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A longitudinal study of the moderating effects of romantic relationships on the associations between alcohol use and trauma in college students

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Abstract

Background and Aims.—College students report high levels of alcohol use, which can be exacerbated by interpersonal trauma exposure (IPT). Romantic relationships may represent salient contexts for moderating associations between IPT and alcohol use. We examined whether relationship status, partner alcohol use, and relationship satisfaction moderated associations between IPT and alcohol use, and whether these associations varied in a sex-specific manner.

Design.—University-wide longitudinal survey of college students.

Setting.—Large, urban public university in mid-Atlantic United States of America.

Participants.—We used two subsets of participants (n = 5,673 and 3,195) from the Spit for Science study, a longitudinal study of college students. Participants completed baseline assessments during the autumn of their freshman year and were invited to complete follow-up assessments every spring thereafter. Participants were included in the present study if they completed surveys at baseline and at least one follow-up assessment ($M_{follow\text{-}ups}$ = 1.70, range = 1–4).

Measurements.—Predictors included precollege and college-onset IPT, relationship status, partner alcohol use, relationship satisfaction, and sex. Alcohol consumption was the primary outcome of interest. Precollege IPT was measured at baseline and all other measures were assessed at each follow-up.

Findings.—Individuals with precollege IPT consumed more alcohol than those without IPT, but this was mitigated for those in relationships (β = −0.15, p = .046, 95% CI: [−0.29, 0.00]).

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Individuals with college-onset IPT consumed more alcohol than those without IPT, and this was more pronounced for those with higher partner alcohol use ($\beta = -0.18$, $p = .001$, 95% CI: [−0.29, −0.07]). Relationship satisfaction was not a significant moderator of the associations between IPT and alcohol use (ps > .05 and 95% CIs include 0).

Conclusions.—Involvement in relationships, but not relationship satisfaction, appears to reduce the effects of interpersonal trauma exposure (IPT) on alcohol use among US college students, while high partner alcohol use appears to exacerbate it. The moderating effects of relationship characteristics depend on the developmental timing of IPT.

Keywords

Alcohol; Interpersonal Trauma; Romantic Relationships; College Students; Longitudinal

Emerging adulthood is a key period for problematic drinking and development of alcohol use disorders [1,2]. Epidemiological studies suggest that rates of past-year problematic drinking and lifetime alcohol use disorders are higher among emerging adults than any other age group [3,4]. Further, compared to their age-matched, non-college peers, college students are more likely to engage in problematic drinking and receive alcohol use disorder diagnoses [5–7]. College students experience numerous negative alcohol-related outcomes, including academic problems [8], memory blackouts, legal trouble, and personal injuries [1,8]. Those who engage in problematic alcohol use are also at greater risk of interpersonal trauma (IPT) exposure, such as physical and sexual victimization [1]. Considering the high rates of problematic drinking and negative consequences among college students, it is important to understand the interplay between factors that influence alcohol use among this high-risk population.

Effects of Interpersonal Trauma on Alcohol Use

IPT exposure is a robust predictor of increased alcohol use in adolescence and adulthood [9–15]. This association is often explained in terms of using alcohol as a coping strategy [16], such that individuals use alcohol to regulate negative affect following trauma [10,12,17]. IPT exposure both before and during college is common [18,19], and the developmental timing of IPT can differentially impact college students' alcohol use trajectories. Individuals with precollege IPT drink more alcohol when starting college relative to peers without IPT [10,20]. Women with college-onset IPT, relative to those without, drink alcohol in greater quantities and with greater frequency over time, while men's alcohol use trajectories are unchanged [10]. Together, these findings highlight the associations between IPT and college students' alcohol use, particularly among women, and underscore the need for longitudinal approaches to fully characterize these associations.

Moderating Effects of Romantic Relationships

Although IPT is linked to problematic alcohol use, not everyone who experiences trauma misuses alcohol. It is well-documented that social support buffers against effects of physiological and psychological stress [21–24] through reductions in autonomic nervous system activation [22] and fostering healthy coping strategies in the face of stress [22,24,25].

Among college students, romantic partners are salient sources of social support [24,26,27]. Being in a romantic relationship, relative to being single, is associated with reductions in stress [23,28], alcohol consumption [29–32], and alcohol-related consequences [31,32]. Of note, some evidence suggests these effects are stronger for men than women [22,31]. Thus, romantic relationships likely play an important role in buffering against increases in alcohol use following IPT among this high-risk population, particularly men.

Importantly, the stress-buffering effects of relationships may differ as a function of key characteristics, including partner alcohol use [33–36] and relationship satisfaction [25,35,37,38]. Romantic partners influence the activities and behaviors the other partner engages in [39,40], such that individuals involved with a heavy-drinking partner tend to increase their own alcohol use over time to match that of their partner [33,41]. This pattern of convergence is observed after controlling for assortative mating [29], suggesting partners socialize one another's alcohol use [39,40]. On the other hand, higher relationship satisfaction is likely to confer greater stress-buffering benefits, such that involvement in satisfying relationships is associated with engagement in healthier behaviors [42] and less alcohol consumption [43]. Involvement in dissatisfying relationships can increase both partners' risk for problematic alcohol use [44], as individuals may drink to cope with their dissatisfaction [44]. In sum, whether relationships mitigate or exacerbate the effects of stress on alcohol use likely depends on partner alcohol use and relationship satisfaction.

