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Drowning the pain: Intimate partner violence, and drinking to cope prospectively predict problem drinking

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Abstract

The present study examined the longitudinal association among drinking problems, drinking to cope, and degree of intimate partner violence (IPV). Two competing models were tested; the first model posited that drinking to cope leads to greater drinking problems and this subsequently leads to more violence in the relationship (an intoxication-violence model). The second model speculated that violence in the relationship leads to drinking to cope, which in turn leads to greater drinking problems (a self-medication model). Eight hundred and eighteen undergraduate students at a large north-western university participated in the study over a two year period, completing assessments of IPV, alcohol related problems and drinking to cope at five time points over a two year period as part of a larger social norms intervention study. Analyses examined two competing models; Analyses indicated there was support for the self-mediation model, whereby people who have experienced violence have more drinking problems later, and this association is temporally mediated by drinking to cope.

Keywords

Alcohol-related problems; Drinking problems; Drinking to cope; Intimate partner violence; Longitudinal mediation

1. Introduction

Intimate partner violence (IPV) occurs at alarming rates among adolescents and college-age young adults, with approximately one in three dating couples experiencing violence (Straus, 2008; White & Koss, 1991), and many experience repeated victimization (Bonomi, Anderson, Rivara, & Thompson, 2007; Breiding, Black, & Ryan, 2008). Equal rates have been found for men and women, with as many as 42% of women and 37% of men report perpetrating dating violence and 37% of women and 45% of men report having been a victim of dating violence (Arias, Samios, & O'Leary, 1987; Cyr, McDuff, & Wright, 2006; Luthra & Gidycz, 2006; Magdol et al., 1997; Muñoz-Rivas, Graña, O'Leary, & González, 2007; Riggs, O'Leary, & Breslin, 1990; White & Koss, 1991). Moreover, approximately 30

to 40 percent of perpetrators report drinking at the time of perpetration (Caetano, Schafer, & Cunradi, 2001) and violent incidents involving alcohol are more likely to lead to more severe forms of violence and to result in more severe injuries to the partner (Sorenson, Upchurch, & Shen, 1996).

Most examinations look at either victimization or perpetration. However, in young adult relationships, such behaviors (being the victim or being the perpetrator) often co-occur (Stets & Straus, 1989; Testa, Hoffman, & Leonard, 2011), and perpetration by one partner is the strongest predictor of perpetration by the other partner (Baker & Stith, 2008; Harned, 2002). This paper aims to examine both IPV victimization and perpetration among college students. Specifically, we propose two competing mediation models for both perpetration and victimization. The first model is the 'intoxication-violence model' (built on Kantor & Straus, 1989, 's intoxication-victimization model). This model posits that because one drinks to cope, one experiences more drinking problems and this drinking contributes to being in situations that increases one's risk of experiencing IPV. The second model is a 'self-medication model' (built on Khantzian, 1985, and Duncan, 1974a, 1974b, 's 'self-medication hypothesis'; for a similar hypothesis, see Stappenbeck & Fromme, 2010) whereby an individual uses alcohol to deal with negative events and affect.

1.1 Drinking as a risk factor for violence

Within the IPV literature, there is strong and consistent evidence that alcohol use is associated with relationship violence (Foran & O'Leary, 2008; Leonard, 1993; Stuart et al., 2013). A recent meta-analysis (Foran & O'Leary, 2008) found a small to moderate effect size for male perpetrated IPV and a small effect size for female perpetrated IPV in the association between alcohol use and IPV. Moreover, Leonard (2005) concluded in an extensive review of the literature that heavy drinking was a contributing factor in relationship violence. Similarly, Smith, Homish, Leonard, and Cornelius (2012), found that alcohol use disorders were robustly associated with both IPV perpetration and victimization. Although they found gender differences in the association between alcohol use disorders and victimization, suggesting that the effect of alcohol use disorders on violence was stronger for women than for men, this difference disappeared when controlling for perpetration. Thus, the authors conclude alcohol use may be related to mutual IPV, rather than male-only violence.

1.2 Drinking in Response to Violence

Although alcohol use may be an antecedent of relationship violence, it may be that individuals who experience IPV in their relationship use alcohol as a consequence of their violence experience (Burnam et al., 1988; Miller & Downs, 1993; Temple, Weston, Stuart, & Marshall, 2008; Testa & Leonard, 2001; Testa, Livingston, & Leonard, 2003). Indeed, some researchers postulate that alcohol is used as a means of self-medication. That is, individuals who report chronic traumatic events (e.g. IPV, repeated sexual assault) report using alcohol as a way of coping with negative affect (Cannon et al., 1992), sleep difficulties (Nishith, Resick, & Mueser, 2001) and other hyper-arousal symptoms (Stewart, Conrod, Samoluk, Pihl, & Dongier, 2000). In fact, research has found that drinking to cope partly explained the association between victimization and alcohol problems (Goldstein, Flett, &

Wekerle, 2010; Grayson & Nolen-Hoeksema 2005; Kaysen et al., 2007), such that victimization led to increased alcohol problems, because people drank to cope with their victimization. Little research has directly examined drinking to cope in connection with IPV perpetration. Some research has indicated that perpetrators also drink as a consequence of violence, as they may attempt to cope with relationship problems (Testa & Leonard, 2001; Testa, et al., 2003) or with the negative affect experienced about or during the incident (Anderson, 2002; Kilpatrick, Acierno, Resnick, Saunders, & Best, 1997).

1.3 Present Study

As indicated in the introduction, rates of IPV and drinking is especially high in late adolescent and college-age populations. Thus, we decided to examine prospective associations among intimate partner violence, drinking to cope and drinking problems in such a population. Based on previous literature, we hypothesized two potential models (see Figure 1). In the first model, an intoxication-violence model (Figure 1, top), we hypothesized that drinking to cope would lead to later drinking problems, and drinking problems would lead to greater victimization/perpetration in the relationship. The second model we proposed, the self-medication model (Figure 1, bottom), posited that victimization/perpetration in the relationship would lead to subsequent drinking to cope, and this drinking to cope would lead to later drinking problems. Furthermore, as previous research has found gender differences in associations between IPV and drinking problems, we examined whether gender moderated the associations.

