Contributions of Work Stressors, Alcohol, and Normative Beliefs to Partner Violence

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ABSTRACT. Objective: A body of research has established that lower socioeconomic populations, including blue-collar workers, are at higher risk for problem drinking and intimate partner violence. This study of married/cohabiting construction workers and their spouses/partners describes how work stressors, hazardous drinking, and couple characteristics interact to influence normative beliefs around partner violence and, thereafter, its occurrence. **Method:** Our survey respondents from a sample of 502 dual-earner couples were asked about drinking patterns, past-year partner violence, normative beliefs about partner violence, work-related stressors, impulsivity, and childhood exposure to violence and other adverse events. We conducted semi-structured qualitative interviews with 81 workers on context of work stress, partner violence, and drinking. **Results:** Analyses of data revealed that men's and women's normative beliefs about partner violence were positively related to male-to-female partner violence; female partner violence normative beliefs were associated with female-to-male partner violence. Both partners' levels of impulsivity were directly associated with male-to-female and female-to-male partner violence, and male partner's frequency of intoxication mediated the association between level of impulsivity and male-to-female partner violence. Female partner's adverse childhood experience was directly associated with male-to-female partner violence. Both survey and qualitative interviews identified individual and work-related factors that influence the occurrence of violence between men and women. **Discussion:** These findings provide guidelines for prevention of partner violence that can be implemented in the workplace with attention to hazardous drinking, job stress, treatment, education, and work culture. (*J. Stud. Alcohol Drugs, 74,* 195–204, 2013)

APPROXIMATELY 20% OF U.S. COUPLES experienced at least one episode of intimate partner violence (IPV) within the previous year (Schafer et al., 1998), indicating that IPV is a significant public health problem. Results from the 1995 National Study of Couples indicate that almost half of IPV events are mutual (Caetano et al., 2005), although women are more likely than men to sustain injuries (Archer, 2000). General population samples show that IPV prevalence is highest among younger couples, racial/ethnic minorities, and couples with objective and subjective household indicators of lower socioeconomic status, including lower income, financial distress, lower education, and unemployment (Bachman and Saltzman, 1995; Field and Caetano, 2004). These indicators often characterize blue-collar couples. What remain unclear are the occupational and personal background characteristics associated with these predictors.

This study adds to existing literature by testing the contribution of work-related stressors, hazardous drinking, and normative beliefs about IPV to the risk of partner violence among heterosexual couples. In their review of research on intoxicated aggression, Graham et al. (1998) proposed that changing societal/cultural norms regarding violence in the context of drinking (e.g., drinking limiting one's responsibility for engaging in IPV) may be a crucial first step toward preventing alcohol-related aggression. Norms typically refer to expected social behavior (Sherif, 1965) and are defined as either the subjective perception of the extent to which significant others approve or disapprove of a particular behavior (Ajzen and Fishbein, 1980) or the extent to which significant others engage in the behavior themselves (Grube and Morgan, 1990).

Based on evidence showing links between normative beliefs and workplace drinking behavior (Ames et al., 2000) and building on our pilot research focusing on the association between perceived IPV approval and past-year IPV perpetration among construction workers (Cunradi et al., 2008), we designed the present study to investigate the influence of normative beliefs on risk of IPV. The association between increased IPV risk and hazardous alcohol use has been widely documented in the literature (Caetano et al., 2000; Leonard, 1993; O'Leary and Schumacher, 2003; Testa et al., 2003). Although not a "necessary or sufficient cause" of IPV, problem drinking (e.g., heavy episodic drinking or intoxication) on the part of the man often precedes

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or accompanies acts of domestic violence (Leonard, 2005). Also, discrepant drinking patterns between male and female partners are themselves a risk factor for IPV, especially when the man is a heavy drinker and the woman does not share this drinking pattern (Leadley et al., 2000).

The original conceptual framework for this study (Figure 1) synthesized three disparate theories: occupational culture, social learning (normative beliefs), and family stress. As will be demonstrated in our definition here and in the discussion section, occupational culture has overarching linkages to both social learning and family stress theory. Drawing from our 2 decades of research on the occupational health of blue-collar and service workers and military populations, we developed and continually refined a conceptual approach for describing organizational-based (e.g., policies, frequent layoffs, excessive overtime, fatigue) and employee-based (e.g., traditions, rituals) characteristics of the work environment that put employees at risk for undesirable drinking and other drug use (Ames and Janes, 1987, 1992) and, thereafter, negative outcomes including injuries, lowered productivity, absenteeism (Ames et al., 2000), and high-risk sexual behavior (Ames et al., 2009). Over time, these elements and negative outcomes of a work environment are acquired, shared, and taken for granted among employees through a process of socialization and thereafter become imbedded into the framework of an occupational culture. For this study, we moved from focusing strictly on negative outcomes in the workplace to a broader purpose of describing the cultural/social/affective influences on negative health consequences in personal and broader spheres of daily life vis-à-vis IPV.

Findings from our previous studies showed that elements of occupational culture, either directly or mediated by normative beliefs about drinking, were significantly related to heavy or heavy episodic drinking (Ames et al., 2000, 2009). We therefore expanded on our existing model as developed for drinking behavior to one that examines the degree to which elements of occupational culture reinforce or crystallize pre-existing (personal) beliefs around IPV. Our conceptual framework for this study hypothesizes that elements of occupational culture may reinforce existing normative beliefs about IPV and, directly or mediated by those normative beliefs, may be linked to occurrences of IPV. In this study, we are only describing the occupational culture of men in a construction industry sample, and we know little about the work environment of their partners.

Our definition of normative beliefs is drawn from social learning theory, which posits that people will practice behaviors they learn from observing others' verbal expressions and behaviors if they are rewarded and if these behaviors are reinforced (Bandura, 1977; Neumark-Sztainer, 1999). Normative beliefs are defined as perceptions of (a) proscriptive norms, the extent to which significant others approve or disapprove of a behavior (Ajzen, 1989), and (b) descriptive norms, the extent to which significant others engage in the behavior themselves (Grube and Morgan,

