Drinking Context and Intimate Partner Violence: Evidence From the California Community Health Study of Couples

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ABSTRACT. Objective: Couples in which one or both partners is a heavy or problem drinker are at elevated risk for intimate partner violence (IPV), yet little is known about the extent to which each partner's drinking in different contexts (volume consumed per setting in bars, parties, at home, or in public places) increases the likelihood that partner aggression will occur. This study examined associations between the volume consumed in different settings by each partner and the occurrence and frequency of IPV. **Method:** We obtained a geographic sample of married or cohabiting couples residing in 50 medium to large California cities. Cross-sectional survey data were collected via confidential telephone interviews (60% response rate). Logistic and negative binomial regression analyses were based on 1,585 couples who provided information about past-12-month IPV, drinking contexts (number of times attended, proportion of drinking occasions when attended, average number of drinks), frequency of intoxication, and psychosocial and demographic factors. Drinking context–IPV associations for each partner were adjusted for the other partner's volume for that context and other covariates. **Results:** Male partner's volume per setting for bars and parks or public places was associated with the occurrence and frequency of male-to-female IPV and female-to-male IPV. Male's volume per setting for quiet evening at home was associated with the occurrence of female-to-male IPV; female partner's volume for this setting was associated with the frequency of male-to-female IPV and female-to-male IPV. **Conclusions:** Among couples in the general population, each partner's drinking in certain contexts is an independent risk factor for the occurrence and frequency of partner aggression. (*J. Stud. Alcohol Drugs, 73,* 731–739, 2012)

INTIMATE PARTNER VIOLENCE (IPV) is a global public health problem. A study of 10 nations from around the world found national past-12-month IPV prevalence rates ranging from 4% (Japan) to 54% (Ethiopia) (World Health Organization, 2005). Within the Americas, a 10-nation study showed that past-2-year prevalence of male-to-female partner violence (MFPV) ranged from 4.4% to 19.8%. Data from male respondents in 9 of these 10 countries revealed that female-to-male partner violence (FMPV) prevalence rates ranged from 3.1% to 14.5% (Graham et al., 2008). Population-based surveys within the United States (Schafer et al., 1998; Smith et al., 2011; Whitaker et al., 2007) and the United Kingdom (Graham et al., 2004) have found that rates of FMPV equal or exceed the rates of MFPV. Of note, adolescent females perpetrate dating violence at higher rates than their male peers (Jain et al., 2010; Magdol et al., 1997; Rothman et al., 2011). Women, however, are more likely than men to sustain injury as a result of IPV (Archer, 2000), and they also report greater levels of fear, upset, and anger (Graham et al., 2008). Because IPV can have devastating consequences for each partner (Fletcher, 2010; Reid et al., 2008; Rhodes et al., 2009; Straus et al., 2009) and for children exposed to the marital aggression of their parents (Klostermann and Kelley, 2009; O'Campo et al., 2010), and because a woman's perpetration of IPV is a strong predictor of her own victimization (Stith et al., 2004), it is important to determine risk factors for both MFPV and FMPV to inform effective screening, prevention, and intervention efforts aimed at reducing all forms of family violence.

Couples in which at least one partner is a heavy or problem drinker are at elevated risk for IPV (Foran and O'Leary, 2008). Moreover, results from the international GENACIS study indicate that self-reported IPV severity was significantly higher for incidents in which one or both partners had been drinking. These findings were consistent for men and women and across respondents from 13 countries (Graham et al., 2011). One important but largely unexplored circumstance that may contribute to the likelihood of IPV is a partner's preferred drinking context (e.g., at bars, at home, or in public spaces). Considerable empirical evidence links certain drinking locations, especially bars and public places (e.g., parks, beaches, parking lots), with increased likelihood of aggressive behavior (Graham et al., 2006; Treno et al., 2008; Wells et al., 2005). For example, in a pooled analysis of respondents from three U.S. National Alcohol Surveys (1984, 1995, and 2005), Nyaronga et al. (2009) found that

