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The Interactive Effects of Effort to Regulate Alcohol Use, Anxiety Disorders, and Affective Disorders on Long-Term Remission from Alcohol Dependence

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Abstract

Objective—The present study examined how effort to regulate alcohol use may interact with anxiety and affective disorders to influence long-term remission from alcohol dependence.

Method—Using participants ($n = 96$; 73% male; 66% children of alcoholics; 71% non-Hispanic Caucasian; 26% Hispanic) from a high-risk community study who showed evidence of recovered alcohol dependence at baseline, the present study examined whether effort to regulate alcohol use at the baseline assessment significantly influenced the likelihood of maintaining remission from alcohol dependence at the 10 year follow-up. This study also examined whether having an anxiety or affective disorder interacted with effort to regulate alcohol use. All analyses controlled for treatment history, baseline alcohol use, parent alcoholism, age, and gender.

Results—Results from logistic regressions showed that effort to regulate alcohol use had a significant unique main effect on maintenance of remission from alcohol dependence. Having an affective and/or anxiety disorder did not have a significant main effect on the maintenance of remission. However, having an anxiety/affective disorder significantly moderated the influence of effort to regulate alcohol use such that the protective effect of effort to regulate use on remission from alcohol dependence was only significant for those without an affective or anxiety disorder.

Conclusions—Individuals who try harder to limit their drinking are more likely to maintain long-term remission from alcohol dependence. However, affective and anxiety disorders may undermine the protective effect of effort to regulate alcohol use on long-term remission.

Keywords

alcohol use disorder; remission; relapse; self-control; comorbidity

Current research conceptualizes Alcohol Use Disorders (AUDs) as “chronic relapsing disorders” (Schuckit, 2009; p.494), such that many individuals display transient changes in substance abuse/dependence status. Although some have reported that as many as twenty percent of those with AUDs are able to drink moderately without problems for a year, others report that less than ten percent are ever able to develop long periods of non-problem

drinking (Dawson et al., 2005; Schuckit, 2009). Therefore, Sobell et al., (2000) suggest that researchers examining recovery from AUDs specify that individuals meet criteria for remission for at least five years to ensure that recovery is stable.

Although research is clear that recovery from AUDs is often intermittent, much of the work on predictors of remission has focused on short-term (less than five years) recovery. The work on short-term recovery in the context of treatment has found that remission rates among individuals who have received treatment ranges from 25–57% for abstinence and 33–40% for non-problem drinking one year later, and 62% for abstinence for at least the last six months at three-year follow-ups (Miller et al., 2001; Moos and Moos, 2006; Weisner et al., 2003). In terms of long term treatment outcomes, although some research has found that individuals who receive formal treatment for a drinking problem were more likely to maintain recovery between eight and twenty years later compared to those who did not (Timko et al., 2000; Trim et al., 2013), some research has found only marginally significant differences between those in treatment and those not in treatment at 16-year follow-up (Moos and Moos, 2007). However, many individuals may recover from alcohol abuse or dependence without formal intervention or treatment, a phenomenon variously referred to as “natural recovery,” “spontaneous remission,” “maturing out,” or “unassisted change” (Walters, 2000). Research has found that the prevalence of spontaneous remission for alcohol ranges from 24–92% for abstinence and/or non-problem drinking two to four years later (Humphreys et al., 1995; Rumpf et al., 2006; Walters, 2000).