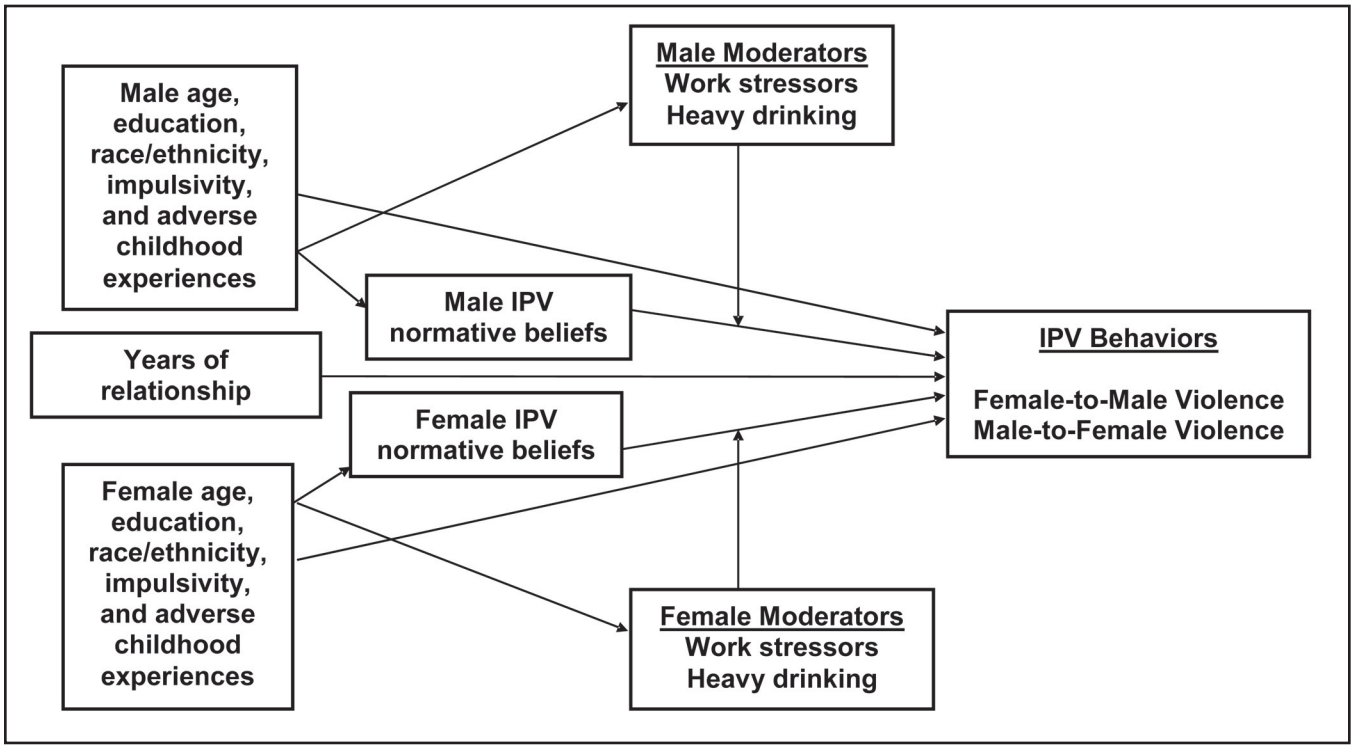

FIGURE 1. Theoretical framework for relations among workplace stressors and intimate partner violence (IPV)

1990). Although social learning theory has been used as an explanatory perspective for marital violence, its application derives from the hypothesis that behaviors to which children are exposed transmit to adult behavior (Bandura, 1986), supporting the notion that domestic violence is transmitted across generations (Markowitz, 2001; Mihalic and Elliott, 1997). In this study, we examined proscriptive and descriptive IPV normative beliefs as related to work and couple characteristics as well as in relation to the respondent's exposure to adverse childhood experiences.

Family stress theory posits that stressors (including work-related stressors), a deficit of emotional resources to address the stressors, and the individual's interpretation of the situation combine to produce a crisis that can result in violence. Fox et al. (2002) suggest that IPV can be seen as the outcome of an accumulation of stressors in which perceived demands exceed resources, resulting in a crisis expressed through IPV. In this scenario, work stressors might directly associate with IPV behaviors or might interact with IPV norms; work stressors might lead to IPV only among those with positive IPV norms.

For example, in the National Survey of Families and Households, Fox et al. (2002) found that job strain (based on indices of job-related irritability and exhaustion) and low-status employment were positively associated with male-to-female personal violence (MFPV). Results from numerous studies (e.g., Bachman and Saltzman, 1995; Fox et al., 2002; Sorenson et al., 1996; Tjaden and Thoennes, 1998) that have found higher rates of IPV among lower income couples or those experiencing unemployment are consistent with—and lend empirical support to—this theory. In our pilot study analysis of construction workers, we found that couples in which the male construction worker reported being on temporary layoff were at elevated risk for MFPV compared with couples in which the man was not on current layoff (Cunradi et al., 2009b).

In line with these combined conceptual approaches, the objective of this analysis was to examine the associations among normative beliefs, work stressors, and the occurrence of IPV among a cohort of blue-collar workers and their spouses/partners and to determine whether work-related stressors moderate the association between IPV norms and the occurrence of IPV. As our first hypothesis, we predicted that work stressors (i.e., job strain, interpersonal conflict at work) would enhance the association between IPV norms and IPV and thus would have a positive moderating effect on the association between IPV normative beliefs and IPV (Figure 1). For our second hypothesis, we predicted that the associations between personal background factors (e.g., impulsivity and adverse childhood experiences) and IPV risk are indirect and at least partially mediated through IPV normative beliefs. Our third hypothesis predicted that the association between IPV normative beliefs and the occurrence of IPV is moderated by hazardous drinking.

Method

Sample and data collection

The research project was a mixed methods study (survey and ethnography) conducted with the cooperation of a union representing approximately 35,000 construction industry workers in Northern California. Primarily, survey data were used for this report, and because of page limits, ethnographic findings are briefly reported. The survey, conducted in 2006 and 2007, used confidential telephone interviews to obtain data on workplace-related issues such as job stress, interpersonal conflicts, normative beliefs about IPV among coworkers, drinking, and IPV behaviors with married or cohabiting union workers and their spouses or cohabiting partners. Details of the worker and spouse/partner survey recruitment protocol are described in Cunradi et al. (2009a). The union provided a database containing its active membership of 35,000 workers, and information in English and Spanish was mailed to 10,884 randomly selected members. A total of 3,960 members were not eligible to participate in the study (not part of study population; did not speak English or Spanish). Eligibility could not be determined (answering machine, busy signal, etc.) for 3,842 workers. Of the remaining 3,082 who met eligibility requirements, 1,088 completed the survey, and 1,119 (36.3%) refused to participate. An additional 875 participants asked for a follow-up call but were not re-contacted because the quota of 1,000 workers was achieved. We assumed the same refusal rate (36.3%) for these 875 workers, had they been re-contacted. Based on this assumption, the response rate was 53.4% (1,645 / 3,082).

