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Intimate partner violence is related to future alcohol use among a nationwide sample of LGBTQIA+ people: results from The PRIDE Study

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**Intimate partner violence is related to future alcohol use among a nationwide sample of  
LGBTQIA+ people: results from The PRIDE Study**

## ABSTRACT

**Background:** Lesbian, gay, bisexual, transgender, queer, intersex, aromantic and asexual (LGBTQIA+) communities in the United States experience higher rates of alcohol use than the general population. While experiencing intimate partner violence (IPV) is thought to lead to increased alcohol use in LGBTQIA+ people, little research has investigated the temporal relationship between IPV and alcohol use in this population.

**Methods:** Data from the two years of The Population Research in Identity and Disparities for Equality Study (The PRIDE Study) longitudinal cohort (n=3,783) were included. Overall IPV and three sub-types (physical, sexual, and emotional), measured in 2021 using the extended Hurt, Insult, Threaten, Scream (E-HITS) screening tool, was examined as a predictor of respondents' Alcohol Use Disorders Identification Test (AUDIT) score in 2022 using multivariable linear regression to assess linear and quadratic associations. Models were adjusted for sociodemographic characteristics and history of alcohol use disorder.

**Results:** One-quarter (24.7%) of respondents reported experiencing past-year IPV in 2021. The mean AUDIT score in 2022 was 3.52 (SD = 4.13). In adjusted models, both linear (b: 0.32, 95% CI: 0.19, 0.45) and quadratic (b: -0.03, 95% CI: -0.05, -0.01) terms for overall IPV were significantly associated with next-year AUDIT score. These patterns were mirrored in each IPV sub-type and were not attenuated when restricted to those currently in a relationship.

**Conclusions:** These results provide evidence of a temporal relationship between IPV and alcohol use in LGBTQIA+ communities, suggesting that efforts to prevent and mitigate IPV may help reduce alcohol use disparities in this population.

## 1. INTRODUCTION

Intimate partner violence (IPV) is a significant public health problem in lesbian, gay, bisexual, transgender, queer or questioning, intersex, aromatic and asexual (LGBTQIA+) communities in the United States (US; Whitfield et al., 2021). Defined as any action within a romantic relationship that causes physical, sexual, or emotional harm, as many as 61.1% of sexual minority women and 37.3% of sexual minority men in the US have experienced IPV, compared to 35% and 29% of heterosexual women and men, respectively (Leemis et al., 2022). Moreover, findings from a recent systematic review and meta-analysis show transgender people are more than twice as likely to experience IPV than their heterosexual, cisgender counterparts (Peitzmeier et al., 2020). To address this disproportionate public health burden, the US White House released its first National Action Plan to End Gender-based Violence in 2023, which calls for more research into the health impacts of IPV specifically in these communities to develop novel interventions tailored to LGBTQIA+ relationships (The White House, 2023).

Minority stress is thought to be a significant driver of negative health outcomes (including IPV) in LGBTQIA+ populations (Decker et al., 2018; Edwards et al., 2015; Swann et al., 2022). The Minority Stress Model posits that health disparities among LGBTQIA+ people exist in part due to the stress from navigating discrimination, prejudice, and stigma experienced due to their minority identity (Hendricks & Testa, 2012) Brooks, 1981; Hendricks & Testa, 2012; Meyer & Frost, 2013; Meyer, 2003). In response to the excess proximal (e.g., internalized homonegativity) and distal (e.g., hate crimes, discrimination) stress of existing as an LGBTQIA+ person in a society dominated by cisgender, heterosexual men (i.e., cisheteropatriarchy), LGBTQIA+ people

may use substances such as alcohol and other drugs to cope (Flentje et al., 2020). Among potential stress-response behaviors, alcohol use is one of the most widely researched behaviors, and evidence indicates a disproportionately high rate of alcohol use and binge drinking among LGBTQIA+ communities (Dyar et al., 2020; Gosling et al., 2022; Hatzenbuehler, 2009; Hoy-Ellis, 2023; Lee et al., 2016; Wolfe et al., 2021). LGBTQIA+ adults are also significantly more likely to be diagnosed with an alcohol use disorder than their cisgender, heterosexual counterparts (Hughto et al., 2021; Krueger et al., 2020). Additionally, some LGBTQIA+ people may also adopt alcohol use to self-manage other effects of minority stress in this population, such as depression (Tebbe & Budge, 2022).

However, despite LGBTQIA+ people having both high rates of alcohol use and IPV, little research has investigated the temporal relationship between IPV and alcohol use in this population. IPV is often found to be associated with alcohol use in specific LGBTQIA+ subgroups (e.g., cisgender men who have sex with men, cisgender women who have sex with women women) (Basting et al., 2023; Davis et al., 2016; Kimmes et al., 2019; King et al., 2022), but current knowledge of the role that IPV plays in alcohol use among LGBTQIA+ people is limited by cross-sectional designs and a preponderance of evidence focusing on cisgender men who have sex with men (Kim & Schmuhl, 2021; Porsch et al., 2022). This precludes researchers from drawing causal inferences and, perhaps more importantly, developing effective evidence-informed interventions for alcohol use for LGBTQIA+ communities that are inclusive of their relationship experiences.