In addition to treatment, the presence of additional psychiatric disorders may also influence remission from alcohol dependence. Given that affective and anxiety disorders are likely to co-occur with AUDs (Grant et al., 2004), it is important to better understand how these disorders influence one’s likelihood of recovering from an AUD. Theoretically, individuals with comorbid anxiety or affective disorders may be at increased risk for AUD relapse to the extent that they use alcohol to self-medicate these symptoms. Many studies examining the influence of affective (Bradizza et al., 2006; Charney et al., 2005; Curran et al., 2000; Hasin et al., 2002; Hodgins et al., 1999; Kodl et al., 2008) and anxiety (Charney et al., 2005; Driessen et al., 2001; Kushner et al., 2005; Willinger et al., 2002) disorders on risk for relapse from AUDs indicate that having a current affective or anxiety disorder is associated with greater risk of relapse, shortened time to first drink, and lower likelihood of maintaining long-term remission from alcohol dependence among individuals treated for AUD. However, all of these studies have follow-ups that are three years or less. Other studies (again, with follow-ups less than three years) have not found significant relations between affective/anxiety disorders and risk for alcohol relapse (Bowen et al., 2000; Davidson and Blackburn, 1998; Marquenie et al., 2006; Ouimette et al., 1999; Powell et al., 1992; Sellman and Joyce, 1996), although some of these studies examined lifetime rather than current affective/anxiety diagnoses or included individuals who were receiving treatment for both their alcohol/affective anxiety problems. Overall, the current literature is unclear as to whether having an affective or anxiety disorder increases risk of relapse from an AUD in treatment samples, particularly in the long-term.

Relatively little is known about how affective and anxiety disorders may influence long-term remission from alcohol dependence among community-based (i.e., non-treatment)

samples. The little work that has been done on long-term remission from AUDs in non-treatment samples suggests that confidence to avoid substance use in stressful situations, avoiding individuals who were drinking companions, greater reliance on positive reappraisal and problem-solving, and less reliance on general avoidance coping, helps to manage a broad range of stressors and predicts stable remission and abstinence 16 to 27 years later (Moos and Moos, 2006; Moos and Moos, 2007; Walters, 2000).

Another potentially important factor for maintaining long-term recovery from AUDs is effort to regulate alcohol use. Effort to regulate alcohol use is thought of as a self-regulatory process through which an individual attempts to control and regulate alcohol intake by intentionally avoiding drinking or consciously controlling or limiting drinking (Collins, 1993). This construct is one facet of the larger “drinking restraint” construct (Collins et al., 2000). The second facet within this larger construct is Cognitive and Emotional Preoccupation with alcohol, which reflects preoccupation with thoughts about drinking. Preoccupation with thoughts about drinking has been generally associated with higher levels of alcohol consumption, whereas plans and attempts to control drinking have been generally associated with lower levels of alcohol consumption (Collins, 1993; Collins and Lapp, 1992). For example, research indicates that the extent to which alcohol dependent individuals attempt to limit, plan to reduce, and worry about controlling their drinking is significantly associated with lower frequency of drinking (Connor et al., 2004; Gudgeon et al., 2005) and fewer number of drinks per drinking day (Connors et al., 1998). Similarly, the use of self-control strategies to regulate alcohol intake and the restriction of alcohol intake are associated with fewer binge-drinking days and lower levels of weekly alcohol consumption, respectively (Collins et al., 2000; Collins et al., 2001).

However, other studies have failed to find that effort to regulate alcohol use significantly predicts drinking outcomes (Connors et al., 2000; Connor et al., 2004; Gudgeon et al., 2005) and a few studies have found that effort to regulate use predicts *greater* levels of alcohol use and alcohol-related problems (Lyvers et al., 2010; MacKillop et al., 2006). Researchers posit that this positive relation may be partially explained by ironic process theory, such that frequent and intense attempts to control and avoid drinking may actually lead to an increase in thoughts about drinking (Cohn et al., 2012; Wenzlaff et al., 1988). Alternatively, some researchers hypothesize that individuals may drink in order to repair the negative affect that results from failures to effectively restrict drinking (Collins et al., 1994). Although the evidence is somewhat mixed, the theory and empirical research on the topic seem to suggest that effort to regulate alcohol use is generally protective against alcohol-related outcomes. However, no studies to our knowledge have directly examined the role of effort to regulate alcohol in the maintenance of long-term remission. Therefore, it is currently unclear whether the extent to which an individual consciously and effortfully attempts to control his or her alcohol use is related to long-term recovery from AUDs.

