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The influence of sexual partner on condom use among urban adolescents

Stephanie A. S. Staras, Ph.D.¹, Melvin D. Livingston, B. A.¹, Mildred M. Maldonado-Molina, Ph.D.¹, and Kelli A. Komro, Ph.D.¹

¹Department of Health Outcomes and Policy, College of Medicine, and the Institute for Child Health Policy, University of Florida, Gainesville, FL

Abstract

Purpose—The influence of partner context (e.g., drinking alcohol in the 2 hours prior to sex, 3 years age discordant, met in public) on adolescent boys' and girls' condom use is unclear. Among an urban cohort of primarily (86%) minority 17–18 year olds who reported having sex (n=1469), we assessed the association between condom use and partner characteristics for the most recent sexual experience.

Methods—We used logistic regression to examine the odds of condom use by measured partner familiarity (casual or unexpected) and context characteristics. Analyses were stratified by gender.

Results—Adolescent boys and girls were twice as likely to use condoms with partners they considered casual or unexpected. Adjusting for partner familiarity risk, adolescent boys' tended to decrease condom use with risky context partners. Adjusting for partner familiarity risk, adolescent girls were half as likely to use condoms with partners drinking alcohol two hours prior to sex [Odds Ratio (OR)=0.6, 95% Confidence Interval (CI) =0.4–0.9]; 3 years age discordant (OR=0.5, 95% CI =0.3–0.8); or met in public places (OR=0.6, 95% CI =0.4–0.8).

Conclusions—Regardless of partner familiarity risk, adolescent boys and girls faced barriers to condom use with risky context partners. Increased understanding of adolescents' perceptions of and control over partner risk and condom use with risky context partners is needed. Interventions aimed at decreasing adolescent sexually transmitted infections should include strategies for adolescents to choose less risky context partners and negotiate condoms with risky context partners.

Keywords

sexual partners; condom use; adolescents; alcohol use; age discordance

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Corresponding author: Dr. Stephanie A. S. Staras, University of Florida, College of Medicine, Department of Health Outcomes and Policy, 1329 SW 16th Street, Room 5241, Gainesville, FL 32610; Phone: 352-265-2553; Fax: 352-265-8047; sstaras@ufl.edu.

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Implications and Contribution. Regardless of partner familiarity risk, condom use tended to decrease among adolescent boys and decreased significantly (Odds Ratios ranged from 0.5 to 0.6) among adolescent girls with risky context partners (drinking alcohol prior to sex, age discordant, or met in public places).

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In the United States, adolescents and young adults account for half of all incident sexually transmitted infections (STIs) (1). Condoms effectively prevent STIs including HIV (2), but the average young adult in the United States reports only seldom or sometimes using condoms during sex (3). Condom use varies primarily among individuals by sex event (3), and thus, likely varies by situational and partner characteristics. Increased understanding of the associations between condom use and partner characteristics is important to guide HIV and STI preventive interventions.

Evidence and theory of interpersonal behavior suggest that adolescents' sexual partner characteristics (e.g., casual, unexpected, drinking alcohol, met in public, and age discordance) influence condom use and STI risk (4–14). Studies consistently show adolescents are less likely to use condoms with steady rather than casual partners possibly because youth expect reduced STI risk from steady partners (4, 14). The theory of interpersonal behavior suggests that sexual risk-taking is influenced by environmental norms and peer modeling supportive of unprotected sex with casual partners, and are likely increased in situations where youth are drinking and meeting partners (13, 15).

The influence of partner characteristics on condom use and STI risk likely differs by gender. First, the theory of gender and power suggests that a man's preferences are more influential than a woman's preferences for condom use (16). Second, partner characteristics may encompass the majority of women's STI risk because compared to themselves women frequently choose substantially riskier steady partners (17, 18).

Among a sample of primarily urban high school students (79%), we considered two objectives to better understand the role of partner characteristics in adolescent condom use. First, we identified common partner characteristics for adolescent boys' and girls' most recent sexual encounter. Second, we assessed the association between each partner risk characteristic and condom use by gender. In both objectives, we grouped related characteristics to compare the influence of constructs of partner familiarity (casual and unexpected) and partner context (drinking alcohol, met in public, and age discordance) on condom use.

