high-risk. Surprisingly, risk scores varied little when selecting ratings for vaginal intercourse only ($M = 1.16$; $SD = 1.35$). For comparison purposes, they were asked (separately) to rate how safe they felt from infection during the sexual encounter (on a scale ranging from 0—not safe to 7—very safe). The mean score was 6.28 ($SD = .80$). In fact, participants always provided a rating of 4 or above, indicating

moderate to high levels of perceived safety. Little variation was noted for scores related to occasions involving vaginal intercourse ($M = 6.16$; $SD = 0.90$). That is, no participant rated an encounter as unsafe, even for occasions involving unprotected sexual intercourse (i.e., penile-vaginal intercourse without condoms). Relatively few participants reported a score above the midpoint that indicated that the encounter was judged as potentially risky ($n = 5$) or below the mid-point ($n = 1$), indicating perceived lack of safety. Moreover, feelings of risk or safety were not significantly correlated with the number of days in which participants had engaged in sexual activity ($r_s = .10$ and $.04$, ns , respectively) nor the total number of sexual activities that they reported across all days ($r_s = .05$ and $.11$, ns , respectively). That is, those who reported being more sexually active during this two-week period did not feel safer or more at risk than those who reported being less sexually active.

Predicting Perceptions of Risk and Safety from Contextual Factors

Generalized estimating equations indicated that perceptions of risk were unrelated to both men's and women's reports of condom use (see Table 2). However, perceptions of risk were predicted by type of sexual partnership (primary vs. new or other partner) for both men and women. Specifically, participation in sexual activity with a new partner was related to higher ratings of risk. Moreover, type of sexual activity was associated with men's (but not women's) ratings of risk: men rated encounters involving new sexual activities as riskier than those involving familiar sexual activities.

Like perceptions of risk, perceptions of safety were also unrelated to men's reports of condom use. However, perceived safety was related to women's reports. Specifically, women gave encounters involving the use of condoms higher ratings of safety (see Table 2). Participation in sexual activity with a regular partner predicted higher ratings of safety among men; type of partner was unrelated to women's perceived safety. Finally, type of sexual activity (new vs. regular) was unrelated to women's ratings of safety, but men gave encounters involving new sexual activities lower ratings of safety. These analyses reveal that there are important differences in the variables affecting women's and men's perceptions regarding the HIV risk or safety associated with their sexual risk interactions. Of note, perceptions of safety and risk associated with sexual activity appear to operate independently for this sample.

DISCUSSION

In this study, we examined a seeming paradox whereby young people continue to engage in unsafe sexual practices despite a moderate to high level of general knowledge about HIV risk. Ethnically diverse college students residing in inner-city neighborhoods characterized by high rates of HIV recorded their sexual activity over a two-week period. Despite knowledge about HIV transmission, and in particular, the need to use condoms during intercourse, participants

Table 2. Generalized Estimating Equations Predicting Women's and Men's Ratings of Perceived Risk and Safety

	Mean Ratings					
	Perceived Risk			Perceived Safety		
	β	SE	<i>p</i>	β	SE	<i>p</i>
Women's Ratings						
Condom Use During Entire Sexual Interaction (Yes/No)	-.08	.06	.16	.21	.08	.01*
Type of Sexual Partner (Other/New vs. Primary)	-.10	.04	.02*	.08	.09	.32
Type of Sexual Activity (New vs. Regular/Familiar)	.02	.06	.78	.01	.05	.77
Men's Ratings						
Condom Use During Entire Sexual Interaction (Yes/No)	.01	.03	.73	-.04	.04	.35
Type of Sexual Partner (Other/New vs. Primary)	-.14	.05	.00*	.23	.06	.00*
Type of Sexual Activity (New vs. Regular/Familiar)	-.18	.08	.02*	.23	.09	.01*

Note. β = Unstandardized Coefficient. SE = Standard Error.

* = Results are statistically significant.

engaged in risky sexual activity over the two-week period of diary collection at relatively high levels, as well as in the two months preceding the study. These findings indicate that these young people had not effectively integrated general knowledge about HIV into their personal lives in ways that could help them prevent infection or else were unwilling or unable to incorporate the few means of prevention available—either abstinence or consistent condom use.