2. Materials and Methods

2.1 Procedures

In the fall of 2005, all incoming freshman students were invited to participate in a social norms alcohol intervention study. Students were first invited to complete a 20-min, web-based screening survey. Invitations for the screening survey were sent by e-mail and U.S. post and included a brief description of the survey. Participants were informed that the survey would ask about their personal characteristics, drinking patterns, alcohol-related consequences, and perceptions of other students' drinking on their campus. Participants were also informed that if they qualified, they would be invited to complete a 50-min survey immediately following the 20-min screening survey (or within 2 weeks) and four additional 50-min surveys at 6-month intervals. Of those that qualified for the study, 91.09% completed the baseline survey; retention rates were 92%, 97%, 85%, and 82% of the original 818 participants at 6, 12, 18, and 24 month follow-ups, respectively (for complete study details, including participation rates, comparison with non-respondents and experimental conditions, please see Neighbors et al., 2010)¹. A Federal Certificate of Confidentiality (AA-79-2005) was obtained to help ensure privacy of research participants. All procedures were approved by the university's Institutional Review Board. No adverse events were reported. All measures and interventions were completed entirely via the Internet.

¹As the data comes from a larger alcohol prevention study, all analyses were also performed controlling for the intervention conditions (in the level 2 file). Results were not different when controlling for the intervention, and therefore, we report here on the simpler analyses. Details regarding intervention effects are available elsewhere (Neighbors et al., 2010).

2.2 Participants

Participants for the present study included 818 students (42.42% men and 57.58% women) at a large public northwestern university. Students must have reported drinking 4/5 drinks (women/men, respectively; Marlatt et al., 1998; Neighbors et al., 2004; Wechsler & Nelson, 2001) or more on at least one occasion during the past month at the time of screening in order to qualify for the longitudinal study. Participants at baseline were an average of 18.14 ($SD = 0.46$) years of age at the time of the survey. Ethnic representation was 65.3% Caucasian, 24.2% Asian/Pacific Islander, 1.5% Black/African American, 4.4% Hispanic/Latino(a), and 4.2% Other. Incentives for participation were \$10 for completing the screening survey, \$25 for completing the baseline survey, and \$25 for completing each of the follow-up assessments at 6, 12, 18, and 24 months post-baseline.

2.3 Measures

2.3.1 Intimate Partner Violence—The 20-item short form of the Revised Conflict Tactics Scale (CTS2S; Straus & Douglas, 2004), which measures both IPV perpetration and IPV victimization, was used to assess how often it occurred in participants' current or most recent relationship. Response options at baseline included the following: 0 = *This has never happened before*; 1 = *Not in the past year, but it did happen before*; 2 = *Once in the past year*; 3 = *Twice in the past year*; 4 = *3–5 times in the past year*; 5 = *6–10 times in the past year*; 6 = *11–20 times in the past year*; and 7 = *More than 20 times in the past year*. Follow-up response options were modified to reflect the past 6 months. In scoring the follow-up assessments, the second response option ("*Not in the past 6 months, but it did happen before*") was assigned a value of 0, such that the scores only reflected occurrences in the past 6 months. Example items include the following: "My partner punched or kicked or beat-me-up"; "I punched or kicked or beat up my partner." Two items in each of the two subscales reflect positive behaviors (e.g., "I explained my side or suggested a compromise for a disagreement with my partner," and "I showed respect for, or showed that I cared about my partner's feeling about an issue we disagreed on"). These items were excluded for the purpose of these analyses, as the lack of these behaviors does not indicate the presence of relationship violence. Thus, the final number of items used to measure perpetration and victimization, respectively, was 8. (α range: .83 to .94 across time points for perpetration and victimization both).

2.3.1 Alcohol Consumption—Alcohol consumption was assessed with the Daily Drinking Questionnaire (DDQ; Collins, Parks, & Marlatt, 1985). Participants were asked: "Consider a typical week during the last three months. How much alcohol, on average (measured in number of drinks), do you drink on each day of a typical week?". Participants provide estimates for the typical number of drinks consumed each day of the week (thus, a total of 7 items). Responses are summed to reflect average number of drinks per week over the past three months. (α range: .77 to .85 across time points).

2.3.2 Drinking to Cope—Drinking to cope was assessed with the five-item coping subscale of the Drinking Motives Questionnaire-Revised (DMQ-R; Cooper, 1994), which contains reasons why people might be motivated to drink alcohol. Participants responded to items rated on a 5-point scale (1 = *Never/Almost never*, 2 = *Some of the time*, 3 = *Half the*

time; 4 = *Most of the time*, and 5 = *Almost always/Always*). Example items include “To forget your worries,” and “Because it helps you when you feel depressed or nervous.” (α range: .82 to .86 across time points).

2.3.3 Alcohol-related problems—A modified version of the Rutgers Alcohol Problems Index (RAPI; White & Labouvie, 1989) assessed frequency of 25 alcohol-related problems over the previous three months. The RAPI was modified to include two additional items (i.e., “drove after having two drinks” and “drove after having four drinks”). Participants responded to the statements using a five point scale with 0 = *never*; 1 = *1 to 2 times*; 2 = *3 to 5 times*; 3 = *6 to 10 times*; 4 = *more than 10 times*. Scores were calculated by summing the 25 items (possible range: 0–100). (α range: .90 to .93 across time points).

2.4 Plan of Analyses

To test the longitudinal mediation analyses, a series of within-person lagged analyses were conducted. Four models examined the self-medication model and four models were tested to evaluate the intoxication-violence model. As an example, in each of the intoxication-violence models drinking to cope was specified as the predictor. In two of the models victimization was the outcome and in two of the models perpetration was the outcome. In two of the models alcohol-related problems was specified as the mediator and in two of the models alcohol consumption was specified as the mediator. Analyses examining the self-medication model followed the same logic.

The data was structured such that the predictor (X) temporally preceded the mediator (M) which, in turn, temporally preceded the outcome (Y). Thus, data were lagged where each participant had up to three observations, T1X T2M T3Y; T2X T3M T4Y; T3X T4M T5Y (see Krull & MacKinnon, 2001). For each model we also tested gender as a potential moderator of both the *a* path (predictor to mediator) and *b* path (mediator to outcome). The test of the *ab* product (i.e., indirect effect) was conducted using the Prodclin R package (Tofighi & MacKinnon, 2011). Prodclin provides accurate asymmetric confidence intervals for tests of indirect effects.

The outcomes were alcohol-related problems, drinks per week, IPV victimization and IPV perpetration. All four outcomes were not normally distributed but rather better approximated by negative binomial distributions (Atkins & Gallop, 2007; Hilbe, 2011; Simons, Neal, & Gaher, 2006). Such models include a log link (Hilbe, 2011), and thus, parameter estimates are on a log scale. As the data structure was longitudinal, we used the hierarchical generalized linear model (Raudenbush & Bryk, 2002) as the primary analytical. With regard to the gender variable, men were coded as 0 and women were coded as 1. Analyses were conducted in HLM v. 7 (Raudenbush & Bryk, 2002).