Current Study

Relatively little research has examined the associations between romantic relationships, IPT, and alcohol use [45], particularly among college students, a population for whom these phenomena are relevant. Given the salience of romantic relationships during this developmental period and the prevalence of IPT and alcohol use among college students, this represents a substantial gap in the literature. We aimed to fill this gap by examining whether relationship status, partner alcohol use, and relationship satisfaction moderated the associations between IPT and alcohol use among college students assessed over time. To account for potential differences depending on developmental timing, precollege and college-onset IPT were assessed. We hypothesized that college students exposed to IPT who were in romantic relationships and who reported lower partner alcohol use and higher relationship satisfaction would consume less alcohol. In view of findings that men benefit more from the protective effects of relationships compared to women [22,31], we also explored whether any associations varied in a sex-specific manner. We hypothesized that the pattern of effects would be stronger for men than women. Study hypotheses were preregistered at https://osf.io/7t5mf.

Method

Participants

Data were from the Spit for Science project, a university-wide longitudinal study focused on behavioral health among five cohorts of college students at a large, urban, public university (N = 12,358) who completed baseline surveys in fall of freshmen year and follow-up surveys every spring thereafter [46]. This sample, briefly described in the Supporting Information,

has been described in detail elsewhere [46]. In the present study, we had two analytic samples. For both samples, we included participants who completed surveys at baseline and at least one follow-up ($M_{follow\text{-}ups}$ = 1.70, range = 1–4). Follow-up data for the fifth cohort (2017) were unavailable at the time of data analysis and were thus excluded. The first sample comprised individuals included in analyses focused on relationship status as a moderator (n = 5,673). The second sample comprised those included in analyses focused on partner alcohol use and relationship satisfaction as moderators. This subsample was limited to individuals who were in a relationship at one or more assessments and thus eligible to answer questions about their relationships (n = 3,195).

Measures

Interpersonal trauma.—Precollege IPT was a time-invariant measure assessed at baseline, and college-onset IPT was a time-varying measure assessed at each follow-up. IPT was measured as participants' self-reported exposure to potentially traumatic events (PTE), assessed via three items from the abbreviated Life Events Checklist [47]: physical assault, sexual assault, and other unwanted/uncomfortable sexual experiences. Precollege IPT was defined as experiencing any PTE "before the past 12 months," "during the past 12 months," or "before starting college" at baseline [10,13,48]. College-onset IPT was defined as experiencing any PTE "since starting college" during spring of freshman year or "in the last 12 months" every spring thereafter [10,13,48]. Precollege and college-onset IPT were coded dichotomously, with participants exposed to IPT (1) or not exposed to IPT (0).

Relationship status.—Relationship status was a time-varying measure assessed at each follow-up. Participants selected one of the following to describe their current relationship status: "not dating," "dating several people," "dating one person exclusively," "engaged," "married," or "married but separated." Relationship status was collapsed into two categories: in a relationship (1) and not in a relationship (0). Participants who identified as dating one person exclusively, being engaged, or being married were coded as 1. Those who identified as not dating, dating several people, and married but separated were coded as 0.

Partner alcohol use.—Partner alcohol use was a time-varying measure assessed at each follow-up. Measured via two items adapted from a measure of peer deviance [49], participants indicated how often their partners "drinks alcohol" and "has a problem with alcohol (like hangovers, fights, accidents)." Participants responded using a Likert-type scale ranging from "never" (1) to "every day" (5). A composite score for partner alcohol use was created from the sum of the endorsed items (inter-item r = 0.46), with higher totals indicating higher partner alcohol use.

Relationship satisfaction.—Relationship satisfaction was a time-varying measure assessed at each follow-up. Measured via three items from the Relationship Assessment Scale [50], participants in relationships reported their general relationship satisfaction, how well their partner meets their needs, and how good their relationship is compared to most. Response options ranged from "not at all" (0) to "a lot/very much" (100), presented on a slider scale. Responses were averaged across all items and transformed to a 1–7 scale. Higher scores indicated higher relationship satisfaction.

Alcohol use.—Alcohol use was a time-varying measure assessed at each follow-up. It was calculated as a self-report measure of past 30-day quantity and frequency of drinking (disregarding periods of atypical use like spring break), which was transformed into an approximation of grams of ethanol consumed. Methods for calculating approximate grams of ethanol consumed per month are described in detail elsewhere [51]. Alcohol use was log-transformed after adding a constant of one to adjust for positive skew and to retain participants who consumed zero grams of alcohol.

