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## RESEARCH ARTICLE

### Risk Factors for Intimate Partner Violence and Relationships to Sexual Risk-Related Behaviors Among College Students

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#### Abstract:

#### Background:

Intimate Partner Violence (IPV) is a major public health concern, often initially experienced in young adulthood; IPV has been associated with adverse sexual health and sexual risk outcomes.

#### Objective:

This study examined 1) correlates of experiencing Intimate Partner Violence (IPV) and 2) IPV in relation to sexual risk-related behaviors among college students.

#### Methods:

We analyzed 2016 cross-sectional survey data regarding sociodemographics, past IPV experiences, and sexual risk-related behaviors (sex after drug/alcohol use, condomless sex) among male and female students aged 18-25 from seven Georgia colleges/universities, respectively.

#### Results:

IPV victimization was associated with being Black, greater depressive symptoms, and substance use. Multivariable regression, including sociodemographic covariates, indicated that alcohol/drug use before the last sex was associated with sexual and physical aggression victimization among men (Nagelkerke R-squared=.155), but with fewer negotiation experiences and more injury experiences among women (Nagelkerke R-squared=.107). Condom less sex at last intercourse was associated with psychological aggression experiences among women (Nagelkerke R-squared=.125), but with no IPV factor among men (Nagelkerke R-squared=.188).

#### Conclusion:

The distinct relationships between IPV and sexual risk among men and women underscore the need for targeted prevention interventions.

**Keywords:** Young adults, Sexual health, Intimate partner violence, College students, Sexual risk, Psychological aggression, Sexual risk, Psychological aggression.

#### Article History

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## 1. INTRODUCTION

Intimate Partner Violence (IPV) is a major public health concern, as a large number of individuals in the US experience IPV [1]. While definitions of IPV vary to some degree across the literature, the Centers for Disease Control and Prevention

(CDC) defines IPV as physical violence, sexual violence, stalking, and psychological aggression by a current or past intimate partner [1]. The literature categorizes IPV as physical, sexual, or psychological in nature and suggests that these types tend to co-occur [2, 3]. The abuse can be categorized as unidirectional (*i.e.*, one partner perpetrating) or bi-directional (*i.e.*, both partners perpetrating) [1].

IPV victimization is a public health problem that incurs risk for numerous negative physical and mental health outcomes [1, 4]. IPV victimization has both short-term

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negative health repercussions (e.g., headaches, insomnia, injury), as well as long-term consequences, including physical outcomes (e.g., chronic pain) and mental health outcomes (e.g., depression, suicide, substance use) [1, 2, 5 - 7]. Particularly relevant to this study, IPV victimization may lead to sexual risk-related behaviors, thus incurring risk for sexually transmitted diseases and unintended pregnancies [8 - 10].

Certain subgroups are at particular risk for IPV victimization. Among US adults, ~35% of women and ~29% of men have been victims of IPV in their lifetime [1]. There is also evidence of disparities, with evidence of higher rates of IPV victimization among racial/ethnic minorities [11 - 13], particularly Blacks [14], as well as among sexual minorities [15, 16]. Young adulthood is a critical period for experiencing IPV victimization; a recent review of the literature among young adults (18-25) indicated estimates as high as 37% of women and 22% of men [17]. Notably, ~47% of female and ~44% of male IPV victims report their first occurrence of IPV as young adults [18]. Some existing data suggests that college-attending young adults are at an increased risk for IPV compared to their non-college-attending counterparts [19, 20], with other literature indicating no difference [21]. Thus, research to better understand risk factors for IPV in this population is warranted.

A vast number of different theories have been applied to predictors and outcomes of IPV, such as Social Learning Theory, Intergenerational Transmission of Violence, Theory of Gender and Power, and others, accounting for various psychosocial risk factors (that may also play a role in disparities across sexes, races/ethnicities, and sexual minorities) [22 - 24]. Adverse Childhood Events (ACEs) are risk factors for both experiencing and perpetrating IPV [25 - 29]; this is particularly noteworthy given that ACEs include parental displays of violence toward one another or children, which could influence behavior *via* role modeling or acceptance of violence [29]. In addition, mental illness, including experiencing depressive symptoms, is associated with experiencing IPV [30, 31], with some research indicating that IPV victimization leads to depressive symptoms and other research indicating that depressive symptoms lead to IPV victimization [32, 33]. Alcohol use is a well-established behavioral risk factor for both experiencing and perpetrating IPV [12, 34, 35]; the evidence is emerging for marijuana and cocaine use in relation to IPV perpetration [2, 36].

The literature regarding IPV in young adults and college students indicates that the risk factors identified in the broader population largely apply to this subpopulation [17]. For example, psychosocial risk factors include ACEs [37, 38], witnessing interparental partner violence [17, 39], depression, suicide attempts [40], and other dimensions of psychosocial functioning [17, 41], as well as substance use [41], including cigarette smoking [40] and alcohol use/abuse [17, 42]. Also noteworthy, IPV is also associated with a greater number of sex partners [43] and relationship dissatisfaction [17].

