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Internalizing and Externalizing Dimensions and Alcohol Use in First Time DWI Offenders: Indirect Effects Through Coping Self-Efficacy

Robert C. Schlauch, Stephanie S. O'Malley, Bruce J. Rounsaville, and Samuel A. Ball
Department of Psychiatry, Division of Substance Abuse, Yale University School of Medicine

Abstract

Using cross-sectional data and structural equation modeling, we evaluated whether coping self-efficacy to abstain from drinking in various situations accounted for the relationship between internalizing (depression, anxiety) and externalizing (aggression, low socialization) dimensions with problematic alcohol use in 292 first-time DWI offenders. Results indicated that an internalizing dimension indirectly predicted problematic alcohol use through coping self-efficacy in negative situations only, whereas an externalizing dimension indirectly predicted problematic alcohol use through coping self-efficacy in positive situations only. These findings support two potential pathways to problematic drinking behavior among DWI offenders and suggest that internalizing and externalizing dimensions may differentially predict high risk drinking situations due to one's inability to abstain in specific situations.

Although significant reductions in alcohol-related traffic fatalities have occurred over the past two decades, drinking and driving continues to be a serious problem in the United States (NHTSA, 2008). Approximately one third of DWI offenders are repeat offenders (NHTSA, 2006), and there is evidence to suggest that a large proportion of offenders continue to drink and drive but are never caught (Wiliszowski et al., 1996). Of those who recidivate, greater problems associated with use, including hazardous drinking patterns, are often noted (see Nochajski & Stasiewicz, 2006 for a review). Despite high costs to society, relatively little is known about how individual difference factors interact with each other and situational-based coping competencies to increase the risk of problematic alcohol use within DWI offenders. With higher rates of psychiatric disorders found among DWI offenders (see Nochajski & Stasiewicz, 2006 for review), dimensions related to psychiatric symptoms may represent important individual difference factors associated with problematic drinking. The current study sought to inform this literature by examining the ways in which internalizing and externalizing dimensions might influence problematic alcohol use among first DWI offenders, with a focus on the effects of coping self-efficacy to abstain from drinking in specific situational contexts.

Correspondence concerning this article should be addressed to Robert C. Schlauch, Research Institute on Addictions, University at Buffalo, State University of New York, 1021 Main Street, Buffalo, NY 14203. rschlauch@ria.buffalo.edu.

Robert C. Schlauch is now at Research Institute on Addictions, University at Buffalo, State University of New York.

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Lower scores on the California Personality Inventory – Socialization subscale indicate greater problems, thus an opposite loading was expected when compared to the indicator measuring overall aggressive behavior (i.e., Buss-Agg).

There is an extensive body of literature examining the relationship between internalizing and externalizing traits and behaviors with problematic alcohol use. For example, neuroticism/negative emotionality, anxiety, depression, impulsivity/disinhibition, and antisocial behaviors have all been associated with problematic alcohol use (see Sher et al., 2005 for a review). In previous research, we found that DWI offenders with higher levels of mood symptoms and disorder reported a greater number of heavy drinking days and negative consequences associated with their drinking (Holt et al., 2009; Palmer et al., 2007). Other research has suggested that traits related to internalizing disorders are associated with greater problematic use among DWI offenders and higher likelihood of repeat offenses (Wells-Parker & Williams, 2002; McMillen et al., 1992). In addition, among DWI offenders, greater hostility and antisocial personality are associated with a higher risk for recidivism (Nochajski & Stasiewicz, 2002). A better understanding of the ways in which dimensions related to psychiatric symptoms influence problematic alcohol use within DWI offenders has the potential to inform both treatment and prevention efforts.