While we know of no studies examining the temporal relationship between IPV and increases in alcohol use in LGBTQIA+ people, substantial evidence finds that experiencing IPV leads to increased alcohol use among cisgender women in relationships with cisgender men (La Flair et al., 2012; Ogden et al., 2022). Feminist examinations of these results find that likely mechanisms for increased alcohol use include structural factors such as gender inequality and coping from the stress of abuse. Given similar structural forces in queer communities (*i.e.*, minority stress), even despite different interpersonal factors within these relationships compared to heterosexual ones, it stands to reason that LGBTQIA+ couples may also turn to alcohol to self-manage the effects of minority stress and IPV (Stubbs & Szoek, 2022; White et al., 2023).

The purpose of this study was to identify the temporal relationships between IPV experiences among LGBTQIA+ people and subsequent alcohol use. We hypothesize that LGBTQIA+ people who report past-year IPV will have higher rates of alcohol use in the subsequent year. Results of this analysis may begin to illustrate the role of IPV in alcohol use disparities among LGBTQIA+ people, add more rigorous evidence on which to build effective interventions for the reduction of substance use in LGBTQIA+ communities broadly, and contribute to the successful completion of the US National Action Plan to reduce intimate partner violence.

## **2. METHODS**

### **2.1 Study Design and Participants**

The PRIDE Study ([www.pridestudy.org](http://www.pridestudy.org)) is a community-engaged, prospective, online cohort study of LGBTQIA+ adults, described previously (Lunn, Capriotti, et al., 2019; Lunn, Lubensky, et al., 2019). Briefly, The PRIDE Study began recruitment in 2017 through LGBTQIA+

community events, partners, organizations, and social media. Eligible participants had to be age  $\geq 18$  years, reside in the US or its territories, identify as LGBTQIA+ or another gender and/or sexual minority person, and be comfortable with reading and writing in English. All participants provided informed consent through the web-based portal. Upon enrollment, participants are invited to complete the lifetime and current annual health and experiences questionnaire, with annual invitations to complete subsequent annual questionnaires. For this study, participants who completed the 2021 and 2022 annual questionnaires (July 26, 2021 to May 16, 2023) were eligible. The PRIDE Study was approved by [REDACTED] [REDACTED] Institutional Review Boards.

## **2.2 Exposures**

The primary exposure is the Extended-Hurt, Insulted, Threaten, Scream (E-HITS) (Chan et al., 2010; Iverson et al., 2015) scale reported in the 2021 annual questionnaire. The E-HITS is a 5-item screening tool that assesses for past-year IPV by asking participants: “Over the last 12 months, how often did your partner: (1) physically hurt you?, (2) insult you or talk down to you?, (3) threaten you with harm?, (4) scream or curse at you?, and (5) force you to have sexual activities?” Responses are scored on a 5-point scale (1 = never to 5 = frequently), resulting in summed score ranging from 5 to 25 (Cronbach’s alpha = 0.71). We classified the E-HITS items into three subtypes which measured physical (items 1 and 3), sexual (item 5), and emotional (items 2 and 4) past-year IPV. The total scores for physical and emotional IPV ranged from 2 to 10.

### **2.3 Outcome**

The main outcome of interest is the Alcohol Use Disorders Identification Test (AUDIT) (Saunders et al., 1993) scale reported in the 2022 annual questionnaire. The AUDIT is a 10-item screening tool that assesses the level of alcohol consumption and dependence in the past year. Items for the AUDIT include the quantity and frequency of drinking and heavy drinking (items 1 to 3); impaired control over drinking, increased salience of drinking, and morning drinking (items 4 to 6); and resulting problems from alcohol, such as guilt after drinking, blackouts, alcohol-related injuries, and whether others are concerned about the participant's drinking (items 7 to 10). Participants respond to each item on a 5-point scale (0 = Never to 4 = Daily or almost daily), except for items 9 and 10 which are scored with values of 0 (No), 2 (Yes, but not in the past year), and 4 (Yes, during the last year). The total scores range from 0 to 40 (Cronbach's alpha = 0.78).

### **2.4 Self-reported alcohol use disorder**

Baseline self-reported alcohol use disorder was identified using the following question from the 2021 annual questionnaire: "Do you currently have any of the following conditions that have been diagnosed by a health care provider?" Participants who selected "Alcoholism or Alcohol Use Disorder" were categorized to have experienced alcohol use disorder at baseline.