MATERIALS AND METHODS

Study population

We used data from students participating in the 2008–2009 follow-up survey of Project Northland Chicago; a group-randomized, alcohol preventive intervention trial conducted among students from a representative sample of Chicago public elementary schools ($n=61$ schools) (19, 20). During the intervention trial, 5711 youth participated in at least one of four behavioral surveys: one pretest (2002, age 11) and three follow-up surveys before and immediately following each intervention year (2003, age 12; 2004, age 13; and 2005, age 14). In 2008–2009, when the students were primarily age 17 or 18 years old, 3032 youth completed a mail- or school-based survey (53% Response Rate) (21). Adolescents from intervention and control schools were included because the intervention produced little difference in adolescent alcohol use or hypothesized mediators (e.g., alcohol norms, expectations) (20). Students lost to follow up were more likely to be male ($t(3734)=-6.85$, $p<0.001$) and non-White ($t(3383)=3.15$, $p<0.01$).

We restricted our study population to youth who participated in 2008–2009 because sexual activity items were not included on prior surveys. We omitted adolescents who did not respond to any item on the survey ($n=2$) or provided inconsistent responses on 10% of the alcohol, sex, or drug use items ($n=34$).

Because our objective was to assess condom use during the last sexual event, we restricted the study population to the 1920 (64% of respondents to 2008–2009 survey) adolescents who did not choose “I have never had sex” on any sexual event-level item. Youth reported the types of sex (oral, vaginal, or anal) they had the last time they had sex. We excluded youth ($n=175$, < 10%) reporting only having oral sex because the probability of condom use was significantly lower among those having only oral sex (45%) compared to vaginal and anal sex (61%), and HIV transmission is significantly reduced for oral sex only (22). We excluded youth reporting same sex partners ($n=47$), not reporting their partner’s gender ($n=39$), or not reporting their own gender ($n=3$) because: (1) our primary interest was assessing gender differences in heterosexual partnerships and (2) too few youth reported female-only partnerships ($n=23$) or male-only partnerships ($n=24$) to assess same sex partnership groups separately. Because condoms impede pregnancy, we omitted youth who desired pregnancy during their last sexual event ($n=70$). We excluded adolescents not reporting the three most common racial/ethnic groups in the sample (non-Hispanic White, non-Hispanic Black, and Hispanic) because other racial/ethnic groups were too diverse to combine and too small to consider independently: Native American ($n=14$), Native Hawaiian or Pacific Islander ($n=6$), Asian ($n=31$), Other ($n=15$), and Mixed Race ($n=48$). Thus, our analysis included the 1,469 adolescents who had vaginal or anal sex with an opposite sex partner the last time they had sex and did not desire pregnancy. The Institutional Review Board at the University of Florida approved this project.

Measures

Measures were adopted and adapted from prior surveys including National Longitudinal Study of Adolescent Health, the HIV Network for Prevention Trials Vaccine Preparedness Study, and the National Longitudinal Survey of Youth 1997 (23–27). All measures were assessed for content validity with adolescent focus groups. We assessed condom use from adolescent’s yes or no response to: “The last time you had sex, did you or your partner use a condom?”

Partner Characteristics

Adolescents were asked five questions about their most recent sexual partner’s characteristics: casual, unexpected, drinking alcohol, met in public, and age discordance. First, adolescents choose from three response options to describe their relationship type: “a person you know, but not a steady partner”; “a casual acquaintance or someone you just met”; or “a boyfriend/girlfriend, husband/wife, or steady partner”. Because few youth reported they just met partners (33 adolescent boys and 7 adolescent girls), we combined just met and not steady partners for analysis (referred to as casual partners). Second, we assessed partner expectation with a question adapted from prior measures of adolescent expectation of sex (24, 28): “The last time you had sex, did you expect to have sex with that partner?” Participants had three response options: “yes, I expected to have sex with that partner on that day”; “yes, I expected to have sex with that partner, but not on that day”; or “no, I did not expect to have sex with that partner”. Because we were primarily interested in expectation of specific partners and not planning the timing of sex, we grouped the two “yes” categories as expected partners.