Although little is known about the mechanisms by which internalizing and externalizing dimensions influence hazardous drinking and driving decisions, findings in other populations suggests some hypotheses. For example, drinking to cope with negative affect has been found to mediate the relationship between anxiety/depression and alcohol use (Grant et al., 2009; Goldsmith et al., 2009; Stewart et al., 2006), whereas positive expectancies (Barnow et al., 2004) and enhancement motives (Tragesser et al., 2008) have been shown to mediate the relationship between impulsivity/antisocial behaviors and alcohol use. Taken together, those high on traits and behaviors related to an internalizing dimension may be at a greater risk for problematic use due to the negative reinforcement properties of alcohol, whereas those high on an externalizing dimension due to the positive reinforcement properties. However, a limitation of past research has been the lack of inclusion of both internalizing and externalizing dimensions in the same model, which is an important consideration given the high rates of comorbidity noted (e.g., Goodwin & Hamilton, 2003). Further, most research examining the relationship between dimensions related to psychiatric symptoms and alcohol use has focused on variables that tend to be more distal in the chain of events (e.g., expectancies and motives) and have failed to take into account specific situational-based coping competencies.

We hypothesize coping self-efficacy to be a key explanatory variable for the association between internalizing and externalizing dimensions and problematic alcohol use. Defined as one's confidence in abstaining from or modifying alcohol consumption in high risk situations, coping self-efficacy is believed to be influenced by alcohol expectancies and to be more predictive of alcohol use (Maisto et al., 2008; Oei & Jardim, 2007). Although there has been theoretical speculation on the ways in which internalizing and externalizing dimensions might influence coping self-efficacy and drinking behavior (e.g., Burke and Stephans; 1999; Gilles et al., 2006), there have been few empirical tests of these associations. Further, to our knowledge there have been no such tests within DWI offenders, and particularly whether coping self-efficacy in specific situations accounts for the relationship between dimensions associated with psychiatric symptoms and problematic alcohol use. Thus, the goal of the current study was to examine the ways in which internalizing and externalizing dimensions influence problematic alcohol use in first time DWI offenders with a focus on the effects of coping self-efficacy in specific situations on these relationships. Drawing upon the literature linking internalizing behaviors with drinking for negative reinforcement and externalizing behaviors with drinking for positive reinforcement, we predicted that:

- 1) An internalizing dimension would indirectly predict problematic alcohol use through coping self-efficacy in negative situations only when controlling for an

externalizing dimension, such that those higher on internalizing would have lower coping self-efficacy in negative situations.

- 2) An externalizing dimension would indirectly predict problematic alcohol use through coping self-efficacy in positive situations only when controlling for an internalizing dimension, such that those higher on externalizing would have lower coping self-efficacy in positive situations.

Method

Participants

Participants were 292 first time DWI offenders whose mean age was 32.2 (SD=10.5). Participants were predominantly male (80%) and Caucasian (84%; 9% African American, 5% Hispanic American, and 2% other), and 86% were high school graduates. Participants were originally recruited for a randomized clinical trial. Eligibility criteria included: a) at least 18 years of age, b) able to read English, c) not actively psychotic or suicidal, and d) not participating in ongoing substance abuse treatment.

Measures

Problematic Alcohol Use—Problematic alcohol use was assessed using the *Time Line Follow-Back* (TLFB; Sobell & Sobell, 1992) and *Addiction Severity Index- Alcohol Subscale* (McLellan et al., 1980). The TLFB interview was used to obtain retrospective daily drinking patterns (3-months prior to baseline interview), including percent days of heavy drinking (i.e., >3 standard drinks for women and >4 standard drinks for men). The ASI is a semi-structured interview assessing seven problem areas in substance users, and we used the alcohol composite severity index.

Externalizing Dimension—The externalizing dimension was measured using the California Psychological Inventory-Socialization subscale (CPI-So; Gough, 1987) and the *Buss-Durkee Hostility Inventory* (BDHI; Buss & Durkee, 1957). The CPI-So is a 46-item self-report measure of a range of behaviors related to delinquency which are associated with a diagnosis of antisocial personality disorder (Cooney et al., 1990). The BDHI is a 75-item self-report measure that assesses hostility and aggression. Scores from the irritation, resentment, assaultive, indirect hostility, and verbal hostility subscales were summed to create an overall aggression composite score.