3. Results

3.1 Descriptive Results

Table 1 gives the correlations among all study variables. IPV victimization and IPV perpetration were consistently associated with alcohol-related problems and drinking to cope at all waves, but not with consumption. Consumption was consistently associated with

alcohol-related problems as well as drinking to cope (with the exception of drinking to cope at Time 1). Alcohol-related problems and drinking to cope were consistently significantly associated with each other. Gender was significantly associated with all variables, with the exception of victimization at Time 1 and 5, and perpetration at Time 1 and 5.

Table 2 includes means and standard deviations for all measures at all time points, while Table 3 displays the contrasts between adjacent time points, obtained via a repeated measures ANOVA performed using PROC MIXED in SAS. IPV victimization and perpetration decreased from Time 1 to Time 2 (from baseline to 6-month follow-up); there were no mean changes at any subsequent time point. Drinking to cope decreased between Time 1 and Time 2, and then again between Time 3 (12 month follow-up) and Time 4 (18 month follow-up). There were no changes between adjacent time points in alcohol-related problems over the study, while consumption decreased between Time 1 and Time 2, and then again between Time 3 and Time 4.

At baseline more than half of the participants (57.29%) reported having had at least one experience of relationship violence (51.74% as a perpetrator and 51.23% as a victim), and 89% of the participants reported at least one alcohol-related problem. Over the course of the project, at one or more time points, 73.56% reported having had at least one experience of relationship violence (68.81% as a perpetrator and 69.06% as a victim) and 98% of the participants reported at least one alcohol-related problem.

3.2 Main Results²

3.2.1 Model 1: Alcohol-related problems as a mediator of the association between drinking to cope and IPV violence (the intoxication-violence model)—

Four models were run to examine whether drinking problems mediated the association between drinking to cope and victimization and perpetration; two with victimization as the outcome and two with perpetration as the outcome. As the results are again identical for victimization and perpetration, we describe only the results for victimization in the text but provide results for victimization and perpetration in figures. Figure 2 and 3 demonstrate these parallel results. Gender is only presented in the figures when found to be a significant moderator.

A significant prospective association was found between drinking to cope and victimization. A significant prospective association was also found between drinking to cope and alcohol-related problems and between drinking to cope and consumption. There were also significant prospective associations between alcohol-related problems and victimization, and between consumption and victimization. The direct effects of drinking to cope predicting victimization remained significant after controlling for either mediator. There was no evidence of significant mediation for analyses examining alcohol-related problems as the mediator (95% CI: .001 to -.002), or for consumption as the mediator (95% CI: .001 to -.002). Gender did moderate both the a-path and b-path in the model with alcohol-related problems as the mediator; the coefficient for the a-path indicated that the effect was stronger

²Analyses were conducted with the HLM default estimation method, which is restricted PQL. We also conducted the analyses using maximum likelihood and the results did not change substantially. Thus, we present the results in the HLM default.

for women than for men, whereas the coefficient for the b-path showed that the effect was weaker for women.

3.2.2 Model 2: Drinking to cope as a mediator of the association between IPV violence and drinking problems (the self-medication model)—Four models were run to examine whether drinking to cope moderated the association between IPV victimization and perpetration and drinking problems; two with victimization as the predictor and two with perpetration as the predictor. As the results are identical for victimization and perpetration (with the exception of a significant direct path from perpetration to consumption, which is non-significant for victimization), we detail only the results for victimization. Figure 4 and 5 show these parallel results. Gender is only presented in the figures when found to be a significant moderator.

As can be seen in Figure 4, a significant prospective association was found between victimization and alcohol-related problems, and between victimization and consumption. A significant prospective association was also found between victimization and drinking to cope. There were also significant prospective associations between drinking to cope and alcohol-related problems, and between drinking to cope and consumption. The direct effect of victimization predicting alcohol-related problems remained significant after controlling for the mediator; the direct effect from victimization to consumption, however, did not remain significant. There was evidence of significant mediation for analyses examining alcohol-related problems as the outcome (95% CI: .020 to .050), and for consumption as the outcome (95% CI: .008 to .029). Gender only moderated the b-path leading to alcohol-related problems; the coefficient indicated that the effect was stronger for women than for men.

4. Discussion

The current study explored the longitudinal associations between IPV violence, drinking problems and drinking to cope. We posited and tested two models; the first model, an intoxication-violence model, specified that people experience more violence in the relationship as a function of drinking. The second model, the self-medication model, specified that the experience of violence leads to more drinking problems, because people drink to cope with the experience. The current study adds to the literature by demonstrating that drinking to cope is an important predictor of drinking problems, as well as an outcome of experiencing violence in the relationship.

Our results found support for the self-medication model, showing that drinking to cope mediated the relationship between IPV violence and both alcohol-related problems and consumption. Of note, when predicting alcohol-related problems, we found that this mediation was stronger for women. These findings are consistent with and extend past work that shows that drinking to cope mediates the relationship between IPV victimization and alcohol-related problems (e.g., Goldstein et al., 2010; Grayson & Nolen-Hoeksema, 2005; Yeater et al., 2010) by finding similar results using a longitudinal design. Individuals who have experienced IPV seem to experience greater alcohol problems because they are drinking as a means of coping with the negative effects associated with their victimization,

including depression, anxiety, and social problems (e.g., Campbell, 1989; Russell, Lipov, Phillips & White, 1989; Star, Clark, Goetz, & O'Malia, 1979). Consistent with previous work, the association between drinking to cope and alcohol-related problems was stronger than that of drinking to cope and consumption (Cooper et al. 1995; Grant et al., 2007). These findings indicate that it may not be a matter of the amount of alcohol consumed, but rather, the number of problems experienced as a consequence of drinking that is associated with more IPV violence.