Third, we calculated the age difference between the adolescent and their partner by subtracting the participant’s age (calculated by subtracting their birthdate from the date we received the completed survey) from the participants’ report of their partner’s age. Based on prior studies suggesting a difference of 2–3 years as a risk threshold for adolescents (29–31), we conservatively analyzed partner age difference as < 3 years or ≥ 3 years. We could not consider younger partners separately because only 27 youth reported partners ≥ 3 years younger. Fourth, adolescents selected one of six responses of how much their partner was

drinking in the 2 hours prior to sex: none, 1–2, 3–4, 5 or more, and “my partner was drinking, but I don’t know how much.” Because only 13% of adolescents reported their partners were drinking, for analysis, we classified partners as drinking or not.

Fifth, to assess meeting venue, adolescents answered “Where did you first meet this sexual partner?” by selecting one of nine options: (a) school, (b) work, (c) through friends or family, (d) at an organized event, (e) at a party at someone’s house, (f) at a bar or nightclub, (g) on the street, (h) Internet, or (i) write in. We created two categories based on written responses: grew up together and around my neighborhood. Similar to our prior study (10), for analysis, we assessed two broad groups of meeting venues because of small sample sizes within some categories and comparable condom use frequencies. We combined organized events (18 adolescent boys and 30 girls), work (19 adolescent boys and 29 girls), party at someone’s house (40 adolescent boys and 25 girls), bar or night club (3 adolescent boys and 4 girls), Internet (25 adolescent boys and 18 girls), around my neighborhood (9 adolescent boys and 22 girls), on the street (52 adolescent boys and 78 girls), and miscellaneous other responses (1 adolescent boy and 8 girls) to create public places. All other responses were categorized as non-public.

Partner Composite Measures

We grouped partner characteristics into two constructs: partner familiarity and partner context. We classified measures of adolescents’ perception of their relationships (casual and unexpected) as partner familiarity measures. We classified verifiable measures of the situations and sexual networks from which the partnership or sex event arose (drinking alcohol, met in public, and age discordance) as partner context measures.

To create the composite measures, we assigned adolescents a score of 1 for each partner risk characteristic (i.e., casual, unexpected, ≥ 3 years different, drinking, or met in public). Then, we summed the scores of measures within each construct. Possible scores for the partner familiarity composite ranged from 0 (steady and expected) to 2 (casual and unexpected). Scores for the partner context composite ranged from 0 (< 3 years different, not drinking, met in non-public places) to 3 (≥ 3 years different, drinking, or met in public). We combined scores of 2 and 3 into one category because only 23 adolescents had scores = 3. For ease of communication, categories are referred to as low (0 risk characteristics), intermediate (1 risk characteristic), and high (2 or more risk characteristics).

Statistical Analysis

We stratified all analyses by gender because of theory and evidence suggesting differential influence of partner characteristics by gender (16, 17). We used chi-square tests to assess differences in the frequency of reporting partner characteristics between adolescent boys and girls. To estimate the association between condom use and partner characteristics by gender, we used logistic regression accounting for the total population variance with SAS software version 9.3 (SAS Institute, Inc., Cary, NC). We did not adjust for school level clustering because we found no evidence of clustering of the sexual-risking taking behaviors among 17–18 year olds by the sampled elementary schools (Interclass correlation < 0.001). Multivariable models were adjusted for the relevant partner composite measure (either familiarity or context) and race/ethnicity. Statistical significance was determined by 95% confidence intervals for Odds Ratios that did not include the null value.

RESULTS

Study population

Most of the 1,469 adolescents reporting having sex were in high school (79%) and were between 17–18 years old (90%). Youth were primarily (80%) from low-income families eligible for free or reduced price lunch. The cohort consisted of primarily minority youth: 56% were non-Hispanic Black; 30% were Hispanic; and 14% were non-Hispanic White.