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those who did most of their drinking in bars (and also drank in other venues) were significantly more likely to report arguments and fighting in the past 12 months compared with those who were light drinkers. These "bar-plus" drinkers were also more likely to report problems with their spouses, although this association varied by respondent gender and race/ethnicity. In contrast, respondents who primarily drank at home were not at elevated risk for arguments, fighting, or problems with their spouses compared with light drinkers (Nyaronga et al., 2009), which is largely consistent with the findings and theoretical framework of Gruenewald and his colleagues (Gruenewald, 2007; Gruenewald et al., 2002). Among a sample of male and female patients at a clinic for treatment of sexually transmitted infections in St. Petersburg, Russia, Zhan et al. (2011) found that those who usually drank on the streets or in parks were significantly more likely to report recent partner violence perpetration than those who did not usually drink in this context. Those who usually drank in other venues (e.g., home, bar, restaurant, nightclub, friend's party) were not at elevated risk for IPV.

The current study, using a geographic sample of married/cohabiting couples residing in 50 medium to large California cities, seeks to refine our understanding of the alcohol–IPV link by examining whether drinking in particular contexts increases the risk for IPV after accounting for each partner's overall risky drinking behavior (frequency of intoxication) and established psychosocial (Anda et al., 2006) and demographic (Cunradi, 2007) IPV risk factors. If certain drinking contexts are associated with elevated risk for IPV, then these findings could be incorporated into and increase the effectiveness of screening, treatment, and prevention programs. Based on previous empirical and theoretical work, we hypothesized that the volume of alcohol consumed by each partner in each of three settings (bars, parties, and parks and public places) would be associated with increased likelihood of IPV. Conversely, we hypothesized that the volume of alcohol consumed by each partner in restaurants would not be associated with elevated IPV risk. We had no a priori hypotheses concerning the association between IPV and drinking in the context of a quiet evening at home or while friends dropped over and visited.

Method

Sample and survey procedures

All procedures were approved by the institutional review board of the Pacific Institute for Research and Evaluation, and a Federal Certificate of Confidentiality was obtained from the National Institute on Alcohol Abuse and Alcoholism. The initial geographic sampling frame was restricted to 138 California cities with 2000 census populations between 50,000 and 500,000. We built our sample of geographically distinct cities by applying a sequence of adjacency tests to our initial set of midsize cities. First, each of the 138 cities was assigned a random number, and the city with the lowest number was selected. The next city in the numerical sequence was then compared with the first city. If this subsequent city was not near (within two cities of) the selected city, it was retained, and the next city in the numerical sequence was then compared with the retained cities. If a city failed this adjacency test (i.e., was within two cities of any retained city), it was rejected from the sample and the next city in the numerical sequence was tested. This procedure was repeated until a sample of 50 cities was obtained. The sample of 50 cities is not a simple random sample of these places but rather a purposive sample of cities intended to maximize validity with regard to the geography and ecology of the state (Lipperman-Kreda et al., 2012). Selected cities tended on average to have smaller populations, less ethnic diversity (e.g., 64% vs. 59% White), smaller households (2.82 vs. 2.93 persons), lower median household incomes ($50,000 vs. $52,000), and higher alcohol outlet densities (e.g., 1.38 vs. 1.15 on-premise outlets per 1,000 residents) relative to the entire 138-city sampling frame, but none of these differences were statistically significant.

Our goal was to recruit approximately 40 couples from each of the 50 cities for a final sample of 2,000 couples (4,000 individuals). Beginning in February 2010 and before telephone recruitment, we mailed a letter announcing the Community Health Study of Couples to all listed sample points (addresses) in a purchased sample of addresses and telephone numbers of households drawn from credit card records, utility company records, and magazine subscription lists (with overlapping/duplicate records removed). Trained, professional survey interviewers attempted to contact potential respondents (n = 28,642) via telephone 3–7 days after potential respondents received the mailing. When a residence within a targeted city was reached, we asked to speak with an adult age 18 or older to ascertain household composition (i.e., numbers of and relationships among adults living in the household). Households with couples who (a) were married or cohabiting, (b) had lived together for at least 12 months at the time of the survey interview, (c) were between 18 and 50 years old, and (d) were fluent in English or Spanish were considered eligible for inclusion. A large proportion of the listed sample (54%) was ineligible to participate because they did not meet study inclusion criteria or had a nonworking or disconnected telephone number. An additional 6,417 potential respondents were never contacted (e.g., no answering machine, no response despite numerous attempts); their eligibility status is unknown. Another 4,508 potential respondents were contacted but refused participation before they could be screened for eligibility.