### **2.5 Relationship Variables**

Questions on participants' current relationship status were obtained in the 2021 annual questionnaire. Participants were asked the following question: "Are you currently in a relationship?" Those who answered "yes" were asked about their general satisfaction with their



current romantic relationships: “In general, how satisfied are you with your current romantic relationship(s)?” Responses were on a 5-point Likert scale, ranging from 0 (Very dissatisfied) to 4 (Very satisfied).

## **2.6 Socio-demographics**

We included the following socio-demographic characteristics in our analysis: current age (continuous), gender identity with the option to select multiple responses (agender, cisgender man, cisgender woman, genderqueer, man, non-binary, questioning, transgender man, transgender woman, Two-spirit, woman, and another), sexual orientation with the option to select multiple responses (asexual, bisexual, gay, lesbian, pansexual, queer questioning, same-gender loving, heterosexual, Two-spirit, and another), ethnoracial identity with the option to select multiple responses (American Indian or Alaska Native; Asian; Black, African American or African; Hispanic, Latino, or Spanish; Middle Eastern or North African; Native Hawaiian or other Pacific Islander; White; and Another), education level (high school or less, some college, 4-year degree, master’s degree, and doctorate/professional degree), employment (yes/no), individual income (\$0-20,000, \$20,001-50,000, \$50,001-100,000, and \$100,001+), and Census region (Northeast, Midwest, South, and West).

## **2.7 Statistical Analysis**

We first described key participant characteristics for the overall sample using descriptive statistics. To assess associations between past-year IPV and subsequent AUDIT scores reported in the 12-months following IPV exposure, we fitted separate linear regression models for each exposure and used a sandwich estimator to obtain robust standard errors. IPV was modeled as

both linear and quadratic terms to explore nonlinear associations between IPV and AUDIT scores. Adjusted models accounted for age, gender identity groups, sexual orientation groups, education, employment, individual income, baseline (2021) alcohol use disorder, and current Census region. To improve model fit, we mean centered overall E-HITS and its subtypes. Using the *mice* package (van Buuren & Groothuis-Oudshoorn, 2011), we accounted for missing data in the covariates with multiple imputation using chained equations to generate 20 imputed data sets assuming that data are missing at random.

While currently being in a relationship was not a prerequisite for inclusion in the analysis, research suggested relationship status is an important marker of IPV; those currently in a relationship were more likely to report IPV and more severe forms of IPV than those who were not currently in a relationship (Carvalho et al., 2011; Sutton & Dawson, 2021). For those in a relationship, there are important gender differences in the role of relationship satisfaction in IPV victimization (Ackerman & Field, 2011), but there has been little exploration of how relationship satisfaction may be associated with IPV in LGBTQIA+ relationships (Scott et al., 2023). We therefore conducted a sensitivity analysis wherein we restricted the sample to those who reported currently being in a relationship and included relationship satisfaction as a covariate in these models. Statistical significance was defined as a 95% confidence interval (CI) excluding 0, assuming a type 1 error rate of 0.05 (two-sided). We used R version 4.2.1 to perform all analyses (R Core Team, 2022).

### **3. RESULTS**

A total of 4,495 participants completed both the 2021 and 2022 annual questionnaires. Of these, we included all individuals who self-reported their gender identity and sexual orientation (n =

4,488). We excluded 705 participants with any missing E-HITS or AUDIT items. The final analytic sample for this analysis was 3,783.

Sample characteristics are summarized in Table 1. The mean current age was 39.1 years (standard deviation [SD] = 14.9). Approximately 49% of participants were transgender or gender diverse, and 47% endorsed multiple sexual orientations. Most participants (92%) identified as White, which included 3,107 people who only reported White (82.1% of sample) and 371 participants who selected White in addition to another ethnoracial identity (9.8% of sample). Participants predominately reported having at least a four-year college degree (78%) and being currently employed (73%); however, 58% reported an individual income of less than \$50,000. Participants were also geographically diverse, with a higher proportion of individuals currently residing in the Pacific region (33%). Two-thirds (66%) reported currently being in a relationship, and among those, 57% reported being satisfied or very satisfied with their current relationship. At baseline (2021), about 4% reported alcohol use disorder, and the mean overall E-HITS score was 5.65 (SD = 1.60). Approximately one-quarter (24.7%) of respondents reported experiencing past-year IPV in 2021. Among subtypes, 3.5% reported physical IPV, with a mean score of the two physical IPV items of 2.06 (SD = 0.42). One-fifth (20.4%) reported sexual IPV using its relevant single item measure (M=1.32, SD = 0.73) and 23.9% reported emotional IPV, with the mean of these two items of 2.54 (SD = 1.24). In the subsequent 12-months (2022 annual questionnaire), the mean AUDIT score was 3.52 (SD = 4.13).