Most sexual encounters reported by the young women and men involved a more established partner and, thus, beliefs about the monogamous, committed nature of the relationship likely dispelled beliefs about risk from other partners, as other studies have found (Hearn, O'Sullivan, El-Bassel, & Gilbert, 2005). As long as both partners are known not to be infected with HIV or other STIs and both partners are monogamous, then they are safe from outside infection through sexual activity for the length of that relationship. However, one fifth of the participants had two or more sexual partners during the two-week period of data collection alone, as well as in the two months preceding the study—likely underestimates of actual rates of multiple partnerships. This finding reflects a relatively high rate of sexual concurrency overall, and hence, risk for HIV and other sexually transmitted infections (STIs). It also corresponds to the recently renewed interest in “hookups” (sexual encounters lasting one occasion between two people who are strangers or brief acquaintances; Paul, McManus, & Hayes, 2000) and the casual sexual attitudes and behaviors of (primarily) college students (Maticka-Tyndale, Herold, & Oppermann, 2003) with corresponding epidemics of STIs in these groups (CDC, 2005b). Casual sexual encounters appear to be relatively common contexts of risk among sexually active young people, especially given inconsistency in condom use overall. We found no gender differences in the number of secondary partnerships in this respect, although men reported a higher number of sexual partners over the two months prior to the study.

Perceptions of Risk and Safety in Relation to Sexual Risk

Many of the sexual encounters recorded by young women and men in this study did not involve condom use during

intercourse, and more specifically, did not involve proper condom use from the beginning to end of the sexual encounter. Even so, participants uniformly reported feeling safe and perceived themselves as facing little to no risk of HIV infection in their sexual encounters despite, as a group, being at relatively high risk. Other researchers addressing perceptions of risk have noted relatively weak associations with actual risk behavior. For example, in a meta-analysis of 26 studies, researchers found little association ($r = .11$) between perceived risk and actual risk behavior (Gerrard, Gibbons, & Bushman, 1996). Interestingly, we found that neither perceptions of risk nor safety were associated with the amount of sexual activity that participants reported, nor specifically with the number of unprotected intercourse occasions in which they had engaged.

Condom use was only related to women's ratings of safety; that is, women rated sexual interactions as being safer if they involved condom use. Women's ratings of risk, however, were surprisingly unrelated to condom use, and both men's ratings of safety or risk were unrelated to condom use. Condoms—the global symbol of prevention—are a powerful manifestation of how the prevailing lessons from education and prevention efforts nationwide have not been sufficiently integrated into the private lives of these young people in ways that motivate or enable them to enact safer sexual practices. These findings are also significant because, at least for women, ratings of safety were not inversely related to ratings of risk. In other words, judgments about sexual risk encounters varied if viewed in terms of the degree of safety as compared to the degree of risk involved, demonstrating the influence of framing effects. Given the exploratory nature of the current study, a more detailed deconstruction of the ways in which young women and men give meanings to the constructs of risk and safety is warranted. This may further elucidate judgment and decision-making processes surrounding sexual risk behaviors, and may inform public health and educational intervention efforts designed to promote healthy behaviors.

Another gender difference that emerged from this study is particularly intriguing. Reports of engaging in a sexual activity that was new to the individual were related to

men's ratings of safety and risk, but not to women's. Specifically, lower ratings of safety and higher ratings of risk were associated with men's reports of new sexual experiences during the two-week period. Men generally score higher on novelty-seeking measures (i.e., the tendency to respond with intense excitement to novel stimuli; Gil, 2005), which may suggest a greater sensitivity compared to women to the features of novel situations associated with risk. Women typically score higher on measures of harm-avoidance compared to men (Brandstrom, Richter, & Przybeck, 2001), yet we did not find that women were especially sensitive to aspects of their encounters involving the potential for harm. Other factors are clearly involved here. For example, research should address whether temperament can help explain the gender differences that arose.

A primary contextual feature influencing perceptions of risk that is emphasized in the literature is the relationship in which sexual risk occurs. Although some have argued in the past that declines in condom use are related to perceived security and trust that is characteristic of more established romantic relationships (Afifi, 1999; Sobo, 1995; St. Lawrence, et al., 1998), we found only limited support for this association. Ratings of safety from HIV were higher only for men in established relationships; type of partnership did not affect women's ratings of safety. Of note, ratings of risk were lower for both women and men in their established relationships as compared to more casual forms. Thus, to some extent, the relationship context may be playing an important role in the ways that these individuals come to understand risk, but this explanation is clearly only partially useful.