While some previous research has found support for the self-medication model, there are other studies suggesting that the self-medication model may be insufficient to explain drug addiction (e.g., Johnson & Breslau, 2006; Smit, Bolier & Cuijpers, 2004). The primary critique of the self-medication hypothesis is that it is incorrect in its assumptions about causality and that negative affect is likely a consequence of drug use (e.g., Cocores, Davies, Mueller, & Gold, 1987; Frances, 1997). Indeed, it is likely, as well as supported by literature, that alcohol use may lead to negative affect. Such evidence does not invalidate the self-medication hypothesis but rather provides evidence that self-medicating can and in some cases does cause more harm than good. Yet, individuals may begin to dull negative emotions by using alcohol, as the hypothesis proposes; indeed, it is likely that it is a negative feedback loop, whereby individuals experience negative emotions, drink to dull such emotions, yet experience more negative emotions as a consequence. When alcohol no longer has the desired effect, individuals may choose to quit drinking or may escalate to other drugs. It should also be noted that the original formulations of the self-medication hypothesis relied on addiction to illegal Class-A drugs (e.g., heroin or cocaine); thus, it may be that in an otherwise clinically normal sample of college students, the use of alcohol may still serve as a means of self-medication, although not in the severity originally examined. Thus, alcohol consumed in more normative quantities may not reach a point at which it no longer reduces tension and negative affect. Future research should seek to examine this possibility.

In the current study, there was little support for the intoxication-violence model. Although there was a significant prospective association between drinking problems and violence, these effects were small and negative, suggesting that drinking is associated with less violence over time. One reason for this association may be the curvilinear trajectory of drinking as people age. On average, drinking in the U.S. begins during adolescence, peaks around age 21, and decreases with transitions into adulthood (Bachman et al., 2002). Similarly, reports of IPV increase notably between the ages of 15 and 25 and then decrease over the life span (O'Leary, 1999). Thus, it may be that younger individuals (i.e., late adolescence) have poorer relationship schemas, which include the occurrence of violence, and may engage in more alcohol use as well. Older individuals (i.e., young adults) may have developed better relationship schemas and conflict resolution skills, which do not include violence. Thus, in response to drinking, they may not turn to violence to resolve potential relationship conflict. This is speculative, naturally, and future studies should seek to incorporate relationship schema and schema change, when examining relationship violence in relation to drinking.

4.1. Limitations and future directions

Several limitations exist for the current study. First, little information is known about the romantic relationships of the participants. Both those who were single and those who were in a relationship were allowed to participate in the study, and over time relationships may have formed or been broken. As previously noted, IPV victimization may be more prevalent among those experimenting with alcohol and different relationship partners, and thus, it may vary as a function of the length of the relationship (see also Temple et al., 2008); however we were not able to control for this. Future longitudinal work using a college population would benefit by gathering information about individuals' romantic relationship initiation and dissolution across the study time. The sample also included only those who reported at least one heavy drinking episode in the previous month, potentially resulting in a range restriction for alcohol-related problems. If anything, we might expect stronger results in a sample that include light or non-drinking students. A strength of the current study is that it expands the scope of research examining the relationship among the study variables in the context of college age, young adults. As noted in the discussion, it may be that IPV is a particular problem among young adults under the age of 25, as they experience a period of increased experimentation with relationships and alcohol.

4.2. Conclusion

In sum, the present study suggest that individuals use drinking to cope as a means of dealing with lasting problems associated with IPV violence. This is problematic as drinking to cope can lead to an increase in problems rather than helping an individual deal with their current issues. Interventions aimed at treating individuals who are victims of IPV should be designed to understand the methods individuals use to cope with the experience and make an effort to assist the victim in developing more adaptive coping mechanisms. Furthermore, as both the experience of violence in dating relationships and drinking problems are worst during late adolescence, interventions may benefit from teaching this age group healthy relationship and conflict resolution behaviors.

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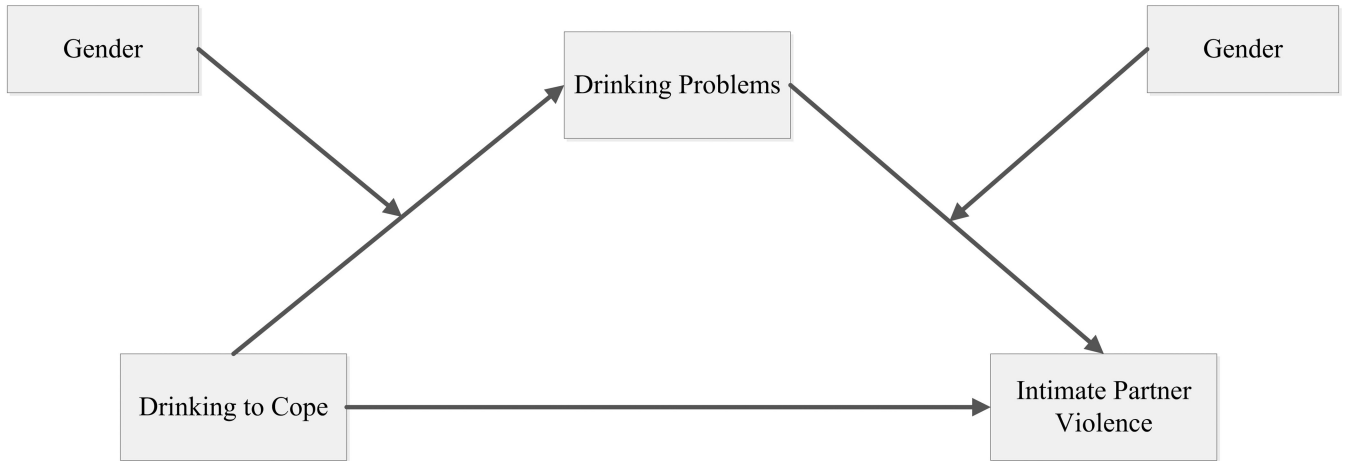
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Intoxication-Violence Model



