Social Contexts of Remission from DSM-5 Alcohol Use Disorder in a High-Risk Sample

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Background: Measures of social context, such as marriage and religious participation, are associated with remission from alcohol use disorders (AUDs) in population-based and treatment samples, but whether these associations hold among individuals at high familial risk for AUD is unknown. This study tests associations of measures of social context and treatment with different types of remission from DSM-5 AUD in a high-risk sample.

Methods: Subjects were 686 relatives of probands (85.7% first-degree) who participated in a high-risk family study of alcohol dependence. All subjects met criteria for AUD at baseline and were re-interviewed 5 years later. Follow-up status was categorized as persistent AUD, high-risk drinking, remitted low-risk drinking, and abstinence. Social context measures were defined as stable or changing from baseline to follow-up, and their bivariate and multivariate associations with follow-up status were tested.

Results: At follow-up, 62.8% of subjects had persistent AUD, 6.4% were high-risk drinkers, 22.2% were remitted low-risk drinkers, and 8.6% were abstinent. Birth of first child during the interval was the only measure of social context associated with remitted low-risk drinking and was significant for women only. Abstinent remission was characterized by being stably separated or divorced for women, new marriage for both sexes, experiencing low levels of family support and high levels of friend support, and receiving treatment. High-risk drinkers were more likely than individuals with persistent AUD to have a stable number of children and to have been recently unemployed.

Conclusions: The social contexts accompanying different types of remission in this high-risk sample resemble those found in population-based and clinical samples. Low-risk drinkers resemble natural remitters from population-based samples who change their drinking habits with life transitions. Abstainers resemble clinical samples in marital context, support from friends, and treatment. High-risk drinkers appear to continue to experience negative consequences of heavy drinking.

Key Words: Alcohol Use Disorder, Social Context, Treatment, Remission, Recovery.

THE ROLE OF social connection in remission from alcohol use disorders (AUDs) has been documented in a wide variety of samples. In treatment samples, alcohol-specific supports, such as Alcoholics Anonymous (AA) or other social networks that support recovery, are associated with reduced alcohol consumption and lower rates of relapse (Ellis et al., 2004; Longabaugh et al., 2010; Project MATCH Research Group, 1998; Stout et al., 2012). In population-based samples, social connections not specific to alcohol use, such as marriage and religious participation, are associated with better drinking outcomes in both treated and untreated individuals (Avalos and Mulia, 2012; Dawson et al., 2005, 2012; Kelly et al., 2011a). The consistency of these findings across samples with varying levels of AUD severity and treatment experience (Fein and Landman, 2005) suggests that social connection is a key component of recovery regardless of severity of alcohol problems.

In population-based samples, measures of social context like marriage can mark significant life transitions that accompany natural reductions in drinking (Dawson et al., 2006), consistent with evidence that more than 50% of individuals who remit from AUD do so without formal treatment (Cunningham et al., 2000; Sobell et al., 1996). In clinical samples, similar measures are associated with treatment outcome and can also mark changes associated with recovery (reviewed in Adamson et al., 2009). Whether this relationship between social context and remission holds in samples with high familial risk for AUD is unknown. The increased genetic and environmental risks for AUD which accompany high-risk samples (e.g., Jacob et al., 2003) might

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decrease the relative salience of social context for remission. Increased familial risk for AUD, however, seems not to contribute to decreased likelihood of remission. In 40 years of longitudinal birth cohort data from sons of fathers with AUDs, for example, only 18 of 361 carefully selected, biologically based, premorbid predictors of alcohol dependence (AD) were associated with failure to remit, suggesting remission is subject to social influences even in high-risk samples (Penick et al., 2010). In the current study, we examine more definitively whether measures of social context are associated with remission in individuals from families with high risk for alcoholism, and whether social context differs by type of remission. Our aims were to (i) examine AUD status at follow-up among individuals with AUD at baseline who were re-interviewed 5 years later and (ii) examine measures of social context and treatment as a function of AUD status at follow-up.