Given that comorbid affective or anxiety disorders and effort to regulate use may both play a role in the maintenance of long-term remission from alcohol dependence, it may be important to examine their interactive effects. One potential reason for the mixed findings regarding the effect of effort to regulate alcohol use on alcohol outcomes is that the effect of effort to regulate alcohol use may be moderated by various individual differences (e.g.,

Connor et al., 2004). For example, the self-control strength model suggests that one's capacity to regulate alcohol use may be depleted under conditions of high self-control demands (Muraven and Baumeister, 2000). A number of experimental studies have demonstrated that emotional distress and negative moods represent high self-control demands that decrease subsequent attempts at self-control (Gray, 1999; Leith and Baumeister, 1996; Tice et al., 2001). Thus, it is possible that efforts to regulate alcohol use may be undermined by negative emotional states, which are common in individuals with anxiety and affective disorders. Indeed, using ecological momentary assessment methodology, Muraven et al., (2005) found that on days when participants experienced higher self-control demands (i.e. had to regulate mood, control thoughts, deal with stress, felt overwhelmed), they drank more and were more intoxicated compared to days when they did not experience high self-control demands. This relation was particularly strong among those who planned to limit their alcohol use that day. This research suggests that those who deplete their self-control strength by regulating negative emotional states may fail to effectively regulate their alcohol use. Given that those with affective and anxiety disorders are likely to experience high self-control demands related to negative emotional states, it is possible that the presence of an affective or anxiety disorder moderates the influence of effort to regulate alcohol use on long-term remission.

The purpose of the present study was to examine predictors of long-term remission from alcohol dependence in a community-based sample. Specifically, this paper focuses on the role of effort to regulate alcohol use on long-term remission from alcohol dependence, and the potentially moderating influences of affective and anxiety disorders. We hypothesized that greater effort to regulate alcohol use would significantly and uniquely increase the likelihood of maintaining long-term remission from alcohol dependence, over and above the influence of other risk and protective factors. We also hypothesized that having an anxiety or affective disorder would interact with the influence of effort to regulate alcohol use on remission from alcohol dependence, such that the protective effect of effort to regulate alcohol use may vary for those with and without an anxiety/affective disorder. Although we also examined whether having an anxiety and/or affective disorder exerted a unique effect on remission from alcohol dependence, we make no *a priori* predictions about this effect given mixed findings in previous research.

Method

Participants

Participants were drawn from a larger longitudinal study of familial alcoholism (e.g., Chassin et al., 1992). All research protocols were approved by the Arizona State University Institutional Review Board. The original study had three annual waves of data collection and three additional follow-ups separated by five years. The present study utilized data from Waves 4 (1995–1999) and 6 (2005–2010) of the larger study. At Wave 1, the total sample consisted of 454 “target” adolescents between the ages of 11 to 15 and their parents; 246 adolescents had at least one biological parent with an alcohol disorder who was also a custodial parent, and the remaining 208 adolescents were demographically-matched controls without any parents with an alcohol disorder. Sample retention was excellent at all follow-

ups (91–99% across waves). Beginning at Wave 4, biological siblings within the same age range (“age-eligible siblings”) were interviewed in addition to G2 targets in order to increase sample size ($N=734$ at Wave 4; $N=757$ at Wave 6).

The present study used a subsample of participants ($n=96$) who showed evidence of recovered alcoholism at Wave 4 (i.e., those who met lifetime DSM-III-R criteria for alcohol dependence at Wave 4 but did not have any past-year symptoms of either abuse or dependence). Therefore, participants were excluded if they were not interviewed at Wave 4, did not meet lifetime criteria for alcohol dependence at Wave 4 ($n=561$), or met lifetime criteria for dependence but had a current (past-year) alcohol disorder at Wave 4 ($n=74$). Three additional participants were excluded due to inconsistent responding at Wave 6. These exclusion criteria resulted in a total sample of 96 participants from 85 unique families (73% male; 66% children of alcoholics; 71% non-Hispanic Caucasian; 26% Hispanic; 3% other ethnicities). The average age of participants was 21.82 ($SD=2.43$) at Wave 4 (i.e., at baseline measure of alcohol dependence remission) and 33.24 ($SD=2.61$) at Wave 6 (i.e., at 10 year follow-up).