Relatedly, the Theory of Gender and Power provides a framework for understanding how IPV can impact sexual behaviors, particularly among vulnerable populations [44, 45]. This theory has been applied to condom use, suggesting that

men may leverage their derived power in relationships to coerce women to engage in sex without condoms [23]. Indeed, research has documented an association between prior experience of psychological IPV and less consistent condom use [46], perhaps related to ineffective condom negotiation [46 - 48]. Moreover, the vast literature also indicates that many of the same risk factors for IPV victimization may also represent a risk for substance use, which may lead to sexual-risk related behaviors (e.g., sexual aggression) [42, 49 - 51].

Given that the young adulthood period is a critical period for IPV victimization and several other developmental risks (mental health, substance use, sexual risk), this study aims to expand the literature regarding risk factors for IPV victimization among young adults and the role of IPV victimization for sexual-risk related behaviors. Specifically, we examined sociodemographic factors, psychosocial risk factors (*i.e.*, ACEs, depressive symptoms), and substance use (*i.e.*, use of tobacco, alcohol, and marijuana) in relation to IPV victimization among racially/ethnically diverse male and female college students in the state of Georgia (USA). A number of IPV victimization factors (*i.e.*, physical assault, injury, psychological aggression, sexual aggression) were included in analyses; we also included relationship negotiation, a protective factor. Additionally, we examined IPV victimization as a correlate of sexual risk-related behaviors (*i.e.*, use of alcohol or drugs prior to intercourse, condom use), controlling for sociodemographic factors and substance use. We delineated confirmatory hypotheses supported by the existing literature and exploratory hypotheses with less conclusive findings in the existing literature. Confirmatory hypotheses were that being younger, being a racial/ethnic minority, more ACEs and depressive symptoms, and substance use would be correlated with more experiences of IPV; exploratory hypotheses were that more experiences of IPV would be associated with greater likelihood of reporting use of alcohol or drugs before last sexual episode and of reporting condomless sex.

## 2. METHODS

### 2.1. Procedures & Participants

The current study is a secondary analysis of data from Project DECOY: Documenting Experiences with Cigarettes and other Tobacco in Young Adults; the parent study examined psychosocial correlates of tobacco use trends among young adults attending college/universities in Georgia [52 - 57]. The parent study and the current analyses were approved by the Emory University Institutional Review Board (IRB00069042) as well as those of ICF and the participating colleges and universities. Informed consent was obtained from all participants in the research.

The study collected data with a cohort of 3,418 racially and ethnically diverse young adults in Georgia attending one of seven colleges or universities (*i.e.*, two public universities, two private colleges/universities, two community/technical colleges, one historically Black college/university [HBCU]). Inclusion criteria included being within the age range of 18 to 25 and able to read English. The sample size was based on power calculations to determine effect sizes relevant to the

parent study focused on tobacco use outcomes.

In Fall, 2014, college email addresses were obtained from the registrar's office from each college or university for students meeting eligibility criteria (*i.e.*, age 18 to 25-year old, ability to read English). Three thousand 18 to 25-year old were selected randomly from one private and 2 public universities. The remainder of the schools had 18 to 25-year-old student populations of less than 3000; thus, the entire student population of that age range at those schools was included in recruitment. Response rates varied, with a total response rate of 22.9% ( $n = 3574/15,607$ ). Seven days after initial recruitment and completion of the baseline survey, we asked participants to confirm their participation by clicking a "confirm" button included in an email sent to them. The confirmation rate was 95.6% ( $N = 3418/3574$ ). Compensation for participation was increased at every other survey wave to retain participants (*i.e.*, \$30 for the first two assessments, \$40 for the third and fourth, \$50 for the fifth and sixth). The baseline sample was largely representative of each school's demographic profile, although respondents were disproportionately female. This study analyzed data collected at Wave 5 (Spring 2016), which included data from 2,689 participants (78.7% of the baseline sample).

## 2.2. Measures

Current analyses focus on the primary outcomes of sexual risk-related behaviors (*i.e.*, use of alcohol or drugs prior to intercourse, condom use), the primary correlate of interest – experiences of IPV victimization, and covariates including sociodemographic variables, psychosocial factors (*i.e.*, ACEs, depressive symptoms), and substance use (*i.e.*, use of tobacco, alcohol, and marijuana).

### 2.2.1. Primary Outcomes

*Sexual risk-related behaviors.* Substance use at the time of last sexual encounter was assessed by asking, "Did you drink alcohol or use drugs before you had sexual intercourse the last time?" Responses to this question included: I have never had sexual intercourse, yes, no, or refuse. Condom use during most recent intercourse was assessed by asking, "The last time you had sexual intercourse, did you or your partner use a condom?" Responses to this question also included: I have never had sexual intercourse, yes, no, or refuse. Analyses of these outcomes were restricted to participants who reported being sexually active and did not provide "refuse" as their response.

### 2.2.2. Primary Correlates of Interest

*Intimate partner violence.* Experiences of IPV victimization were assessed using the revised Conflict Tactics Scale (CTS2) [58]. Participants were asked to indicate the number of times they experienced their partners engaging in various behaviors toward them in the past year. Two items assessed each of the factors, including the protective factor of negotiation (*e.g.*, "partner explained his/her side or suggested a compromise...") and the four IPV victimization dimensions, specifically physical assault (*e.g.*, "partner pushed, shoved, or slapped me"), injury (*e.g.*, "I had a sprain bruise or small cut, or felt pain the next day because of a fight with my partner"),

psychological aggression (*e.g.*, "partner insulted, swore, shouted or yelled..."), and sexual aggression (*e.g.*, "partner insisted on sex when I did not want to or insisted on sex without a condom..."). Response options for the questions included: 0=this has never happened, 1=not in the past year, but it did happen before, 2=once, 3=twice, 4=3-5 times, 5=6-10 times, 7=11-20 times, 8=more than 20 times, refuse, and not in a relationship. Note that participants who reported either "refuse" or "not in a relationship" were excluded from analyses. Cronbach's alphas for each subscale in the current study were: negotiation .73; physical assault .91; injury .91; psychological aggression .66; and sexual aggression .70.

