

Published in final edited form as:

Drug Alcohol Depend. 2013 February 1; 128(0): 123–129. doi:10.1016/j.drugalcdep.2012.08.016.

“Drinking buddies” and alcohol dependence symptoms among African American men and women in Baltimore, MD

Cui Yang, Melissa Davey-Rothwell, and Carl Latkin

Johns-Hopkins School of Public Health, Department of Health, Behavior and Society, 2213 McElderry Street, 2nd Floor, Baltimore, MD 21205, Phone: 410-502-5368/ Fax: 410-502-5385

Abstract

BACKGROUND—Social network characteristics have been found to be associated with a variety of risky behaviors, including alcohol consumption. This study assessed the relationships between the characteristics of drinking buddies and alcohol dependence symptoms among a sample of African American men and women.

METHODS—This is a cross-sectional study using baseline data from 721 impoverished African American men and women participating in an HIV prevention study in Baltimore, MD. Alcohol dependence symptoms were assessed through the Alcohol Use Disorders Identification Test (AUDIT) and was defined as AUDIT score ≥ 13 for females and AUDIT score ≥ 15 for males. Logistic regression models with generalized estimating equations (GEE) using network member as the unit of analysis were conducted to assess the associations between the gender or relationship (i.e., kin, non-kin or sex partner) of the drinking buddies and the participants’ alcohol dependence symptoms.

RESULTS—Approximately 22% of the participants had alcohol dependence symptoms. Among male participants, alcohol dependence symptoms were associated with having drinking buddies who were sex partners (AOR: 2.41, 95% CI: 1.32, 4.39) or who were female (AOR: 2.29, 95% CI: 1.29, 4.05). Among female participants, association between the presence of drinking buddy and alcohol dependence symptoms did not depend on the types of relationship or the gender of the drinking buddy.

CONCLUSIONS—Social network characteristics with respect to alcohol dependence symptoms vary according to the type of relationship or the gender of the drinking buddies, especially among

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Corresponding Author/Address for Reprints: Cui Yang, Johns Hopkins Bloomberg School of Public Health, Department of Health, Behavior and Society, 2213 McElderry Street, 2nd Floor, Baltimore, MD 21205, USA, Phone: 410-502-5368, Fax: 410-502-5385, cyang@jhsph.edu.

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Contributors

Author Yang managed the literature search, summaries and undertook the statistical analysis. Authors Latkin and Davey-Rothwell designed the study and wrote the protocols. All authors contributed to and have approved the final manuscript

Conflict of Interest

All authors declare that they have no conflicts of interest.

men. Gender-specific norm-based interventions may be a useful strategy to decrease drink problems.

Keywords

Alcohol dependence symptoms; African American; social networks; drinking buddy

1. INTRODUCTION

Excessive alcohol use is a leading preventable cause of death and disability worldwide (World Health Organization, 2007). Alcohol dependence is associated with a higher rate of mental and physical illness and a wide range of social problems (Pilling et al., 2011). Alcohol dependence may lead to injury, domestic violence, poor medication adherence, economic costs and lost productivity, and psychiatric comorbidity (Caetano et al., 2001; Tucker et al., 2003; Chou et al., 2006; Kamali et al., 2006). In a representative sample of adults, the lifetime prevalence of alcohol dependence in the United States has been reported to be 12.5% and the 12-month prevalence is 3.8%. However, only 24.1% of those with alcohol dependence have received treatment (Hasin et al., 2007).

Despite a higher prevalence of alcohol dependence among non-Hispanic whites than other ethnicity minorities (Hasin et al., 2007), African Americans experienced higher rates of recurrent or chronic dependence as compared to non-Hispanic whites (Chartier and Caetano, 2010). The consequences of drinking appear to be more profound among ethnicity minorities. Research suggests that African American adult drinkers are more likely than non-Hispanic white drinkers to report negative social consequences, such as arguments or fights with others as a result of drinking (Mulia et al., 2009). Research is needed to better understand the complexities of alcohol dependence as well as to develop prevention programs among African Americans (Hasin et al., 2007).

Alcohol consumption is often a social behavior, and hence social networks and norms are likely to be linked to drinking patterns. There has been increasing interest in the role of the social network characteristics in contributing to alcohol use and alcohol use disorders (Reifman, 2004). Social networks refer to the web of social ties that exist among individuals. Social network members are people who can provide both tangible (e.g., alcohol; financial resources, etc.) and intangible resources (i.e., emotional support; Berkman and Glass, 2000), which may facilitate or protect against alcohol use. Social network characteristics have been linked to alcohol use. Among both males and females, having a larger social network of heavy drinkers was associated with greater frequency of binge drinking (McCrary, 2004; Lau-Barraco and Collins, 2011). On the other hand, Bond and researchers (2003) found that fewer heavy drinkers in one's social network and having network members encourage reduced drinking were associated with alcohol abstinence. The Framingham study is a population-based, longitudinal, observational cohort study that was initiated in 1948 to prospectively investigate risk factors for cardiovascular disease. Results from the Framingham study are consistent with the theory that alcohol use can be attributed in part to the influence of close social network members (Rosenquist et al., 2010). The National Longitudinal Study of Adolescent Health (Add Health) included a well-designed social

network substudy (Haas et al., 2010). In an analysis of Add Health data, Stevens-Watkins and Rostocky (2010) found that perceiving less substance use among one's three best friends during high school years would be associated with a lower probability of binge drinking in young adulthood among African American males.