If the potential respondent expressed interest in the study, informed consent was obtained. The consent procedure emphasized the confidential nature of the interview and the voluntary nature of participation. Potential respondents who

wished to continue were allowed to participate during the initial telephone contact or to schedule the interview for a more convenient time when privacy could be assured. A toll-free number was provided to respondents who wished to call back at their own convenience or from a location other than their home.

In all cases, trained, professional survey interviewers first spoke with the female partner in the couple using computer-assisted telephone interviewing procedures. If the female partner reported that she had experienced severe IPV (e.g., had been beaten up by her partner), the interviewer asked her permission before contacting her male partner for his interview (in which no questions about IPV were asked). Otherwise, the male partner was contacted for the full interview following completion of the female partner's interview. Sixteen women reported that they experienced severe IPV; all gave permission for their male partner to be interviewed. Each respondent was sent a $40.00 check as compensation for his or her participation, along with a bilingual fact sheet on the 2-1-1 information system for connecting individuals with a variety of social service agencies and organizations. To our knowledge, no adverse events occurred during or following survey data collection as a result of participation in the study. Data collection activities concluded in September 2010. Although the full Council of American Survey Research Organizations (CASRO) or Institute for Social and Economic Research (ISER) response rate was 59.5%, the cooperation rate was 78.3% (Lynn et al., 2001). The calculation of the CASRO response rate takes into account the large number of potential respondents whose eligibility is unknown. A total of 2,135 women completed survey interviews, along with 1,972 of their male partners.

Measures: Outcome variables

Intimate partner violence (occurrence). Respondents were asked about physically aggressive acts their spouse or partner may have committed against them or that they may have committed against their spouse or partner during the past 12 months. These acts were measured with the physical assault subscale of the revised Conflict Tactics Scales. Straus and colleagues (1996) reported that the internal consistency reliability (α) for this subscale was .86. The subscale asks about the occurrence of 12 behaviors, including moderate aggression (e.g., pushing or shoving, grabbing) and severe aggression (e.g., choking, beating up). Separate variables were created for MFPV and FMPV. Violence was considered to have occurred if at least one partner reported a violent incident in the past year, regardless of whether the incident was corroborated by the other partner. Thus, if either partner reported the occurrence of a violent incident, the partner violence variable (MFPV or FMPV, depending on the gender of the perpetrator) was coded 1; if neither reported an incident, the variable was coded 0. This method allows for the correction of underreporting of violence common in one-partner data (Caetano et al., 2000). The level of agreement between partners as to the occurrence of past-year MFPV and FMPV was tested using Cohen's κ statistic (Schafer et al., 1998).

Intimate partner violence (frequency). Frequency measures of MFPV and FMPV were created based on each partner's report of 12 aggressive behaviors (as described above) that they may have perpetrated against their partner and that their partner may have perpetrated against them. The frequency of each act was valued using the midpoint of each category: *never* (0), *once* (1), *twice* (2), *3–5 times* (4), *6–10 times* (8), and *more than 10 times* (15). The number of acts for both MFPV and FMPV were then summed. If the male and female partner reported discordant scores, the higher of the two scores was used to minimize underreporting.