### 2.2.3. Covariates

*Sociodemographic variables.* For current analyses, we included the following factors assessed at baseline: age, sex (*i.e.*, male, female, other), sexual orientation (*i.e.*, heterosexual, bisexual/lesbian/gay, homosexual, other), race, ethnicity, and parental education. The latter was assessed by asking participants to indicate the highest level of education earned by either parent, which was dichotomized as less than bachelor's degree versus bachelor's degree or higher based on the distribution of the data and associations with outcomes. The race was categorized as White, Black, Asian, and other due to small cell sizes in some racial categories. At each wave, we assessed relationship status and included this information from Wave 5. In multivariable analyses, the relationship status variable was recoded to married, living with a partner, or in a committed relationship versus other responses.

*Psychosocial factors.* To assess *adverse childhood events (ACEs)*, participants were asked 10 items from the CDC-developed assessment from the Behavioral Risk Surveillance Survey [59], administered at Wave 2. These items assessed experiences before the age of 18 that were stressful or traumatic (*e.g.*, physical and sexual violence, parental mental health, parental substance use, childhood maltreatment). *Depressive symptoms* were assessed at Wave 5 using the Patient Health Questionnaire – 9 (PHQ-9 scale) [60], in which participants are asked how often in the past two weeks they experienced symptoms such as "little interest or pleasure in doing things" or "feeling bad about yourself or that you are a failure..." using a four-point Likert scale of 0=not at all to 3=nearly every day (range 0 to 27). Cronbach's alpha was 0.87.

*Substance use.* At Wave 5, participants were asked how many of the last 30 days they used tobacco, alcohol, and marijuana (coded as current users vs. not current users) [61].

## 2.3. Data Analysis

Of the 2,689 Wave 5 participants, 1,496 (55.6%) reported being in a relationship ( $n = 514$  men;  $n = 982$  women) and thus were able to provide data on the IPV factors assessed. Of these, 764 were also sexually active ( $n = 210$  men;  $n = 554$  women). Thus, analyses of IPV factors as outcomes focused on the 1,496 in relationships; analyses of sexual risk-related behaviors focused on the 764 who were both in relationships and sexually active. These sample sizes allow sufficient power for examining the outcomes of IPV and sexual risk-related behaviors.

Analyses were completed using SPSS version 25 [62]. Before conducting further analyses, descriptive analyses were conducted to characterize the sample and determine the distribution of the data (e.g., any outliers). No exclusions of data were made based on these results. Next, bivariate analyses were conducted among men and women, respectively, to examine: 1) correlates of IPV subscale scores, including sociodemographics, psychosocial factors, and substance use (using Pearson r correlation for continuous correlates and ANOVAs for categorical correlates); and 2) correlates of sexual risk-related behavioral outcomes (i.e., alcohol/drug use before last intercourse, condomless sex at last encounter), including sociodemographics, psychosocial factors, substance use, and IPV subscale scores (using ANOVAs for continuous correlates and Chi-Squared tests for categorical correlates).

Then, multivariable regression analyses were conducted to

examine correlates of the two outcomes among men and women, respectively. The primary correlates of interest – the IPV subscale scores – were entered first into each model. Age, sexual orientation, relationship status, race, ethnicity, parental education, and substance use were also entered into each model. We explored all models, both including and excluding the covariates. ACEs and depressive symptoms were not significantly associated with the outcomes, so in order to maximize power in subsequent analyses, the measures of ACEs and depressive symptoms were excluded from further analyses. Given high collinearity among IPV subscales (see correlations in Table 1 for men and Table 2 for women), we also modeled each IPV subscale separately, controlling for all other factors. Finally, we examined IPV subscale scores and their interactions with sex and with sexual orientation as correlates in the multivariable models. None of these interactions contributed significantly to the models.