Study protocols were approved by the Pacific Institute for Research and Evaluation Institutional Review Board (IRB). The IRB required that initial contact be made with the union worker and that the worker's permission should be obtained to contact his or her spouse (partner) by telephone. Study eligibility requirements for workers were (a) membership in the construction industry union, (b) currently married or cohabiting with the same partner for at least 12 months, and (c) physically and mentally able to complete a telephone interview in English or Spanish. Respondent eligibility was determined during the screening process. Interviews lasted 30 minutes, and respondents received $25.00. Of 1,088 workers completing the interview, 95.6% gave their assent for their spouses (partners) to be contacted. The final sample consisted of 927 married or cohabiting couples (including 30 same-sex couples and 49 couples composed of female construction workers and male spouses/partners) and an additional 161 workers who lacked collateral reports from spouses/partners. Because the current study sought to test the contribution of work-related factors to IPV, and because of the small number of couples composed of female construction workers and male spouses/partners, we limited the sample to 502 dual-earner couples consisting of only male

construction workers and their employed female partners. Hereafter, we refer to the construction worker as "male partner" and his spouse or cohabiting romantic partner as "female partner"; both were employed at the time of their respective survey interviews.

Measures

Intimate partner violence. Past-12-month IPV was 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 that respondents may have perpetrated against their spouse/partner and that their spouse/partner may have perpetrated against them (e.g., threw something at my partner that could hurt; twisted my partner's arm or hair; pushed or shoved my partner; choked my partner; beat up my partner). Separate variables were created for MFPV and female-to-male personal violence (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 occurrence of aggression, 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). As in previous analyses based on data from the study described here (Cunradi et al., 2009a), data from the current subsample showed that among couples in which at least one partner reported any MFPV, one quarter of couples agreed about the occurrence of MFPV (24.8%; κ = .29), and among those in which at least one partner reported any FMPV, one third of couples agreed (33.0%; κ = .42).

IPV normative beliefs. Perceived approval/disapproval for engaging in IPV by coworkers, peers, and family members was measured by two sets of questions. The first set asked about IPV approval in the context of the participant perpetrating IPV against his or her spouse (or partner): "Suppose you slapped or hit your spouse or partner during an argument. How much do you think the following people would approve or disapprove of your behavior? Take your best guess." Referent categories were (a) immediate supervisor, (b) closest friend at work, (c) other coworkers, (d) best friend outside of work, (e) neighbors, (f) other family members. The second set of questions asked about approval for IPV in the context of the participant's spouse or partner perpetrating IPV against the participant (i.e., victimization): "Suppose your spouse or partner slapped or hit you during an argument. How much do you think the following people would approve or disapprove of his or her behavior?" Referent categories were the same as above. Responses to these questions were measured on an ordered 5-point rating scale (1 = *disapprove strongly,* 2 = *disapprove,* 3 = *neither disapprove nor approve,* 4 = *approve,* 5 = *approve strongly*). We originally distinguished workplace from nonworkplace referents and perpetration from victimization. Preliminary analyses indicated that in the case of men, for example, responses to workplace and nonworkplace referents were highly correlated (r = .73 for perpetration and r = .86 for victimization), as were responses to perpetration and victimization (r = .66 for workplace referents and r = .70 for nonworkplace referents). To avoid the problem of multicollinearity, we used a single measure (by computing a mean across all items) representing overall perceived (social) approval/disapproval of IPV. Cronbach's α for this measure was .95 for men and .94 for women.

Work stressors: Workplace interpersonal conflict. Work conflict was measured using questions previously used (Ames et al., 1997). Respondents were asked to indicate in the past 12 months, about how many times had each of the following things happened to them: (a) had a heated argument with supervisor, (b) had a heated argument with a coworker, (c) been in a physical fight with a coworker. Response categories were *never, once, 2–5 times, 6–9 times,* and *10 or more times*. This frequency scale was recoded into number of times using category midpoint and with a maximum of 12. The recoded scores for these three items were then summed to represent the level of workplace interpersonal conflict. Cronbach's α for this measure was .49 for men and .64 for women.

Work stressors: Job strain. Measurement of job strain was based on two questions from the 1994 National Survey of Families and Households (Sweet and Bumpass, 1996). Participants were asked to rate how strongly they agreed or disagreed with the following statements: "I am usually tense and irritable when I get home from work," and "I am usually exhausted when I get home from work." Agreement was measured on an ordered 5-point scale (1 = *disagree strongly* through 5 = *agree strongly*). A mean score was calculated for each respondent.

Frequency of intoxication. Respondents were asked how often they drink enough to feel intoxicated or drunk. Responses to these questions were measured on a 9-point Likert-type scale (1–9, indicating *not at all* to *every day*). This 9-point scale was used in the main data analysis. It was recoded into number of days for rates of heavy drinking that are presented in the Results section.

Background factors. Background variables were included in the analyses as controls. Impulsivity was measured with a set of questions previously used in national alcohol surveys (Schafer, 1994). Respondents were asked how well a series of statements describe them on a 4-point scale (1–4: *not at all, a little, some,* and *quite a lot*): (a) "I often act on the spur of the moment without stopping to think," (b) "You might say I act impulsively," and (c) "Many of my actions seem to be

hasty." Cronbach's α for this measure was .81 for men and .75 for women. 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) asks respondents about the following experiences as a child: (a) parent/caregiver-perpetrated physical abuse; (b) psychological abuse; (c) sexual abuse; (d) alcoholism or problem drinking by a household member; (e) depression or mental illness of a household member; and (f) domestic violence toward mother or caregiver. A scale of exposure to adverse childhood experiences, ranging from 0 to 6, was created by summing the number of positive responses to each of the six categories. Sociodemographics included relationship length (years) and each partner's age, race/ethnicity, and level of education. Race/ethnicity was re-categorized as non-Hispanic White, Latino, and non-Hispanic other. Two dummy variables were constructed to indicate Latino and non-Hispanic other, with non-Hispanic White as the referent group.

Methods for the qualitative data are reported in detail elsewhere and include semi-structured in-person interviews and archival data (Duke et al., 2010). To focus on workers who were experiencing significant conflicts with their romantic partners, we selected members of the survey participant pool who reported engaging in IPV—as a perpetrator, victim, or both—based on their responses to the Conflict Tactics Scale. A total of 40 worker interviews were completed (women = 16; men = 24).