In adjusted models, both linear (b: 0.32, 95% CI: 0.19, 0.45) and quadratic (b: -0.03, 95% CI: -0.05, -0.01) terms for overall IPV were significantly associated with AUDIT scores. This

indicates that there was a positive increase in AUDIT scores with each additional point increase in E-HITS score, but this increase was at a lower rate after an E-HITS score exceeded 10 points (Table 2, Figure 1a). Among IPV subtypes, patterns of associations with AUDIT largely reflected those of overall IPV, with AUDIT scores increasing with respect to all subtypes, but at a lower rate at higher E-HITS scores. Sexual IPV (Figure 1b) showed the largest association with AUDIT (linear b: 1.76, 95% CI: 0.64, 2.89 & quadratic b: -0.66, 95% CI: -1.07, -0.26), followed by physical IPV (linear b: 0.72, 95% CI: 0.11, 1.33 & quadratic b: -0.16, 95% CI: -0.30, -0.03) and emotional IPV (linear b: 0.45, 95% CI: 0.26, 0.64 & quadratic b: -0.08, 95% CI: -0.13, -0.03) (Figure 1c and 1d).

Among participants with available information on current relationship status ( $n = 3,757$ ), there were few differences in sociodemographic characteristics, IPV, and alcohol use by current relationship status (Supplemental Table 1). A higher percentage of participants who were currently in relationships (vs. those who were not) received an advanced college degree (47% vs. 34%), were currently employed (77% vs. 68%), and had annual incomes greater than \$100,000 (17% vs. 10%).

Our sensitivity analysis indicated that estimates for overall IPV, sexual IPV, and emotional IPV were robust to potential confounding by relationship status and satisfaction (Table 3). After restricting the sample to participants who were currently in relationships and further adjusting for relationship satisfaction, associations between physical IPV and subsequent AUDIT scores were no longer detected and had a wider confidence interval (linear b: 0.69, 95% CI: -0.14, 1.51 &

quadratic b: -0.15, 95% CI: -0.34, 0.05). Associations between sexual and emotional IPV remained.

#### **4. DISCUSSION**

The results of this study provide some of the first data on the temporal relationship between IPV and alcohol use among LGBTQIA+ people in the US. While previous work with cisgender, heterosexual women suggests that the stress resulting from partner violence may result in incident increases in alcohol use (Abbey et al., 2004; Ogden et al., 2022), this relationship was largely unexplored in LGBTQIA+ relationships prior to this study. The results reported here add to the evidence base concerning the role of violence in substance use among LGBTQIA+ people and provide insight into potential points of intervention for the reduction of alcohol use in these communities and adding to the goals of the National Action Plan.

The results indicate that reporting any type of violence in the past year is related to a subsequent higher AUDIT score of 0.32 points. When broken down by typology, experiencing sexual violence had the strongest relationship with alcohol use and was related to greater AUDIT scores (1.76 points per sexual E-HITS point, recalling that E-HITS is a measure of the frequency of violence). Experiencing physical violence was associated with greater AUDIT scores of nearly three quarters of a point (0.72), while reporting emotional violence resulted in higher AUDIT scores of nearly half a point (0.45). These are consistent with studies of cisgender, heterosexual women, in which findings indicated increases in alcohol use in the year following IPV (La Flair et

al., 2012; Ogden et al., 2022). However, the differential effects by typology should be interpreted with caution given the fact that the E-HITS scale is designed as a screening tool for IPV and is not reflective of the full breadth of violence types experienced by LGBTQIA+ populations. Together, these findings suggest that interventions designed to reduce IPV (especially sexual IPV) and mitigate its harms may also decrease future alcohol use in LGBTQIA+ communities.

Conditioning on relationship status and satisfaction did not significantly attenuate the results found in the larger sample, a null finding which has important implications for future IPV research. One common limitation of IPV research in LGBTQIA+ populations is that samples are limited to those who reported currently being in a relationship (Juwono et al., 2023; Mustanski et al., 2019). However, those who were not currently in a relationship may have also recently experienced IPV and, in fact, may not be in a relationship for precisely that reason. This sub-analysis therefore suggests that inclusion criteria for IPV-related research should be agnostic to current relationship status. Additionally, individual-level interventions designed to understand patterns of relationships (e.g., partner selection, communication skills, relationship functioning) may help those not currently in a relationship to be more mindful about future relationships and therefore reduce their propensity to enter a(nother) violent relationship. While these types of individual interventions may provide some support, future work should concentrate on the context in which IPV occurs in order to change broader social norms (e.g., minority stress) that undergird the perpetration of relationship violence.

Here, we interrogated the relationship between IPV and alcohol use with both linear and quadratic functions. The results of this analysis suggest that there is a dose-response relationship

between IPV and alcohol use until a value of approximately 10 points on the E-HITS scale.