Recruitment and Procedure

Families with parental alcoholism were recruited using court DUI records, questionnaires returned from newly enrolled members of a large HMO, and community phone surveys. Matched control families (matched on child’s age, family composition, ethnicity, and SES) living in the same neighborhoods as the families with parental alcoholism were recruited. The final sample was unbiased with respect to alcoholism indicators in archival records. See Chassin, et al. (1992) for details. After participants provided informed consent, interviews were conducted in person by using computer-assisted interviews or via telephone for out-of-state participants.

Measures

Gender—Gender was coded 1 for females ($n=26$, 27%) and 0 for males ($n=70$, 73%).

Parental alcoholism—Parents’ self-reported lifetime DSM-III diagnoses of alcohol disorder (abuse or dependence) were assessed at Wave 1 using the computerized Diagnostic Interview Schedule (DIS, Version 3; Robins et al., 1981). For non-interviewed parents, lifetime alcoholism diagnoses were established using Family History-Research Diagnostic Criteria (FH-RDC, Version 3; Endicott et al., 1975) based on spousal report. Parental alcoholism was coded 1 for participants who had at least one biological parent with an alcohol disorder who was also a custodial parent ($n=63$; 66%) and 0 for those with no biological or custodial parents with an alcohol disorder ($n=33$; 34%).

Baseline remission from alcohol dependence—DSM-III-R criteria were used to establish lifetime alcohol dependence at Wave 4 (baseline) via the computerized diagnostic interview schedule (CDIS-III-R; Robins et al., 1989). We restricted our sample to individuals with a history of alcohol dependence rather than abuse or dependence because of concerns about the over-diagnosis of DSM-III-R alcohol abuse (Rounsaville et al., 1993). Participants were considered remitted if they met lifetime criteria for alcohol dependence

but did not meet any past-year alcohol abuse or dependence symptoms. All participants included in this study were in remission at Wave 4.

Baseline drinking status—At Wave 4, two items assessed how often participants drank beer/wine or hard liquor in the past year. A dichotomous summary variable was coded 1 for participants who abstained from alcohol use (i.e., responded *never* to both items) at the baseline assessment, and 0 for participants who consumed any alcohol within the past year at Wave 4. There were 13 (13.5%) participants who abstained from alcohol use at baseline (Wave 4).

Baseline effort to regulate alcohol use—Participants responded to two items at Wave 4, adapted from the "Restrict" subscale of Collins and Lapp's (1992) Restraint scale. Items asked participants the extent to which they (1) intentionally avoid drinking and, (2) consciously control or limit the amount of alcohol they drink. Items ranged from 1 (*not at all*) to 5 (*very much*). High levels indicate greater effort to regulate alcohol use ($M = 3.85$, $SD = .95$). Cronbach's alpha in the current sample was .62. Collin and Lapp's (1992) original Restrict subscale has been found to predict lower levels of drinking and successful alcohol intake control in previous non-clinical studies, thus establishing its criterion-related validity (Collins, 1993; Collins et al., 2000; Collins and Lapp, 1992). Note that we use the term "effort to regulate alcohol use" rather than "drinking restraint" in order to avoid confusion, given that drinking restraint is a multifaceted construct involving both successful and unsuccessful regulation of alcohol intake (Collins, 1993).