Characteristics of Most Recent Sex Partners

Adolescent Boys—Over half (60%) of adolescent boys had partners with at least one risk characteristic. Partners of adolescent boys were similarly likely to have familiarity risk characteristics (42%) as context risk characteristics (38%) (Table 1). The most common risk characteristics among adolescent boys' partners were casual (30%) or met in public (24%).

Among adolescent boys, context risk characteristics were common among partners of all familiarity risks (Figure 1). A similar percentage of boys with low (21%), intermediate (29%), and high (26%) familiarity risk partner met their partner in public. The percentage of partners drinking in the two hours before sex increased with partner familiarity risk (8% low, 19% intermediate, and 29% high).

Adolescent Girls—Half (54%) of adolescent girls' partners had at least one risk characteristic. Partners of adolescent girls were less likely to have familiarity risk characteristics (21%) than context risk characteristics (42%) (Table 1). The most common risk characteristic among adolescent girls' partners was met in public (27%).

Regardless of partner familiarity risk, at least 40% of adolescent girls' partners had at least one context risk characteristic (Figure 2). The percentage of adolescent girls who met partners in public places was similar among girls with low (27%), intermediate (25%), and high (19%) familiarity risk partner. High familiarity risk partners were two to three times more likely than intermediate or low familiarity risk partners to be drinking alcohol prior to sex (low =12%, intermediate =16%, and high = 32%) or age discordant (low =14%, intermediate =12%, and high = 32%).

Reported Condom Use by Partner Characteristics

Adolescent Boys—Nearly three-quarters (74%) of adolescent boys reported using condoms the last time they had sex. Adjusting for partner context risk and race/ethnicity, condom use was 1.7 times more likely among adolescent boys with a casual rather than a steady partner (Table 2). We found a trend toward increased condom use comparing unexpected to expected partners. Odds ratios suggest decreased condom use with context risk partners (drinking alcohol, age discordance, and met in public), but confidence intervals did not reach statistical significance.

Adolescent Girls—Two-thirds (61%) of adolescent girls reported using condoms the last time they had sex. Adjusting for partner context risk and race/ethnicity, condom use was two to three times more likely among adolescent girls with a casual rather than a steady partner or an unexpected compared to expected partner (Table 2). Adolescent girls were half as likely to report using condoms with partners who were drinking versus not drinking, age discordant versus age concordant, and met in public versus non-public places (Table 2).

Reported Condom Use by Partner Construct Composite Measures

Adolescent Boys—Condom use was reported by a greater percentage of adolescent boys with intermediate (83%) or high familiarity (75%) risk partners compared to low familiarity (69%) risk partners (Table 3). The probability of condom use decreased linearly by increasing number of partner familiarity risk characteristics ($p=0.007$).

Adolescent boys with high context risk partners were less than half as likely to use condoms compared to boys with low context risk partners (Table 3). We found a trend to decreased condom use when comparing the odds of condom use between intermediate and low context risk partners.

Adolescent Girls—Compared to adolescent girls with low familiarity risk partners, the odds of reporting condom use was two times greater among girls with intermediate familiarity risk partners and five times greater among girls with high familiarity risk partners (Table 3). We found a linear decrease in the probability of condom use by increasing number of partner familiarity risk characteristics ($p=0.0003$).

Compared to girls with low context risk partners, condom use was 70% less likely among girls with high context risk partners and 40% less likely among girls with intermediate context risk partners (Table 3). We found a significant linear trend in decreasing condom use by increasing partner context risk ($p<0.0001$).

DISCUSSION

Approximately half of adolescent boys and girls reported a sex partner with at least one of the measured risk characteristics. Partner context risk characteristics (i.e., age discordance, alcohol use, and public meeting) were common and presented barriers to condom use regardless of partner familiarity risk. Among adolescents whose partners had increased context risk, condom use was even less likely. The influence of partner context risk characteristics on condom use was more pronounced among adolescent girls than adolescent boys. Strategies to aid adolescents' selection of lower context risk partners and condom use with high context risk partners should be included in STI and HIV preventive interventions.