Covariates.—Covariates included age, race/ethnicity, time, and cohort. Sex, coded as male (0) or female (1), was included as a covariate when testing the first research aim and as a moderator when testing the second research aim. All covariates, except time and cohort, were self-report items, measured at baseline. Age was measured in years. Race/ethnicity was coded into six categories: White, African American/Black, Asian, and Hispanic/Latino, any other race/ethnicity, and more than one race/ethnicity. Participants who reported their race/ethnicity as unknown or chose not to answer were coded as missing. Time was measured in years to correspond to each year in college at which participants were assessed. Finally, cohort corresponded to the year in which participants were recruited.

Analysis Plan

We conducted a series of longitudinal hierarchical linear models (HLM) with observations nested within individuals. One strength of this approach for longitudinal modeling is its handling of missing data [52,53], such that individuals with data at baseline and any other assessment were included in this study. HLM also allows for the inclusion of time-varying and time-invariant variables. College-onset IPT, all three relationship characteristics, and alcohol use were measured at multiple assessments and thus treated as time-varying variables. Precollege IPT was measured only at baseline and thus treated as time-invariant. Cohort, age, and race/ethnicity were included as time-invariant covariates, and time (measured in years) was included as time-varying. Sex was time-invariant when treated as a covariate and moderator.

We used the “nlme” package [54] in R [55] to examine whether relationship status, partner alcohol use, and relationship satisfaction moderated the associations between IPT exposure and alcohol use. All models were fit using restricted maximum likelihood estimation (REML) and autoregressive (AR1) correlation structure. We first fit models examining the main effects of each relationship characteristic and IPT on alcohol use. We then fit models examining the two-way interactions between each relationship characteristic and IPT to test whether any characteristics moderated the associations between IPT and alcohol use. Last, we fit models examining the three-way interactions between each relationship characteristic, IPT, and sex to test whether any of the characteristics moderated the associations between IPT and alcohol use in a sex-specific manner. Each relationship characteristic was examined in a separate model because each represents a unique construct.

Results

Descriptive Statistics

Table 1 contains means and standard deviations for continuous variables, and frequencies and percentages for categorical variables. Less than half of all respondents were in a relationship at each assessment, but the percentage of students in relationships increased between freshman and senior year (39.4% to 47.0%). Approximately 38.2% of respondents reported a history of precollege IPT. The percentage of respondents who reported college-onset IPT at each assessment ranged from 17.7% to 20.7%. Results from representativeness analyses (see Supporting Information) comparing participants in the analytic samples to those excluded suggest small but significant differences, with the former participants more likely to be younger, female, and have higher rates of precollege and college-onset IPT than the latter. We note that all differences were of small effect according to Cohen's d (all < .24).

Primary Analyses

Table 2 shows parameter estimates from longitudinal HLM examining the main effects of relationship status and IPT (model 1), the two-way interaction between relationship status and IPT (model 2), and three-way interaction between relationship status, IPT, and sex to predict alcohol use (model 3). Relationship status and IPT emerged as significant main effects. Involvement in a committed relationship was associated with lower alcohol use, while precollege and college-onset IPT exposure were associated with higher alcohol use. We observed a significant two-way interaction between relationship status and precollege IPT. Individuals exposed to precollege IPT reported higher alcohol use (M_{adj} = 19.2 drinks per month [dpm]) than those not exposed to precollege IPT (M_{adj} = 15.7 dpm), but this effect was mitigated among those in relationships (M_{adj} = 17.0 dpm; see Figure 1). The interaction between relationship status and precollege IPT accounted for approximately 0.02% of the variance in alcohol use. There was not conclusive evidence to suggest that relationship status moderated the association between college-onset IPT and alcohol use (p = .743), or that associations between relationship status, precollege (p = .342) or college-onset IPT (p = .556), and alcohol use varied in a sex-specific manner.

Table 3 shows parameter estimates from longitudinal HLM examining the main effects of partner alcohol use and IPT (model 1), the two-way interaction between partner alcohol use and IPT (model 2), and the three-way interaction between partner alcohol use, IPT, and sex (model 3) to predict alcohol use. Partner alcohol use and college-onset IPT had significant main effects. Higher partner alcohol use and college-onset IPT exposure were associated with higher alcohol use. We also observed a significant two-way interaction between partner alcohol use and college-onset IPT. Individuals with college-onset IPT consumed more alcohol (M_{adj} = 18.6 dpm) compared to those without college-onset IPT (M_{adj} = 14.7 dpm), and this effect was more pronounced among those who reported higher partner alcohol use (M_{adj} = 27.8 dpm; see Figure 2). The interaction between partner alcohol use and college-onset IPT use accounted for 0.20% of the variance in alcohol use. There was not conclusive evidence to suggest that partner alcohol use moderated precollege IPT to predict alcohol use (p = .728), or that associations between partner alcohol use, precollege (p = .674) or college-onset IPT (p = .478), and alcohol use varied in a sex-specific manner.