MATERIALS AND METHODS

Participants

Subjects for this study were 686 relatives of probands, from 460 families, from the Collaborative Study on the Genetics of Alcoholism (COGA) who met criteria for DSM-5 AUD (American Psychiatric Association, 2013) in the year preceding the baseline interview and who participated in a follow-up interview 5 years later. As described elsewhere (Bucholz et al., 1996; Culverhouse et al., 2005; Nurnberger et al., 2004; Reich, 1996), COGA is a multisite, high-risk family study of AD. Probands for COGA were recruited from treatment settings at 6 sites across the United States and were required to meet criteria for DSM-III-R-defined AD (American Psychiatric Association, 1987) and Feighner definite alcoholism (Feighner et al., 1972). Probands were also required to have at least 2 first-degree relatives living in one of the COGA catchment areas available for study. All of these first-degree relatives were sought for baseline interviews and for follow-up interviews approximately 5 years later. The protocol was approved by the institutional review board at each site, and written informed consent was obtained from all subjects. Of the subjects studied in the present report, 85.7% were first-degree relatives of the proband (father, mother, sibling, offspring). The sample was 80.0% White, 12.5% African American, 4.5% Hispanic, and 3.0% was classified as Native American, Pacific Islanders and "other."

Assessment

The Semi-Structured Assessment for the Genetics of Alcoholism (SSAGA) was used to interview all subjects. The SSAGA is a comprehensive diagnostic interview with documented reliability and validity (Bucholz et al., 1994, 1995; Hesselbrock et al., 1999) developed specifically for the COGA study and accommodates several diagnostic systems, including information that allowed classification of AUD by the recent Fifth Diagnostic and Statistical Manual (DSM-5) of the American Psychiatric Association (2013).

Alcohol Use Disorder. Lifetime AUD was defined as at least 2 symptoms occurring within any 12-month period (American Psychiatric Association, 2013). Current AUD at baseline was defined as AUD within 1 year of interview, based on reported age at the most recent symptom. At follow-up, AUD status was determined using recency data for each symptom; persistent AUD required at least 1 symptom to be present within a year of this second interview.

Remission Categories and High-Risk Drinking. Remission from AUD was defined in accordance with DSM-5 sustained remission as having met none of the AUD criteria for at least 1 full year at the follow-up interview. Remitted individuals who reported not having drunk any alcohol for at least 1 full year were classified as "abstinent remitted." Individuals who were still drinking were considered "remitted low-risk drinkers" if their current alcohol consumption fell within the National Institute on Alcohol Abuse and Alcoholism defined low-risk drinking guidelines (men: no more than 4 drinks in 1 day and no more than 14 drinks per week; women: no more than 3 drinks in 1 day and no more than 7 drinks per week; National Institute on Alcohol Abuse and Alcoholism, 2010). Finally, subjects with no current AUD symptoms but whose alcohol consumption exceeded low-risk drinking were classified as high-risk drinkers. Follow-up status was represented by a 4-level variable: (i) persistent AUD (1 or more current AUD symptoms), (ii) high-risk drinking, (iii) remitted low-risk drinking, and (iv) abstinent remitted. Although DSM-5 criteria state that craving may be present in remission, none of the remitted subjects in this sample reported craving.

Alcohol Treatment. A 3-level variable representing individuals who had no treatment, who received professional treatment with or without AA attendance (cell counts were too small to create a separate category for professional treatment only), or who received AA-only was created for baseline and follow-up based on lifetime history at each assessment. Individuals whose treatment category was the same at both time points were categorized as stable for that treatment category. Individuals who endorsed no treatment at baseline and AA at follow-up were coded as receiving "new AA-only" and those who endorsed no treatment or AA-only at baseline and professional treatment at follow-up were coded as having received "new professional treatment."

Marital Status. Individuals who reported the same marital status at baseline and follow-up were coded as being (1) stably married, (2) stably separated, divorced, or widowed (only 1.0% of the sample reported being widowed at either phase; given the small number of individuals affected, this group was combined with those reporting separation or divorce), or (3) stably never married. Individuals who had never married or were separated, divorced, or widowed at baseline, and who at follow-up were married were coded as newly married. Individuals who were married at baseline and separated, divorced, or widowed at follow-up were coded as newly separated or divorced.

Children. Variables representing individuals who reported the same number of children at both time points (including no children), or who had their first or an additional child between assessments, were created.