While the E-HITS ranges from 5-25, there are important variations in how a value of 10 can be calculated (e.g., one person may endure frequent emotional violence accompanied by infrequent of physical or sexual violence while another may endure rare instances of all five forms of violence measured). This initial glimpse into the dynamic relationship between IPV and alcohol use suggests that LGBTQIA+ people who experience lower scores on the E-HITS show increased levels of alcohol use, whereas those who have higher E-HITS scores show a more marginal effect on alcohol use beyond that already observed with mild-to-moderate alcohol use. There are several potential explanations for this finding. First, though we controlled for alcohol use disorder at baseline in the analysis, it may be that those who experience chronic violence may already cope with these added stressors through heavier use of alcohol use while not having received a diagnosis for alcohol use disorder, rendering the increases in alcohol use over the subsequent year marginal in nature. Second, those who experience more frequent IPV may turn to substances other than alcohol to cope with the additional stress of experiencing IPV. Previous studies suggest that men who have sex with men who report severe or frequent IPV have higher rates of illicit substance use (e.g., Wu et al., 2015) than those who report less frequent or severe IPV (e.g., Gezinski et al., 2021). Third, previous studies suggest that frequent instances of IPV often lead to the termination of a relationship, while less frequent instances of IPV are often endured for longer periods of time (Ackerman & Field, 2011; Gelles, 1976; Raghavan et al., 2005; Rhatigan et al., 2006), potentially compounding stress and leading to greater increases in alcohol use. Thus, reporting less frequent IPV may be indicative of more chronic violence and longer-term changes to the couple's relationship (e.g., breakdown in communication patterns, additional life stressors) that together lead to increased alcohol use. This may suggest that interventions targeting IPV and

alcohol should make a concerted effort to include those experiencing IPV less frequently, but are enduring IPV less often as part of a broader constellation of relationship dysfunction (Bresin et al., 2023). Additional research is needed to better understand the mechanisms that lead from IPV to increased alcohol use as well as how violence and alcohol use fit into couples' broader relationship contexts.

#### **4.1 Strengths and Limitations**

While this study contains important strengths, including its longitudinal design, robust methods, diverse sample, and theoretical grounding, there are important limitations to note. First, the measure of IPV, the E-HITS scale, is an IPV screener and is not meant to capture the full experience of IPV among LGBTQIA+ individuals. There are important forms of violence (e.g., “outing” or threatening to “out” someone, making fun of a partner based on gender expression) that fall outside the traditional measures of IPV and remain unaccounted for in most studies of IPV in these communities. Second, we did not control for other drug use or polydrug use, only alcohol use. LGBTQIA+ people may turn to (multiple) substances other than alcohol to cope with the stressors of existing as an LGBTQIA+ person in a cisheteropatriarchal society, as well as the other stressors due to their other intersectional identities (e.g., race-, ethnicity- socio-economic-based) that they may face. Future studies may query other substance use in relation to IPV. Even without accounting for other substance use, it is important to understand how IPV is related to alcohol use specifically given its ubiquitous nature in the US and high rates of use among these communities. Third, while The PRIDE Study is a diverse sample, stratified analyses by LGBTQIA+ sub-groups fall outside the scope of this study. Building on this initial study, future research focused on specific sexual identity (e.g., cisgender sexual minority men, lesbian



women, and asexual individuals) and gender identity (e.g., transgender men, transgender women, non-binary individuals of different sexual orientations) sub-groups should be conducted to better understand how interventions can be tailored to these specific communities. Finally, given that E-HITS was only included in The PRIDE Study beginning on 2021, we were only able to model the relationship between IPV on alcohol use across the two most recent years of the study. As The PRIDE Study cohort continues, we will be able to draw longer-term inferences on the effects of IPV on alcohol use.

## **5. CONCLUSION**

Together, the results of these analyses suggest that LGBTQIA+ relationships in The PRIDE study (nearly one-quarter) are deeply affected by relationship violence, and this can be measured in terms of alcohol use. Consistent with the Minority Stress Model, these results point to the need for additional research that can elucidate the means by which interpersonal and individual interventions can prevent and mitigate the harms of IPV.

This analysis represents a first step toward understanding the role of IPV in alcohol use among a marginalized and under-resourced population. By adding rigor to the existing evidence base, we aim to begin understanding the temporal relationship between violence and individual alcohol use outcomes. Our results demonstrate that experiencing IPV is related to increased alcohol use across a wide range of sexual and gender identities, providing a foundation on which to conduct additional analyses in specific communities that may yield important results for intervention development. Though exploratory in nature, this study is among the first to show the temporal relationship between IPV and alcohol use, paving the way for future interventions that include preventing and mitigating IPV as a component of broader interventions designed to reduce

alcohol use disparities in LGBTQIA+ communities, achieve the goals of the National Action Plan, and lead to health equity for this population.