Table 4 contains parameter estimates from longitudinal HLM examining the main effects of relationship satisfaction and IPT (model 1), the two-way interaction between relationship satisfaction and IPT (model 2), and the three-way interaction between relationship satisfaction, IPT, and sex (model 3) to predict alcohol use. Relationship satisfaction and IPT exposure emerged as significant main effects. Higher relationship satisfaction was associated with lower alcohol use, while precollege and college-onset IPT exposure were associated with higher alcohol use. We did not find evidence that relationship satisfaction moderated the associations between precollege ($p = .812$) or college-onset IPT ($p = .251$) and alcohol use (see Figure 3). Further, there was not conclusive evidence to suggest that associations between relationship satisfaction, precollege ($p = .090$) or college-onset IPT ($p = .121$), and alcohol use varied in a sex-specific manner.

Discussion

In the present study, we examined whether relationship status, partner alcohol use, and relationship satisfaction moderated the effects of IPT on alcohol use. We also explored whether any associations varied in a sex-specific manner. We first examined the main effects of each relationship characteristic and IPT on alcohol use. Consistent with prior literature [9–12], we observed that precollege and college-onset IPT exposure were associated with elevated alcohol use[1]. Similar to previous research [29,31], we observed that being in a committed, satisfying relationship was associated with lower alcohol use, while higher partner alcohol use was associated with higher alcohol use. Next, we examined the interactive effects, which were the parameters of interest. These findings are interpreted in turn below.

First, we observed a buffering effect of relationship status and a pathogenic effect of partner alcohol use on the associations between IPT and alcohol use. These findings are consistent with previous research conducted with adults, which suggest that involvement in a romantic relationship is protective against increased alcohol use [31,32] unless involved with a heavy-drinking partner [29,33,41]. Importantly, this pattern of effects was robust in sensitivity analyses controlling for relationship length (see Supporting Information). Involvement in relationships generally confers greater social support, which promotes healthy coping strategies and reductions in stress [22,25,42]. However, involvement with partners with higher alcohol use can increase stress levels and is linked to increases in one's own drinking [39,40]. These types of partner socialization effects may be especially relevant for college students, for whom peer norms are robust predictors of behavior [56,57]. It thus follows that elevated alcohol consumption following IPT is exacerbated among individuals whose partners exhibit higher levels of alcohol use. In sum, our findings suggest that relationship status and partner alcohol use are relevant moderators of the associations between IPT and alcohol use for college students.

[1]Although there was a significant main effect of precollege IPT in models examining the association between relationship status and relationship satisfaction and alcohol, we did not observe this main effect in models examining the association between partner alcohol use and participants' alcohol use. The difference in main effects across models is likely due to the fact that 1) partner alcohol use analyses made use of a different subset of participants from relationship status analyses (i.e., only participants in committed relationships) and 2) slightly different numbers of observations from relationship satisfaction analyses due to missing data patterns.

Notably, we observed a differential pattern of effects depending on the developmental timing of IPT exposure, such that relationship status moderated precollege IPT while partner alcohol use moderated college-onset IPT. Consistent with previous research [22,24], social support conferred by romantic partners buffers against stressful effects of previous IPT exposure to protect against increased alcohol use. However, our findings suggest this protective effect may not be sufficient for recent college-onset IPT exposure. In contrast, partner alcohol use may be more influential on college-onset IPT, relative to precollege IPT, perhaps because partners influence how individuals make meaning out of and cope with post-traumatic stress [38,39]. This pattern of effects highlights the importance of developmental timing when considering the role of risk and protective factors, consistent with a developmental psychopathology perspective [58,59].

Clinicians can use information from this study to educate survivors of IPT, and their partners, about positive and negative effects conferred by romantic relationships during this developmental stage. By recognizing that individuals' relationship characteristics can alter the effect of IPT exposure to predict alcohol use, clinicians can adapt treatment plans for those exposed to IPT. More broadly, these positive and negative effects of relationships can inform awareness campaigns on college campuses by educating students about the ways that social ties can improve or undermine health habits, particularly concerning alcohol consumption.

Limitations

Results should be interpreted in the context of study limitations. First, data were collected via self-report and are thus subject to self-presentation biases. Second, there were high levels of attrition across later waves of the sample. Third, measures included in our study were imperfect, such that data on potential confounds were unavailable. Specifically, we did not have data on participants' precollege alcohol use, which could influence one's likelihood of victimization [60]; nor information regarding IPT perpetrated by romantic partners, which could have negative implications for relationship characteristics; nor did we account for post-traumatic stress symptoms (PTSS), as we were unable to directly link participants' PTSS to IPT exposure. Fourth, we only examined IPT among a sample of gender-conforming college students in largely satisfying relationships, not inclusive of other types of relationship heterogeneity, so findings may not generalize to other types of traumatic events or to a wider population.

Lastly, our observed effect sizes were small. To determine whether this was due to how our variables were measured, we conducted two sets of sensitivity analyses. Extant research suggests that the cumulative effect of repeated IPT confers greater risk than a single event (e.g., [61–63]), so we first conducted sensitivity analyses to determine if our pattern of results changed when including cumulative IPT exposure as a predictor. Next, we conducted sensitivity analyses including experiencing a past-year breakup, another common predictor of problematic drinking [64], as a binary, time-varying covariate, to determine whether our pattern of results changed when relationship stability was formally modeled. Across both sets of sensitivity analyses, we observed largely the same pattern of results (see Supporting Information). Thus, our small effect sizes are likely not due to measurement limitations.