Data analysis plan

A major hypothesis of this study was that the associations between IPV normative beliefs and IPV behavior are moderated by work stressors and frequency of intoxication. The moderation effects were tested by including interaction terms along with main effects in the model. To reduce collinearity among interaction terms and constituent main effects, we mean-centered the variables when constructing the interaction terms. For example, the interaction term for IPV normative beliefs (X) and job stress (Y) was the product of [X – mean(X)] and [Y – mean(Y)]. The hypotheses were tested using structural equation modeling as implemented under Mplus 6.11 (Muthén and Muthén, 1998–2011). All models were estimated using Mplus's robust maximum likelihood estimator. Path models with binary dependent variables and continuous mediating and moderating variables were specified as depicted in Figure 1.

The data set was constructed such that each couple represented a single case. This data structure allowed for straightforward modeling of (and controlling for) nonindependence of responses within couples. Wendorf (2002) has presented the details of this modeling approach. We started with a full model that had respondents' background variables (age, race/ethnicity, education, impulsivity, and adverse childhood experiences) predicting IPV normative beliefs, main effects of moderators, and interaction effects, which in turn predicted IPV behaviors. Based on past research (e.g., Ramisetty-Mikler and Caetano, 2005), we expected relationship length to be inversely associated with IPV.

Similarly, based on previous findings, we expected many of the background variables, such as age, to directly predict IPV. Although not shown in Figure 1, male partners' background variables were allowed to co-vary with female partners' background variables, men's IPV normative beliefs were allowed to co-vary with women's IPV normative beliefs, and men's drinking was allowed to co-vary with women's drinking. Only those couples with complete data (n = 485) were included in the analyses. Nonsignificant paths were removed from the models.

The ethnographic interviews were audio recorded and transcribed verbatim. The research team developed the coding manual. All transcriptions were then coded by the researchers using a thematic analysis approach (cf., Miles and Huberman, 1994) via the ATLAS.ti software package, Version 5.0 (ATLAS.ti Scientific Software Development, 2006).

Results

Ethnographic data collected with this population revealed a number of key features of construction work that provide context to the survey findings reported in the following sections. Expanded details on ethnography can be seen in Duke et al. (2010). Specifically, several work stressors particular to construction work may spill over into the domestic sphere, resulting in couple conflict and subsequent violence. For example, because many construction workers move from one temporary job to another—peppered with periods of layoff—they consistently had to prove their abilities and work ethic to supervisors and lacked a steady cohort of coworkers with whom they could build relationships. The study population also reported that being in a constant state of competition with their fellow workers to obtain and hold a job assignment was particularly stressful. Most workers made long commutes to and from the job site. If traffic was heavy, the return trip in particular would amplify the stress that they had experienced while on the job. Many male workers also reported that their spouses did not appreciate the physical challenges of their work and their need to rest at the end of the day. Perhaps most important, male construction workers' identity was intimately related to their role as breadwinner, a role difficult to sustain in an industry where layoffs are common. As one worker noted, "Finances stress me out just because, you know, I'm a dude. You're a dude and you want to provide for your family and you want to provide for your kids. So when the belt gets tight, it's stressful. You start stressing about it and then kind of being real short with your wife for having an attitude or whatever."

TABLE 1. Descriptive statistics for sample sociodemographic characteristics

Variable	Men (n = 485) M (SD) or %	Women (n = 485) M (SD) or %
Age, in years	40.6 (10.5)	39.0 (10.5)
Race/ethnicity		
White/non-Hispanic	58%	59%
Hispanic/Latino	28%	29%
Other	14%	12%
Education		
Less than high school	14%	7%
High school graduate	40%	26%
Some college	40%	47%
College graduate	7%	21%

An additional stress factor often mentioned—and known to be embedded in this occupational culture—is occupational safety. Construction is one of the most dangerous occupations in the United States, and respondents spoke of injuries as a regular occurrence on job sites. For example, in 2004, construction workers accounted for 7.7% of the U.S. workforce but suffered 22.2% of the nation's 5,764 work-related deaths (Bureau of Labor Statistics, 2005).

Sample characteristics with complete data (n = 485 couples) are shown in Table 1. In terms of race/ethnicity, most men (58%) and women (59%) were White. Approximately 28% of men and 29% of women were Hispanic. The remainder of men (14%) and women (12%), categorized as "other," consisted of African Americans, Asian Americans, and those who reported their race/ethnicity as multiethnic. Most men had graduated high school (40%) or had some college education (40%); of the women, approximately 26% were high school graduates and 47% had some college education. Relationship length ranged from 1 to 41 years (M = 11.6, SD = 9.4). In addition, 40% of men had drunk enough to feel drunk in the past 12 months, as did 27% of women. Men who ever felt drunk reported an average of 18.9 days (SD = 39.9) of feeling drunk, compared with an average of 6.8 days (SD = 12.1) reported by women. Prevalence rates of IPV were 19.9% for male-to-female violence and 24.5% for female-to-male violence. Tables 2 and 3 present the within-gender group bivariate correlations and cross-gender bivariate correlations, respectively.

We started with testing a full model (Akaike information criterion [AIC] = 43,390.28, Bayesian information criterion [BIC] = 44,487.12, sample-size adjusted BIC = 43,661.86). The nonsignificant paths were then removed from the model, resulting in a final model (Table 4) that better fit the data (AIC = 32,719.60, BIC = 33,322.11, sample-size adjusted BIC = 32,865.07; smaller AIC/BIC values indicate better fit). For illustrative purposes, major findings also are presented

TABLE 2. Within-gender group bivariate correlations among model variables

	Male											
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Age												
2. Education	.23**											
3. Hispanic/Latino[a]	-.26**	-.26**										
4. Other race/ethnicity[a]	-.02	.01	-.25**									
5. Impulsivity	-.03	-.03	-.11*	-.06								
6. Adverse childhood experience	-.07	-.04	.07	-.10	.21**							
7. Years of relationship	.60**	.11*	-.10*	-.09*	-.03	-.05						
8. Workplace interpersonal conflict	-.05	-.02	-.05	-.06	.14**	.09*	-.03					
9. Job stress	-.10*	.01	.04	.00	.19**	.25**	-.09*	.24**				
10. Intoxication	-.18**	-.05	-.14**	-.01	.22**	.00	-.11*	.15**	.07			
11. IPV norms	-.08	-.07	.19**	.10*	.00	.04	-.04	-.04	.16**	.04		
12. Female-to-male violence	-.21**	.00	-.02	.10*	.20**	.12*	-.12**	.14**	.15**	.16**	.10*	
13. Male-to-female violence	-.19**	-.09*	.09*	.08	.21**	.10*	-.14**	.12*	.16**	.17**	.16**	.53**
	Female											
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Age												
2. Education	.24**											
3. Hispanic/Latina[a]	-.25**	-.31**										
4. Other race/ethnicity[a]	-.01	.05	-.24**									
5. Impulsivity	-.02	-.02	-.06	.02								
6. Adverse childhood experience	.01	.00	-.12**	-.02	.22**							
7. Years of relationship	.61**	.09	-.09*	.01	-.10*	-.08						
8. Workplace interpersonal conflict	-.07	.00	-.02	.03	.22**	.19**	-.09*					
9. Job stress	-.12**	-.10*	.18**	.02	.21**	.18**	-.16**	.22**				
10. Intoxication	-.09*	.04	-.13**	-.04	.07	.17**	-.10*	.03	.04			
11. IPV norms	-.09*	-.15**	.16**	.10*	.04	.00	-.08	.08	.16**	-.01		
12. Female-to-male violence	-.21**	-.02	.05	.10*	.13**	.10*	-.12**	.08	.06	.10*	.16**	
13. Male-to-female violence	-.19**	-.03	.14**	-.01	.12*	.16**	-.14**	.09*	.11*	.08	.15**	.53**