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## TABLES

**Table 1.** Baseline participant characteristics

	<b>Total (n = 3783)</b>
Current age (years), mean (SD)	39.1 (14.9)
Gender identity, <sup>a</sup> no. (%)	
Agender	208 (5.5)
Cisgender man	643 (17.0)
Cisgender woman	892 (23.6)
Genderqueer	548 (14.5)
Man	784 (20.7)
Non-binary	980 (25.9)
Questioning	179 (4.7)
Transgender man	518 (13.7)
Transgender woman	214 (5.7)
Two-spirit	40 (1.1)
Woman	810 (21.4)
Another gender identity	257 (6.8)
Gender identity groups, no (%)	
Cisgender man	929 (24.6)
Cisgender woman	998 (26.4)
Gender diverse, assigned female at birth	954 (25.2)
Gender diverse, assigned male at birth	138 (3.6)
Transgender man	541 (14.3)
Transgender woman	223 (5.9)
Sexual orientation, <sup>a</sup> no. (%)	
Asexual	440 (11.6)
Bisexual	1148 (30.3)
Gay	1290 (34.1)
Lesbian	841 (22.2)
Pansexual	602 (15.9)
Queer	1738 (45.9)
Questioning	88 (2.3)
Same-gender loving	173 (4.6)
Heterosexual	73 (1.9)
Two-spirit	29 (0.8)
Another sexual orientation	163 (4.3)
Sexual orientation groups, no. (%)	
Asexual	110 (2.9)
Bisexual	306 (8.1)
Gay or Lesbian	1123 (29.7)
Pansexual	96 (2.5)

Queer	310 (8.2)
Heterosexual	35 (0.9)
Multiple options selected	1780 (47.1)
Other <sup>c</sup>	23 (0.6)
Ethnoracial identity, <sup>a,d</sup> no. (%)	
American Indian or Alaska Native	107 (2.8)
Asian	173 (4.6)
Black, African American or African	138 (3.6)
Hispanic, Latino or Spanish	227 (6.0)
Middle Eastern or North African	54 (1.4)
Native Hawaiian or other Pacific Islander	8 (0.2)
White	3478 (91.9)
Another ethnoracial identity	59 (1.6)
Education level, no. (%)	
High school or less	142 (3.8)
Some college	707 (18.7)
4-year college grad	1322 (34.9)
Advanced degree	1611 (42.6)
Missing	1 (0.0)
Current employment, no. (%)	
No	1004 (26.5)
Yes	2778 (73.4)
Missing	1 (0.0)
Individual income, no. (%)	
\$0-20,000	1095 (28.9)
\$20,001-50,000	1109 (29.3)
\$50,001-100,000	990 (26.2)
\$100,001+	563 (14.9)
Missing	26 (0.7)
Current Census region, no. (%)	
Northeast	776 (20.5)
Midwest	770 (20.4)
South	962 (25.4)
West	1253 (33.1)
Missing	22 (0.6)
Currently in relationship, no. (%)	
No	1261 (33.3)
Yes	2496 (66.0)
Missing	26 (0.7)
Relationship satisfaction (n = 2496), no. (%)	
Very dissatisfied	49 (1.3)
Dissatisfied	111 (2.9)
Neutral	189 (5.0)
Satisfied	857 (22.7)
Very satisfied	1289 (34.1)

Experienced any IPV	936 (24.7)
Physical IPV	133 (3.5)
Sexual IPV	772 (20.4)
Emotional IPV	904 (23.9)
Overall E-HITS, mean (SD)	5.65 (1.60)
Physical E-HITS, mean (SD)	2.06 (0.42)
Sexual E-HITS, mean (SD)	1.32 (0.73)
Emotional E-HITS, mean (SD)	2.54 (1.24)
Self-reported alcohol use disorder diagnosis, n	
(%)	136 (3.6)
AUDIT, mean (SD)	3.52 (4.13)

<sup>a</sup> Participants could select multiple responses; thus, the sum of percentages is greater than 100%.

<sup>b</sup> AMAB/AFAB= assigned male at birth, assigned female at birth, respectively

<sup>c</sup> Category includes participants who only self-identified as questioning, same-gender loving, or another sexual orientation

<sup>d</sup> Approximately 11% selected multiple ethnoracial identities.

SD, standard deviation; E-HITS, Extended-Hurt, Insulted, Threaten, Scream; AUDIT, Alcohol Use Disorders Identification Test.