**Table 1. Bivariate analyses examining participant characteristics associated with IPV factors in Men, N=514.**

Variable	Total	Negotiation		Physical Assault		Injury		Psych Aggression		Sexual Aggression	
	N (%) or *M (SD)	M (SD) or *r	p	M (SD) or *r	p	M (SD) or *r	p	M (SD) or *r	p	M (SD) or *r	p
<i>Sociodemographics</i>											
Age *	20.78 (2.02)	0.12	.005	0.01	.791	0.03	.518	0.10	.022	-0.38	.399
Heterosexual	481 (94.1)	9.44 (3.78)	.198	0.99 (2.46)	.080	0.73 (2.22)	.238	2.35 (2.85)	.593	0.71 (2.12)	.336
Other	30 (5.9)	8.53 (3.42)	-	1.81 (3.26)	-	1.23 (2.85)	-	2.63 (2.77)	-	1.10 (2.48)	-
Relationship Status	-	-	<.001	-	.764	-	.477	-	.037	-	.279
Single/never married	319 (62.1)	8.76 (3.95)	-	1.10 (2.61)	-	0.86 (2.36)	-	2.03 (2.70)	-	0.87 (2.27)	-
Married	51 (9.9)	10.78 (3.09)	-	1.04 (2.84)	-	0.71 (2.30)	-	3.12 (3.34)	-	0.69 (2.32)	-
Living with partner	91 (17.7)	10.70 (3.29)	-	0.98 (2.31)	-	0.65 (2.22)	-	2.00 (2.85)	-	0.49 (1.73)	-
Other	53 (10.3)	9.64 (3.07)	-	0.69 (1.82)	-	0.35 (1.44)	-	2.73 (2.92)	-	0.37 (1.62)	-
Sexually Active	210 (41.6)	9.86 (3.55)	.031	0.87 (2.19)	.286	0.64 (2.02)	.516	2.65 (2.77)	.065	0.70 (2.03)	.813
No	295 (58.4)	9.13 (3.89)	-	1.12 (2.72)	-	0.77 (2.30)	-	2.17 (2.86)	-	0.74 (2.19)	-
Race	-	-	.023	-	.006	-	<.001	-	.009	-	.005
White	387 (75.3)	9.50 (3.84)	-	0.91 (2.40)	-	0.61 (2.02)	-	2.16 (2.75)	-	0.62 (1.99)	-
Black	46 (9.1)	9.15 (3.57)	-	2.28 (3.47)	-	1.96 (3.34)	-	3.33 (3.11)	-	1.76 (3.23)	-
Asian	42 (8.3)	7.95 (3.50)	-	1.11 (2.45)	-	1.34 (3.07)	-	2.54 (3.10)	-	0.97 (2.16)	-
Other	31 (6.1)	10.55 (3.08)	-	0.83 (1.18)	-	0.24 (1.30)	-	3.43 (2.85)	-	0.48 (1.66)	-
Hispanic	33 (6.5)	8.42 (4.07)	.131	0.91 (1.94)	.768	0.52 (1.52)	.535	2.63 (2.35)	.621	0.58 (1.65)	.673
No	478 (93.5)	9.45 (3.75)	-	1.04 (2.56)	-	0.78 (2.30)	-	2.37 (2.88)	-	0.75 (2.17)	-
Parental Education < BA	169 (33.1)	9.14 (3.62)	.281	0.92 (2.29)	.469	0.76 (2.15)	.988	2.58 (2.87)	.278	0.73 (2.20)	.980
≥ BA	341 (66.9)	9.52 (3.85)	-	1.09 (2.63)	-	0.75 (2.32)	-	2.28 (2.83)	-	0.73 (2.14)	-
<i>Psychosocial Factors</i>											
ACEs *	0.98 (1.58)	0.12	.007	0.08	.093	0.03	.578	0.17	<.001	0.08	.105
Depressive Symptoms *	4.31 (5.07)	0.04	.406	0.19	<.001	0.18	<.001	0.22	<.001	0.17	<.001
<i>Substance Use</i>											
Tobacco	115 (22.4)	9.56 (3.83)	.579	1.50 (2.93)	.025	1.26 (2.95)	.007	3.35 (3.28)	<.001	1.13 (2.45)	.024
No	399 (77.6)	9.34 (3.83)	-	0.90 (2.37)	-	0.61 (1.89)	-	2.10 (2.65)	-	0.62 (2.02)	-
Alcohol	379 (73.7)	9.49 (3.67)	.352	1.03 (2.55)	.994	0.70 (2.16)	.342	2.39 (2.90)	.909	0.62 (1.90)	.046
No	135 (26.3)	9.13 (4.04)	-	1.03 (2.42)	-	0.92 (2.52)	-	2.35 (2.68)	-	1.05 (2.67)	-
Marijuana	60 (12.0)	9.55 (3.74)	.795	0.81 (1.89)	.551	0.41 (2.30)	.259	2.50 (2.49)	.690	0.40 (1.14)	.243
No	439 (88.0)	9.41 (3.79)	-	1.02 (2.53)	-	0.76 (2.29)	-	2.34 (2.90)	-	0.74 (2.20)	-
<i>IPV Factors</i>											
Negotiation *	9.39 (3.77)	--	--	-0.04	.425	-0.09	.042	0.19	<.001	-0.82	.065
Physical Assault *	1.03 (2.52)	--	--	--	--	0.80	<.001	0.67	<.001	0.76	<.001
Injury *	0.75 (2.25)	--	--	--	--	--	--	0.59	<.001	0.83	<.001

(Table 1) contd....

-	Total	Negotiation		Physical Assault		Injury		Psych Aggression		Sexual Aggression	
Variable	N (%) or *M (SD)	M (SD) or *r	p	M (SD) or *r	p	M (SD) or *r	p	M (SD) or *r	p	M (SD) or *r	p
Psychological Aggression *	2.37 (2.84)	--	--	--	--	--	--	--	--	0.54	<.001
Sexual Aggression *	0.74 (2.14)	--	--	--	--	--	--	--	--	--	--

Table 2. Bivariate analyses examining participant characteristics associated with IPV factors in women, N=982.

