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The Enduring Influence of Drinking Motives on Alcohol Consumption After Fateful Trauma

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Abstract

Objective—Drinking motives predict later levels of alcohol consumption and development of alcohol dependence, but their effects on stress-related drinking are less clear. Proximity to the terrorist attack on the World Trade Center (WTC) on 09/11/01 was significantly associated with alcohol consumption 1 and 16 weeks after 09/11/01. We investigated the relationship between drinking motives measured a decade earlier, proximity to the WTC, and drinking after 09/11/01. This event constitutes a natural experiment for studying the effects of previously measured drinking motives on alcohol consumption after fateful trauma.

Methods—Adult drinkers (N=644) residing in a New Jersey county were evaluated for four drinking motives: coping with negative affect, for enjoyment, for social facilitation and social pressure. After 09/11/01, their exposure to the WTC attack and subsequent drinking were assessed. Poisson regression was used to assess the relationships between proximity to the WTC, drinking motives and post-09/11/01 drinking; models were adjusted for alcohol dependence, age, gender and race.

Results—Drinking to cope with negative affect predicted alcohol consumption one week after 09/11/01 ($p=0.04$) and drinking for enjoyment predicted drinking 1 and 16 weeks after 09/11/01 ($p=0.001$ and 0.01 , respectively). The associations were independent of proximity to the WTC. No interactions were observed between drinking motives, proximity to the WTC or lifetime alcohol dependence.

Conclusion—Drinking motives a decade earlier predicted higher alcohol consumption after fateful trauma independently from proximity to the WTC on 09/11/01. Results suggest that drinking motives constitute a robust, enduring influence on drinking behavior, including after traumatic experiences.

Increased alcohol consumption following stress has been demonstrated in animal models (Fahlke et al., 2000; Chester et al., 2004) and drinking alcohol is one way that humans cope with feelings of anxiety, anger and sadness when faced with traumatic experiences (Volpicelli et al., 1999). The original tension-reduction hypothesis posits that alcohol reduces fear associated with conflict (Conger, 1956), but the relationship between tension and alcohol consumption is complex, involving gender differences, alcohol expectancies and motivations, perceived stress and adaptive coping mechanisms (Carney et al., 2000; Cooper

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et al., 1992b). Experimental laboratory studies on stress and human alcohol consumption suggest that exposure to stressful events can alter subjective effects of alcohol, but may not increase alcohol consumption (de Wit et al., 2003; Söderpalm and de Wit, 2002). Daily diary studies have been used to investigate the impact of stress and mood on drinking (Armeli, Carney, O'Neil, Tennen and Affleck 2000; Young & Orei, 2000; Armeli, Tennen, Affleck & Kranzler, 2000; Schroder and Perrine 2007; Park et al., 2004), but the results have not been consistent, even when examining within-person effects. A possible reason for inconsistencies in alcohol consumption within and between individuals exposed to daily hassles and stressors is that the source and type of stress matters (Shrout et al., 1989). For example, politically motivated mass violence such as terrorism is more likely to cause psychological impairment than natural or technological disasters (Norris 2002; Dohrenwend 2000). Terrorism, a fateful trauma, (i.e., trauma that occurs independently of an individual's personal traits; Dohrenwend 2000), provides a natural experiment in which factors affecting subsequent alcohol consumption can be investigated.