Baseline past-year anxiety and/or affective disorder—The CDIS-III-R (Robins et al., 1989) was used to assess whether participants met DSM-III-R criteria for a past-year anxiety disorder (panic disorder, agoraphobia, generalized anxiety disorder, social phobia, and PTSD) or affective disorder (depression or dysthymia) at Wave 4. We used past-year anxiety/affective disorder diagnoses rather than lifetime diagnoses in order to establish temporal precedence when predicting long-term remission from alcohol dependence (i.e., lifetime anxiety/affective diagnoses may have remitted prior to onset of alcohol dependence and would thus not be expected to influence one's risk for relapse). There were 17 participants with an anxiety disorder and eight participants with an affective disorder in the past-year at Wave 4. A dichotomous summary variable was coded 1 for participants with a current (past-year) anxiety or affective disorder ($n = 19$; 20%) and 0 for those without a current anxiety or affective disorder ($n = 77$; 80%).

Additional analyses tested the effects of anxiety and affective disorders in separate models, rather than compositing across anxiety and affective disorders. Results were nearly identical to those reported below (both disorders moderated the influence of effort to regulate alcohol use on long-term remission from alcohol dependence).

History of alcohol treatment—At Wave 6 (i.e., the 10 year follow-up), participants reported whether they had ever received treatment or counseling for alcohol use. A dichotomous variable was coded 1 for those who responded *yes* ($n = 24$; 28% of interviewed participants) and 0 for those who responded *no* ($n = 62$; 72% of interviewed participants). This variable was missing for 10 participants who were not interviewed at Wave 6. Among

those who received treatment, seven participants received treatment in a residential rehabilitation facility; fifteen participants received treatment in an outpatient rehabilitation facility, mental health center, or doctor/therapist's office; eight participants received treatment in prison or jail; seventeen participants received treatment in a self-help group; and nine participants received treatment in some other setting. Participants also reported how recently they received treatment for alcohol. Responses ranged from zero (likely reflecting ongoing attendance at self-help meetings) to 18 years, with an average of 7.50 ($SD = 5.76$ years) years since treatment.

Long-term remission from alcohol dependence—At Wave 6, participants responded to 23 items adapted from Sher's (1987) questionnaire assessing potential social consequences (e.g., complaints from friends) and dependence symptoms (e.g., using larger amounts than expected) due to alcohol use. Follow-up probes assessed the recency of each endorsed symptom. On average, participants reported experiencing 3.31 ($SD = 4.49$) alcohol-related consequences or symptoms in the past five years. Participants were considered to have maintained long-term recovery from alcohol dependence if they had not experienced any alcohol-related consequences or symptoms within the past five years at the 10 year follow-up (i.e., Wave 6). This criterion was used based on Sobell et al.'s, (2000) recommendation that researchers examining recovery from alcohol disorders set a minimum recovery criterion of five years.

A dichotomous variable was coded 1 for participants who maintained long-term recovery from alcohol dependence ($n=39$; 44% of interviewed participants) and 0 for those who did not ($n=50$; 56% of interviewed participants). This variable was missing for 10 participants who were not interviewed at Wave 6. DSM-III-R alcohol disorders were also assessed at Wave 6 via the CDIS-III-R (Robins et al., 1989). As expected, none of the 39 participants who were considered to have maintained long-term recovery met diagnostic criteria for a current alcohol disorder at Wave 6. Among the 50 participants who did not maintain long-term recovery from alcohol dependence, 23 (46%) participants met diagnostic criteria for a past-year alcohol disorder (abuse or dependence) at Wave 6 (the other 27 participants likely had subclinical problems or were diagnosable at some other point in time between Waves 4 and 6 other than the past-year).

Data Analytic Strategy

A series of logistic regressions were conducted in MPlus version 6.11 (Muthén and Muthén, 1998–2011). Because participants were nested within families, the maximum-likelihood estimator with robust standard errors (MLR) was used, which computes parameter estimates with standard errors that are robust to non-independence of observations and non-normality. Full information maximum likelihood estimation was used to account for missing data on 10 participants who were not interviewed at Wave 6.