Notes: IPV = intimate partner violence. [a]White/non-Hispanic is the reference category.
*p < .05; **p < .01.

Table 3. Cross-gender bivariate correlations among model variables (n = 485 couples)

	Female partner									
Male partner	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Age	.89**	.26**	-.26**	.01	-.04	-.01	-.03	-.11*	-.08	-.10*
2. Education	.27**	.31**	-.30**	.08	.02	.02	-.02	-.12*	.04	-.16**
3. Latino[a]	-.23**	-.24**	.68**	-.19**	-.01	-.12*	.04	.20**	-.11*	.10*
4. Other race/ethnicity[a]	-.08	-.02	-.12*	.47**	-.05	-.06	-.06	.03	-.07	.13**
5. Impulsivity	-.04	.01	-.02	-.04	.02	.18**	.07	-.02	.10*	.01
6. Adverse childhood experience	-.08	.05	.01	-.02	.08	.08	.08	.08	.05	-.06
7. Workplace interpersonal conflict	-.07	.02	-.04	.02	.16**	.10*	.05	-.03	.04	.00
8. Job stress	-.10*	-.04	.04	-.03	.06	.09*	.04	.06	.04	.05
9. Intoxication	-.16**	-.02	-.09*	.04	.03	.07	-.02	-.11*	.25**	.01
10. IPV norms	-.09*	-.11*	.17**	-.02	-.02	-.06	-.10*	-.01	-.05	.20**

Notes: IPV = intimate partner violence. [a]White/non-Hispanic is the reference category.
*p < .05; **p < .01.

in Figure 2. Path coefficients are linear regression coefficients (for continuous dependent variables, e.g., workplace conflict, job strain, and intoxication) and logistic regression coefficients (for binary outcome variables, i.e., MFPV and FMPV). Regarding MFPV, there were direct effects for male IPV norms, male level of impulsivity, female IPV norms, female level of impulsivity, and female adverse childhood experiences. The male frequency of intoxication mediated the association between male impulsivity and MFPV (indirect effect = .07, p = .027). In terms of FMPV, there were direct effects for male impulsivity, female IPV normative beliefs, and female impulsivity. Because none of the interac-

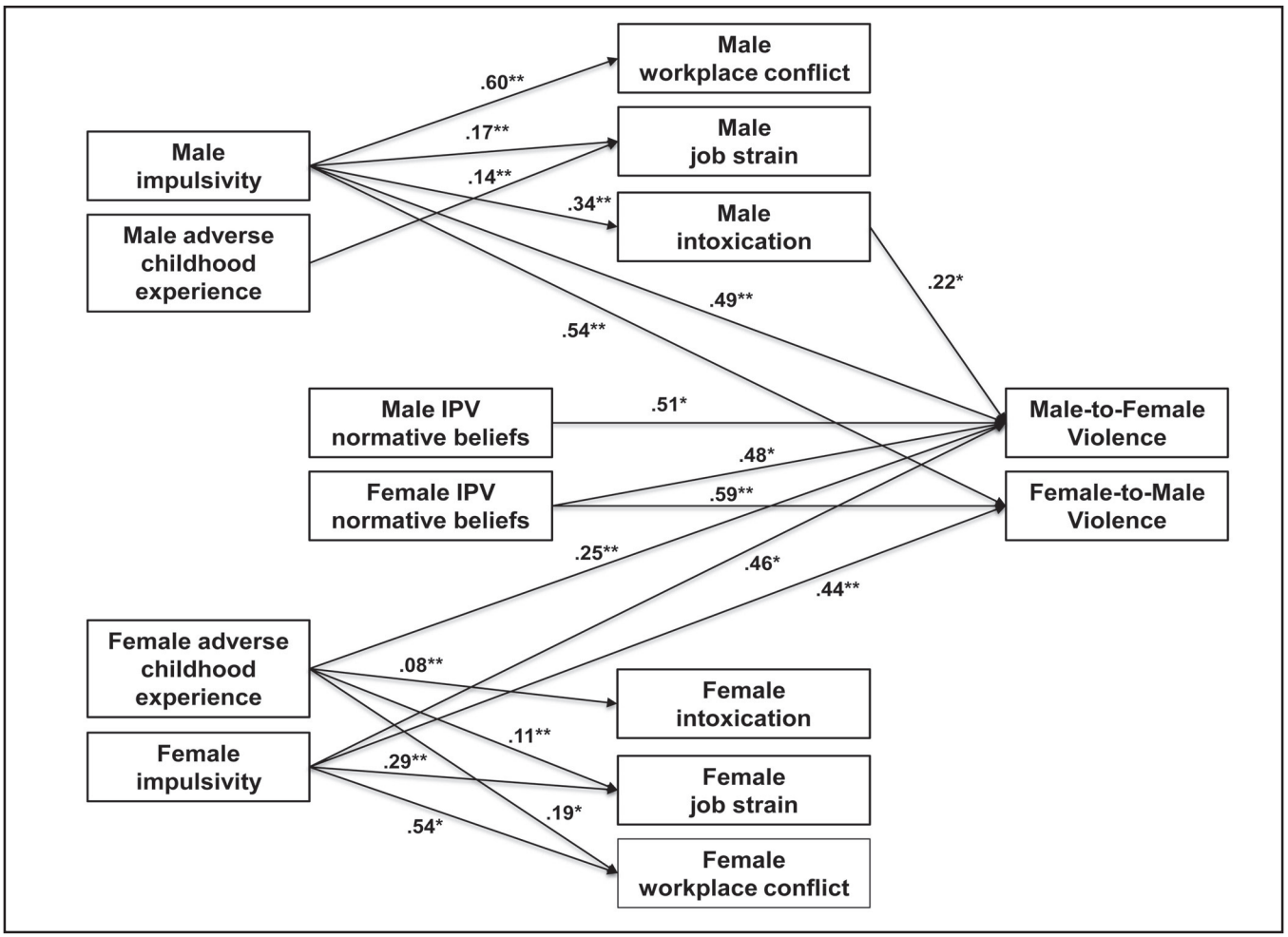

Figure 2. Results of final path model analysis with unstandardized path coefficients. IPV = intimate partner violence.
*p < .05; **p < .01.