Religious Attendance. At each assessment, respondents who indicated a religious preference were asked "In the past 12 months how many times did you attend religious services?" Variables representing attendance fewer than 12 times, 12 to 51 times, and 52 or more times (at least weekly) were created. These frequencies were used to create variables representing stable, increasing, and decreasing attendance frequency from baseline to follow-up.

Social Support. Two questionnaires about the perceived level of social support received from family and friends were completed at the follow-up assessment (Procidano and Heller, 1983). Each questionnaire had 20 questions with responses on a 4-level Likert scale ranging from "Generally false" to "Generally true," with higher scores indicating higher levels of support. Representative questions were "I have a deep sharing relationship with a number of members of my family/friends," "I rely on my family/friends for emotional

support." Missing data for 93 individuals were imputed at the median score (60 for both family and friend support), and a dummy variable was created to represent individuals with missing data. This variable was not significantly associated with follow-up status, indicating that individuals without questionnaire data were not disproportionately from 1 category. Binary variables representing above-median scores on family and friend support were used in analyses.

Drug Use and Nicotine Habitual Use or Dependence. Illicit drug use was defined as lifetime use 11 or more times of marijuana, cocaine, stimulants, sedatives, opiates, PCP, hallucinogens, solvents, or other illicit drugs. Not all wave 1 participants were assessed for nicotine dependence (Bierut et al., 2008); therefore, habitual smoking (at least 20 cigarettes daily for at least 6 months) was used as the nicotine use measure at wave 1. At wave 2, all participants were assessed for nicotine dependence. For both drug and nicotine measures, current use was defined as occurring within the last year. Remitted use at follow-up was divided into 2 categories based on most recent use from 1 to 5 years ago or more than 5 years ago.
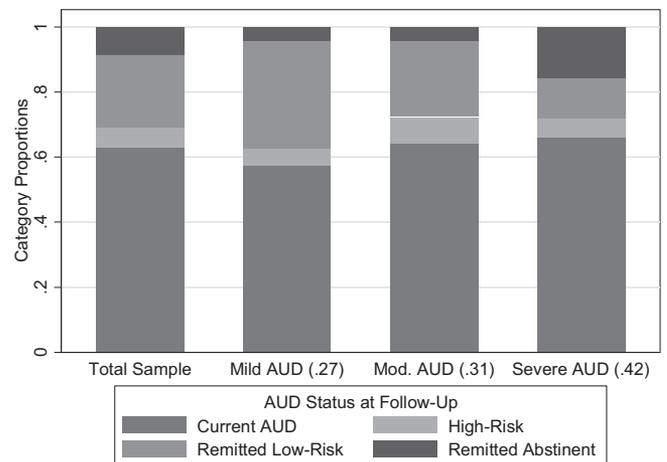
Data Analysis

Bivariate associations with remission status at follow-up for demographics, alcohol and drug use, social measures and treatment were tested using multinomial logistic regression, with current AUD as the reference group. Variables from bivariate analyses with *p*-values of 0.25 or less in relation to the outcome category being evaluated were selected for initial inclusion in the multivariate model (Hosmer and Lemeshow, 2000). Multivariate models were developed using logistic regression, rather than multinomial regression, because bivariate models showed that few variables were associated with all outcome categories; therefore, a multinomial model would not provide a good fit to the data. Separate logistic regression models were fit for high-risk drinking, remitted low-risk drinking, and abstinence, using persistent AUD as the reference group for each. This method approximates a multinomial model in cases such as this where covariates are significant in some categories but not in others (Hosmer and Lemeshow, 2000). Variables that were not associated with the outcome category and that did not contribute to model fit based on comparison of fit statistics were eliminated from the model if they were not necessary for interpretation. Once final models were identified, interactions of gender with marital status were tested, based on evidence that marriage is differentially associated with gender in individuals with AUDs (Schneider et al., 1995), and that women who are regular drinkers are more likely than their male counterparts to select partners with AD (Agrawal et al., 2006). All statistical tests were adjusted for familial clustering using the Huber–White robust variance estimator in the Stata statistical program (StataCorp, 2009).