**Table 2.** Adjusted associations between intimate partner violence and its subtypes with AUDIT scores among the total sample (n = 3783)

		<b>Adjusted b</b>	<b>95% CI</b>	<b>P-value</b>
Overall intimate partner violence	E-HITS	0.32	0.20, 0.45	<0.001
	E-HITS <sup>2</sup>	-0.03	-0.05, -0.01	<0.001
Types of intimate partner violence	Physical E-HITS	0.72	0.11, 1.33	0.020
	Physical E-HITS <sup>2</sup>	-0.16	-0.30, -0.03	0.020
	Sexual E-HITS	1.76	0.64, 2.89	0.002
	Sexual E-HITS <sup>2</sup>	-0.66	-1.07, -0.26	0.001
	Emotional E-HITS	0.45	0.26, 0.64	<0.001
	Emotional E-HITS <sup>2</sup>	-0.08	-0.13, -0.03	<0.001

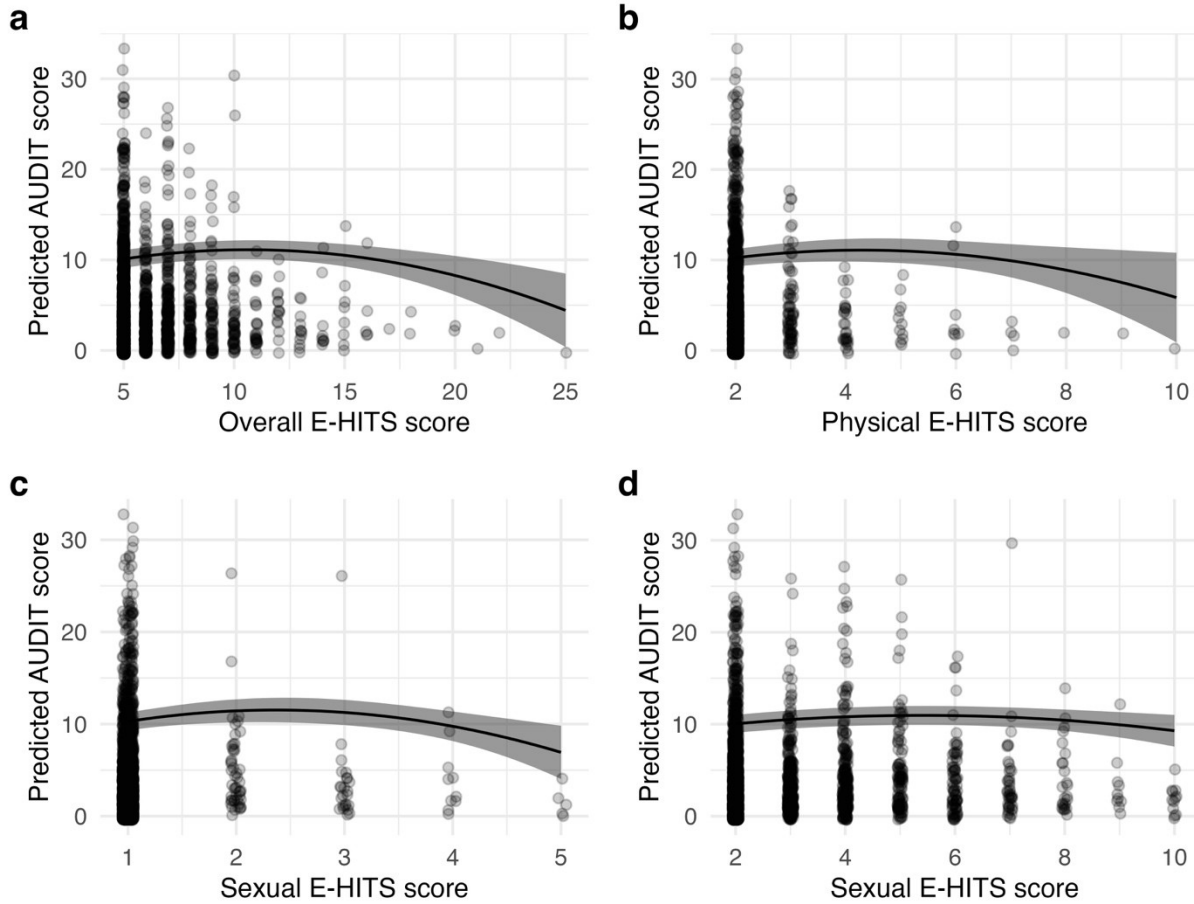
Models adjusted for age, gender identity groups, sexual orientation groups, education level, employment, individual income, baseline Census region, and baseline self-reported alcohol use disorder diagnosis. All E-HITS measures were mean centered. AUDIT, Alcohol Use Disorders Identification Test; E-HITS, Extended-Hurt, Insulted, Threaten, Scream; CI, confidence interval.