The terrorist attack on the New York City World Trade Center (WTC) on September 11, 2001, constitutes such an event, as it was highly stressful for individuals in lower Manhattan (Galea et al., 2002; Schlenger et al., 2002) and nearby areas (Hasin et al., 2007). Increased alcohol consumption after the 9/11 attack was demonstrated in Manhattan adults (Vlahov et al., 2002, 2004a, 2004b), New York City high school students (Wu et al., 2006) and in adult drinkers from a New Jersey county near lower Manhattan, the site of the 09/11/01 terrorist attack (Hasin et al., 2007). Further, increases in drinking were still present two years after the WTC attack (Boscarino, Adams and Galea, 2006). We previously showed that alcohol consumption after 09/11/01 was significantly higher in those who were within five miles of the WTC on 09/11/01 compared to those further away, while knowing someone who was killed in the attack was not (Hasin et al., 2007). Importantly, the significant association between proximity to the WTC and alcohol consumption was not moderated or mediated by previous alcohol dependence (Hasin et al., 2007). While the consistency of 09/11 effects on drinking has recently been summarized in a meta-analysis (DiMaggio et al., 2009), little is known about individual characteristics influencing drinking after exposure to such fateful trauma.

One set of characteristics that merit investigation are drinking motives. A growing body of research suggests that drinking motivated by a desire or need to regulate positive versus negative affect is associated with unique patterns of alcohol use and distinct etiologic processes (Kuntsche et al., 2005, 2006; Cooper et al., 2008; Cox and Klinger, 1988, 1990; Cooper 1994; Cooper et al., 1995). Drinking motives are persistent over time, predict later problem drinking (Bennett et al., 1999; Jackson and Sher, 2005) and are partly heritable (Prescott et al., 2004; Agrawal et al., 2008). Those who drink to cope with negative affect, including stress-related drinking, are at greater risk of alcohol problems than others (Cooper et al., 1992b; Cooper 1994, 1995; Read et al., 2003). Drinking to enhance positive affect has been conceptualized as an appetitive motivational process (Cooper et al., 2008, 1995) that prospectively predicts heavy drinking and drinking to intoxication (Read et al., 2003; Schulenberg et al., 1996). In our prospective study of adult drinkers, drinking to reduce negative affect at baseline (1991-1992) increased the risk for first-time occurrence of DSM-IV alcohol dependence one year (Carpenter and Hasin, 1998a) and ten years later (Beseler et al., 2008).

The impact of drinking motives on alcohol consumption after exposure to a fateful traumatic event has never been investigated. Our prospective study provided a unique opportunity to investigate the effects of drinking motives measured at baseline (1991-1992) and later proximity to a fateful trauma, the 9/11 attack, on subsequent alcohol consumption. We addressed two questions: (1) Did drinking motives measured ten years prior to 09/11/01

predict alcohol consumption after 09/11/01 above that predicted by proximity to the WTC? (2) Did proximity to the WTC moderate or mediate the effect of drinking motives on post-09/11/01 drinking? We hypothesized that drinking to reduce negative affect would predict increased drinking after 09/11/01 and that this motive could interact with proximity to the WTC, resulting in higher levels of alcohol consumption among those in close proximity to the attack.

Methods

Sample design, procedures, and participants

The study and sample have been described previously (Hasin et al., 2007; Beseler et al., 2008; Hasin et al., 1996; Hasin et al., 1997a, 1997b; Carpenter and Hasin, 1998a; Hasin et al., 2001). The study was originally designed to prospectively characterize alcohol consumption, abuse and dependence among a community sample whose eligibility criteria included at least one occasion of ≥ 5 drinks in the past 12 months (Hasin et al., 1996; Hasin et al., 1997a, 1997b; Hasin et al., 2001). Binge drinking, or 5+ drinks, is now part of the NIAAA guidelines to signal at-risk drinking (NIAAA, 2004). In 1991-1992, 24.5% of U.S. adults drank ≥ 5 drinks at least once in the past 12 months, and 41.8% drank ≥ 5 drinks ever (Dawson et al., 1995); thus, binge drinking is a relatively common phenomenon in the U.S. In this sample, the frequency of binge drinking in the year prior to the interview ranged considerably; 7.6% did so only once, 10.7% did so approximately once a month, 14.3% did so 1-2 times a week, and 3.3% did so daily or near-daily.