Measures: Independent variables

Drinking context. Measurement of drinking context was modeled after the procedures described by Nyaronga et al. (2009). Each respondent was asked how often in the past year he or she went out to a restaurant (not including fast-food places); went to bars, taverns, or cocktail lounges; went to parties at someone else's home; spent a quiet evening at home; had friends drop over and visit in their home; and hung around with friends in a public place, such as a park, street, or parking lot. Responses ranged from 0 to 365 days. Next, respondents were asked how often they had at least one drink in each context, with response categories of *never, less than half the time, about half the time, more than half the time,* and *almost all the time.* These values were coded as 0, 0.25, 0.5, 0.7, and 0.9, respectively. Finally, respondents who drank in each setting were asked how many drinks they typically had. Respondents who reported an average number of drinks greater than 30 ($n = 5$) were recoded to 30. Volume per setting was calculated as [frequency of involvement × proportion of drinking occasions × typical number of drinks]. To reduce skew, volume + 1 values in each setting were logged, consistent with Nyaronga et al. (2009).

Frequency of intoxication. Each partner reported how many times during the past 12 months he or she drank "enough to feel intoxicated or drunk."

Demographic factors. Because the ages of partners were strongly correlated ($r = .79$), using them as separate predictors proved to be problematic because of high collinearity. We therefore used a couple-level average of partners' ages (i.e., sum of female partner age and male partner age, divided by 2). Educational attainment consisted of four categories: did not graduate from high school or obtain a General Educational Development (GED) credential, graduated from high school or obtained a GED, enrolled in or completed some post–high school education/training (vocational training, some college, or an associate's degree),

and graduated with a bachelor's degree or completed some postgraduate education. In the models presented below, this measure was treated as a nominal variable, with the bachelor's degree or higher category serving as the reference category. Self-reported race/ethnicity was categorized as Hispanic/Latino, non-Hispanic Black/African American, Asian/Asian American/Pacific Islander, multiracial/other, and non-Hispanic White/Caucasian. In the models reported below, non-Hispanic White was treated as the reference category. A composite score was created for each partner based on the Financial Strain Index used in the main adult survey of the Welfare, Children and Families study (Coley et al., 2007). Because response scales varied widely across the seven items, we used *z* score transformations of raw item scores (i.e., $M = 0$, $SD = 1$) and then computed a composite score for each partner using the transformed item scores (Cronbach's $\alpha = .82$ and .79 for women and men, respectively). Because of high collinearity between partners' scores ($r = .61$), we computed a mean financial strain composite score for the couple.

Psychosocial characteristics

Impulsivity. This construct was measured with a three-item scale based on questions that originated in the U.S. National Alcohol Survey and have been used in previous IPV studies (Caetano et al., 2000). Respondents were asked to describe how well each of the following statements described them: "I often act on the spur of the moment without stopping to think"; "You might say I act impulsively"; and "Many of my actions seem to be hasty." Response options ranged from 1 (*quite a lot*) to 4 (*not at all*). Items were reverse-coded before computing separate composite scores for each partner (Cronbach's $\alpha = .76$ and .78 for women and men, respectively).

Adverse childhood experiences. Childhood exposure to violence, alcoholism, and other adverse events was measured with a modified version of the Adverse Childhood Experiences (ACE) scale (Felitti et al., 1998). The modified ACE (Cabrera et al., 2007) covers six categories of experiences respondents may have experienced while they were growing up (physical, psychological, or sexual abuse; parent/caregiver alcoholism, depression, or mental illness; and mother/caregiver victim of domestic violence). A scale of exposure to adverse childhood experiences, ranging from 0 to 6, was created by summing the number of affirmative responses. A separate ACE score was computed for each partner (Cronbach's $\alpha = .66$ and .59 for women and men, respectively).

Analytic strategy.

We used logistic regression models to analyze the associations between volume per drinking context and the occurrence of MFPV and FMPV. We estimated 12 logistic regression models: 6 with MFPV as the outcome and 6 with FMPV as the outcome. A male and female log volume per setting score was included in the same model for each of the six drinking settings. All models included demographic and psychosocial variables, financial strain, and frequency of intoxication as covariates. A complementary set of models was run to examine the frequency of MFPV and FMPV using negative binomial regression. Because the outcome count measure was highly skewed, and in order to use a modeling strategy with few assumptions, we used negative binomial regression with a log link function as suggested by Testa and colleagues (2012). The coefficients of these models can be interpreted as the difference in the logs of the expected counts of IPV events for 1-unit increases in log volume drinking. Model coefficients were transformed to represent risk ratios. All risk ratios were adjusted for demographic and psychosocial variables, financial strain, and frequency of intoxication. Of the 1,972 sampled couples, 1,817 had complete demographic and psychosocial information for both partners. Of these, 1,604 couples had information on all drinking contexts. An additional 19 couples were missing information on MFPV, FMPV, or both, leaving a final sample size of 1,585 couples.