**Table 3.** Adjusted associations between intimate partner violence and its subtypes with AUDIT scores among participants currently in a relationship (n = 2496)

		<b>Adjusted b</b>	<b>95% CI</b>	<b>p-value</b>
Overall intimate partner violence	E-HITS	0.32	0.16, 0.49	<0.001
	E-HITS <sup>2</sup>	-0.03	-0.06, -0.01	0.005
Types of intimate partner violence	Physical E-HITS	0.69	-0.14, 1.51	0.104
	Physical E-HITS <sup>2</sup>	-0.15	-0.34, 0.05	0.145
	Sexual E-HITS	1.77	0.19, 3.36	0.029
	Sexual E-HITS <sup>2</sup>	-0.66	-1.30, -0.02	0.043
	Emotional E-HITS	0.42	0.19, 0.64	<0.001
	Emotional E-HITS <sup>2</sup>	-0.07	-0.13, -0.01	0.018

Models adjusted for age, gender identity groups, sexual orientation groups, education level, employment, individual income, baseline Census region, baseline self-reported alcohol use disorder diagnosis, and relationship satisfaction. All E-HITS measures were mean centered. AUDIT, Alcohol Use Disorders Identification Test; E-HITS, Extended-Hurt, Insulted, Threaten, Scream; CI, confidence interval.

**FIGURE**



**Figure 1.** Model-predicted AUDIT scores for a) overall E-HITS, b) physical E-HITS, c) sexual E-HITS, and d) emotional E-HITS. Fitted blue lines indicate predicted AUDIT scores, grey bands indicate 95% confidence intervals, black dots indicate raw AUDIT scores of individual participants. AUDIT, Alcohol Use Disorders Identification Test, E-HITS, Extended-Hurt, Insulted, Threaten, Scream.



## SUPPLEMENTAL MATERIALS

**Table 1.** Participants characteristics by current relationship status

	In a current relationship	
	No	Yes
No.	1261	2496
Age, mean (SD)	37.96 (15.89)	39.70 (14.30)
Gender identity groups, no (%)		
Cisgender man	318 (25.2)	605 (24.2)
Cisgender woman	272 (21.6)	720 (28.8)
Gender diverse, assigned female at birth	333 (26.4)	612 (24.5)
Gender diverse, assigned male at birth	52 (4.1)	86 (3.4)
Transgender man	212 (16.8)	324 (13.0)
Transgender woman	74 (5.9)	149 (6.0)
Sexual orientation groups, no. (%)		
Asexual	83 (6.6)	27 (1.1)
Bisexual	99 (7.9)	206 (8.3)
Gay or Lesbian	359 (28.5)	754 (30.2)
Pansexual	27 (2.1)	68 (2.7)
Queer	87 (6.9)	220 (8.8)
Heterosexual	3 (0.2)	31 (1.2)
Multiple options selected	595 (47.2)	1175 (47.1)
Other <sup>a</sup>	8 (0.6)	15 (0.6)
Ethnoracial identity, <sup>b</sup> no. (%)		
American Indian or Alaska Native	31 (2.5)	74 (3.0)
Asian	68 (5.4)	102 (4.1)
Black, African American or African	48 (3.8)	90 (3.6)
Hispanic, Latino or Spanish	74 (5.9)	150 (6.0)
Middle Eastern or North African	20 (1.6)	34 (1.4)
Native Hawaiian or other Pacific Islander	3 (0.2)	5 (0.2)
White	1151 (91.3)	2305 (92.3)
Another	20 (1.6)	38 (1.5)
Education level, no. (%)		
High school or less	75 (5.9)	65 (2.6)
Some college	292 (23.2)	407 (16.3)
4-year college grad	469 (37.2)	847 (33.9)
Advanced degree	424 (33.6)	1177 (47.2)
Missing	1 (0.1)	0 (0.0)
Employment, no. (%)		
No	409 (32.4)	586 (23.5)
Yes	852 (67.6)	1909 (76.5)
Missing	0 (0.0)	1 (0.0)
Individual Income, no. (%)		
\$0-20,000	487 (38.6)	597 (23.9)

\$20,001-50,000	385 (30.5)	717 (28.7)
\$50,001-100,000	251 (19.9)	734 (29.4)
\$100,001+	128 (10.2)	432 (17.3)
Missing	10 (0.8)	16 (0.6)
Region, no. (%)		
Northeast	255 (20.2)	516 (20.7)
Midwest	245 (19.4)	517 (20.7)
South	344 (27.3)	612 (24.5)
West	403 (32.0)	843 (33.8)
Missing	14 (1.1)	8 (0.3)
Overall E-HITS, mean (SD)	5.45 (1.63)	5.74 (1.52)
Physical E-HITS, mean (SD)	2.07 (0.44)	2.06 (0.37)
Sexual E-HITS, mean (SD)	1.05 (0.32)	1.03 (0.26)
Emotional E-HITS, mean (SD)	2.33 (1.15)	2.65 (1.25)
Self-reported alcohol use disorder diagnosis, n (%)	54 (4.3)	82 (3.3)
AUDIT, mean (SD)	3.17 (4.03)	3.55 (3.82)

<sup>a</sup> Category includes participants who only self-identified as questioning, same-gender loving, or another sexual orientation

<sup>b</sup> Non-mutually exclusive categories

SD, standard deviation; E-HITS, Extended-Hurt, Insulted, Threaten, Scream; AUDIT, Alcohol Use Disorders Identification Test.