Analyses were conducted in two steps. First, analyses tested the main effects of effort to regulate alcohol use and affective/anxiety disorder on long-term remission from alcohol dependence, over and above the following predictors: age, gender, parent alcoholism, baseline drinking status, and treatment history. Note that ethnicity was not included in

analyses because preliminary analyses showed it to be unrelated to all study variables, and we had no theoretical rationale for including it as a predictor. Second, analyses tested whether affective or anxiety disorders moderated the effect of effort to regulate alcohol use, controlling for the above predictors. Effort to regulate alcohol use was centered prior to computing the interaction term.

Results

Correlations among study variables are presented in Table 1. Participants who abstained from alcohol use within the past-year at baseline (i.e., Wave 4) showed higher levels of effort to regulate alcohol use ($r = .25, p = .017$), which were associated with long-term remission from alcohol dependence at the 10 year follow-up ($r = .27, p = .017$). However, baseline drinking status was not related to long-term remission from alcohol dependence. Having an anxiety and/or affective disorder at baseline was not associated with effort to regulate alcohol use, baseline drinking status, long-term remission from alcohol dependence, or history of alcohol treatment. Neither treatment history nor parental alcoholism was significantly related to any study variables.

Table 2 presents results from logistic regressions predicting the likelihood of maintaining remission from alcohol dependence at the 10 year follow-up. Results indicated that effort to regulate alcohol use had a significant unique main effect (i.e., its effect averaged across the levels of the other predictors) on the maintenance of remission from alcohol dependence, over and above the effects of past-year anxiety/affective disorder, baseline drinking status, treatment history, age, gender, and parental alcoholism. That is, participants who tried harder to limit their alcohol use were significantly more likely to maintain long-term remission. Neither anxiety nor affective disorder at baseline had significant main effects on maintenance of remission. Parental alcoholism, history of alcohol treatment, gender, and baseline drinking status were not significantly related to the likelihood of maintaining remission from alcohol dependence. However, age had a significant effect over and above the other predictors, such that older participants were significantly more likely to have maintained remission compared to younger participants.

Next, we tested whether having an anxiety or affective disorder significantly moderated the effect of effort to regulate alcohol use on long-term remission from alcohol dependence (see Table 2, Interaction Model). Results indicated a significant interaction such that the effect of effort to regulate alcohol use significantly varied for those with and without an anxiety/affective disorder. Effort to regulate alcohol use significantly increased the likelihood of maintaining remission from alcohol dependence for those without an anxiety or affective disorder. However, reverse dummy-coding revealed that effort to regulate alcohol use did not have a significant influence on maintenance of remission from alcohol dependence for participants who had an anxiety or affective disorder. Consistent with the main effects models, age was the only other predictor with a significant effect of maintenance of remission.

Discussion

The present study examined a simple but surprisingly overlooked question—how much does a recovered alcoholic's effort to regulate alcohol use actually influence his or her odds of maintaining long-term recovery? Utilizing a subsample of participants from a high-risk community study who showed evidence of recovered alcohol dependence at baseline, we examined whether their effort to regulate alcohol use at the baseline assessment significantly influenced their odds of maintaining remission from alcohol dependence at the 10 year follow-up. We also examined whether having an anxiety and/or affective disorder interacted with the effect of effort to regulate alcohol use. All analyses used a rather conservative criterion for alcohol remission at the 10 year follow-up (i.e., no alcohol-related symptoms or social consequences in five years) to ensure stability of recovery.

Results from logistic regression analyses showed that effort to regulate alcohol use at baseline had a significant main effect on maintenance of remission from alcohol dependence 10 years later, over and above the effects of past-year anxiety/affective disorder, baseline drinking status, treatment history, age, gender, and parental alcoholism. That is, participants who tried harder to limit their drinking were significantly more likely to maintain long-term recovery. However, follow-up analyses indicated that having an anxiety and/or affective disorder significantly moderated the influence of effort to regulate alcohol use. Specifically, results indicated that the protective effect of effort to regulate alcohol use was significant for those individuals *without* an anxiety or affective disorder, but not for those *with* an anxiety or affective disorder.