Results

Couple characteristics

Couple characteristics are shown in Table 1. The mean age of couples was 41.9 years ($SD = 5.5$). In terms of education, slightly more than half of male and female partners had at least a college degree. Most respondents (71%) categorized themselves as White, and approximately 16% described themselves as Hispanic or Latino. Approximately 6.4% of couples reported past-12-month MFPV, and 9.5% reported past-12-month FMPV. The level of dyadic agreement beyond chance as to the occurrence of MFPV ($\kappa = .22$) and FMPV ($\kappa = .32$) was low based on values suggested in Fleiss (1981). The mean frequency of MFPV was 0.19 ($SD = 1.27$), and the mean frequency of FMPV was 0.33 ($SD = 2.67$). Chi-square analyses (data not shown) revealed that couples with incomplete data on the model covariates ($n = 357$) were no more or less likely to report MFPV or FMPV than couples with complete data on all covariates ($p = .56$ and $p = .34$, respectively). On average, women reported drinking to intoxication 2.1 times in the past 12 months ($SD = 15.2$), and men reported 4.4 episodes of intoxication ($SD = 20.7$). Table 2 reports the mean and standard deviation of each log volume per drinking setting. Both men and women had the highest volume during a quiet evening at home, followed by restaurants. The lowest volume for both partners was for parks and public places.

Table 1. Descriptive statistics for demographic and psychosocial characteristics (n = 1,585 couples)

Continuous variables	*M*	(*SD*)
Financial strain, couple	-0.03	(0.6)
Age, couple	41.9	(5.5)
No. of times intoxicated, past 12 months		
Female	2.1	(15.2)
Male	4.4	(20.7)
Impulsivity		
Female	1.5	(0.6)
Male	1.6	(0.6)
Adverse childhood experiences		
Female	0.9	(1.3)
Male	0.7	(1.1)
Categorical variables	***n***	**(%)**
Any past-12-month MFPV	102	(6.4%)
Any past-12-month FMPV	151	(9.5%)
Education		
Female		
Did not graduate from high school	83	(5.2%)
High school graduate/GED	200	(12.6%)
Some post–high school education	479	(30.2%)
BA/BS degree or higher	823	(51.9%)
Male		
Did not graduate from high school	88	(5.6%)
High school graduate/GED	222	(14.0%)
Some post–high school education	435	(27.4%)
BA/BS degree or higher	840	(53.0%)
Race/ethnicity		
Female		
Hispanic/Latina	281	(17.7%)
Black	35	(2.2%)
Asian	70	(4.4%)
Other	70	(4.4%)
White	1,129	(71.2%)
Male		
Hispanic/Latino	260	(16.4%)
Black	49	(3.1%)
Asian	61	(3.9%)
Other	86	(5.4%)
White	1,129	(71.2%)

Notes: MFPV = male-to-female partner violence; FMPV = female-to-male partner violence; GED = General Educational Development credential; BA = bachelor of arts; BS = bachelor of science.

Table 2. Means and standard deviations for measures of log volume of alcohol consumed for each drinking context (n = 1,585 couples)

Male partner	*M*	(*SD*)
Restaurants	1.7	(1.5)
Bars	1.1	(1.4)
Party at another house	1.3	(1.3)
Quiet evening at home	2.6	(2.4)
Friends at your home	1.6	(1.7)
Parks and public places	0.4	(1.0)
Female partner		
Restaurants	1.4	(1.5)
Bars	0.8	(1.2)
Party at another house	1.0	(1.2)
Quiet evening at home	2.2	(2.3)
Friends at your home	1.3	(1.5)
Parks and public places	0.3	(0.8)

Bivariate analysis

Correlations between the male's and female's volume per setting were examined for the six drinking settings (data not shown). The strongest correlation (r = .54) was for restaurants, followed by bars (r = .51), parties at another's home (r = .46), friends over at one's home (r = .41), and quiet evening at home (r = .39). The smallest correlation was for parks and public places (r = .08).