TABLE 4. Path coefficients and standard errors for dependent variable-predictor pairs from final path model

Dependent variable/predictor	Coefficient	*SE*
Male workplace conflict		
Male impulsivity	0.598**	0.190
Male job strain		
Male impulsivity	0.167**	0.051
Male adverse childhood experience	0.145**	0.031
Male intoxication		
Male age	-0.029**	0.006
Male impulsivity	0.337**	0.087
Male Latino ethnicity[a]	-0.533**	0.134
Male IPV normative beliefs		
Male Latino ethnicity[a]	0.267**	0.053
Male "other" race/ethnicity[a]	0.243**	0.084
Female workplace conflict		
Female impulsivity	0.537*	0.256
Female adverse childhood experience	0.186*	0.074
Female job strain		
Female impulsivity	0.287**	0.075
Female adverse childhood experience	0.109**	0.031
Female Latina ethnicity[a]	0.456**	0.091
Female intoxication		
Female age	-0.010**	0.003
Female adverse childhood experience	0.081**	0.028
Female Latina ethnicity[a]	-0.251**	0.083
Female IPV normative beliefs		
Female Latina ethnicity[a]	0.238**	0.056
Female "other" race/ethnicity[a]	0.238**	0.080
Female-to-male violence		
Male age	-0.046**	0.011
Male impulsivity	0.545**	0.130
Female impulsivity	0.438**	0.159
Female IPV normative beliefs	0.592**	0.207
Male-to-female violence		
Male "other" race/ethnicity[a]	0.858*	0.348
Male impulsivity	0.486**	0.149
Male intoxication	0.218*	0.089
Male IPV normative beliefs	0.511*	0.239
Female Latina ethnicity[a]	1.003**	0.283
Female impulsivity	0.459*	0.188
Female adverse childhood experience	0.246**	0.081
Female IPV normative beliefs	0.484*	0.225

Notes: Path coefficients are linear regression coefficients for continuous dependent variables and logistic regression coefficients for binary outcome variables. IPV = intimate partner violence. [a]White/non-Hispanic is the reference category.
*$p < .05$; **$p < .01$.

tion terms was significant, there was no evidence indicating that the associations between IPV normative beliefs and risk of IPV behaviors were moderated by work-related stressors or hazardous drinking (Hypotheses 1 and 3). However, although we had predicted that IPV norms would mediate the association between personal background factors and IPV (Hypothesis 2), the results showed that there were direct effects for these background factors, with the exception of Latino and non-White race/ethnicity (Table 4).

Discussion

To our knowledge, this is the first study to analyze the role of IPV normative beliefs among dual-earner blue-collar couples, an understudied population at elevated risk for IPV. As hypothesized, our findings showed a significant and direct association between the male partner's IPV norms and MFPV and between the female partner's IPV norms and MFPV and FMPV, even after controlling for all other variables. This suggests that workplace-based programs aimed at challenging or changing IPV normative beliefs may hold potential as an IPV prevention strategy.

Our hypothesis that frequency of intoxication would moderate the association between normative beliefs and IPV was not supported by the survey data. However, the male frequency of intoxication was directly associated with MFPV. This is consistent with a number of studies (see review in Klostermann and Fals-Stewart, 2006) that suggest a proximal effect between drinking and IPV via the psychopharmacologic effects of alcohol on cognitive processing or through alcohol-related expectancies (Leonard and Quigley, 1999). Because participants were asked about their general drinking behaviors and general experiences with IPV but not asked to indicate how frequently they drank just before engaging in IPV, these findings do not necessarily suggest a proximal effect between drinking and IPV.

Interestingly, male frequency of intoxication did not significantly predict FMPV, nor did female frequency of intoxication predict MFPV or FMPV. It may be that the male drinking pattern is the most salient factor to consider in the alcohol–IPV relationship. Other researchers, however, have found the female alcohol-related problems to be significantly associated with FMPV in studies based on general population samples of couples (Caetano et al., 2005; Cunradi et al., 2002). Because less is known about FMPV than MFPV (Holtzworth-Munroe, 2005; Reid et al., 2008; Straus, 1999), additional research is needed to determine how each partner's drinking may be related to FMPV.

The results did not support our hypothesis that work stressors (job strain and workplace interpersonal conflict) were moderators between IPV norms and IPV, nor were work stressors directly linked to IPV. Instead, each partner's impulsivity and adverse childhood events were shown to have direct associations with IPV and direct associations with intoxication, job strain, and workplace conflict. The link between impulsivity and IPV is consistent with and supports other studies (Schafer et al., 2004), as is the association between adverse childhood events and IPV (Ehrensaft et al., 2003; Whitfield et al., 2003). These findings underscore the importance of promoting healthy families and early intervention to prevent adverse experiences in childhood, which have been shown to increase the likelihood of somatic and mental health problems, substance use, and marital aggression in adulthood (Anda et al., 2006).

One of the innovations of this study is the unique data set from which the findings were drawn: an occupational cohort of blue-collar workers from the same industry and their employed spouses/partners. These data, in turn, provide important topical contributions to the IPV, work, and alcohol

fields. First, studying the contribution of workplace factors, drinking, and IPV norms among blue-collar families is an important first step toward addressing social class–based disparities seen in IPV prevalence rates (Cunradi et al., 2008). Given the increasing number of dual-earner households, limiting the current study to couples in which both are employed enabled us to test a symmetrical model that accounts for each partner's work-related stressors and IPV normative beliefs. Second, calculating an upper-bound estimate of IPV (i.e., based on both partners' reports of IPV regardless of agreement that the aggression occurred) more completely captures both partners' experiences and thus minimizes the impact of potential underreporting.

Third, obtaining both partners' reports allows for the characteristics of the couple to be modeled. Such dyadic models can give a fuller picture of the risk and protective factors that each partner may contribute to the occurrence of IPV. The current study includes an array of sociodemographic, psychosocial, drinking, and work-related factors for each partner in relation to MFPV and FMPV. This is in accord with Straus (2005), who argues that FMPV deserves equal attention with MFPV because women's acts of aggression put them in danger of more severe retaliation by men. Moreover, women's acts of IPV help perpetuate the cultural norms that bolster "the marriage license as a hitting license" (Stets and Straus, 1990, p. 227). Finally, physical aggression between parents, regardless of perpetrator gender, is likely to cause harm to children who witness such events (Straus, 1999). Another study strength is that it tested and found support for aspects of occupational culture and normative beliefs theory (Ames et al., 2000), social learning theory, and family stress theory in relation to IPV.