The Community Study sample was recruited by random digit dialing in 1991-1992 from 6,500 households in a New Jersey county near lower Manhattan (about 12 miles from the site of the WTC). Within the 1,046 eligible households, household members age 18-65 were identified, and a randomly selected member was screened for eligibility. Household and person eligibility status was determined for 81% of all randomly dialed numbers and 92.0% (N=962) of those eligible were personally interviewed using the NIAAA Alcohol Use Disorders and Associated Disabilities Interview Schedule (AUDADIS) (Grant et al., 1995; Grant et al., 2003; Hasin et al., 1997c). Interviewers were trained using procedures from national surveys (Grant et al., 2004; Hasin and Grant, 2002). Informed consent was obtained for all interviews, as approved by the New York State Psychiatric Institute Institutional Review Board.

Of the original 962 participants, 846 completed the one-year follow-up survey, 777 (81%) completed a baseline self-administered questionnaire (SAQ) that included drinking motivations and 791 participated in the 09/11/01 study. The original 962 participants were 18 to 65 years of age (mean=33.4, SD=11.12), 82% Caucasian, 6% had less than a high school education, 51.4% were unmarried and 17% met the criteria for alcohol dependence. At baseline, those 30 and younger were significantly more likely than those over 30 to score high on drinking for enjoyment (18-25: $p < 0.0001$; 26-30: $p = 0.0001$); no other drinking motives differed by age group.

Of the 791 who completed the 9/11 survey, 644 had complete drinking motives information at baseline (67% of 962). These 644 respondents did not differ significantly from the 318 who were lost to follow-up on gender, age, marital status, drinking initiation prior to age 15, or family history of alcoholism, but were more likely to be white ($p < 0.0001$), to work full-time ($p = 0.0003$), to have completed high school ($p < 0.05$) and have a lifetime diagnosis of alcohol abuse or dependence ($p < 0.05$). Of the 644 respondents, 53.4% were male and 46.6% female, 84.5% were white, 62.4% were married and 79.2% had at least some college education. The mean age at the 10-year follow-up was 43.4 (sd=11.1, range 27-77). The minimum amount of time between September 11 and the interview was 123 days, which

allowed time to measure alcohol consumption at one and sixteen weeks after 9/11 (mean days = 380.9, sd=135.5). The length of time between 09/11/01 and the date of interview was not significantly associated with either drinking outcome. At the time of the 9/11 study, the mean maximum number of drinks consumed by age group was as follows: 27-35 (n=181), 2.79 ± 2.93 ; 36-40 (n=128), 3.22 ± 3.59 ; 41-49 (n=172), 3.57 ± 2.79 ; 50-77 (n=163), 2.99 ± 2.1 . Using respondents aged 27-35 as the reference group, those aged 41-49 differed significantly ($\chi^2=5.38$, $p=0.02$), but no other differences by age group were observed. Proximity to the respondent's home was not associated with an increase in alcohol consumption after 09/11/01, nor was it associated with symptoms of PTSD, so we chose to use proximity to the WTC at the time of the attack.

Measures of outcomes: alcohol use

Modified AUDADIS questions were used to assess maximum number of drinks per day consumed after September 11, 2001. Respondents were specifically asked about the maximum number of drinks they consumed per day in the "7 days after September 11, 2001" (1-week drinking) and "16-weeks from September 11 to December 31, 2001" (16-week drinking). Self-reports of drinking using AUDADIS questions are highly reliable (Grant et al., 1995, 2003; Hasin et al., 1997).

Measures of Predictors: Drinking motives

The drinking motives scale used in this study, the Reasons for Drinking Scale, is a reliable measure of drinking motives (Carpenter and Hasin, 1998a, 1998b) and is similar to other four-category scales of drinking motives (Kuntsche et al., 2005, Cooper, 1994). It is a 35-item Likert-style questionnaire of drinking motives based on social learning constructs applied to substance use (Hilton, 1987). Item responses range over five levels from "agree strongly" to "disagree strongly". The items administered to the Community Study participants formed four drinking motive factors (Carpenter and Hasin, 1998a, 1998b; Beseler et al., 2008): (1) drinking to cope with negative affect (Cronbach's $\alpha=0.83$), (2) drinking for enjoyment ($\alpha=0.67$) (3) drinking for social facilitation ($\alpha=0.87$), and (4) drinking due to social pressure ($\alpha=0.76$).