Male-to-female partner violence

Table 3 shows the results of six separate logistic regression and negative binomial regression models of each partner's drinking in each setting in relation to MFPV. Regarding the logistic regression models, each odds ratio (OR) in the table is adjusted for the other partner's corresponding drinking context variable as well as each partner's own frequency of intoxication and the demographic and psychosocial characteristics of the couple. The results show that four of the six drinking contexts of the male partner were associated with increased likelihood of MFPV. Specifically, the male partner's volume per setting in bars (OR = 1.41, 95% CI [1.20, 1.65]), at parties at another's home (OR = 1.20, 95% CI [1.01, 1.43]), while having friends over at one's own home (OR = 1.17, 95% CI [1.02, 1.33]), and in parks and public places (OR = 1.36, 95% CI [1.16, 1.60]) were linked with elevated risk for MFPV. None of the female partner's drinking contexts increased the couple's risk for the occurrence of MFPV, nor did either partner's frequency of intoxication. In terms of the negative binomial models, each risk ratio in the table is adjusted for the other partner's corresponding drinking context variable as well as each partner's own frequency of intoxication and the demographic and psychosocial characteristics of the couple. Model results for the frequency of MFPV were qualitatively similar to the logistic regression model results. Of note, the female partner's volume per setting for "quiet evening at home" was significantly associated with frequency of MFPV (risk ratio [RR] = 1.15, 95% CI [1.01, 1.31]).

Female-to-male-partner violence

The results of six separate models for the occurrence and frequency of FMPV in relation to the couple's drinking contexts are shown in Table 3. As with the models of MFPV, each FMPV model is adjusted for the other partner's drinking context variables as well as each partner's frequency of intoxication and the demographic and psychosocial characteristics of the couple. Regarding the logistic regression models, the results show that three of the six drinking contexts of the male partner were associated with the couple's increased risk for the occurrence of FMPV. These include the male partner's volume per setting in bars (OR = 1.20, 95% CI [1.05, 1.37]), during a quiet evening at home (OR = 1.09, 95% CI [1.01, 1.18]), and in parks and public places (OR =

TABLE 3. Adjusted odds ratios (ORs), risk ratios (RRs), and 95% confidence intervals (CIs) [in brackets] for associations between log volume of alcohol consumed in each drinking context and male-to-female partner violence (MFPV) and female-to-male partner violence (FMPV), occurrence of intimate partner violence, and frequency of intimate partner violence (n = 1,585 couples)