Self-Medication Model

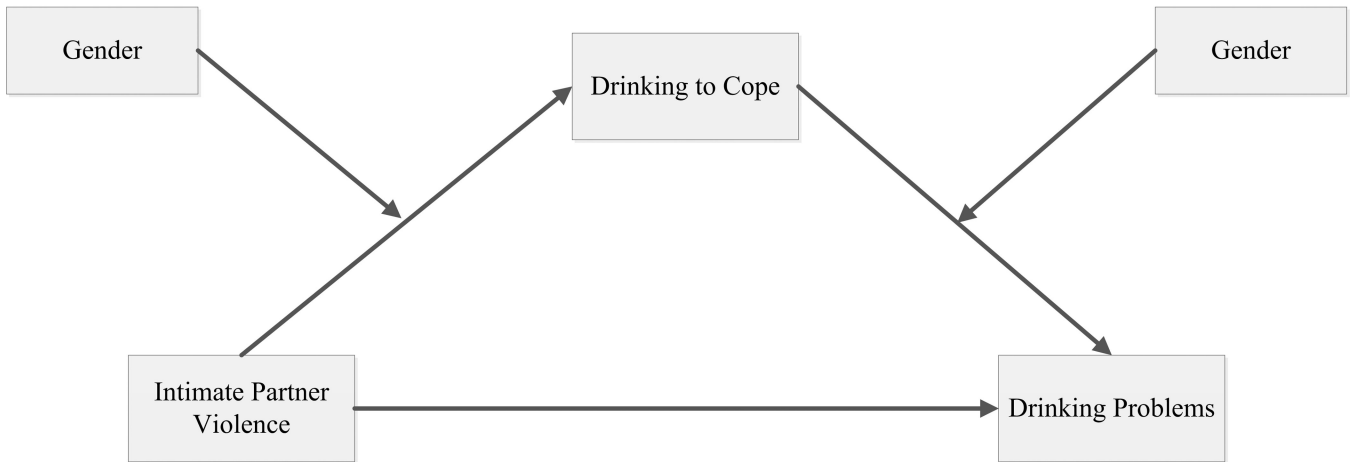


Figure 1.
Conceptual models tested

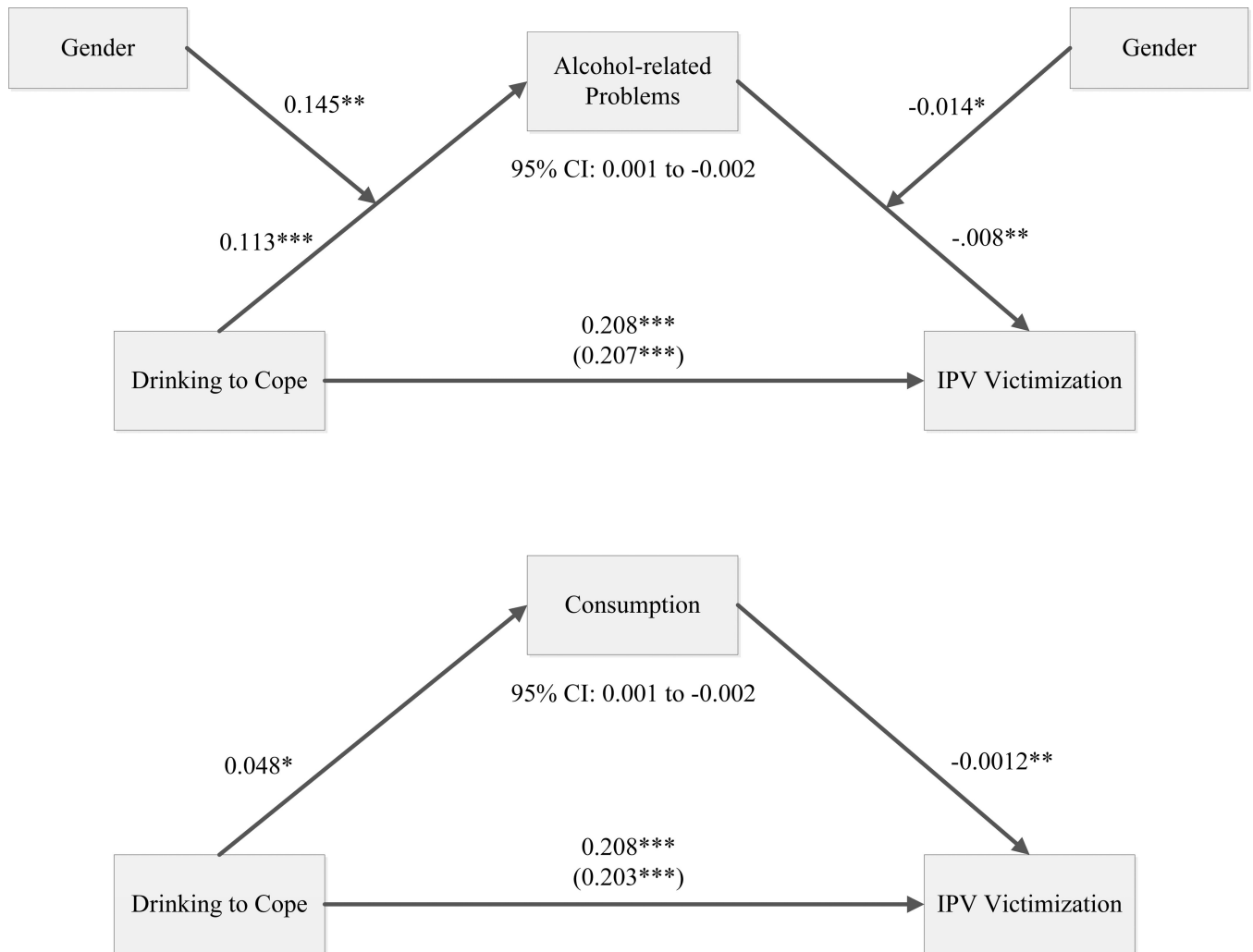


Figure 2. Results for the Intoxication - Violence model with victimization as the outcome and alcohol-related problems (top) and consumption (bottom) as the mediator
Note. *** p < .001, ** p < .01, * p < .05. The parentheses contain the direct effect, after controlling for the mediator. Gender is not displayed when non-significant.