These results suggest that anxiety and affective disorders may undermine the protective effect of effort to regulate alcohol use on maintaining long-term remission from alcohol dependence. Findings are consistent with the self-control strength model (e.g., Muraven et al., 2005), in which one's capacity to regulate alcohol use may be depleted under conditions of high self-control demands. Indeed, given that both depression and anxiety are associated with increased self-control demands and depletions in self-control resources (Muraven and Baumeister, 2000), the stress of having an anxiety or affective disorder may decrease individuals' ability to effectively exert self-control over drinking. The lack of effect of effort to regulate alcohol use for those individuals with an anxiety or affective disorder suggests that these individuals may have had to exert greater self-control in nondrinking areas (e.g., in order to regulate their mood, cope with stress, etc.), which may have thus depleted their capacity to effectively regulate their alcohol use.

Findings from the present study help to clarify the importance of effort to regulate alcohol use for maintaining long-term recovery from alcohol dependence. Little research has examined the association between effort to regulate alcohol use and long-term recovery, and studies examining shorter-term associations have had mixed findings. Indeed, this study is the first community-based (non-treatment) prospective study we know of to examine how effort to regulate alcohol use influences long-term recovery. Our analyses examining the unique main effect of effort to regulate alcohol use demonstrated that the odds of maintaining remission from alcohol dependence were approximately twice as high for every one-unit increase in effort to regulate alcohol use, even after controlling for a number of

variables that may theoretically influence one's risk for relapse; namely, whether the individual received treatment, abstained from alcohol use, had an anxiety or affective disorder, or had an alcoholic parent (as well as gender and age). Moreover, among individuals without an anxiety/affective disorder, the odds of maintaining remission from alcohol dependence increased 2.5 times for every one-unit increase in effort to regulate alcohol use. Thus, our findings clearly suggest that enhancing one's intention to consciously limit drinking may help to decrease risk of alcohol relapse, but also suggest that this protective effect may be eroded for certain subgroups of individuals. The mixed findings in previous research may be due to a lack of consideration of potential moderators. It is important for future studies to also examine potential moderators of effort to regulate alcohol use in order to identify potential factors that may need to be addressed during treatment.

There are also a number of null findings in the present study worth discussion. First, having a baseline anxiety or affective disorder did not uniquely influence the likelihood of maintaining remission from alcohol dependence over and above the other predictors, suggesting that mood and anxiety disorders do not directly militate against achieving long-term remission from alcohol dependence. However, our finding that having an anxiety or affective disorder interacted with effort to regulate alcohol use suggests that these disorders may nonetheless impact risk for relapse by interfering with various coping and motivational factors that may play a more direct role. Second, treatment history did not significantly influence maintenance of alcohol disorder remission. This finding is unsurprising, given the heterogeneity in types of treatment that participants received and biases in terms of who gets treatment. Third, parental alcoholism did not significantly influence maintenance of alcohol disorder remission. However, participants selected for inclusion in the subsample for the present study (i.e., participants with recovered alcohol dependence) were significantly more likely to have an alcoholic parent than were participants who were excluded from our study. Thus, although parental alcoholism undoubtedly influences overall risk for alcohol dependence, it may not differentiate risk for relapse amongst individuals with a history of alcohol dependence.

Several limitations to this study should be noted. First, in order to establish temporal precedence when predicting long-term remission from alcohol dependence, the present study included only participants with evidence of recovery from alcohol dependence at the baseline assessment (Wave 4). Consequently, the present study examines risk for maintaining remission from alcohol dependence among a unique group of individuals with early-onset of alcoholism (the average age of alcohol disorder onset in the present study was approximately 17 years-old), who also showed evidence of recovery at an early age (no symptoms in past-year at Wave 4, in which the average age was approximately 22 years-old). Findings from the present study may not generalize to individuals who develop alcohol dependence later in life. Second, reliability for our adapted effort to regulate alcohol use measure was below the recommended coefficient of .80. However, it should be noted that although measurement unreliability can attenuate correlations among variables, unreliability *cannot* cause correlations to spuriously high (Cohen et al., 2003). The associations between effort to regulate alcohol use and remission from alcohol dependence may have been larger