Variable	Logistic regression OR [95% CI]	Negative binomial regression RR [95% CI]
MFPV as outcome		
Male partner drinking contexts		
Restaurants	1.15 [0.98, 1.36]	1.12 [0.90, 1.42]
Bars	1.41 [1.20, 1.65]*	1.39 [1.10, 1.75]*
Parties at another house	1.20 [1.01, 1.43]*	1.26 [0.99, 1.60]
Quiet evenings at home	1.07 [0.97, 1.18]	1.04 [0.92, 1.17]
Friends at your home	1.17 [1.02, 1.33]*	1.06 [0.88, 1.28]
Parks and public places	1.36 [1.16, 1.60]*	1.46 [1.11, 1.91]*
Female partner drinking contexts		
Restaurants	1.08 [0.90, 1.29]	1.03 [0.80, 1.34]
Bars	0.87 [0.71, 1.07]	0.86 [0.64, 1.15]
Parties at another house	1.10 [0.91, 1.34]	1.09 [0.83, 1.44]
Quiet evenings at home	1.08 [0.98, 1.19]	1.15 [1.01, 1.31]*
Friends at your home	1.02 [0.88, 1.18]	1.13 [0.92, 1.39]
Parks and public places	1.03 [0.81, 1.30]	1.17 [0.86, 1.58]
FMPV as outcome		
Male partner drinking contexts		
Restaurants	1.02 [0.89, 1.17]	1.07 [0.88, 1.32]
Bars	1.20 [1.05, 1.37]*	1.27 [1.05, 1.55]*
Parties at another house	1.09 [0.94, 1.26]	1.14 [0.93, 1.40]
Quiet evenings at home	1.09 [1.01, 1.18]*	1.11 [0.99, 1.24]
Friends at your home	1.10 [0.98, 1.23]	1.02 [0.87, 1.20]
Parks and public places	1.21 [1.05, 1.40]*	1.35 [1.07, 1.70]*
Female partner drinking contexts		
Restaurants	1.06 [0.92, 1.23]	1.09 [0.86, 1.35]
Bars	0.87 [0.73, 1.04]	0.94 [0.73, 1.21]
Parties at another house	0.98 [0.83, 1.16]	1.01 [0.80, 1.27]
Quiet evenings at home	0.97 [0.89, 1.06]	1.14 [1.02, 1.28]*
Friends at your home	0.95 [0.84, 1.07]	1.07 [0.90, 1.28]
Parks and public places	0.96 [0.78, 1.19]	1.17 [0.91, 1.51]

Notes: ORs and RRs are adjusted for mean age (couple), mean financial strain (couple), adverse childhood experiences (male and female), race/ethnicity (male and female), education (male and female), impulsivity (male and female), and frequency of intoxication (male and female).
*$p < .05$.

1.21, 95% CI [1.05, 1.40]). The female partner's drinking contexts were not associated with the couple's risk for the occurrence of FMPV, nor were either partner's frequency of intoxication. Results for the FMPV negative binomial models were qualitatively similar to the results of the FMPV logistic regression models. As with the MFPV binomial regression results, the female partner's volume for the setting of quiet evening at home was significantly associated with the frequency of FMPV (RR = 1.14, 95% CI [1.02, 1.28]). The results were consistent when limiting the sample to drinkers only (n = 982 couples; data not shown but available from authors).

Discussion

To our knowledge, this is the first study to examine associations between male and female partner's drinking in various contexts and the risk for past-12-month IPV in a sample of married/cohabiting couples drawn from the general household population. Overall, findings for each type of aggression were consistent across both types of models (occurrence and frequency). Some of the hypothesized associations were observed; for example, drinking volume in particular locations or contexts, such as bars, parties, and parks and public places, was associated with elevated risk for partner violence after taking into account the frequency of intoxication and other demographic and psychosocial IPV risk factors. Most of these associations, however, were significant for the male partner only. Specifically, the male partner's volume per setting in bars, parties at another home, and parks or public places was associated with elevated risk for MFPV. The male partner's volume per setting when friends dropped over and visited was also linked with increased MFPV risk. In addition, the male partner's volume per setting in bars and parks and public places was associated with an elevated risk for FMPV, as was (unexpectedly) the male partner's volume per setting during quiet evenings at home. None of the hypothesized associations between the female partner's context-specific drinking and IPV were significant. Interestingly, the female partner's volume per setting during

quiet evenings at home was significantly associated with the frequency of MFPV and FMPV.

The findings suggest that environmental factors, especially certain settings in which the male partner drinks, confer additional risk for IPV perpetration and victimization and need to be considered within the framework of the couple's interactions and characteristics. For example, the largest volume values for both partners were for alcohol consumed during a quiet evening at home. For this setting, the male partner's alcohol volume was associated with the occurrence of FMPV; the female partner's volume was associated with the frequency of MFPV and FMPV. One possible explanation is that the male partner's drinking becomes a catalyst for conflict that escalates into aggression on the part of the female partner. This explanation is consistent with longitudinal findings showing that husbands' excessive drinking was predictive of wives' partner aggression (Schumacher et al., 2008). Data for the current study do not allow us to determine the temporal relationship between both partners drinking in the home and the occurrence of IPV nor whether both partners' aggression occurred during the same episode. Moreover, by asking about "a quiet evening at home," the question may have cued respondents to include in their count of nights drinking at home only those occasions that did not involve conflict with their partner. The current findings may therefore underestimate drinking at home as well as the association between drinking at this location and IPV.