Measures of Predictors: Proximity to the WTC

WTC proximity was determined by asking respondents their location when they first heard about or experienced the attack. ArcGIS (ESRI GIS Mapping and Software, Redlands, CA) was used to map this location to calculate its distance from the WTC.

Control variables

Potential control variables included gender, age, race, post-traumatic stress symptoms and lifetime DSM-IV alcohol dependence. Post-traumatic stress (PTS) was measured with the PTSD Checklist - Civilian Version (Ruggiero et al., 2003), also used in a national survey shortly after 09/11/01 (Schuster et al., 2001). PTS scores (range 5 to 25, or no stress to maximum stress, respectively) showed excellent internal consistency in the Community Study respondents ($\alpha=0.83$) (Hasin et al., 2007).

Lifetime DSM-IV alcohol dependence was assessed at baseline, one- and ten-year follow-up with the AUDADIS, a fully-structured diagnostic interview for non-clinician interviewers. The AUDADIS includes an extensive list of symptom questions that operationalize DSM-IV criteria for alcohol abuse and dependence. In contrast to other epidemiologic instruments that use DSM-IV alcohol abuse as a screener for DSM-IV alcohol dependence (Kessler and Ustun, 2004), the AUDADIS ascertains data on all criteria for DSM-IV alcohol abuse and dependence criteria independently, allowing full identification of alcohol dependent

individuals regardless of whether they met criteria for abuse (Hasin and Grant, 2004; Grant et al., 2007). The discriminant, concurrent, convergent, construct and population validity of the AUDADIS alcohol and drug use disorder diagnoses have been well documented (Hasin et al., 2007; Compton et al., 2007), including work done in the present sample as well as in a World Health Organization/National Institutes of Health (WHO/NIH) reliability and validity study (Hasin et al., 1996; Hasin et al., 1997a, 1997b, 1997c; Grant et al., 1995, 2003; WHO, 1992).

Analysis

A natural log transformation was used to improve the normality of the drinking outcome measures. The drinking motive variables were skewed and therefore dichotomized at the median ($\geq$ median=1), consistent with our previous work (Beseler et al., 2008). Tetrachoric correlations were used to examine correlations between the drinking motive variables after dichotomization. Consistent with a previous report, proximity to the WTC was defined as a binary variable (≤ 5 miles=1) because being within this distance to the WTC was significantly associated with greater alcohol consumption after 09/11/01 (Hasin et al., 2007). Control variables included lifetime DSM-IV alcohol dependence, gender, race (white vs. other) and age (continuous). Preliminary analyses indicated that PTS scores were unrelated to drinking motives and the drinking outcomes, so PTS was not retained as a control variable. (Inclusion of PTS as a control variable did not affect findings reported below).