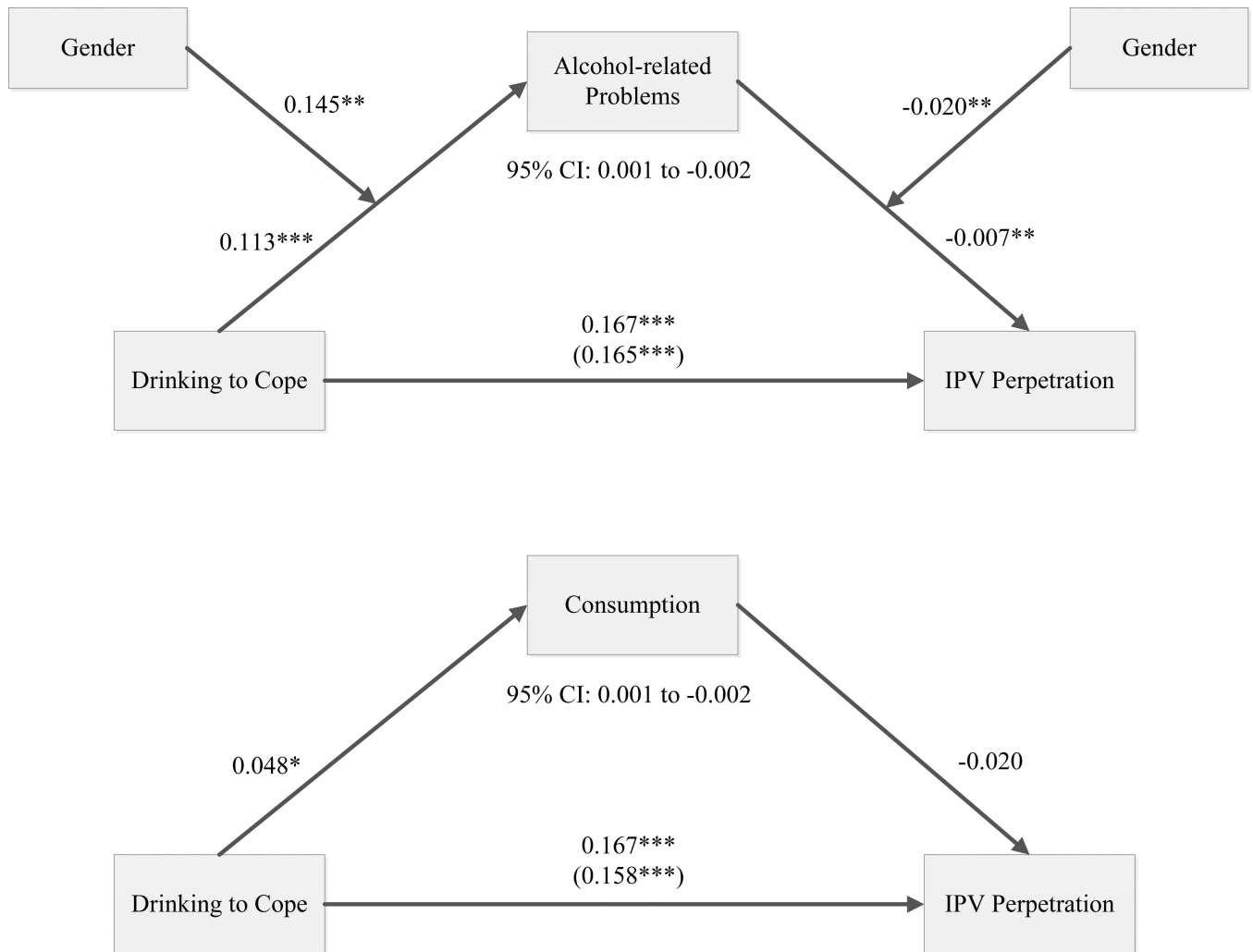


Figure 3. Results for the Intoxication - Violence model with perpetration as the outcome and alcohol-related problems (top) and consumption (bottom) as the mediator.
Note. *** $p < .001$, ** $p < .01$, * $p < .05$. The parentheses contain the direct effect, after controlling for the mediator. Gender is not displayed when non-significant.

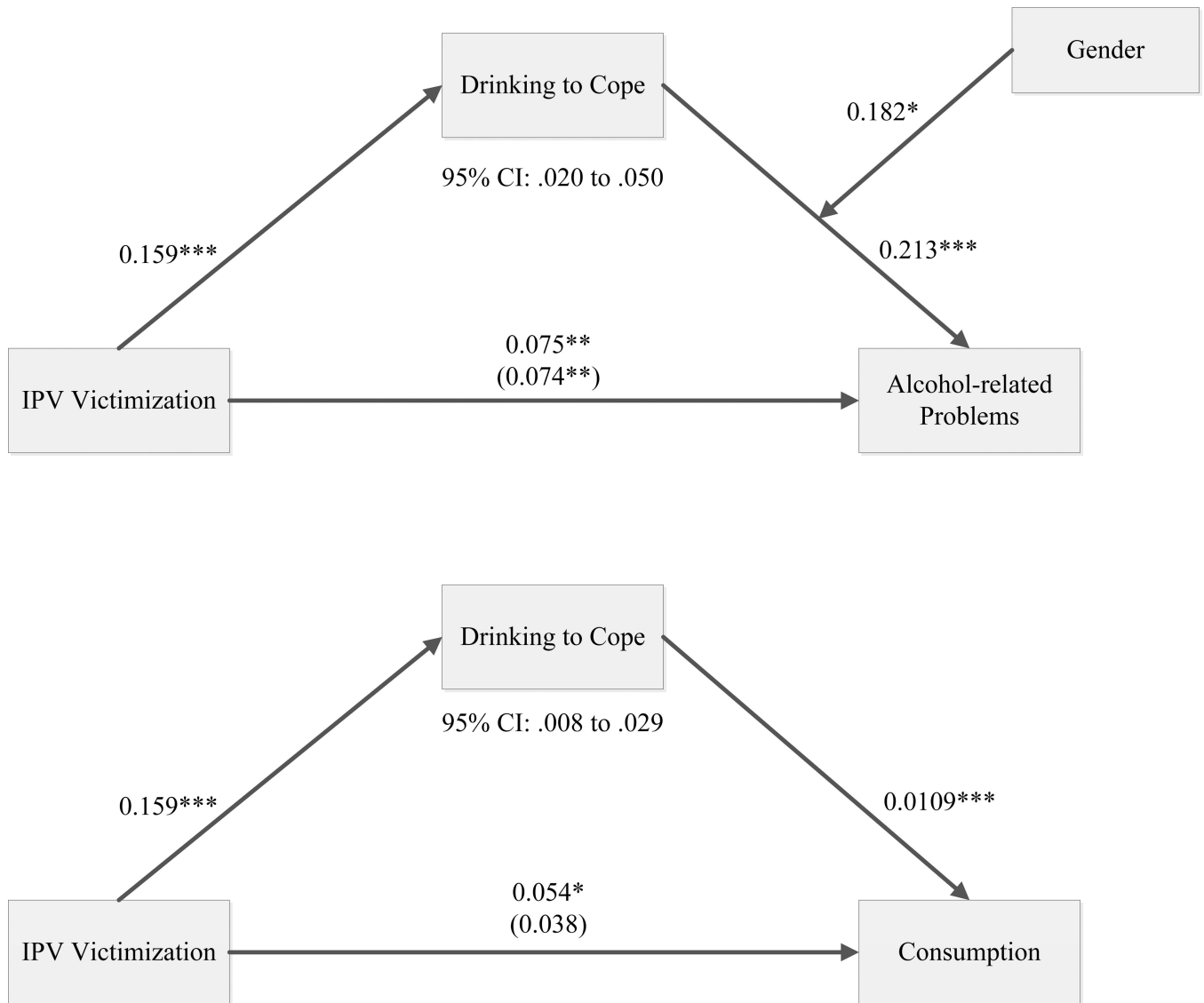


Figure 4. Results for the Self-Medication model with victimization as the predictor and alcohol-related problems (top) and consumption (bottom) as the outcome.
Note. *** $p < .001$, ** $p < .01$, * $p < .05$. The parentheses contain the direct effect, after controlling for the mediator. Gender is not displayed when non-significant.