Moreover, we believe these findings are important to understanding the interplay between the factors that influence alcohol use.

Conclusions

The present study suggests that relationship status and partner alcohol use, but not relationship satisfaction, moderate the effects of IPT on college students' alcohol use. Findings underscore the importance of developmental timing, as moderating effects of relationship characteristics varied depending on the timing of IPT. Better understanding of romantic relationships as part of efforts to reduce problematic alcohol use following trauma is critical, as it represents a potentially useful component of treatment and the promotion of wellbeing. Stressful experiences may undermine one's ability to form and maintain high quality romantic relationships [37,38], and additional research is needed to understand whether trauma-exposed individuals are likely to find themselves in the types of protective relationships that buffer stress. Continuing this line of research on the interplay between these factors can advance the understanding of alcohol use risk and protective factors across the lifespan.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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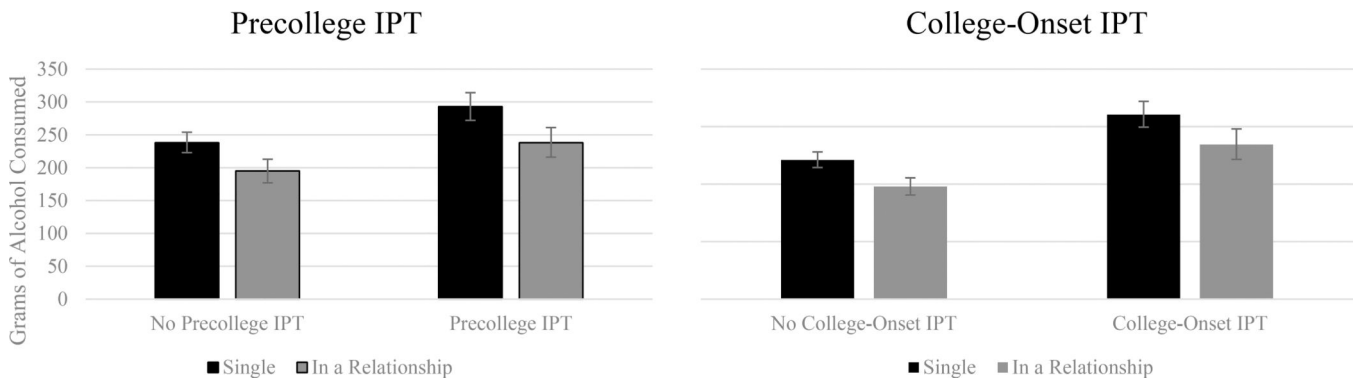

Figure 1.

Grams of alcohol consumed per month as a function of the interaction between relationship status and interpersonal trauma exposure (IPT), controlling for all covariates, shown as predicted values. Precollege IPT is shown on the left panel; College-onset IPT is shown on the right panel. Bars represent standard errors.

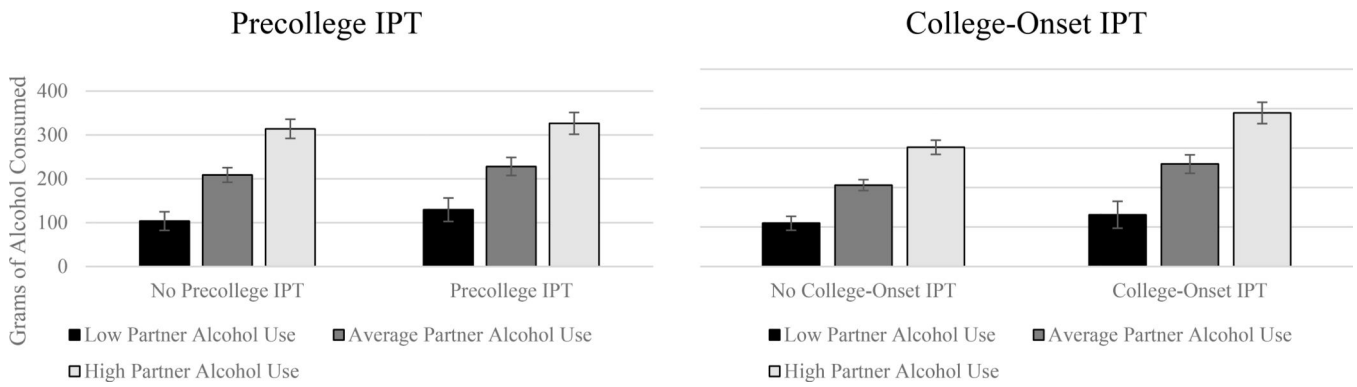

Figure 2.

Grams of alcohol consumed per month as a function of the interaction between partner alcohol use and interpersonal trauma exposure (IPT), controlling for all covariates, shown as predicted values. Precollege IPT is shown on the left panel; College-onset IPT is shown on the right panel. Bars represent standard errors.