RESULTS

Remission

At follow-up, 30.8% of the sample was remitted. Remitted low-risk drinking was more prevalent than abstinent remission (22.2 and 8.6%, respectively), and high-risk drinkers comprised 6.4% of the sample (Fig. 1). Thirty-seven percent of individuals with mild lifetime AUD severity at baseline (2 to 3 symptoms) had remitted by follow-up; most were remitted low-risk drinkers. Individuals with moderate (4 to 5 symptoms) and severe (6 to 11 symptoms) lifetime severity at baseline had similar remission rates at follow-up (27.8 and 28.0%, respectively) but

Fig. 1. Proportion of sample with mild (2 to 3 symptoms), moderate (4 to 5 symptoms), and severe (6 or more symptoms) lifetime alcohol use disorders at baseline in parentheses.

differed in remission type, with low-risk drinking more common among individuals with moderate than severe AUD (23.6 vs. 12.3%, respectively; $X^2(1) = 15.0$, $p < 0.01$), and abstinence more common among individuals with severe than moderate AUD (15.7 versus. 4.2%, respectively; $X^2(1) = 12.5$, $p < 0.01$).

Bivariate Results

Demographics and Substance Use. Compared to individuals with persistent AUD, remitted low-risk drinkers were more likely to be female (Table 1). The persistent AUD group was youngest, and the mean age gradually increased from high-risk drinkers to remitted low-risk drinkers to abstainers. All nonpersistent groups began regular drinking (i.e., once a month or more for at least 6 months) at a significantly later age than the persistent AUD group. Compared to individuals with persistent AUD, remitted low-risk drinkers had fewer lifetime AUD symptoms and fewer years from onset to recency of AUD, and abstinent individuals had more lifetime symptoms. The past week's alcohol consumption among remitted low-risk drinkers decreased from baseline to follow-up, and at follow-up was well within low-risk drinking guidelines (National Institute on Alcohol Abuse and Alcoholism, 2010). A majority of all groups reported lifetime illicit drug use. Current drug use was highest in the persistent AUD group and was significantly lower in the remitted low-risk drinking and abstinent groups. High-risk drinkers and abstainers were more likely than the persistent AUD group to have remitted from drug use more than 5 years before the follow-up. Abstainers had the highest rate of lifetime nicotine habitual use or dependence (72.9%) and remitted low-risk drinkers the lowest (40.8%). Current nicotine habitual use or dependence was significantly lower among high-risk drinkers and remitted low-risk drinkers than among individuals with persistent AUD. Remitted low-risk drinkers were less likely to have remitted within the

Table 1. Demographic, Alcohol and Drug Use Characteristics of Individuals with Alcohol Use Disorder (AUD) at Baseline, by Remission Status at Follow-Up

| | Status at follow-up | | | |
| | | | Remitted | |
	Persistent AUD[R] $N = 431$	High-risk drinkers $N = 44$	Low-risk drinkers $N = 152$	Abstinent $N = 59$
Female,%	37.3	47.7	53.9**	45.8
African American,%	13.2	13.6	11.8	8.5
Age at baseline, M (SD)	30.5 (9.5)	31.3 (9.6)	32.2 (10.8)	35.4 (10.5)**
Age regular drinking, M (SD)	16.8 (3.4)	18.0 (5.1)*	17.5 (3.3)*	17.9 (5.3)
Age AUD onset, M (SD)	19.5 (5.7)	19.7 (6.3)	20.1 (5.4)	20.9 (7.1)
AUD symptoms, lifetime, M (SD)	6.5 (2.8)	5.9 (2.8)	4.8 (2.5)**	8.5 (2.7)**
Years from AUD onset to AUD recency,%				
<15 years[R]	46.4	61.4	69.7	44.1
15 or more years	53.6	38.6	30.3**	55.9
Drinks last week at baseline and follow-up, M (SD)[a]				
Male, baseline	20.4 (22.5)	21.6 (21.4)	11.5 (22.9)**	18.5 (25.8)
Male, follow-up	19.0 (21.7)	13.8 (17.2)	3.2 (3.9)**	0 (0)[b]
Female, baseline	13.6 (22.2)	7.4 (8.6)	5.7 (8.0)**	4.5 (8.4)**
Female, follow-up	10.1 (14.5)	4.3 (4.9)*	1.1 (1.6)**	0 (0)[b]
Illicit Drug Use[c],%				
None[R]	25.5	22.8	44.0	25.4
Current (within 1 year)	41.5	25.0	14.5**	11.9**
Remitted (more than 1 to 5 years ago)	19.0	20.4	13.2**	28.8
Remitted (more than 5 years ago)	13.9	31.8*	28.3	33.9*
Nicotine habitual use or dependence,%[d]				
None[R]	41.1	43.2	59.2	27.1
Current (within 1 year)	26.9	4.5*	13.8**	30.5
Remitted (more than 1 to 5 years ago)	19.7	31.8	11.2**	22.0
Remitted (more than 5 years ago)	12.3	20.4	15.8	20.3*