-	Total	Negotiation		Physical Assault		Injury		Psych Aggression		Sexual Aggression	
Variable	N (%) or *M (SD)	M (SD) or *r	p	M (SD) or *r	p	M (SD) or *r	p	M (SD) or *r	p	M (SD) or *r	p
<i>Sociodemographics</i>											
Age *	20.70 (1.96)	0.00	.959	-0.03	.365	-0.01	.711	-0.02	.615	-0.08	.015
Heterosexual	884 (90.9)	9.73 (3.62)	.338	0.68 (2.12)	.044	0.59 (1.98)	.088	2.12 (2.79)	<.001	0.82 (2.18)	.318
Other	89 (9.1)	10.11 (3.48)	-	1.67 (2.74)	-	0.98 (2.78)	-	3.36 (3.68)	-	1.07 (2.54)	-
Relationship Status	-	-	<.001	-	.551	-	.657	-	.700	-	.241
Single/never married	594 (60.5)	9.30 (3.70)	-	0.79 (2.28)	-	0.66 (2.11)	-	2.29 (3.07)	-	0.93 (2.21)	-
Married	124 (12.6)	10.52 (3.56)	-	0.59 (1.91)	-	0.41 (1.62)	-	2.21 (2.56)	-	0.49 (1.73)	-
Living with partner	177 (18.0)	10.49 (3.19)	-	0.69 (2.04)	-	0.61 (2.06)	-	2.23 (2.75)	-	0.78 (2.23)	-
Other	87 (8.9)	10.34 (3.22)	-	0.49 (2.12)	-	0.70 (2.31)	-	1.90 (2.60)	-	0.89 (2.69)	-
Sexually Active	554 (58.2)	9.88 (3.44)	.448	0.61 (1.95)	.192	0.67 (2.19)	.336	2.53 (2.98)	<.001	0.92 (2.34)	.126
No	398 (41.8)	9.70 (3.74)	-	0.80 (2.37)	-	0.54 (1.85)	-	1.79 (2.66)	-	0.70 (1.94)	-
Race	-	-	.001	-	<.001	-	<.001	-	<.001	-	<.001
White	628 (65.0)	10.11 (3.40)	-	0.47 (1.81)	-	0.43 (1.74)	-	1.95 (2.68)	-	0.60 (1.76)	-
Black	248 (25.7)	9.01 (3.87)	-	1.38 (2.99)	-	1.19 (2.84)	-	3.09 (3.38)	-	1.48 (3.03)	-
Asian	37 (3.8)	10.05 (3.84)	-	0.54 (1.56)	-	0.32 (1.06)	-	1.43 (2.48)	-	0.57 (1.77)	-
Other	53 (5.5)	9.08 (3.70)	-	0.83 (1.85)	-	0.61 (1.65)	-	2.31 (2.85)	-	1.08 (2.46)	-
Hispanic	208 (17.7)	9.07 (3.74)	.061	0.86 (2.15)	.464	0.60 (1.46)	.978	2.39 (2.77)	.601	0.95 (2.30)	.599
No	890 (91.3)	9.83 (3.57)	-	0.68 (2.10)	-	0.61 (2.07)	-	2.21 (2.90)	-	0.82 (2.19)	-
Parental Ed < BA	525 (54.2)	9.50 (3.65)	.014	0.92 (2.50)	.002	0.77 (2.31)	.011	2.42 (3.07)	.031	0.98 (2.45)	.030
≥ BA	444 (45.8)	10.07 (3.54)	-	0.48 (1.67)	-	0.43 (1.69)	-	2.01 (2.68)	-	0.67 (1.85)	-
<i>Psychosocial Factors</i>											
ACEs *	1.61 (1.90)	-0.45	.180	0.13	<.001	0.12	<.001	0.16	<.001	0.16	.001
Depressive Symptoms *	5.50 (5.55)	0.78	.015	0.19	<.001	0.21	<.001	0.26	<.001	0.24	<.001
<i>Substance Use</i>											
Tobacco	148 (15.1)	9.47 (3.41)	.293	1.67 (3.43)	<.001	1.36 (2.95)	<.001	3.54 (3.48)	<.001	1.45 (3.00)	<.001
No	834 (84.9)	9.81 (3.63)	-	0.55 (1.83)	-	0.49 (1.84)	-	2.00 (2.73)	-	0.73 (2.02)	-
Alcohol	660 (67.2)	10.04 (3.39)	<.001	0.63 (1.96)	.061	0.55 (1.94)	.130	2.20 (2.73)	.621	0.80 (2.11)	.442
No	322 (32.8)	9.18 (3.94)	-	0.91 (2.57)	-	0.77 (2.30)	-	2.30 (3.24)	-	0.92 (2.39)	-
Marijuana	133 (14.0)	9.56 (3.41)	.425	1.19 (2.66)	.002	1.02 (2.40)	.005	3.17 (3.15)	<.001	1.28 (2.65)	.004
No	815 (86.0)	9.83 (3.64)	-	0.58 (1.95)	-	0.50 (1.87)	-	2.02 (2.78)	-	0.71 (2.02)	-
<i>IPV Factors</i>											
Negotiation *	9.76 (3.60)	--	--	-0.31	.328	-0.40	.210	0.92	.004	-0.38	.238
Physical Assault *	0.72 (2.19)	--	--	--	--	0.91	<.001	0.67	<.001	0.74	<.001
Injury *	0.61 (2.03)	--	--	--	--	--	--	0.61	<.001	0.76	<.001
Psychological Aggression *	2.24 (2.91)	--	--	--	--	--	--	--	--	0.54	<.001
Sexual Aggression *	0.82 (2.17)	--	--	--	--	--	--	--	--	--	--