Internalizing Dimension—The Internalizing dimension was measured using the *Beck Depression Inventory* (BDI; Beck & Steer, 1987) and the *State-Trait Anxiety Inventory* (STAI; Spielberger, Gorsuch, Lushene, 1970). The BDI is a 21 item scale that measures current symptoms of depression. The STAI is a 40-item self-report measure that assesses temporary or state anxiety and long-standing or trait anxiety, with the latter used in the current study.

Situational Confidence Questionnaire—(SCQ; Annis & Graham, 1988). The SCQ is a 39-item questionnaire that assessed participant's coping self-efficacy to abstain from drinking in three broad situational categories on a scale of 0 (not at all confident) to 100 (completely confident), including negative situations (e.g., "If I felt that I had let myself down") and positive situations (e.g., "If I were enjoying myself at a party and wanted to feel even better").

Procedure

Participants were originally recruited for a randomized clinical trial beginning in October of 1992 and continuing through September of 1994. A total of 1,097 individuals were referred for assessment and intervention services at the Alcohol Service Organization, a state funded program in New Haven, CT that provides screening and intervention for first-time offenders (i.e., first arrest) without additional charges (i.e., DWI and possession of drugs). The majority of individuals declined participation (794). From the remaining sample ($n=303$), 292 first time DWI offenders were included in the final analysis (11 reported multiple DWI offenses). Participants did not differ from nonparticipating clients on gender, ethnicity, education level, marital status, or gross income, but as a group were somewhat younger in age. Participants could earn up to \$125 for completing assessments, including \$25 paid at baseline. For more details regarding recruitment and procedures see Ball et al. (2000) and Palmer et al. (2009). The current study reports on data obtained during baseline assessments only.

Data Analysis

Structural equation modeling (Mplus 5.21; Muthen & Muthen, 2007) was used to examine the relationships among internalizing and externalizing dimensions, coping self-efficacy in positive and negative situations, and problematic alcohol use (see Figure 1). Prior to analysis, all variables were examined for outliers and non-normality. Upon reigning in outliers (+ or - 3 standard deviations) some distributions continued to demonstrate a moderate to severe non-normality. Therefore, model fit indices and parameters were estimated using maximum likelihood estimation with robust standard errors (MLM; Muthen & Muthen, 2007). Multiple imputation was used to address missing data, as it performs well even when data are non-normal (see Enders, 2006 for review). Based on the total number of missing entries (see Table 1), 10 copies of the sample dataset were created using NORM software (Schafer, 1999). Specifically, every 20th cycle (initial EM convergence obtained at 8 iterations) was used to create 10 datasets to ensure independence (Schafer & Olsen, 1998).

Results

Descriptive Statistics and Bivariate Correlations

Bivariate correlations, means, standard deviations, and skewness statistics among all variables in the proposed model were examined in order to confirm that it was appropriate to test for indirect effects and to examine the relationship among the hypothesized variables (see Table 1). All intercorrelations were significant and in the expected directions.

Measurement Model

First we examined the measurement model consisting of three latent variables (internalizing dimension, externalizing dimension, and problematic alcohol use) with six (two each) indicators. Results from the analysis indicated a good fitting model with all fit indices falling within acceptable ranges. Specifically, the S-B chi-square for this model was non-significant ($\chi^2(6) = 5.8, p=.44$), suggesting an excellent fitting model. The standardized root mean square residual (SRMR) was .01, also suggesting a good fit (i.e., $< .08$). The Tucker-Lewis Index (TLI=1.0) and Comparative Fit Index (CFI=1.0) were greater than the recommended .95. Finally, the root mean square error of approximation (RMSEA<.01) was well below the recommended .05. Further, factor loadings for the BDI ($\beta=.75$), STAI ($\beta=.90$), Buss-Agg ($\beta=.82$), CPI-So ($\beta= -.76$), % heavy drinking days ($\beta=.73$), and ASI-Alcohol ($\beta=.87$) were all significant (p values $<.001$) and in the expected direction. In addition, the correlations between the internalizing and externalizing, internalizing and problematic alcohol use, and externalizing and problematic alcohol use were .73, .45, .40 (p -values $<.001$) respectively.