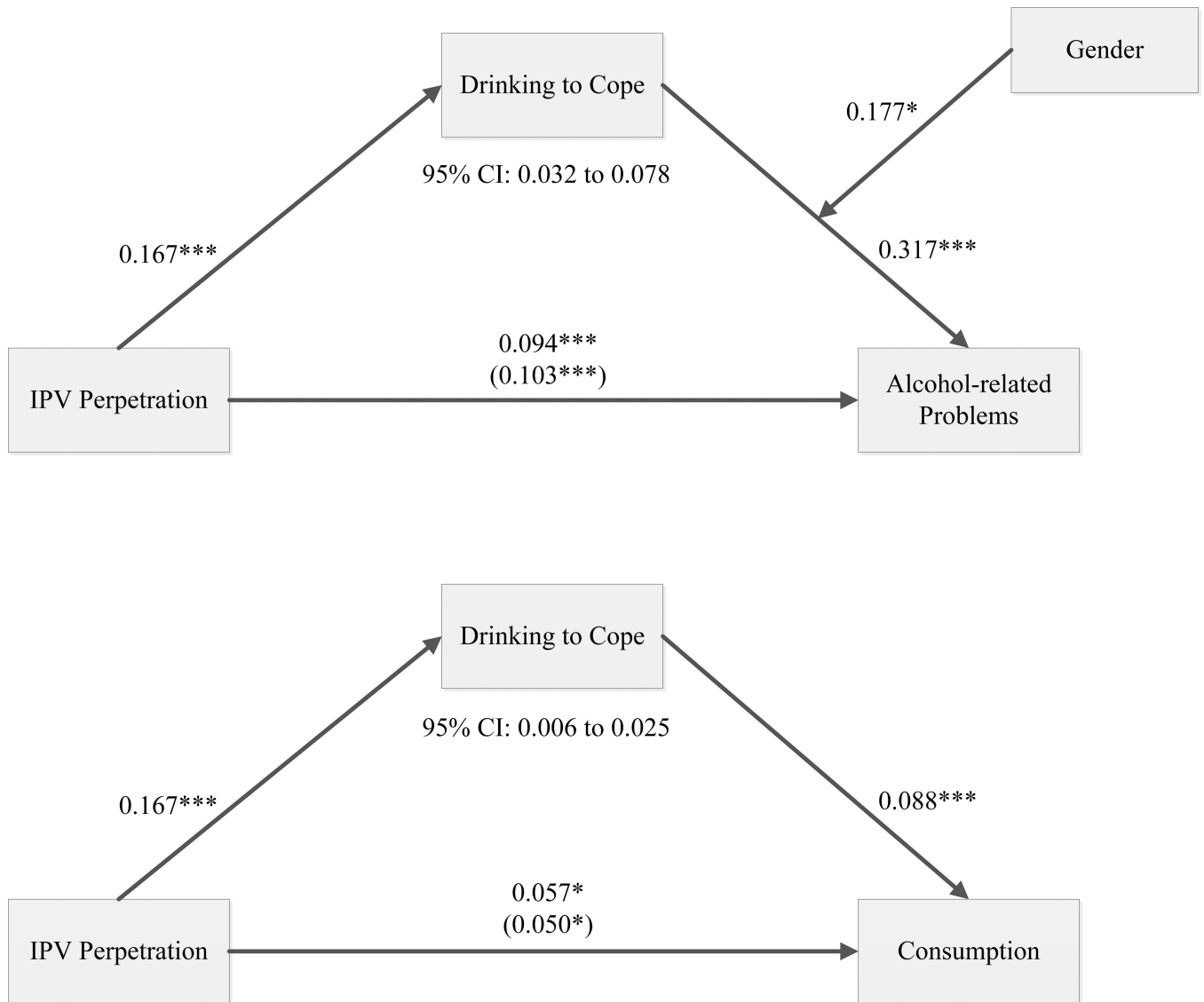


Figure 5. Results for the Self-Medication model with perpetration as the predictor and alcohol-related problems (top) and consumption (bottom) as the outcome
Note. *** $p < .001$, ** $p < .01$, * $p < .05$. The parentheses contain the direct effect, after controlling for the mediator. Gender is not displayed when non-significant.

Table 1

Correlations among study variables at all time points.

	1	2	3	4	5	6	7	8	9	10
1 Victimization T1	--									
2 Victimization T2	0.399***	--								
3 Victimization T3	0.396***	0.510***	--							
4 Victimization T4	0.417***	0.444***	0.542***	--						
5 Victimization T5	0.410***	0.455***	0.572***	0.501***	--					
6 Perpetration T1	0.896***	0.352***	0.385***	0.404***	0.438***	--				
7 Perpetration T2	0.588***	0.939***	0.531***	0.451***	0.475***	0.381***	--			
8 Perpetration T3	0.583***	0.478***	0.982***	0.533***	0.578***	0.395***	0.518***	--		
9 Perpetration T4	0.376***	0.429***	0.539***	0.973***	0.501***	0.394***	0.444***	0.545***	--	
10 Perpetration T5	0.421***	0.406***	0.551***	0.490***	0.968***	0.442***	0.446***	0.558***	0.488***	--
11 Rapi T1	0.177***	0.181***	0.233***	0.221***	0.099*	0.174***	0.236***	0.228***	0.215***	0.109**
12 Rapi T2	0.180***	0.375***	0.340***	0.305***	0.289***	0.171***	0.410***	0.334***	0.310***	0.283***
13 Rapi T3	0.216***	0.384***	0.462***	0.310***	0.323***	0.240***	0.417***	0.461***	0.334***	0.283***
14 Rapi T4	0.314***	0.422***	0.451***	0.419***	0.367***	0.346***	0.481***	0.440***	0.444***	0.366***
15 Rapi T5	0.295***	0.395***	0.512***	0.496***	0.390***	0.321***	0.403***	0.523***	0.528***	0.374***
16 Consumption T1	0.098**	0.092*	0.097*	0.087*	0.012	0.055	0.086*	0.090*	0.057	0.022
17 Consumption T2	0.022	0.084*	0.046	0.078†	0.051	0.016	0.091*	0.059	0.073†	0.057
18 Consumption T3	0.038	0.177***	0.033	0.044	0.028	0.013	0.173***	0.027	0.028	0.026
19 Consumption T4	0.067†	0.160***	0.088*	0.115**	0.047	0.050	0.175***	0.081†	0.094*	0.059
20 Consumption T5	0.052	0.105*	0.084*	0.089*	0.051	0.022	0.088*	0.086*	0.081†	0.070†
21 Coping T1	0.238***	0.195***	0.152***	0.221***	0.128**	0.203***	0.198***	0.148***	0.223***	0.121**
22 Coping T2	0.174***	0.170***	0.144***	0.201***	0.172***	0.176***	0.189***	0.147***	0.193***	0.167***
23 Coping T3	0.119**	0.181***	0.250***	0.248***	0.240***	0.104**	0.187***	0.248***	0.269***	0.233***