3. RESULTS

3.1. Participant Characteristics

Tables 1 and 2 provide descriptive statistics characterizing our sample of men and women, respectively. The majority of participants reported high negotiation (59.8% with scores ≥10 out of 14) and no experience of physical assault (83.3%; 80.3%

in men, 84.8% in women), injury (86.9%; 86.1% in men, 87.2% in women), or sexual aggression (82.9%; 86.2% in men, 81.2% in women; not shown in tables). However, 52.7% (57.7% in men, 54.3% in women; 55.1% in men, 51.5% in women) reported at least one experience of psychological aggression (with 25.8% reporting ≥5). Also note that, among both men and women, all IPV subscales were significantly correlated with each other in the expected directions, with the

exceptions of negotiation and physical assault and of negotiation and sexual aggression.

### 3.2. Bivariate Analyses Examining Correlates of IPV Factors

Table 1 provides bivariate results among *men*, indicating that significant correlates ( $p < .05$ ) of higher scores on *negotiation* were being older, married, sexually active, and White, as well as higher ACE scores. Higher scores on *physical assault* were associated with being Black and higher levels of depressive symptoms. Higher scores on *injury* were associated with being Black, higher levels of depressive symptoms, and past 30-day tobacco use. Higher scores on *psychological aggression* were associated with being older, being Black, greater ACEs and depressive symptoms, and past 30-day tobacco use. Higher scores on *sexual aggression* were associated with being Black, higher levels of depressive symptoms, and past 30-day tobacco use.

Table 2 provides bivariate results among *men*, indicating that correlates ( $p < .05$ ) of higher scores on *negotiation* were being married, being White, higher parental education, higher depressive symptoms, and past 30-day alcohol use. Higher scores on *physical assault* were associated with being Black, lower parental education, higher ACE score, higher levels depressive symptoms, and past 30-day tobacco and marijuana use. Higher scores on *injury* were associated with being Black, lower parental education, greater ACEs and depressive symptoms, and past 30-day tobacco and marijuana use. Higher scores on *psychological aggression* were associated with being a sexual minority, being Black, lower parental education, greater ACEs and depressive symptoms, and past 30-day tobacco and marijuana use. Higher scores on *sexual aggression* were associated with being younger, being sexually active, Black, lower parental education, greater ACEs and depressive symptoms, and past 30-day tobacco and marijuana use.

### 3.3. Alcohol or Drug Use Before Last Sexual Encounter

Multivariable regression analysis (Table 3) indicated that alcohol or drug use before last sex among *men* was associated with higher scores on sexual aggression ( $p = .038$ ), as well as past 30-day use of alcohol ( $p = .020$ ; Nagelkerke R-squared = .155). Bivariate analyses (not shown in tables) found that other correlates included higher IPV subscales scores for physical assault ( $p = .013$ ), not being in a relationship ( $p = .010$ ), higher parental education ( $p = .002$ ), and past 30-day use of tobacco and marijuana ( $p < .001$ ). In the models entering each IPV subscale individually, controlling for all other factors (not shown in tables), only physical assault (OR = 1.13, CI: 1.03, 1.24,  $p = .011$ , Nagelkerke R-squared = .128) and sexual aggression (OR = 1.16, CI: 1.04, 1.30,  $p = .007$ , Nagelkerke R-squared = .131) significantly contributed to these models.

Multivariable analyses (Table 3) indicated that correlates of alcohol or drug use before last sexual encounter among *women* included lower negotiation scores ( $p = .002$ ), as well as being Black ( $p = .006$ ), alcohol use ( $p < .001$ ), and marijuana use ( $p = .005$ ; Nagelkerke R-squared = .188). Bivariate analyses (not shown in tables) found that other correlates included higher subscale scores for physical assault ( $p = 0.011$ ), injury

( $p = 0.001$ ), psychological aggression ( $p = 0.005$ ), and sexual aggression ( $p < .001$ ), as well as being single or never married ( $p < .001$ ), higher levels of depressive symptoms ( $p < .001$ ), and past 30-day use of tobacco ( $p < .001$ ). In models entering each of the IPV subscales individually (not shown in tables), only negotiation (OR = 0.91, CI: 0.86, 0.97,  $p = 0.006$ , Nagelkerke R-squared = 0.179) and injury (OR = 1.09, CI: 1.01, 1.19,  $p = .048$ , Nagelkerke R-squared = 0.161) significantly contributed to these models.

### 3.4. Condom Use During Last Sexual Encounter

Multivariable regression analyses (Table 3) indicated that correlates of not using condoms during the last sexual encounter among *men* included being older ( $p = 0.002$ ; Nagelkerke R-squared = 0.107); bivariate analyses also indicated that being married ( $p < .001$ ) was correlated (not shown in tables). In the models entering each of the subscales individually (not shown in tables), no individual factor contributed to these models.

Multivariable regression analysis (Table 3) indicated that correlates of not using condoms during the last sexual encounter among *women* included more experiences of psychological aggression ( $p = 0.021$ ), as well as being older ( $p = 0.015$ ), being a sexual minority ( $p = .005$ ), and being in a relationship (Nagelkerke R-squared = 0.125). Bivariate analyses (not shown in tables) indicated that race ( $p = 0.040$ ), lower parental education ( $p = 0.040$ ), and higher ACE scores ( $p = 0.007$ ) were also correlates. In the models entering each of the IPV subscales individually (not shown in tables), no individual factor contributed to these models.