[a]Log-transformed for regression.
[b]Inestimable due to zero cell.
[c]Drug use = lifetime use 11 or more times of marijuana, cocaine, stimulants, sedatives, opiates, PCP, hallucinogens, solvents, combination, or other illicit drugs; drug use history = most recent drug use at least 1 year ago.
[d]Nicotine habitual use (20 cigarettes or more daily for at least 6 months) was used in wave 1 data, since nicotine dependence was added late in wave 1 and thus was not available for all participants.
Significance tests conducted using multinomial logistic regression with AUD as reference category and robust variance estimator to correct for clustering of family data. [R]Reference category; *$p \leq 0.05$, **$p \leq 0.01$.
High-risk drinking, men: >4 drinks per day or >14 drinks per week; women: >3 drinks per day or >7 drinks per week; Low-risk drinking = drinking below high-risk levels.

5 years before follow-up, and abstainers were more likely to have remitted more than 5 years previous.

Social Context. High-risk drinkers were more likely than their counterparts with persistent AUD to have increased their religious attendance between baseline and follow-up (Table 2). Compared to the persistent AUD group, remitted low-risk drinkers were more likely to be stably or newly married, to have had a first child since baseline, to report stable religious attendance, and higher levels of family support. The abstinent group, relative to the persistent AUD group, was more likely to be separated/divorced (stable or new), to have a stable number of children or an additional child since baseline, and to report being stably unemployed since baseline.

At follow-up, 58.4% of the sample had never accessed alcohol treatment, 31.2% had accessed professional treatment (with or without AA attendance), and 10.4% had attended AA without professional treatment. Relative to the persistent AUD group, the abstinent group was more likely to have attended AA-only prior to baseline and to have

accessed professional treatment before or after the baseline interview, and the low-risk remitted group was less likely to have accessed professional treatment (Table 2).

Multivariate Results

Multivariate results are shown in Table 3 and described below for each outcome category. Persistent AUD at follow-up is the reference group for all categories.

High-Risk Drinking. High-risk drinkers were more likely to have a stable number of children and to have become unemployed since baseline, compared to individuals with persistent AUD. They also had a shorter duration of AUD, were more likely to have quit using drugs more than 5 years previous, and were less likely to have current nicotine dependence.

Remitted Low-Risk Drinking. Women (but not men) who were remitted low-risk drinkers were more likely than

Table 2. Social Context Measures and Alcohol Treatment at Follow-Up Among Individuals with Past-Year Alcohol Use Disorder (AUD) at Baseline, by Follow-Up Remission Status