Structural Model

Results for the structural model indicated a good fitting model. Specifically, the S-B chi-square for this model was non-significant ($\chi^2(12) = 18.1, p=.11$). In addition, the SRMR, TLI, CFI, and RMSEA were .02, .98, .99, and .04 respectively, all suggesting an excellent fitting model. Summaries of the unstandardized and standardized parameter estimates are presented in Table 2 and Figure 1. The internalizing dimension directly predicted coping self-efficacy in negative situations (SCQ-Neg; $\beta = -.41, p<.001$), but not positive situations (SCQ-Pos; $\beta = -.21, p=.08$). The externalizing dimension directly predicted coping self-efficacy in positive (SCQ-Pos; $\beta = -.37, p<.01$) and negative situations (SCQ-Neg; $\beta = -.26, p<.05$). Both coping self-efficacy in positive (SCQ-Pos; $\beta = -.34, p<.001$) and in negative situations (SCQ-Neg; $\beta = -.23, p<.05$) predicted problematic alcohol use, whereas the externalizing ($\beta = -.11, p=.41$) and internalizing dimensions ($\beta = .25, p=.06$) were non-significant. Further, as predicted, results from Sobel tests indicated a significant indirect effect of the internalizing dimension predicting problematic alcohol use through coping self-efficacy in negative situations ($\beta = .10, p<.05$), but not through coping self-efficacy in positive situations ($\beta = .07, p=.13$). In addition, a significant indirect effect of the externalizing dimension predicting problematic alcohol use through coping self-efficacy in positive situations ($\beta = .13, p<.05$) was also observed, but not through coping self-efficacy in negative situations ($\beta = .06, p=.09$).

Discussion

To our knowledge, the current study is the first to examine the ways in which internalizing and externalizing dimensions impact problematic alcohol use among DWI offenders. Specifically, we hypothesized that coping self-efficacy in specific situational contexts would account for the relationship between dimensions related to psychiatric symptoms and problematic alcohol use. Consistent with our predictions, we found that an internalizing dimension indirectly predicted problematic alcohol use through coping self-efficacy in negative situations only, whereas an externalizing dimension indirectly predicted problematic alcohol use through coping self-efficacy in positive situations. Taken together, these findings suggest that internalizing and externalizing dimensions may differentially predict high risk drinking situations among DWI offenders due to lower confidence in one's ability to abstain in specific situations.

DWI offenders high on an internalizing dimension reported greater problematic use of alcohol due to difficulty abstaining in situations that elicit negative affect, suggesting that these individuals may be drinking partly as a means to regulate such emotions. The notion that alcohol intoxication results in a reduction of stress and negative affect has been central to many psychological theories of drinking behavior (Curtin & Lang, 2007). Indeed, there is considerable evidence in support of a "tension-reduction hypothesis" such that many individuals hold strong expectations that alcohol reduces stress and anxiety (e.g., Fromme et al., 1993) and report drinking to cope with negative affect (e.g., Cooper et al., 1992). In contrast, DWI offenders high on an externalizing dimension reported consuming greater problematic alcohol use due to difficulty abstaining in situations that are positively rewarding, suggesting that these individuals may be drinking partly to enhance their experience, a finding that is consistent with previous research (Lynam et al., 2005; Stewart & Devine, 2000). It is also possible that an externalizing dimension may not be specific to high risk drinking per se, but representative of a broader risk factor for the engagement in risky behaviors of which one is drinking and driving. Nevertheless, findings from the current study continue to support the growing literature suggesting that externalizing traits and behaviors increase high risk drinking in situations in which one perceives alcohol will enhance their experience.