## 4. DISCUSSION

This study was guided by the Theory of Gender and Power [22, 23] and examined correlates of IPV victimization and such victimization in relation to sexual risk-related behaviors among college students in Georgia. Within this racially/ethnically diverse sample, results supported our initial assumption that men and women would show different risk profiles, both for IPV victimization and for sexual risk-related behaviors. Moreover, the types of IPV victimization were uniquely associated with different sexual risk-related behaviors. More experiences of sexual and physical aggression victimization among men and lower negotiation scores and more injury experiences among women were associated with alcohol or drug use before the last sex. Broadly, these findings may reflect the fact that, in young adult relationships, substance use is often reciprocal [63, 64] and may put partners at risk both for aggression and sexual risk-related behaviors [42, 49, 65, 66]. Additionally, while no IPV factor predicted condomless sex among men, condomless sex among women was associated with more experiences of psychological aggression, which may reflect insufficient skills to confidently negotiate condom use in this context [42, 46, 47, 49, 65, 66]. Findings that older age, being in a relationship, and female sexual minority status correlated with less likelihood of using condoms might reflect more stable or monogamous relationships and/or sexual relationships that may not require condom use.

Unfortunately, results underscore the need to address

disparities in IPV victimization among young adults, given that, for both men and women, being Black was associated with more experiences of all types of IPV, aligning with some prior research [12, 14, 67], with Black women also being more likely to use alcohol or drug use before last sex, highlighting the particular risks among Black women.

Findings also highlight the role of depressive symptoms in IPV victimization, which correlated with all types of IPV victimization [14, 30 - 33, 67, 68]. Higher ACE scores were also associated with more experiences of psychological aggression among men and women, as has been previously documented [25]. Additionally, among both men and women, tobacco use was associated with all types of IPV victimization; marijuana use was associated with IPV outcomes among women. Such findings have been less well documented relative to those regarding the role of alcohol use in IPV [2, 12, 34, 36]. Current results might reflect that alcohol use was prevalent in this college student sample and that tobacco and marijuana use may be more relevant markers for risk in this population.

In terms of negotiation experiences as a protective factor, as in prior research, both men and women reported better experiences on average if they were married [69] and White [12, 14, 67]. Other findings were also not surprising, such that better negotiation experiences were associated with higher parental education among women (also reflecting a protective factor) and being older among men (potentially indicating better developed skills related to negotiation). However, higher ACE scores among men and higher depressive symptoms among women were associated with better negotiation

experiences, which might suggest some level of heightened sensitivity to interpersonal processes among those with a history of trauma or mental health problems. In addition, current alcohol use was associated with better negotiation experiences among women, which may reflect some personality characteristics of women who engage in alcohol use in young adulthood, such as confidence [52, 57].

The current study has implications for both research and practice. First, it is critical to further examine the reasons for a particular risk among certain groups, particularly young Black women, both in terms of experiencing IPV and certain sexual risk-related behaviors. Moreover, research is needed to further elucidate underlying mechanisms (e.g., differential power dynamics, disinhibition) that contribute to sexual risk, particularly substance use and the impact of use among individuals in relationships (i.e., dyads) and behavioral outcomes. From a practical standpoint, research should also specify relationship types (e.g., married, partnered, casual, multiracial) as well as specific influences relevant to these relationships in terms of interpersonal interactions and specific sexual risk-related behaviors. In practice, these findings call for improvements in college campus education around alcohol and drug use, sexual risk-related behaviors, and IPV. Given that many college campuses already provide some education around these topics, more novel or intensive strategies are needed to create environments where social norms support healthy behaviors and resources for students are readily available, particularly given the highly sensitive nature of drug use/dependence, IPV, and sexual risk.