This study has several limitations. Because of the cross-sectional study design, causality cannot be inferred from the findings. It is therefore possible, for example, that those who engage in IPV would be more likely to endorse positive IPV norms. However, it is certainly plausible that certain factors predate others. For example, the findings suggest that the male impulsivity is associated with workplace interpersonal conflict, job strain, frequency of intoxication, and IPV. Similarly, the female adverse childhood experiences are associated with workplace interpersonal conflict, job strain, frequency of intoxication, and MFPV. Impulsivity may be an innate personality characteristic or one likely to be molded at an early age; adverse childhood experiences are retrospective reports of events in childhood. It is therefore reasonable to assume that these factors are antecedents to the outcomes they predict in the analysis. This has implications for prevention of these problem behaviors and highlights the importance of early intervention.

In the context of an occupational survey, some respondents may have underreported their alcohol use because of concerns of their drinking-related behavior being inadvertently revealed to their employers or the union, despite assurances of confidentiality. Underreporting would likely have attenuated the association between frequency of intoxication and MFPV shown in our findings. Finally, because of survey time constraints, other potentially confounding factors such as depression and stressful life events were not measured, nor were objective and subjective measures of job stress. More detailed dimensions of job stress, such as those measured with the Job Content Questionnaire (Karasek et al., 1998), would have allowed for comparability across studies.

References

Ajzen, I. (1989). Attitude structure and behavior. In A. R. Pratkanis, S. J. Breckler, & A. G. Greenwald (Eds.), *Attitude structure and function* (pp. 241–274). Hillsdale, NJ: Lawrence Erlbaum.

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior.* Englewood Cliffs, NJ: Prentice-Hall.

Ames, G. M., Duke, M. R., Moore, R. S., & Cunradi, C. B. (2009). The impact of occupational culture on drinking behavior of young adults in the U.S. Navy. *Journal of Mixed Methods Research, 3,* 129–150.

Ames, G. M., Grube, J. W., & Moore, R. S. (2000). Social control and workplace drinking norms: A comparison of two organizational cultures. *Journal of Studies on Alcohol, 61,* 203–219.

Ames, G. M., Grube, J. W., & Moore, R. S. (1997). The relationship of drinking and hangovers to workplace problems: An empirical study. *Journal of Studies on Alcohol, 58,* 37–47.

Ames, G. M., & Janes, C. R. (1987). Heavy and problem drinking in an American blue-collar population: Implications for prevention. *Social Science & Medicine, 25,* 949–960.

Ames, G. M., & Janes, C. (1992). A cultural approach to conceptualizing alcohol and the workplace. *Alcohol Health & Research World, 16,* 112–119.

Anda, R. F., Felitti, V. J., Bremner, J. D., Walker, J. D., Whitfield, C., Perry, B. D., . . . Giles, W. H. (2006). The enduring effects of abuse and related adverse experiences in childhood: A convergence of evidence from neurobiology and epidemiology. *European Archives of Psychiatry and Clinical Neuroscience, 256,* 174–186.

Archer, J. (2000). Sex differences in aggression between heterosexual partners: A meta-analytic review. *Psychological Bulletin, 126,* 651–680.

ATLAS. ti Scientific Software Development (2006). *ATLAS.ti, Version 5.0.* Berlin, Germany: Author.

Bachman, R., & Saltzman, L. E. (1995). *Violence against women: Estimates from the redesigned survey* (No. NCJ-154348). Washington, DC: U.S. Dept. of Justice, Office of Justice Programs.

Bandura, A. (1977). *Social learning theory.* Oxford, England: Prentice-Hall.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive perspective.* Englewood Cliffs, NJ: Prentice-Hall.

Bureau of Labor Statistics. (2005). *Census of fatal occupational injuries, summary 2004.* Retrieved from http://www.bls.gov/news.release/archives/cfoi_08252005.pdf

Cabrera, O. A., Hoge, C. W., Bliese, P. D., Castro, C. A., & Messer, S. C. (2007). Childhood adversity and combat as predictors of depression and post-traumatic stress in deployed troops. *American Journal of Preventive Medicine, 33,* 77–82.

Caetano, R., Cunradi, C. B., Schafer, J., & Clark, C. L. (2000). Intimate partner violence and drinking patterns among White, Black, and Hispanic couples in the U.S. *Journal of Substance Abuse, 11,* 123–138.

Caetano, R., McGrath, C., Ramisetty-Mikler, S., & Field, C. A. (2005). Drinking, alcohol problems and the five-year recurrence and incidence of male to female and female to male partner violence. *Alcoholism: Clinical and Experimental Research, 29,* 98–106.

Cunradi, C. B., Ames, G. M., & Moore, R. S. (2008). Prevalence and cor-

relates of intimate partner violence among a sample of construction industry workers. *Journal of Family Violence, 23,* 101–112.

Cunradi, C. B., Bersamin, M., & Ames, G. (2009a). Agreement on intimate partner violence among a sample of blue-collar couples. *Journal of Interpersonal Violence, 24,* 551–568.

Cunradi, C. B., Caetano, R., & Schafer, J. (2002). Alcohol-related problems, drug use, and male intimate partner violence severity among US couples. *Alcoholism: Clinical and Experimental Research, 26,* 493–500.

Cunradi, C. B., Todd, M., Duke, M., & Ames, G. (2009b). Problem drinking, unemployment, and intimate partner violence among a sample of construction industry workers and their partners. *Journal of Family Violence, 24,* 63–74.

Duke, M. R., Bergmann, L., & Ames, G. (2010). Competition and the limits of solidarity among unionized construction workers. *Anthropology of Work Review, 31,* 83–91.

Ehrensaft, M. K., Cohen, P., Brown, J., Smailes, E., Chen, H., & Johnson, J. G. (2003). Intergenerational transmission of partner violence: A 20-year prospective study. *Journal of Consulting and Clinical Psychology, 71,* 741–753.

Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., . . . Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine, 14,* 245–258.

Field, C. A., & Caetano, R. (2004). Ethnic differences in intimate partner violence in the U.S. general population: The role of alcohol use and socioeconomic status. *Trauma, Violence & Abuse, 5,* 303–317.