Associations between male partner's drinking in bars and parks and public places and both MFPV and FMPV is in accord with other studies linking drinking in these locations with aggression and other negative consequences (Nyaronga et al., 2009). The lack of association between female partner's drinking in these locations and either type of IPV may reflect the lower levels of attendance and drinking at these public venues among married women (Bond et al., 2010). Other studies have found younger female bar drinkers to be at risk for engaging in physical aggression with other patrons and sexual risk-taking behavior (Collins et al., 2007; Parks et al., 2009), but these studies did not assess risk for IPV. Zhan et al. (2011) found that patients in Russian sexually transmitted infection clinics who usually drank on the street or in parks were at elevated risk for IPV perpetration but did not find those who usually drank in other venues, including bars, to be at increased risk. Our results linking risk for MFPV with the male partner's volume of drinking at parties at another house and when friends drop over to visit are consistent with findings reported by Treno et al. (2008), in which self-reported hostility and norms for alcohol-related aggression were related directly to drinking at bars and pubs, parties, and friends' homes. Last, it is instructive to compare the current results with findings of a pilot study by Freisthler (2011), which showed that in a convenience sample of parents frequent drinking and frequently going to bars, parties in a parent's home, and parties in friends' homes were positively related to physical child abuse. Despite numerous differences between the two studies, these results do point to the importance of considering not just the amount of alcohol consumed but also the context of drinking in relation to violent and aggressive behavior. Freisthler (2011) suggests that time spent in these drinking venues provides opportunities to mix with others who may share (and reinforce) similar violence-related norms and attitudes. Although our current data do not allow us to test this hypothesis, such interactions could plausibly account for the current findings.

The findings of the current study must be interpreted with certain limitations in mind. First, because of the cross-sectional study design, it is not possible to make causal inferences from the observed associations. Studies using longitudinal designs (e.g., diary methods) for assessing alcohol consumption and related activities can afford more rigorous examination of the temporal relations between volume consumed in each drinking context and IPV. Although we obtained data on drinking context for both partners in each dyad, we have no information on whether partners were together during these drinking occasions, precluding a test of the potential impact of these patterns. Our measures of drinking context combine the frequency of attending and the average quantity consumed within each drinking location. Although this provides strong evidence of the heterogeneity in associations between IPV and drinking contexts, it does not allow us to differentiate between frequency and volume of alcohol consumption within each location. Also, the study's recruitment methods relied on households having landline telephones. Because young adults are increasingly living in wireless-only households (Blumberg et al., 2011), these methods may have limited the participation of younger couples (ages 18–29 years). Because this age group has been shown to have the highest rates of both IPV and heavy drinking, our findings could represent an underestimate of the association between drinking volume in each context and IPV. In addition, slightly more than half of the study's male and female partners reported being college graduates, which represents a higher level of educational attainment relative to the California state average. Because some studies have found an inverse relationship between education level and IPV (e.g., Cunradi, 2007; Sorenson et al., 1996), a more highly educated sample might show lower rates of IPV, thus making it somewhat less likely that we would be able to detect associations between IPV and our predictors of interest. Finally, no data were collected on a number of potential confounders of the associations under study, including level of anger, hostility, and psychological aggression (Frye and Karney, 2006; Schumacher et al., 2008; Shorey et al., 2011).

Despite these limitations, our results provide evidence that among couples in the general population, each partner's drinking volume in specific contexts is an independent risk factor for the occurrence and/or frequency of partner aggression. To translate these findings into IPV prevention, how-

ever, additional research is needed to identify the underlying mechanisms that link some drinking contexts with increased IPV risk. This includes obtaining more precise information on the temporal relationships between each partner's drinking contexts and the occurrence of aggressive behaviors, the extent that couples drink together (or separately) in these contexts, and the influence of the social environment (e.g., bars) on the drinker.

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