	Persistent AUD $N = 431$	High-risk drinkers $N = 44$	Low-risk drinkers $N = 152$	Abstinent $N = 59$
			Remitted	
Marital status				
Stable[a]				
Never Married[R]	40.8	27.3	25.7	22.0
Married	21.6	25.0	31.6**	22.0
Separated/ Divorced/Widowed	15.1	18.2	11.8	28.8**
New[b]				
Marriage	13.0	20.4	24.3**	13.6
Separated/ Divorced/Widowed	9.5	9.1	6.6	13.6*
Children				
Stable				
No children[R]	37.8	29.5	27.6	20.3
One or more children	39.7	54.5	42.8	61.0**
First child since baseline	11.1	6.8	21.7**	3.4
Additional child since baseline	11.4	9.1	7.9	15.2*
Employment				
Stably/newly employed[R]	77.0	68.2	77.6	71.2
Stably unemployed	12.8	13.6	11.2	23.7*
Newly unemployed	10.2	18.2	11.2	5.1
Religious attendance				
Stable				
None[R]	31.3	18.2	21.7	23.7
Any (less than monthly to weekly or more)	27.8	25.0	32.2**	22.0
Increased	20.9	34.1*	23.7	30.5
Decreased	20.0	22.7	22.4	23.7
High perceived support, Family[c]	40.1	45.4	49.3*	28.8
High perceived support, Friends[c]	39.3	36.4	46.7	52.5
Alcohol treatment history				
Stable				
No treatment[R]	56.8	59.1	75.7	25.4
Alcoholics Anonymous (AA)-only	3.0	4.5	2.6	10.2**
Professional treatment with/without AA attendance	22.9	22.7	12.5**	40.7**
New				
First AA attendance (no professional treatment)	6.7	6.8	6.6	6.8
First professional treatment	10.4	6.8	2.6**	16.9**

[a]Stable = same at both waves.
[b]New = changed between baseline and follow-up.
[c]Reported at follow-up only.
Significance tests conducted using multinomial logistic regression with AUD as reference category and robust variance estimator to correct for clustering of family data. [R]Reference category. *$p \leq 0.05$, **$p \leq 0.01$.

women with persistent AUD to have had a first child between the baseline and follow-up interviews (26.8 and 7.4%, respectively). The women who had a first child were significantly younger than those who did not [age at baseline, M (min, max) = 23.8 (18, 36) and 33.1 (18, 55), $t(80)$ = 4.6,

$p < 0.001$]. Compared to individuals with persistent AUD, remitted low-risk drinkers also had fewer lifetime AUD symptoms, fewer years from AUD onset to recency, were less likely to be current drug users and more likely to have remitted from drug use more than 5 years ago, and were less likely to have remitted from nicotine habitual use or dependence within the last 5 years. The associations of stable and new marriage, religious attendance, and family support with remitted low-risk drinking were nonsignificant in the multivariate model.

Abstinence. Abstinent women were more likely than women with persistent AUD to be stably separated or divorced (44.4 and 18.6%, respectively); this was not true for men. Men and women in abstinent remission were more likely than those with persistent AUD to be newly married and less likely to have had a first child during the follow-up interval. They reported lower levels of support from family and higher levels of support from friends than individuals with persistent AUD. They had greater AUD severity, a shorter duration of AUD, were less likely to be current drug users, and more likely to have remitted from drug use more than 5 years ago. A history of AA attendance or professional treatment at baseline, and new professional treatment during the interval, were associated with abstinent remission.

DISCUSSION

We examined remission, measures of social context, and treatment 5 years after a current AUD diagnosis in a sample of men and women from families with histories of AD. Thirty-one percent of the sample was remitted at follow-up and 6.4% of the sample had no AUD symptoms but was drinking at high-risk levels. The most common form of remission was low-risk drinking, but among individuals with greatest AUD severity, abstinence was more common. The social contexts accompanying high-risk drinking and remitted low-risk drinking differed from the context of persistent AUD, with high-risk drinkers more likely to have a stable number of children and to have become unemployed during the follow-up interval, and female remitted low-risk drinkers more likely to have had a first child during the interval. The context of abstinent remission showed the greatest differentiation from persistent AUD, with differences in marital status, children, family and friend support, and treatment.

Lifetime AUD severity and rates of treatment were greatest among abstinent individuals and lowest among remitted low-risk drinkers, consistent with evidence that abstinence is a more common form of remission among individuals with severe AUD, and that moderate drinking is the most common form of remission among untreated individuals (Dawson et al., 2005; Sobell et al., 1996). Remission rates in this high-risk sample were higher than those found among alcohol-dependent individuals from a population-based sample who were re-interviewed 3 years after meeting criteria for

Table 3. Results of Multivariate Equations Showing Correlates of High-Risk Drinking, Remitted Low-Risk Drinking, and Abstinent Remission