if we had a more reliable measure of effort to regulate alcohol use. Third, although we attempted to control for a number of risk factors when examining effort to regulate alcohol use and anxiety/affective disorders as predictors of remission from alcohol dependence, there are many other factors that may influence risk for alcohol relapse. Finally, the present study was limited by its small sample size and low prevalence of anxiety and affective disorders. Replication of findings in future studies with larger samples sizes is needed before definitive conclusions about results can be made.

Despite these limitations, the present study contributes to our understanding of the association between effort to regulate alcohol use and long-term remission from alcohol dependence. Recovered alcoholics may benefit from interventions aimed at regulating alcohol use more effectively, particularly in the presence of an anxiety or affective disorder. Indeed, this study suggests that anxiety and affective disorders may impair one's ability to effectively control drinking, thus highlighting the importance other psychopathology within risk for relapse and recovery from alcohol disorders.

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Table 1

Correlations among Study Variables

Variable	1	2	3	4	5	6	7	8
1. Age	—							
2. Gender	.03	—						
3. Parent alcoholism	-.05	.05	—					
4. Baseline drinking status	.06	-.10	.16	—				
5. Treatment history	-.07	-.03	.17	.05	—			
6. Past-year anxiety and/or affective disorder	.08	.23*	.03	-.04	.04	—		
7. Effort to regulate alcohol use	.11	.04	.19	.25*	-.02	.08	—	
8. Maintenance of remission from alcohol dependence at follow-up	.22*	-.03	.11	.13	-.16	-.10	.27*	—

Note. $n = 96$.

^a Gender was coded 0 for males and 1 for females.

* $p < .05$,

** $p < .01$,

*** $p < .001$.

Table 2

Results of Logistic Regressions Predicting Maintenance of Remission from Alcohol Dependence

Maintenance of Remission from Alcohol Dependence at 10 Year Follow-Up			
Predictor	<i>b</i>	<i>SE</i>	Odds Ratio [95% CI]
Main Effects Model			
Age	.20*	.10	1.22 [1.01, 1.47]
Gender ^a	-.10	.54	.90 [.31, 2.62]
Parent alcoholism	.64	.58	1.89 [.62, 5.84]
Baseline drinking status	.31	.82	1.36 [.27, 6.75]
Treatment history	-.91	.60	.40 [.12, 1.30]
Past-year anxiety/affective disorder	-.82	.71	.44 [.11, 1.79]
Effort to regulate alcohol use	.61*	.31	1.84 [1.01, 3.36]
Interaction Model			
Age	.22*	.10	1.25 [1.02, 1.53]
Gender ^a	.06	.57	1.06 [.35, 3.21]
Parent alcoholism	.65	.60	1.92 [.60, 6.19]
Baseline drinking status	-.08	.80	.92 [.19, 4.40]
Treatment history	-.69	.62	.50 [.15, 1.69]
Past-year anxiety/affective disorder	-.72	.64	.49 [.14, 1.72]
Effort to regulate alcohol use	.91**	.34	2.48 [1.28, 4.79]
Effort to regulate × anxiety/affective disorder ^b	-1.62*	.76	.20 [.05, .88]

Note. *n*=96.

^aGender was coded 0 for males and 1 for females.

^bDue to the significant interaction between anxiety/affective disorder and effort to regulate alcohol use, the coefficients for effort to regulate alcohol use apply only to participants without an anxiety/affective disorder. The effect of effort to regulate alcohol use on remission from alcohol dependence was non-significant for those with an anxiety/affective disorder ($B = -.67$, $SE = .67$, $p = .31$, $OR = .51$, 95% CI = [.14, 1.88]).

*
 $p < .05$,

**
 $p < .01$,

 $p < .001$.