Fox, G. L., Benson, M. L., DeMaris, A. A., & Van Wyk, J. (2002). Economic distress and intimate violence: Testing family stress and resources theories. *Journal of Marriage and Family, 64,* 793–807.

Graham, K., Leonard, K. E., Room, R., Wild, T. C., Pihl, R. O., Bois, C., & Single, E. (1998). Current directions in research on understanding and preventing intoxicated aggression. *Addiction, 93,* 659–676.

Grube, J. W., & Morgan, M. (1990). Attitude-social support interactions: Contingent consistency effects in the prediction of adolescent smoking, drinking, and drug use. *Social Psychology Quarterly, 53,* 329–339.

Holtzworth-Munroe, A. (2005). Female perpetration of physical aggression against an intimate partner: A controversial new topic of study. *Violence and Victims, 20,* 251–259.

Karasek, R., Brisson, C., Kawakami, N., Houtman, I., Bongers, P., & Amick, B. (1998). The Job Content Questionnaire (JCQ): An instrument for internationally comparative assessments of psychosocial job characteristics. *Journal of Occupational Health Psychology, 3,* 322–355.

Klostermann, K. C., & Fals-Stewart, W. (2006). Intimate partner violence and alcohol use: Exploring the role of drinking in partner violence and its implications for intervention. *Aggression and Violent Behavior, 11,* 587–597.

Leadley, K., Clark, C. L., & Caetano, R. (2000). Couples' drinking patterns, intimate partner violence, and alcohol-related partnership problems. *Journal of Substance Abuse, 11,* 253–263.

Leonard, K. E. (1993). Drinking patterns and intoxication in marital violence: Review, critique, and future directions for research. In S. E. Martin (Ed.), *Alcohol and interpersonal violence: Fostering multidisciplinary perspectives* (NIAAA Research Monograph No. 24, NIH Pub. No. 93-3496, pp. 253–280). Rockville, MD: National Institutes of Health.

Leonard, K. E. (2005). Alcohol and intimate partner violence: When can we say that heavy drinking is a contributing cause of violence? *Addiction, 100,* 422–425.

Leonard, K. E., & Quigley, B. M. (1999). Drinking and marital aggression in newlyweds: An event-based analysis of drinking and the occurrence of husband marital aggression. *Journal of Studies on Alcohol, 60,* 537–545.

Markowitz, F. E. (2001). Attitudes and family violence: Linking intergenerational and cultural theories. *Journal of Family Violence, 16,* 205–218.

Mihalic, S. W., & Elliott, D. (1997). A social learning theory model of marital violence. *Journal of Family Violence, 12,* 21–47.

Miles, M., & Huberman, M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.). Beverly Hills, CA: Sage.

Muthén, L. K., & Muthén, B. O. (1998–2011). *Mplus user's guide.* Sixth Edition. Los Angeles, CA: Muthén & Muthén.

Neumark-Sztainer, D. (1999). The social environments of adolescents: Associations between socioenvironmental factors and health behaviors during adolescence. *Adolescent Medicine, 10,* 41–55.

O'Leary, K. D., & Schumacher, J. A. (2003). The association between alcohol use and intimate partner violence: Linear effect, threshold effect, or both? *Addictive Behaviors, 28,* 1575–1585.

Ramisetty-Mikler, S., & Caetano, R. (2005). Alcohol use and intimate partner violence as predictors of separation among U.S. couples: A longitudinal model. *Journal of Studies on Alcohol, 66,* 205–212.

Reid, R. J., Bonomi, A. E., Rivara, F. P., Anderson, M. L., Fishman, P. A., Carrell, D. S., & Thompson, R. S. (2008). Intimate partner violence among men: Prevalence, chronicity, and health effects. *American Journal of Preventive Medicine, 34,* 478–485.

Schafer, J. (1994). *Latent class and factor analyses of the 1990 National Alcohol Survey adult items* (Tech. Report No. C75). Berkeley, CA: Alcohol Research Group.

Schafer, J., Caetano, R., & Clark, C. L. (1998). Rates of intimate partner violence in the United States. *American Journal of Public Health, 88,* 1702–1704.

Schafer, J., Caetano, R., & Cunradi, C. B. (2004). A path model of risk factors for intimate partner violence among couples in the United States. *Journal of Interpersonal Violence, 19,* 127–142.

Sherif, M. (1965). *The psychology of social norms.* New York, NY: Octagon Books.

Sorenson, S. B., Upchurch, D. M., & Shen, H. (1996). Violence and injury in marital arguments: Risk patterns and gender differences. *American Journal of Public Health, 86,* 35–40.

Stets, J., & Straus, M. (1990). The marriage license as a hitting license: A comparison of assaults in dating, cohabiting, and married couples. In M. Straus & R. Gelles, (Eds.), *Physical violence in American families* (pp. 227–244). New Brunswick, NJ: Transaction.

Straus, M. A. (1999). The controversy over domestic violence by women: A methodological, theoretical, and sociology of science analysis. In X. Arriaga & S. Oskamp (Eds.), *Violence in intimate relationships* (pp. 17–44). Thousand Oaks, CA: Sage.

Straus, M. A. (2005). Women's violence toward men is a serious social problem. In D. R. Loseke, R. J. Gelles, & M. M. Cavanaugh (Eds.), *Current controversies on family violence* (pp. 55–77). Newbury Park, NJ: Sage.

Straus, M. A., Hamby, S. L., Boney-McCoy, S., & Sugarman, D. B. (1996). The revised Conflict Tactics Scales (CTS2): Development and preliminary psychometric data. *Journal of Family Issues, 17,* 283–316.

Sweet, J. A., & Bumpass, L. L. (1996). *The National Survey of Families and Households—Waves 1 and 2: Data description and documentation.* Madison, WI: Center for Demography and Ecology, University of Wisconsin.

Testa, M., Livingston, J. A., & Leonard, K. E. (2003). Women's substance use and experiences of intimate partner violence: A longitudinal investigation among a community sample. *Addictive Behaviors, 28,* 1649–1664.

Tjaden, P., & Thoennes, N. (1998). *Prevalence, incidence, and consequences of violence against women: Findings from the National Violence Against Women Survey* (No. NCJ-172837). Washington, DC: Institute of Justice.

Wendorf, C. A. (2002). Comparisons of structural equation modeling and hierarchical linear modeling approaches to couples' data. *Structural Equation Modeling: A Multidisciplinary Journal, 9,* 126–140.

Whitfield, C. L., Anda, R. F., Dube, S. R., & Felitti, V. J. (2003). Violence childhood experiences and the risk of intimate partner violence in adults: Assessment in a large health maintenance organization. *Journal of Interpersonal Violence, 18,* 166–185.