The results from this study may have important implications as we seek to account for why young people perceive themselves as being at low risk for HIV, despite their participation in behaviors that clearly place them at risk. Individuals may plan to refrain from sex, engage in foreplay with the expectation of using a condom at the next stage, or initiate sex believing that they will interrupt the progression of events to do so (Loewenstein & Schkade 1999). Yet they may ultimately underpredict the power of situational factors, their own desire, or possibly their concerns in the moment about their partners' reactions to actually implement their plan. Students certainly *do* plan to avoid risky activity, as documented by in-depth interviews using a similar sample from this population (O'Sullivan, Montrose, Udell & Hoffman, 2006). They can elaborate at length about their concerns regarding infection with sexually transmitted infections, including HIV (Hammer, Fisher, Fitzgerald, Fisher, 1996; Ramos, Shain & Johnson, 1995; Wingood, Hunter-Gamble, & DiClemente, 1993). As Gold (1993) argued, resolutions to engage in safer sexual behaviors often break down "in the heat of the moment." This explanation is consistent with the findings from other studies noting discrepancies between individuals' evaluations of general risk and personal risk (Kershaw et al., 2003; van der Pligt, 1996). It appears that, as we speculat-

ed, what these young people understand in terms of HIV transmission at the general level is not incorporated into the understanding of risk scenarios in the personal realm.

Limitations

This study involved a small convenience sample of college students, although it was ethnically diverse and comprised of individuals at higher risk of HIV infection than many other groups of young people. Also, the participants volunteered and successfully completed requirements involving tracking of their sexual interactions over time. Although participants who did not meet this criterion were not different from those retained for the analyses in terms of key background and sexual variables, there still is likely a selection bias in the sampling approach that we adopted here. Even though small sample sizes are common in diary studies where the burden of data collection is high, it is important to replicate this exploratory study with larger, random samples of young women and men.

Another limitation of the study relates to the possibility that participants' reports reflect reactivity from having to monitor their behaviors and feelings closely over time. Researchers have argued that diary methods may invariably introduce implicit demands to change one's behavior (Okami, 2003). However, an in-depth investigation of daily data collection of sexual and other health-related behaviors showed that reactivity is generally in the direction of decreased reporting as a result of fatigue or sensitization effects (Gillmore et al., 2001). If this is the case, the rates of sexual risk behaviors obtained using our diary methods may actually be underestimated. However, the rates obtained were relatively high and consistent with data capturing risk activity for the two months preceding the study.

It may also be the case that the measure we employed to assess general working knowledge of HIV transmission was inadequate, and that in fact, these participants did not have sufficient levels of general knowledge to reinforce healthy choices. We chose this measure to ensure comparability to other studies purporting to tap such knowledge and specific information regarding the transition of HIV via intercourse, but a more comprehensive assessment of the levels of general knowledge characteristics of this group may have been in order. We do not know how extensive the coverage of HIV had been in their health education. Even so, most educational campaigns and behavioral interventions are focused on the acquisition of often fairly superficial levels of risk-relevant knowledge (Kirby, 2000), rather than more in-depth understanding of how transmission can occur.

Conclusion

Although general information about HIV risks is the foundation upon which young people can be motivated to protect themselves from infection, a primary conclusion from this study is that it is the type of knowledge (general/objective versus personal/subjective), not just depth of understanding,

that is critical to decisions about risk. Schools may not be providing the information that may be most useful to young people, or other strategies for integrating general knowledge about risks into their personal lives. Helping individuals to personalize risk to their daily encounters, especially within the context of an intimate relationship, is perhaps one of the most difficult hurdles faced by education and intervention specialists today. Despite the study's limitations, the findings are of interest and use because they provide insights into the contextual features of sexual interactions associated with young people's perceptions of risk and safety. This study also has implications for the development of cognitive models around sexual decision-making for young adults at risk for HIV. Young people may be motivated to reconfigure their sexual interactions to the extent that interventions can help them to understand how contextual features of risk scenarios may bias their perceptions of risk and safety, and hence, their application of risk-prevention knowledge to their encounters.

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