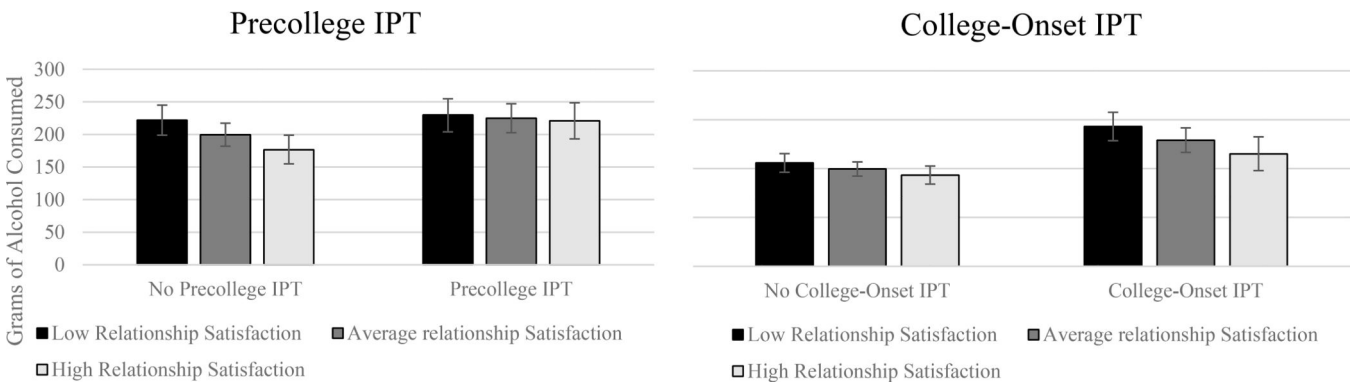

Figure 3.

Grams of alcohol consumed per month as a function of the interaction between relationship satisfaction and interpersonal trauma exposure (IPT), controlling for all covariates, shown as predicted values. Precollege IPT is shown on the left panel; College-onset IPT is shown on the right panel. Bars represent standard errors.

Table 1

Means, standard deviations, frequencies, and percentages by year for all continuous and categorical variables.

	Year 1		Year 2		Year 3		Year 4		Overall	
Variable	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Age	18.50	0.43								
Relationship Satisfaction	6.39	1.07	6.20	1.09	6.17	1.13	6.16	1.16	6.25	1.11
Partner Alcohol Use	3.85	1.52	4.06	1.44	4.22	1.46	4.35	1.47	4.08	1.48
Alcohol Use (raw)	219.00	488.00	219.00	469.00	253.00	481.00	291.00	509.00	235.29	485.06
Alcohol Use (log+1)	3.31	2.46	3.50	2.34	3.93	2.20	4.25	2.09	3.61	2.36

	Year 1		Year 2		Year 3		Year 4	
Variable	*N*	*%*	*N*	*%*	*N*	*%*	*N*	*%*
Precollege IPT	2,895	38.22						
College-Onset IPT	1,391	18.94	963	20.71	651	17.66	450	19.34
Relationship Status	2,190	39.44	1,982	41.90	1,713	45.70	1,113	46.98

Note. IPT = Interpersonal trauma; *M* = Mean; *SD* = Standard deviation. *N* = Frequency of respondents who positively endorsed that variable. *%* = Percentage of respondents who positively endorsed that variable. Means, standard deviations, frequencies, and percentages were calculated using cross-sectional data.

Table 2

Associations between relationship status, IPT, and sex to predict alcohol use.