Differences in post-09/11/01 alcohol consumption in those scoring low and high on the drinking motive scales were first tested using the Wilcoxon two-sample test on the untransformed alcohol consumption variables. Next, multivariable modeling was conducted using Poisson regression because the dependent variable was an ordinal count of alcoholic drinks consumed with a right-skewed distribution. Additionally, to correct for slight underdispersion, we adjusted the standard errors by scaling them using the ratio of the square root of the Pearson chi-square statistic divided by the degrees of freedom (McCullagh and Nelder, 1989; Agresti, 2002; Heinzl and Mittlbock, 2003). Analyses were conducted separately for each of the four drinking motives (drinking to cope with negative affect, social facilitation, social pressure, enjoyment); each model included proximity to the WTC and control variables. Motives significantly associated with alcohol consumption were included together in a single model. Lastly, all four drinking motives were included in the same model to control for the effects of other drinking motives when examining each one. All models were adjusted for age, gender and race and ever being alcohol dependent. Interactions between (1) drinking motives and proximity to the WTC and (2) drinking motives and lifetime alcohol dependence were tested by first assessing main effects and then adding a cross-product term between the two variables of interest. We further tested whether drinking level at baseline (1991-1992) was associated with drinking after 09/11/01 and could explain any significant associations identified. All analyses were conducted for the post-09/11/01 drinking outcome in the two time frames measured, 1 week and 16 weeks after 09/11/01. SAS version 9.2 (SAS Institute, Cary, NC) was used in all analyses. All tests were two-tailed and significance was set at $p < 0.05$.

Results

Drinking Motives and Alcohol Consumption after 09/11/01

In bivariate analyses, respondents scoring above the median on each of the drinking motive variables drank significantly more alcoholic beverages in the week following 09/11/01 than those scoring below the median (Table 1). The largest differences in means were seen for drinking to cope with negative affect and drinking for enjoyment. The tetrachoric correlation between drinking for enjoyment and drinking to cope with negative affect was 0.35

($p<0.01$); other correlations ranged from 0.18 (enjoyment and social pressure; $p=0.01$) to 0.62 (drinking to cope and social pressure; $p<0.01$).

Proximity to the WTC, drinking motives and alcohol consumption after 09/11/01

Proximity to the WTC was significantly associated with alcohol consumption in models adjusted for lifetime alcohol dependence, gender, age and race ($\beta=0.29$, $se=0.12$, $p=0.02$). Motives had virtually no effect on the regression coefficients used to estimate the relationship between proximity to the WTC and alcohol consumption and none of the drinking motives significantly moderated the association at 1 or 16 weeks post-09/11/01. Those who scored above the median on drinking to cope with negative affect or drinking for enjoyment drank at significantly higher levels one week after 09/11/01 than those scoring below the medians (Table 2). Sixteen weeks after 09/11/01, drinking for enjoyment continued to predict the highest number of drinks ($\beta=0.20$, $se=0.08$, $p=0.02$) (Table 2). With both drinking for enjoyment and drinking to cope with negative affect in the model, proximity to the WTC remained significant at 1 and 16 weeks, as did drinking for enjoyment (Table 2). By 16 weeks, the effects of drinking motives on alcohol consumption after 09/11/01 had attenuated, but proximity to the WTC did not (Table 2).

Including all four drinking motives in the same model did not alter these results (Table 2). Drinking motives did not significantly interact with lifetime alcohol dependence or proximity to the WTC in predicting alcohol consumption. Three-way interactions between drinking motives, proximity to the WTC and lifetime alcohol dependence were not significant. In addition, the association between alcohol consumption and drinking motives was unchanged after controlling for baseline drinking. Thus, drinking after 09/11/01 was not simply a reflection of baseline drinking levels in this study population.

Discussion

In this prospective study of a sample of adult drinkers originally living about 12 miles from lower Manhattan, drinking motives measured a decade earlier predicted alcohol consumption after exposure to a fateful trauma. The findings showed that drinking to cope with negative affect and drinking for enjoyment at baseline predicted greater alcohol consumption shortly after the fateful trauma of the 09/11/01 attack independently of proximity to the WTC at the time of the attack and after adjusting for a lifetime diagnosis of DSM-IV alcohol dependence. The study therefore adds to evidence that drinking motives have an enduring and robust influence on alcohol-related behaviors, even years later (Bennett et al., 1999; Jackson and Sher, 2005; Beseler et al., 2008). This observation aids in explaining the relationship between proximity to fateful trauma, drinking motives and drinking. Among vulnerable individuals, such drinking motives may contribute to the onset of, or relapse to, an alcohol use disorder.