A key contribution of the current study was the inclusion of coping self-efficacy in specific situational contexts, an individual difference variable that is posited to be more predictive of and proximal to alcohol use. Indeed, self-efficacy is hypothesized to be an important component of relapse behavior (e.g., Maisto, Carey, & Bradizza, 1998), and as such, often targeted in alcohol treatment programs (Witkiewitz & Marlatt, 2004). To our knowledge, the current study was the first to model coping self-efficacy and dimensions related to psychiatric symptoms to predict problematic alcohol use, as well as test whether coping self-efficacy accounts for the relationship between internalizing and externalizing dimensions and drinking behavior within DWI offenders. More importantly, coping self-efficacy may represent a key variable in the identification of high risk drinking and the situational context in which it may occur. Indeed, our results suggest that coping-self-efficacy in specific situational contexts may account for the relationship between internalizing and externalizing dimensions and problematic alcohol use among DWI offenders. Thus, future research should continue to explore the relationship between coping self-efficacy and problematic alcohol use within DWI offenders, and the potential of coping self-efficacy to act as a mechanism of change in treatment.

In this connection, the current findings offer several potential strategies that may improve alcohol intervention outcomes among DWI offenders. Coping self-efficacy is posited to play a key role in relapse behavior and often targeted in treatment, and among DWI offenders, may be particularly important in preventing recidivism as there is some evidence to suggest that those higher on self-efficacy have lower short-term recidivism rates (Wells-Parker et al., 2000). Results from the current study highlight the importance of coping self-efficacy in predicting problematic drinking patterns among DWI offenders. Further, results also suggest that intervention outcomes may improve with additional focus on internalizing and externalizing traits and behaviors in treatment, as internalizing and externalizing dimensions indirectly influences problematic drinking through coping self-efficacy. This seems particularly important as combined treatment approaches to rehabilitation (education, substance abuse counseling) have been among the most promising for reducing recidivism among DWI offenders (see Nochajski & Stasiewicz, 2006 for a review). Interventions focused on risk reduction by targeting contributory factors for high risk drinking, rather than alcohol abstinence, may improve treatment outcomes particularly among those who are ambivalent about changing their behavior (Nochajski & Stasiewicz, 2006).

Overall, the results of the current study offer interesting findings for better understanding the heterogeneity seen within DWI offenders. However, the current study is not without limitations. Most importantly, the current study relied heavily on correlational methods that limit the ability to draw conclusions about the predictive validity of internalizing and externalizing dimensions on problematic alcohol use. Within an SEM framework, reliance of such methodology gives rise to concerns of equivalent models. Further, our inability to establish temporal relationships among the variables of interest precludes a true test of mediation. Thus, longitudinal designs should be utilized to examine the relationship between internalizing and externalizing dimensions, coping-self-efficacy, and problematic alcohol use. In addition, although problematic alcohol use is a known predictor of future offenses, findings from the current study cannot speak directly to recidivism, which arguably represents the most important outcome regarding DWI offending. Future research would benefit from directly assessing recidivism and its relationship to important individual difference factors. Finally, it is possible that legal sanctions may interact with individual difference variables in predicting drinking and DWI behavior, thus limiting the generalizability of the present findings in jurisdictions where legal sanctions are significantly different from those where and when the data were collected.

In summary, findings from the current study continue to support the growing body of literature highlighting the importance of individual difference variables in the study of problematic drinking among DWI offenders. Exploration of the role of coping self-efficacy in predicting problematic drinking, including the potential to serve as a mechanism of change, provides many exciting avenues for investigators concerned with the treatment of alcohol problems among DWI offenders and addiction research more broadly.

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Figure 1. Summary of standardized estimates for the full model (solid lines represent significant pathways; dotted lines represent non-significant pathways).