	Model 1 Main Effects		Model 2 Interaction Effects		Model 3 Sex-Effects	
Predictors	***β***	***CI***	***β***	***CI***	***β***	***CI***
(Intercept)	***3.43***	***[1.02, 5.84]***	***3.41***	***[1.00, 5.81]***	***3.43***	***[1.02, 5.83]***
Time	***0.40***	***[0.37, 0.42]***	***0.40***	***[0.37, 0.42]***	***0.40***	***[0.37, 0.42]***
Cohort						
Cohort 2	**0.16**	**[0.02, 0.31]**	**0.16**	**[0.02, 0.31]**	**0.16**	**[0.02, 0.31]**
Cohort 3	**0.15**	**[0.01, 0.30]**	**0.16**	**[0.01, 0.30]**	**0.15**	**[0.01, 0.30]**
Cohort 4	***0.22***	***[0.06, 0.37]***	***0.22***	***[0.07, 0.37]***	***0.22***	***[0.06, 0.37]***
Race/Ethnicity (0 = White)						
African American/Black	***−0.88***	***[−1.02, −0.74]***	***−0.88***	***[−1.02, −0.74]***	***−0.88***	***[−1.02, −0.74]***
Asian	***−1.39***	***[−1.53, −1.24]***	***−1.38***	***[−1.53, −1.24]***	***−1.38***	***[−1.53, −1.23]***
More than one race	***−0.31***	***[−0.53, −0.08]***	***−0.31***	***[−0.54, −0.08]***	***−0.32***	***[−0.55, −0.09]***
Hispanic/Latino	***−0.32***	***[−0.55, −0.10]***	***−0.32***	***[−0.55, −0.09]***	***−0.32***	***[−0.54, −0.09]***
Other race/ethnicity	−0.32	*[−0.81, 0.17]*	−0.32	[−0.81, 0.17]	−0.31	[−0.80, 0.18]
Sex (0 = Male)	***−0.52***	***[−0.64, −0.41]***	***−0.52***	***[−0.63, −0.41]***	***−0.63***	***[−0.79, −0.48]***
Age	0.00	[−0.13, 0.13]	0.00	[−0.13, 0.13]	0.00	[−0.13, 0.13]
Relationship Status	***−0.10***	***[−0.16, −0.03]***	−0.05	[−0.14, 0.04]	−0.07	[−0.23, 0.08]
Precollege IPT	***0.35***	***[0.24, 0.47]***	***0.42***	***[0.29, 0.55]***	**0.27**	**[0.05, 0.48]**
College-Onset IPT	***0.29***	***[0.21, 0.37]***	***0.28***	***[0.18, 0.38]***	0.17	[−0.02, 0.36]
Relationship Status*Precollege IPT			**−0.15**	**[−0.29, 0.00]**	−0.04	[−0.31, 0.22]
Relationship Status*College-Onset IPT			0.03	[−0.13, 0.18]	−0.06	[−0.36, 0.24]
Sex*Precollege IPT					0.23	[−0.03, 0.50]
Sex*College-Onset IPT					0.15	[−0.07, 0.37]
Sex*Relationship Status					0.05	[−0.14, 0.23]
Sex*Precollege IPT*Relationship Status					−0.15	[−0.46, 0.16]
Sex*College-Onset IPT*Relationship Status					0.10	[−0.24, 0.45]
Observations	13,019					

Note. IPT = interpersonal trauma. **Bold** type indicates $p < .05$. ***Bold italic*** type indicates $p < .01$. Model 1 corresponds to the model examining the main effects of relationship status and IPT on alcohol use. Model 2 corresponds to the model examining the two-way interactions between relationship status and IPT to predict alcohol use. Model 3 corresponds to the model examining the three-way interactions between relationship status, IPT, and sex to predict alcohol use. Alcohol use was log-transformed and added to a constant of one.

Table 3

Associations between partner alcohol use, IPT, and sex to predict alcohol use.

	Model 1 Main Effects		Model 2 Interaction Effects		Model 3 Sex-Effects	
Predictors	***β***	***CI***	***β***	***CI***	***β***	***CI***
(Intercept)	**3.18**	**[0.56, 5.80]**	**3.10**	**[0.48, 5.72]**	**3.06**	**[0.44, 5.68]**
Time	***0.32***	***[0.28, 0.36]***	***0.32***	***[0.28, 0.36]***	***0.32***	***[0.28, 0.36]***
Cohort						
Cohort 2	0.11	[−0.06, 0.27]	0.11	[−0.06, 0.27]	0.11	[−0.06, 0.27]
Cohort 3	**0.18**	**[0.02, 0.35]**	**0.18**	**[0.02, 0.35]**	**0.18**	**[0.01, 0.35]**
Cohort 4	**0.23**	**[0.05, 0.41]**	**0.23**	**[0.05, 0.41]**	**0.22**	**[0.04, 0.40]**
Race/Ethnicity (0 = White)						
African American/Black	***−0.58***	***[−0.74, −0.41]***	***−0.57***	***[−0.74, −0.41]***	***−0.58***	***[−0.75, −0.41]***
Asian	***−0.80***	***[−0.98, −0.62]***	***−0.80***	***[−0.98, −0.62]***	***−0.80***	***[−0.98, −0.62]***
More than one race	−0.18	[−0.43, 0.06]	−0.18	[−0.43, 0.06]	−0.19	[−0.43, 0.06]
Hispanic/Latino	−0.19	[−0.45, 0.06]	−0.19	[−0.44, 0.06]	−0.19	[−0.44, 0.06]
Other race/ethnicity	−0.10	[−0.63, 0.42]	−0.10	[−0.63, 0.42]	−0.12	[−0.65, 0.40]
Sex (0 = Male)	***−0.58***	***[−0.71, −0.44]***	***−0.58***	***[−0.72, −0.45]***	***−0.64***	***[−0.81, −0.47]***
Age	0.02	[−0.12, 0.16]	0.02	[−0.12, 0.16]	0.03	[−0.11, 0.17]
Partner Alcohol Use	***0.74***	***[0.69, 0.79]***	***0.78***	***[0.71, 0.85]***	***0.91***	***[0.78, 1.03]***
Precollege IPT	0.09	[−0.03, 0.22]	0.09	[−0.03, 0.22]	0.07	[−0.17, 0.32]
College-Onset IPT	***0.20***	***[0.08, 0.32]***	***0.24***	***[0.12, 0.36]***	0.06	[−0.19, 0.31]
Partner Alcohol Use*Precollege IPT			−0.02	[−0.08, 0.12]	−0.01	[−0.21, 0.18]
Partner Alcohol Use*College-Onset IPT			***−0.18***	***[−0.29, −0.07]***	**−0.24**	**[−0.47, −0.02]**
Sex*Precollege IPT					0.02	[−0.26, 0.31]
Sex*College-Onset IPT					0.22	[−0.06, 0.51]
Sex*Partner Alcohol Use					**−0.18**	**[−0.33, −0.03]**
Sex*Precollege IPT*Partner Alcohol Use					0.05	[−0.18, 0.28]
Sex*College-Onset IPT*Partner Alcohol Use					0.09	[−0.16, 0.34]
Observations				5,612		