	High-risk drinking versus persistent AUD OR (95% CI)	Remitted low-risk drinking versus persistent AUD OR (95% CI)	Abstinent remission versus persistent AUD OR (95% CI)
Social context			
Stable separation/divorce, Women	NS	NS	**6.0 (1.8** to **19.7)**
Men	NS	NS	0.5 (0.2 to 1.7)
New marriage	1.9 (0.7 to 4.8)	NS	**3.0 (1.1** to **8.2)**
New separation/divorce	NS	NS	2.9 (0.9 to 9.1)
Stable number children	**2.5 (1.1** to **5.7)**	NS	NS
New first child, Women	0.5 (0.1 to 1.8)	**4.4 (1.8** to **10.6)**	**0.2 (0.05** to **0.64)**
Men		1.1 (0.5 to 2.3)	
New additional child	NS	NS	NS
Increased religious attendance	2.3 (0.9 to 5.3)	NS	1.8 (0.8 to 4.0)
Decreased religious attendance	1.7 (0.7 to 4.4)		1.3 (0.6 to 3.0)
High family support[a]	NS	NS	**0.4 (0.2** to **0.9)**
High friend support[a]	NS	NS	**3.1 (1.3** to **7.3)**
Newly unemployed	**2.4 (1.0** to **5.7)**	NS	NS
Alcohol treatment			
Stable Alcoholics Anonymous (AA)-only	NS	NS	**9.1 (2.7** to **31.0)**
Stable professional treatment	NS	NS	**2.5 (1.0** to **6.4)**
New AA-only	NS	NS	2.3 (0.7 to 7.8)
New professional treatment	NS	NS	**3.2 (1.1** to **9.7)**
Alcohol/drug use covariates			
Severe lifetime AUD (≥6 symptoms)	0.8 (0.4 to 1.8)	**0.5 (0.3** to **0.7)**	**3.9 (1.6** to **9.4)**
15 or more years from onset to recency	**0.2 (0.1** to **0.5)**	**0.2 (0.1** to **0.4)**	**0.4 (0.2** to **0.9)**
Current drug use	1.2 (0.4 to 3.4)	**0.4 (0.2** to **0.7)**	**0.2 (0.1** to **0.5)**
Remitted drug use, 1 to 5 years	1.7 (0.6 to 4.8)	0.7 (0.3 to 1.3)	1.5 (0.6 to 3.7)
Remitted drug use, >5 years	**4.2 (1.6** to **11.1)**	**1.8 (1.0** to **3.3)**	**2.7 (1.0** to **6.9)**
Current nicotine dependence	**0.1 (0.0** to **0.7)**	0.5 (0.2 to 1.0)	0.9 (0.4 to 2.0)

[a]Above median; adjusted for age, ethnicity, and gender, significant associations ($p \geq 0.05$) bolded.

NS, parameter not significant, not estimated in multivariate model; AUD, alcohol use disorder.

current AD (Dawson et al., 2012). In that study, only 11% of the sample was remitted at follow-up. The higher rate of remission in this study may be due to the fact that remission was based on DSM-5 AUD, which has a lower severity threshold than DSM-IV AD, and therefore a lower threshold for remission (i.e., remission of 2, rather than 3, symptoms). Also, related to the sample's high-risk status, each individual in the current study had at least 1 family member with life-time AD who had accessed professional treatment, which may have influenced them to consider reducing their own alcohol use. This possibility is consistent with evidence that the shared familial environment accounts for a significant proportion of variance in treatment seeking (True et al., 1996). In the current study, individuals with no current AUD symptoms who were drinking at risk levels were differenti-ated from individuals with persistent AUD. In the study by Dawson and colleagues (2012), these individuals were included in the no recovery group, comprising about 8% of that group (D.A. Dawson, personal communication, July 24, 2013). Designating them as a separate category in the current study revealed that although they were drinking at high-risk levels, they differed in substantive ways from individuals with current AUD, having a shorter duration of AUD, higher rates of remitted drug use, and lower rates of current nicotine dependence.