Table 1

Descriptive Statistics and Correlations of Observed Data

	M	SD	Skewness	% Missing	1	2	3	4	5	6	7	8	9	10
1. Age	32.24	10.47	1.00	0	--									
2. Gender	.20	.40	1.52	0	-.04	--								
3. BDI	5.12	5.73	1.45	3	.08	.10	--							
4. STAI	14.47	9.23	.53	7	-.06	.10	.66**	--						
5. Buss-Agg	21.27	8.97	.45	<1	-.16**	-.10	.43**	.54**	--					
6. CPI-So	27.22	6.04	-.45	<1	.20**	.06	-.45**	-.49**	-.63**	--				
7. SCQ-Pos	79.96	19.04	-1.09	0	.17**	.15*	-.35**	-.42**	-.42**	.43**	--			
8. SCQ-Neg	88.90	15.52	-1.48	0	.04	.09	-.49**	-.48**	-.44**	.46**	.74**	--		
9. % Heavy	.11	.16	2.08	<1	-.17**	-.15*	.25**	.30**	.28**	-.25**	-.43**	-.39**	--	
10. ASI-Alc	.18	.16	1.27	0	-.01	-.11	.34**	.34**	-.23**	.29**	-.50**	-.50**	.63**	--

Note: BDI=Beck Depression Inventory; STAI=Trait Anxiety; Buss-Agg= Buss-Durkee Hostility Inventory - Aggression Sum Score; CPI-So=California Personality Inventory-Socialization Subscale (inverted); SCQ-Pos=Situational Confidence Questionnaire-Positive Situations; SCQ-Neg=Situational Confidence Questionnaire-Negative Situations; % Heavy= % Heavy Drinking Days (last 3 months); ASI-Alc=Addiction Severity Index-Alcohol subscale.

** p<.01

* p<.05

Table 2

Summary of unstandardized estimates, standardized estimates, and indirect effects.

	Estimate	SE	β
<u>Latent Variables</u>			
Internalizing Dimension	--	--	--
BDI	4.40	.35	.77**
STAI	8.26	.53	.88**
Externalizing Dimension	--	--	--
Buss-Agg	7.16	.52	.80**
CPI-So	-4.72	.29	-.78**
Problematic Alcohol Use	--	--	--
% Heavy Drinking Days (TLFB)	.09	.01	.72**
ASI-Alcohol subscale	.11	.01	.89**
<u>Model Pathways</u>			
Internalizing → SCQ-Pos	-4.03	2.35	-.21
Internalizing → SCQ-Neg	-6.32	2.00	-.41**
Externalizing → SCQ-Pos	-7.07	2.34	-.37**
Externalizing → SCQ-Neg	-3.96	1.88	-.26*
SCQ-Pos → Problematic Alcohol Use	-.023	.007	-.34**
SCQ-Neg → Problematic Alcohol Use	-.018	.006	-.23*
Internalizing → Problematic Alcohol Use	.33	.18	.25
Externalizing → Problematic Alcohol Use	-.14	.17	-.11
Internalizing ↔ Externalizing	.76	.05	.76**
SCQ-Pos ↔ SCQ-Neg (residuals)	116.75	16.09	.61**
<u>Indirect Effects</u>			
Internalizing → SCQ-Pos → Problematic Alcohol Use	.08	.06	.07
Internalizing → SCQ-Neg → Problematic Alcohol Use	.11	.05	.10*
Externalizing → SCQ-Pos → Problematic Alcohol Use	.16	.07	.13*
Externalizing → SCQ-Neg → Problematic Alcohol Use	.07	.04	.06

Note: BDI=Beck Depression Inventory; STAI=Trait Anxiety; Buss-Agg= Buss-Durkee Hostility Inventory - Aggression Sum Score; CPI-So=California Personality Inventory-Socialization Subscale (inverted); ASI=Addiction Severity Index; SCQ-Pos=Situational Confidence Questionnaire-Positive Situations; SCQ-Neg=Situational Confidence Questionnaire-Negative Situations.

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p<.01

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p<.05