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Note. IPT = interpersonal trauma. **Bold** type indicates $p < .05$. ***Bold italic*** type indicates $p < .01$. Model 1 corresponds to the model examining the main effects of partner alcohol use and IPT on alcohol use. Model 2 corresponds to the model examining the two-way interactions between partner alcohol use and IPT to predict participants' alcohol use. Model 3 corresponds to the model examining the three-way interactions between partner alcohol use, IPT, and sex to predict alcohol use. Partner alcohol use was standardized. Alcohol use was log-transformed and added to a constant of one.

Table 4

Associations between relationship satisfaction, IPT, and sex to predict alcohol use.

	Model 1 Main Effects		Model 2 Interaction Effects		Model 3 Sex-Effects	
Predictors	***β***	***CI***	***β***	***CI***	***β***	***CI***
(Intercept)	2.71	[−0.37, 5.79]	2.74	[−0.34, 5.82]	2.60	[−0.61, 5.54]
Time	***0.42***	***[0.37, 0.46]***	***0.42***	***[0.37, 0.46]***	***0.42***	***[0.38, 0.47]***
Cohort						
Cohort 2	0.05	[−0.15, 0.25]	0.04	[−0.16, 0.24]	0.04	[−0.15, 0.25]
Cohort 3	0.13	[−0.07, 0.33]	0.13	[−0.07, 0.33]	0.13	[−0.07, 0.33]
Cohort 4	0.19	[−0.02, 0.41]	0.19	[−0.02, 0.41]	0.20	[−0.02, 0.41]
Race/Ethnicity (0 = White)						
African American/Black	***−0.86***	***[−1.06, −0.65]***	***−0.85***	***[−1.06, −0.65]***	***−0.84***	***[−1.05, −0.64]***
Asian	***−1.03***	***[−1.24, −0.81]***	***−1.02***	***[−1.24, −0.81]***	***−1.03***	***[−1.25, −0.82]***
More than one race	−0.23	[−0.52, 0.06]	−0.23	[−0.52, 0.06]	−0.23	[−0.52, 0.06]
Hispanic/Latino	−0.19	[−0.49, 0.11]	−0.18	[−0.49, 0.12]	−0.19	[−0.49, 0.11]
Other race/ethnicity	−0.22	[−0.84, 0.40]	−0.21	[−0.83, 0.41]	−0.23	[−0.87, 0.37]
Sex (0 = Male)	***−0.45***	***[−0.61, −0.29]***	***−0.45***	***[−0.61, −0.29]***	***−0.44***	***[−0.64, −0.23]***
Age	0.03	[−0.13, 0.20]	0.03	[−0.14, 0.19]	0.04	[−0.12, 0.21]
Relationship Satisfaction	***−0.09***	***[−0.14, −0.03]***	−0.06	[−0.14, 0.02]	***−0.19***	***[−0.37, −0.08]***
Precollege IPT	**0.17**	**[0.02, 0.33]**	**0.18**	**[0.02, 0.33]**	0.26	[−0.04, 0.54]
College-Onset IPT	***0.29***	***[0.16, 0.43]***	***0.28***	***[0.14, 0.42]***	0.19	[−0.07, 0.54]
Relationship Satisfaction*Precollege IPT			−0.01	[−0.12, 0.10]	−0.20	[−0.37, 0.08]
Relationship Satisfaction*College-Onset IPT			−0.07	[−0.19, 0.05]	0.11	[−0.18, 0.38]
Sex*Precollege IPT					−0.11	[−0.44, 0.25]
Sex*College-Onset IPT					0.11	[−0.27, 0.41]
Sex*Relationship Satisfaction					**0.19**	**[0.05, 0.39]**
Sex*Precollege IPT*Relationship Satisfaction					0.22	[−0.09, 0.43]
Sex*College-Onset IPT*Relationship Satisfaction					−0.24	[−0.56, 0.06]
Observations				4,744		

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Note. IPT = interpersonal trauma. **Bold** type indicates $p < .05$. ***Bold italic*** type indicates $p < .01$. Model 1 corresponds to the model examining the main effects of relationship satisfaction and IPT on alcohol use. Model 2 corresponds to the model examining the two-way interactions between relationship satisfaction and IPT to predict alcohol use. Model 3 corresponds to the model examining the three-way interactions between relationship satisfaction, IPT, and sex to predict alcohol use. Relationship satisfaction was standardized. Alcohol use was log-transformed and added to a constant of one.