	1	2	3	4	5	6	7	8	9	10
24 Coping T4	0.152***	0.204**	0.234***	0.244***	0.228***	0.164***	0.242***	0.238***	0.267***	0.235***
25 Coping T5	0.152***	0.223***	0.219***	0.218***	0.241***	0.161***	0.251***	0.221***	0.231***	0.246***
26 Sex	-0.035	-0.105**	-0.081*	-0.082*	-0.026	0.020	-0.100**	-0.079*	-0.076 [†]	-0.012

	11	12	13	14	15	16	17	18	19	20
1 Victimization T1										
2 Victimization T2										
3 Victimization T3										
4 Victimization T4										
5 Victimization T5										
6 Perpetration T1										
7 Perpetration T2										
8 Perpetration T3										
9 Perpetration T4										
10 Perpetration T5										
11 Rapi T1	--									
12 Rapi T2	0.479***	--								
13 Rapi T3	0.355***	0.594***	--							
14 Rapi T4	0.455***	0.621***	0.609***	--						
15 Rapi T5	0.370***	0.529***	0.537***	0.736***	--					

	11	12	13	14	15	16	17	18	19	20
16 Consumption T1	0.434***	0.331***	0.275***	0.283***	0.239***	---				
17 Consumption T2	0.275***	0.482***	0.376***	0.379***	0.312***	0.562***	--			
18 Consumption T3	0.244***	0.359***	0.402***	0.362***	0.276***	0.540***	0.670***	--		
19 Consumption T4	0.248***	0.363***	0.386***	0.485***	0.371***	0.537***	0.628***	0.723***	--	
20 Consumption T5	0.182***	0.311***	0.299***	0.361***	0.403***	0.467***	0.561***	0.652***	0.753***	--
21 Coping T1	0.347***	0.192***	0.237***	0.279***	0.206***	0.134***	0.029***	0.058***	0.045***	-0.017***
22 Coping T2	0.260***	0.370***	0.322***	0.347***	0.283***	0.138***	0.156***	0.158***	0.153***	0.119***
23 Coping T3	0.203***	0.289***	0.394***	0.369***	0.303***	0.101***	0.173***	0.159***	0.183***	0.117***

	11	12	13	14	15	16	17	18	19	20
24 Coping T4	0.247***	0.279***	0.293***	0.453***	0.330***	0.091*	0.114**	0.133***	0.182***	0.100*
25 Coping T5	0.240***	0.290***	0.314***	0.370***	0.381***	0.107**	0.111**	0.103*	0.186***	0.142***
26 Sex	-0.087*	-0.168***	-0.191***	-0.134***	-0.129***	-0.197***	-0.249***	-0.247***	-0.245***	-0.256***

	21	22	23	24	25
1 Victimization T1					
2 Victimization T2					
3 Victimization T3					
4 Victimization T4					
5 Victimization T5					
6 Perpetration T1					
7 Perpetration T2					
8 Perpetration T3					
9 Perpetration T4					
10 Perpetration T5					
11 Rapi T1					
12 Rapi T2					
13 Rapi T3					
14 Rapi T4					
15 Rapi T5					

	21	22	23	24	25
16 Consumption T1					
17 Consumption T2					
18 Consumption T3					
19 Consumption T4					
20 Consumption T5					
21 Coping T1	--				
22 Coping T2	0.575***	--			
23 Coping T3	0.511***	0.627***	--		
24 Coping T4	0.448***	0.512***	0.543***	--	

	21	22	23	24	25
25 Coping T5	0.419***	0.486***	0.528***	0.561***	--
26 Sex	0.017	-0.008	-0.053	0.012	-0.068 [†]

Note. Ns range from 553–818.

[†] $p < 0.1$,

* $p < 0.05$,

** $p < 0.01$,

*** $p < 0.001$.

T1 = baseline, T2 = Wave 1 (6 months), T3 = Wave 2 (12 months), T4 = Wave 3 (18 months), T5 = Wave 4 (24 months). Sex coded 0 = men, 1 = women.

Table 2

Means and standard deviations for study variables at all time points

	IPV Victimization	IPV Perpetration	Drinking to Cope	Alcohol- related Problems	Consumption
Time point 1	2.687 (5.094)	2.685 (5.151)	2.040 (0.897)	6.914 (7.745)	11.649 (10.810)
Time point 2	1.340 (4.090)	1.247 (4.047)	1.955 (0.894)	6.511 (8.548)	10.384 (10.267)
Time point 3	1.404 (4.938)	1.474 (5.046)	1.933 (0.885)	6.117 (9.586)	10.569 (11.248)
Time point 4	1.737 (5.685)	1.787 (5.875)	1.817 (0.800)	6.372 (10.717)	9.863 (10.145)
Time point 5	1.668 (5.027)	1.664 (4.931)	1.778 (0.779)	5.731 (10.071)	9.798 (10.053)

Table 3

Comparisons between adjacent time point

	T1 vs T2	T2 vs T3	T3 vs T4	T4 vs T5
IPV Victimization	13.51 ^{***}	0.00	0.23	0.32
IPV Perpetration	10.26 ^{**}	0.08	0.46	0.17
Drinking to Cope	5.88 [*]	1.24	12.79 ^{***}	1.32
Alcohol-related Problems	0.42	2.60	0.37	2.29
Consumption	12.72 ^{***}	1.49	5.90 [*]	0.02

Note.

^{*}
 $p < 0.05$,

^{**}
 $p < 0.01$,

^{***}
 $p < 0.001$.

Contrasts are reported in the F -statistic. T1 = baseline, T2 = Wave 1 (6 months), T3 = Wave 2 (12 months), T4 = Wave 3 (18 months), T5 = Wave 4 (24 months).

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