We did not find that drinking for social facilitation or due to social pressure predicted level of drinking after 09/11/01. Instead, the two drinking motives significantly associated with post-09/11/01 alcohol consumption (coping with negative affect and drinking for enjoyment) were those that can be seen as alteration or management of an individual's internal state (i.e., attempts to increase positive feelings or reduce negative ones). In this sense, the two drinking motives that significantly predicted post-09/11/01 drinking in our study can be considered internalizing motives (Cox and Klinger, 1990; Cooper, 1994). Internalizing motives may be of much higher salience after a fateful trauma due to an individual's need to manage his or her internal states during such a time. In contrast, drinking motives such as drinking to gain social acceptance or for social conformity involve situations and concerns that may be much more salient to an individual during more everyday, non-traumatic periods (Cox and Klinger, 1990; Cooper, 1994).

Several studies have found that drinking in NYC remained elevated for up to six months after 09/11/01 (Vlahov et al., 2002, 2004a, 2004b) and our findings suggest that at 16 weeks this was particularly true for those within five miles of the WTC at the time of the attack and also for those who endorsed drinking for enjoyment. Drinking for enjoyment is associated with social drinking, e.g., in bars (Cooper, 1994; Cooper et al., 1992a) and is associated with social support (Burda and Vaux, 1988). Anecdotal information suggests that drinking in bars after 09/11/01 increased in the New York City area (New York Times, December 2001). The majority of those in close proximity to a fateful trauma experience distress, and maladaptive coping behaviors often occur, even among those without PTSD (Ruzek et al., 2008; Gard and Ruzek, 2006), requiring planning for delivery of mental health disaster planning (Ruzek et al., 2008; Gard and Ruzek, 2006).

The eligibility requirement for inclusion into the Community Study sample was having binge drank at least once in the 12 months prior to the baseline interview. Although several drinking measures were associated with drinking for enjoyment at the baseline interview (Carpenter and Hasin, 1998b), baseline drinking did not account for the association between drinking for enjoyment and maximum number of drinks after 09/11/01.

Limitations of the study are noted. Alcohol consumption and other stressful life events were not measured immediately before 09/11/01. While such data might have helped in interpreting the findings, such data are unlikely to become available in studies of large-scale fateful traumatic events since these events and a study of them cannot be planned in advance. In addition, the average time to interview after 09/11/01 was approximately a year because the study design required collecting alcohol consumption data at one week and sixteen weeks as well as much additional ten-year follow-up study data among the sample. To our knowledge, the reliability or validity of AUDADIS alcohol measures at specific times after exposure to mass trauma has not been assessed. However, a one-year timeframe is a very common timeframe in the alcohol field, and extensive evidence supports its reliability and validity. Further, the study offers a considerable advantage over other studies of drinking after 9/11/01 because we were able to incorporate measures of respondents' drinking history ascertained before exposure to the 9/11 attack. Additionally, while drinking motives have been shown to be relatively stable over time (Jackson and Sher, 2005), they may have changed in some individuals, a topic on which little information is available. Drinking for enjoyment was significantly more likely to be endorsed by those 30 and younger at baseline, suggesting that this motive is not as stable over time as the other three, but we adjusted for age group in the analyses. Additionally, we did not have measures of resiliency or of coping mechanisms, which may mediate the relationships in this study and which should be addressed in future studies. These limitations are offset by important and unique strengths for examining the research question, including (1) a prospective design in a defined cohort of adult drinkers who were assessed repeatedly for alcohol dependence, and assessed for their drinking motives before the 09/11/01 attack could even be imagined; (2) use of the AUDADIS, a valid and reliable assessment of alcohol use and alcohol diagnoses, and (3) a validated and reliable measure of the drinking motives variables.