Our finding of relatively similar percentages of partners with risk context characteristics across familiarity risk categories is novel, but reasonable for two important reasons. First, adolescents' distinctions of partner familiarity risk are subtle (32, 33). For example, adolescents frequently describe casual or hook-up partners as friends or ex-romantic partners (33). Second, less than 10% of adolescents have sex with someone they just met, and the average time between meeting partners and having sex is one month for both dating and non-dating partners (33). Adolescents' consistent length of delay between meeting and having sex across partner types likely explains the equivalent distribution of public met partners within familiarity risk categories. Our finding of a greater percentage of adolescent girls' age discordant partnerships within intermediate and high familiarity risk categories is consistent with the increased probability of age discordant non-relationship partners found among a nationally representative sample (34).

Consistent with the vast literature among adolescents demonstrating condom use is more common with casual versus steady partners and new versus established relationships (4, 14), we found increased condom use with less familiarity risk partners. Adolescents, however, do not differentiate partners for long periods of time; By 21 days into a relationship, adolescent girls' rates of condom use with new partner were indistinguishable from rates with established partners (35). Quick transitioning of adolescent partnerships may explain the apparent contrast between both our and Woodrume et. al.'s (6) findings of reduced condom

use with drinking partners of all relationship type among high school and younger girls compared to partner drinking influencing condom use only in casual relationships among college students (36). Similarly, adolescent girls whose partners used alcohol or drugs prior to sex were more likely to have unprotected sex and test positive for an STI (5).

While some studies do not find an influence of partner age discordance and adolescent boys' condom use (8, 37), our findings are consistent with findings among African American adolescents showing lower condom use probabilities among age discordant partnerships (7, 12). At least among adolescent girls, reduced condom use with age discordant partners may be explained by increased fear of negative partner reactions to discussing condoms (12). Reduced condom use with age discordant partners at least partially accounts for increased STI diagnoses among adolescents with age discordant partners (29, 30). Our finding of fewer adolescents who meet their partner in public places using condoms is consistent with increased STI diagnoses when partners were from different schools (29).

Similar to studies assessing STI diagnoses (30, 38), we found the greatest differentiation of condom use when considering multiple partner characteristics simultaneously. The improved predictability and the reality that an individual partner's risk is reflected by their spectrum of traits suggest future research should continue to identify combinations of partner characteristics associated with condom use and STI-risk. Based on the theory of gender and power (16), partnership disparities in socio-economic status or access to economic resources may be important predictors of condom use. Moreover, preventive interventions should focus on the conglomeration of a partner's characteristics rather than focusing on any one characteristic.

Consistent with the theory of gender and power, characteristics of male partners were more predictive of condom use than characteristics of female partners (16). The influence of adolescent boy's partners on condom use and STI diagnoses is less clear. Prior findings of partner context risk among adolescent boys are limited to assessing age discordance and present conflicting results (8, 39). Our findings of trends towards decreased condom use with risky context partners suggest further study of the influence of adolescent boys' partners may be useful for STI and HIV prevention.

This study had four important limitations. First, we were unable to evaluate whether adolescents varied condom use between partners because our data was for the most recent sexual event. It is possible that the associations between condom use and partner characteristics are explained by risky adolescents choosing risky partners and not to use condoms. Second, partner characteristics may not be accurate because we collected the adolescent's perception of their partner's characteristics (40). Third, due to the limited number of reported older partners for men (n=21) and younger partners for both men (n=22) and women (n=5), we were not able to assess older and younger partners separately. Fourth, adolescents' interpretation of partner familiarity likely includes features that were not measured in this study such as relationship length, attachment, and trust.

This study had two important strengths. First, partner and condom use measures were solicited for the adolescent's most recent sex act, and thus, have important advantages as event-level measures: (a) recall bias is reduced because the sexual event likely occurred in the recent past, and (b) the temporal sequence of events is established because partner characteristics and condom use were reported for the same sexual experience. Second, we considered the influence of multiple partner context characteristics simultaneously; thereby, incorporating the complex reality that individual partners have several characteristics.