Family context, represented by marital status and chil-dren, differentiated high-risk drinking and both types of remission from persistent AUD. A smaller proportion of the persistent AUD group had ever been married or had children compared to high-risk drinkers, remitted low-risk drinkers, and abstainers. This difference is consistent with evidence that heavy drinkers are more likely to delay marriage and children, or to remain single, than individuals who do not drink heavily (Chilcoat and Breslau, 1996; Waldron et al., 2008), or to transition out of heavy drinking as they adopt changing adult roles (Miller-Tutzauer et al., 1991). Similarly, the birth of a first child among women who became remitted low-risk drinkers is consistent with adult role transitions and with natural recovery (Dawson et al., 2006; Russell et al., 2001; Sobell et al., 2000), suggesting a group of individuals adjusting their drinking habits to new roles, largely without formal treatment. Abstinent individuals were less likely to have a first child than individuals with AUD, possibly reflect-ing their older age and, also, the higher likelihood among women of being stably separated or divorced. The higher likelihood of stable separation or divorce among abstinent women, but not men, is consistent with findings which sug-gest that marriage is more beneficial for men with alcohol problems than similar women. In the current study, women who were separated or divorced at baseline, and stayed that way, were more likely than similar men to be abstinent at fol-low-up, suggesting that being single increased their chances of recovery from AUD. In a 5-year follow-up of problem-drinking women, women who had been separated or divorced between assessments had reduced risk of alcohol problems at follow-up compared to those who remained

married (Wilsnack et al., 1991). Similarly, evidence from treatment studies suggests that married men have better outcomes following treatment than unmarried men, whereas for women, marriage increases the risk of relapse (reviewed in Walitzer and Dearing, 2006). These gender differences regarding the benefits of marriage for individuals attempting to recover from severe AUDs might be interpreted in light of evidence for positive assortative mating for alcohol use and dependence (Grant et al., 2007), with females more likely than males to choose a partner with a history of AD (Agrawal et al., 2006). Investigations in more recent data are needed, however, as the rates of alcohol problems among women are increasing (Grucza et al., 2008) and rates of marriage are decreasing (Copen et al., 2012) in younger cohorts. Perhaps reflecting this shift, a recent meta-analysis of treatment studies found that marital status was a less salient predictor of treatment outcome when samples included larger proportions of women, suggesting that increasing numbers of women entering treatment may shift the findings from previous research based in predominately male samples (Adamson et al., 2009).

Abstinent individuals reported lower levels of support from family and higher levels of support from friends than did individuals with persistent AUD. These differences may be related to the likelihood in this high-risk sample of active AUD in relatives. Individuals who became abstinent between baseline and follow-up may have distanced themselves from their families and cultivated friends who did not have drinking problems, or who were also trying to abstain, to maintain abstinence themselves. It is equally plausible that lower perceived family support is due to the respondent's behavior, wherein objectionable alcohol-related behaviors alienated family members. As social support was measured only at follow-up, and alcohol-specific support (e.g., support for remission) was not queried, we cannot examine change in support or determine whether support from friends is related to AA or treatment participation. Treatments designed specifically to increase support for abstinence in the social networks of individuals with AUDs result in drinking outcomes similar to or better than those attained with more traditional treatments (Litt et al., 2007, 2009; UKATT Research Team, 2005). Similarly, drinking outcomes are improved when individuals attend AA as an adjunct to professional treatment (Bond et al., 2003; Kelly et al., 2011b; Stout et al., 2012), consistent with the association of stable AA attendance with abstinence in the current study.

Limitations

This study must be interpreted with several limitations in mind. Foremost is the fact that the sample was selected for its high risk for AUD and therefore cannot be generalized to the larger population. However, the examination of the context of remission in a high-risk sample extends similar findings in population-based and clinical samples. The lack of recency ages for individual symptoms at baseline necessitated basing current AUD status at baseline on a single question about age at most recent symptom. Finally, the sample was primarily white with little power to detect ethnic differences.

Conclusions and Future Directions

The social contexts accompanying remission patterns in this high-risk sample resemble those found in population-based and clinical samples. Low-risk drinkers resemble natural remitters from population-based samples who change their drinking habits with life transitions. The social context of abstainers, represented by marital dissolution and new marriage, high levels of friend support, and treatment, corresponds to similar findings in clinical samples. The greater likelihood of recent unemployment among high-risk drinkers may reflect the negative consequences of heavy drinking. The social context of remission appears to be as important in this sample with high familial risk for AUD as it is in population-based and clinical samples. Future work will examine whether the remission status of family members is associated with the remission status of subjects, and how these relate to social context.

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