**Table 3. Multivariable analyses examining correlates of sexual risk-related behavioral outcomes.**

Variable	Men, N=210						Women, N=554					
	Alcohol/Drug Use Before Sex			No Condom Use During Sex			Alcohol/Drug Use Before Sex			No Condom Use During Sex		
	OR	CI	p	OR	CI	p	OR	CI	p	OR	CI	p
<i>Sociodemographics</i>												
Age	1.13	0.98, 1.30	.107	1.45	1.03, 1.28	.015	1.04	0.92, 1.18	.523	1.15	1.05, 1.26	.002
Heterosexual	Ref	--	--	Ref	--	--	Ref	--	--	Ref	--	--
Other	0.76	0.21, 2.76	.676	1.51	0.67, 3.40	.324	0.80	0.35, 1.81	.594	2.50	1.32, 4.74	.005
Partnered	Ref	--	--	Ref	--	--	Ref	--	--	Ref	--	--
Other	1.59	0.84, 3.02	.156	0.68	0.43, 1.08	.106	1.39	0.83, 2.34	.212	0.44	0.31, 0.63	<.001
<i>Race</i>												
White	Ref	--	--	Ref	--	--	Ref	--	--	Ref	--	--
Black	1.11	0.41, 3.05	.834	0.52	0.24, 1.23	.095	2.09	1.23, 3.54	.006	0.98	0.66, 1.46	.932
Asian	1.69	0.67, 4.25	.266	0.49	0.22, 1.09	.080	0.46	0.06, 3.66	.466	0.52	0.22, 1.23	.135
Other	0.00	0.00, 0.00	.998	1.07	0.38, 3.02	.899	0.59	0.15, 2.31	.447	0.80	0.37, 1.72	.559
Hispanic	0.53	0.11, 2.54	.425	1.33	0.52, 3.41	.551	1.02	0.59, 2.93	.971	1.26	0.66, 2.43	.448
Parental Ed < BA	Ref	--	--	Ref	--	--	Ref	--	--	Ref	--	--
≥ BA	1.27	0.66, 2.46	.474	0.74	0.47, 1.18	.206	1.40	0.85, 2.30	.188	0.79	0.57, 1.10	.163
<i>Substance Use, Past 30 Day</i>												
Tobacco	1.31	0.69, 2.47	.410	1.59	0.96, 2.65	.072	1.46	0.80, 2.65	.217	1.57	0.95, 2.60	.080
Alcohol	2.99	2.19, 7.58	.020	0.86	0.51, 1.46	.583	4.97	2.27, 10.89	<.001	1.31	0.79, 1.63	.508
Marijuana	1.75	0.84, 3.67	.136	1.29	0.70, 2.38	.419	2.27	1.27, 4.04	.005	1.15	0.69, 1.92	.588
<i>IPV Factors</i>												
Negotiation	0.96	0.89, 1.04	.324	1.02	0.96, 1.09	.447	0.90	0.84, 0.96	.002	0.97	0.93, 1.02	.281
Physical Assault	1.17	0.96, 1.43	.129	0.86	0.73, 1.02	.079	0.83	0.64, 1.08	.162	1.03	0.84, 1.25	.800

(Table 5) *contd....*

Variable	Men, N=210						Women, N=554					
	Alcohol/Drug Use Before Sex			No Condom Use During Sex			Alcohol/Drug Use Before Sex			No Condom Use During Sex		
	OR	CI	p	OR	CI	p	OR	CI	p	OR	CI	p
Injury	0.78	0.60, 1.01	.062	0.98	0.80, 1.19	.811	1.16	0.91, 1.47	.244	0.85	0.69, 1.04	.104
Psychological Aggression	0.99	0.86, 1.14	.890	1.06	0.96, 1.18	.248	1.09	0.98, 1.22	.117	1.10	1.01, 1.19	.021
Sexual Aggression	1.27	1.01, 1.60	.038	1.13	0.95, 1.35	.179	1.04	0.89, 1.21	.658	1.07	0.96, 1.20	.239
<b>Nagelkerke R-squared</b>		.155			.188			.107			.125	

## 5. LIMITATIONS

There were a few notable limitations of this study. One is that the study population consisted of only young adult college students in Georgia, thus limiting generalizability to other age groups or for young adults in other states. However, the strength of the study is its inclusion of diverse adults from different racial and ethnic groups and institutions. Secondly, there were relatively limited frequencies of IPV experiences, particularly with regard to physical assault, injury, and sexual aggression, which may have limited our ability to detect associations. Third, there were challenges to addressing nuances in our sample (*e.g.*, relationship status, sexual orientation). Sexual orientation (particularly for women) as well as relationship status may have had implications for condomless sex behaviors; however, the proportions of people who were married or sexual minorities were small (<10%, respectively), and including them or excluding them from analyses did not change other findings. Similarly, alcohol and marijuana use naturally are intertwined with the behavioral outcome of drug or alcohol use before last intercourse. In this sample, the proportion of participants using alcohol was large (77.2%) and the proportion using marijuana (16.8%) was small, and we accounted for these behaviors in analyses. Moreover, preliminary analyses indicated that, without tobacco, alcohol, or marijuana use included in the models identifying correlates of alcohol/drug use before last intercourse, Nagelkerke R-squared was 0.111 for men and 0.089 for women (compared to 0.155 for men and 0.188 for women with these variables included), thus indicating the appropriateness of including these variables in the models. In addition, the internal reliability (*i.e.*, Cronbach's alpha) for some of the IPV subscales were marginal (*e.g.*, .66 for psychological aggression), which may have had some implications for some of the unanticipated findings. Finally, due to the self-report method, there could be social desirability or recall bias. The data were based on a cross-sectional design, which limits the ability to draw causal inferences.

## CONCLUSION

IPV is a concerning issue within the United States, with young adults attending college being at particular risk. This study provided further evidence that IPV-related factors are associated with sexual risk-related behaviors in a diverse college student population highlighted other risk factors for engaging in these behaviors, as well as for IPV victimization. These findings have implications for intervention efforts aimed at promoting sexual and reproductive health, as well as mental health, among college students and informing targeted interventions for subgroups of college students (*e.g.*, Black women).

## ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The present study and the current analyses were approved by the Institutional Review Board of Emory University, Georgia (IRB00069042) as well as those of ICF and the participating colleges and universities.

## HUMAN AND ANIMAL RIGHTS

Not applicable.

## CONSENT FOR PUBLICATION

Informed consent was obtained from all participants in the research.

## AVAILABILITY OF DATA AND MATERIALS

The data that support the findings of this research are available from the corresponding author [C.B] upon request.

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## CONFLICT OF INTEREST

The authors declare no conflict of interest.

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