Adolescent girls, and possibly adolescent boys, face barriers to using condoms when partners are age discordant, drinking, or met in public. Barriers are especially important with

partners who have more than one context risk. Potentially, reduced condom use with risky context partners is explained by adolescent girls' expectation of partner's negative reception of condom use (12). Further research should investigate reasons adolescent girls are less likely to use condoms with risky context partners. In the meantime, STI and HIV preventive interventions should inform adolescent girls of potentially increased barriers to condom use with risky context partners and include strategies to avoid risky partners and negotiate condom use.

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Figure 1.
Adolescent boys with all levels of partner familiarity risk had risky context partners

Figure 2.
Adolescent girls with all levels of partner familiarity risk had risky context partners

Table 1

Percent of adolescent boys and girls reporting risky characteristics for their most recent sex partners

	Adolescent Boys n = 662	Adolescent Girls n = 807	Chi-square test P-value
Partner characteristics			
Casual	30%	11%	<0.0001
Unexpected	20%	14%	<0.01
Drinking alcohol	13%	14%	0.87
Age discordant	9%	14%	0.01
Met in public	24%	27%	0.23
Partner construct composites			
Partner familiarity risk			
Low	58%	79%	<0.0001
Intermediate	34%	18%	
High	8%	3%	
Partner context risk			
Low	62%	58%	0.10
Intermediate	30%	30%	
High	8%	12%	

n = the number of adolescents responding

% = percent of adolescents reporting each partner characteristic

Table 2

Odds of Reporting Condom use by Partner Characteristics

	In those with characteristic	In those without characteristic	With to Without Adjusted Odds Ratio ^a
Adolescent boys			
Casual	80%	72%	1.7 (1.0, 2.8) *
Unexpected	81%	73%	1.4 (0.8, 2.4)
Drinking alcohol	69%	75%	0.6 (0.4, 1.1)
Age discordant	72%	75%	0.9 (0.4, 2.1)
Met in public	71%	76%	0.7 (0.4, 1.0)
Adolescent girls			
Casual	70%	59%	1.9 (1.0, 3.5)
Unexpected	77%	58%	2.9 (1.6, 5.4) *
Drinking alcohol	50%	62%	0.6 (0.4, 0.9) *
Age discordant	45%	64%	0.5 (0.3, 0.8) *
Met in public	52%	64%	0.6 (0.4, 0.8) *

% = percent of adolescents using condoms for the given partner characteristic

* statistically significant at $p = 0.05$

^a Adjusted for race/ethnicity, free/reduced price lunch, and relevant partner construct composite (i.e., casual and unexpected partner are adjusted for partner context risk and drinking alcohol, age discordant, and met in public are adjusted for partner familiarity risk). The measure of free/reduced price lunch was not collected during the 12th grade wave. Thus, we used the data from the participant's most recent wave.

Table 3

Odds of Reporting Condom use by Partner Construct Composite Measures

	Low	Intermediate	High	Intermediate to Low Adjusted Odds Ratio ^a	High to Low Adjusted Odds Ratio ^a
Adolescent Boys					
Partner familiarity risk	69%	83%	75%	3.0 (1.7, 5.3) *	1.2 (0.6, 2.4)
Partner context risk	77%	74%	63%	0.7 (0.4, 1.2)	0.4 (0.2, 0.9) *
Adolescent Girls					
Partner familiarity risk	58%	70%	84%	1.9 (1.2, 3.2) *	5.4 (1.3, 22.0) *
Partner context risk	67%	55%	43%	0.6 (0.4, 0.9) *	0.3 (0.2, 0.6) *

% = percent of adolescents reporting condom use for the given partner composite risk

* statistically significant at p 0.05

^aAdjusted for race/ethnicity, free/reduced price lunch, and relevant partner construct composite (i.e., partner familiarity risk is adjusted for partner context risk and partner context risk is adjusted for partner familiarity risk). The measure of free/reduced price lunch was not collected during the 12th grade wave. Thus, we used the data from the participant's most recent wave.