In conclusion, the results suggest that drinking motives constitute an important and enduring influence on drinking behavior. The findings suggests that drinking motives should be assessed when evaluating the mental health needs of individuals in close proximity to traumatic events such as terrorism, and the information included when planning services. Further, the relationship of drinking motives to other causes of alcohol dependence, including earlier exposure to fateful and other types of trauma, social norms, and genetic factors (Luo et al., 2005, 2006; Dick et al., 2008; Edenberg et al., 2004; Covault et al., 2007; Armeli et al., 2008), should be further investigated to provide a broader understanding of the etiology of alcohol use disorders. Since traumatic events will continue to occur,

understanding how drinking motives lead to increased drinking after trauma can assist with future disaster planning and may lead to a general improvement in understanding the etiology of heavy drinking and alcohol use disorders.

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Table 1

Baseline Drinking Motives (1991-1992) and Alcohol Consumption after September 11, 2001: Bivariate Relationships

	Highest number of drinks per day after 09/11/01 (n=644)	
Drinking Motive	1 week after 09/11/01 Mean (s.d.)	16 weeks after 09/11/01 Mean (s.d.)
Cope with negative affect		
< median of 1.50	2.68 (2.45)	3.35 (2.90)
≥ median of 1.50	3.47 (3.14) ^b	4.12 (3.63) ^c
Drinking for enjoyment		
< median of 3.50	2.67 (2.64)	3.27 (3.09)
≥ median of 3.50	3.59 (3.09) ^a	4.33 (3.54) ^a
Social facilitation		
< median of 2.86	2.87 (2.53)	3.55 (3.08)
≥ median of 2.86	3.42 (3.24) ^d	4.07 (3.62)
Social pressure		
< median of 1.33	2.78 (2.30)	3.45 (2.78)
≥ median of 1.33	3.42 (3.28) ^d	4.07 (3.74)

^a p < 0.0001

^b p < 0.001

^c p < 0.01

^d p < 0.05

Table 2

Baseline Drinking Motives (1991-1992), Proximity to WTC on 09/11/01 and Alcohol Consumption after September 11, 2001: Poisson Regression Models.^a

	1 week after 09/11/01 β (s.e.) ^b	16 weeks after 09/11/01 β (s.e.) ^b
Proximity to WTC	0.29 (0.12) p=0.02	0.29 (0.11) p=0.01
Cope with negative affect	0.19 (0.09) p=0.04	0.11 (0.08) p=0.16
Proximity to WTC	0.27 (0.12) p=0.03	0.28 (0.11) p=0.01
Drinking for enjoyment	0.30 (0.09) p=0.001	0.20 (0.08) p=0.01
Proximity to WTC	0.29 (0.12) p=0.02	0.29 (0.11) p=0.01
Social facilitation	0.03 (0.09) p=0.76	-0.00 (0.08) p=0.99
Proximity to WTC	0.30 (0.12) p=0.01	0.29 (0.11) p=0.01
Social pressure	0.05 (0.09) p=0.57	0.01 (0.08) p=0.93
Proximity to WTC	0.27 (0.12) p=0.03	0.28 (0.11) p=0.009
Cope with negative affect	0.14 (0.09) p=0.13	0.08 (0.08) p=0.34
Drinking for enjoyment	0.27 (0.09) p=0.003	0.19 (0.08) p=0.02
Proximity to WTC	0.27 (0.12) p=0.03	0.28 (0.11) p=0.009
Cope with negative affect	0.17 (0.10) p=0.10	0.11 (0.09) p=0.22
Drinking for enjoyment	0.28 (0.09) p=0.002	0.20 (0.08) p=0.02
Social facilitation	-0.07 (0.09) p=0.44	-0.06 (0.08) p=0.44
Social pressure	-0.02 (0.10) p=0.83	-0.04 (0.09) p=0.65

^a reference groups for all models are respondents scoring below the median on the drinking motive scale and those being greater than a five mile radius from the WTC at the time of 09/11/01

^b Adjusted for ever alcohol dependent, age, gender and race