Prior research also suggests that not all network members have an equal influence on health behaviors, including alcohol use. Individuals' behaviors are often shaped and influenced by referent groups, who are often peers, with whom individuals feel some degree of similarity (Festinger, 1954; Tajfel, 1981). Although much of the previous research has focused on the prevalence of alcohol use among peers (Homish and Leonard, 2008; Davey-Rothwell et al., 2011), there has been a great interest in the potential impact on problematic use of alcohol from the presence of "drinking buddies," individuals who engaged in drinking as an integral part of the relationship. For example, the number of drinking buddies among peers was predictive of alcohol misuse one year after the baseline assessment among college students (Reifman et al., 2006).

It remains unclear if the association between social networks and alcohol use is influenced by the gender of the alcohol drinker. It has been suggested that women's alcohol intake is often more solitary, while men's alcohol consumption is more convivial with a more socially favorable acceptance (Limosin, 2002). A review of peer relationships and alcohol use among college students found that men were more likely to have drinking buddies as compared to women (Borsari and Carey, 2003). These findings suggest that social network characteristics may be different between male and female alcohol drinkers (Lewis and Neighbors, 2004; Homish and Leonard, 2008).

Social network analyses are valuable approaches to studying social influence and alcohol consumption patterns. They may provide information about micro-social process that influence drinking patterns and inform feasible social influence approaches to alcohol interventions and treatment (Copello et al., 2002; Litt et al., 2007). One of the mechanisms social network members can affect behavior is through social norms (Coleman, 1989). Yet, many of previous norm-based alcohol risk reduction intervention efforts, mostly targeting colleague students, are hampered by lack of a clarity delineating the complexity of social network characteristics that may influence alcohol consumption. For example, Wechsler and colleagues (2003) evaluated 37 U.S. colleges that used norms-based social marketing and did not find a significant decline in alcohol consumption among the targeted student population across any of the seven measures of consumption. One of the explanations was the lack of specificity of the referent groups in those interventions, which used messages about an "average" or "typical" student as references (Real and Rimal, 2007). Investigators have found that college students' drinking behaviors are uniquely related to perceived norms of drinking for more specific referent groups based on the gender or relationship (Larimer et al., 2009, 2011). One intervention providing referent group-specific normative feedback had significantly reduced intercollegiate athletes' normative misperception of alcohol use and drinking level (LaBrie et al., 2008).

Although the results from previous studies among college students provide evidence of specific social network influences on alcohol drinking, we do not know if these influence

processes are similar in adult populations or if there are important gender or racial differences. Limited research on adults has shown that alcohol use, especially among women, is often influenced by their sex partners drinking patterns (Demers et al., 1999; Grant et al., 2007). In a longitudinal network cohort study from the Framingham Study, female networks were significantly more influential in increasing individuals' heavy alcohol consumption behavior over time as compared to male networks (Rosenquist et al., 2010). African Americans may have different social network composition than other racial ethnic groups. Previous ethnographic research indicates that in urban African American communities, as compared to someone who was not a family member, kinship plays a much more important role in an individual's life because of the close geographic proximity of family members (Taylor, 1980). These findings highlight the need to examine different types of network members and their role on alcohol use or alcohol use disorders among African Americans.

Despite the health disparity of alcohol problems among ethnicity minorities, the role of the social networks in alcohol use among minority inner-city populations has received considerably less attention. Alcohol use is common in urban cities which have a high prevalence of alcohol outlets (Berke et al., 2010). Impoverished urban minority populations have disproportionately high levels of substance abuse and dependence (Caetano et al., 2001; Williams et al., 2010). Despite substantial evidence that social networks are strongly linked to health behaviors and conditions, most large-scale studies of social networks have focused on middle-class populations, such as the Framingham study, which may miss unique network dynamics or processes that contribute to the concentration of disease burdens and associated costs among impoverished populations.

The goal of the present study is to assess the relationships between the presence of drinking buddies and alcohol dependence symptoms among a sample of African American men and women who were at high risk of HIV infection and were living in impoverished urban neighborhoods. Specifically, the aims of this study are to investigate: 1) whether alcohol dependence symptoms were associated with the presence of drinking buddies in the social network; 2) the extent to which such associations depended on the type of relationship and the gender of the participants or the gender of their drinking buddies.

2. METHOD

2.1 Procedures and Study Participants

This study was conducted in Baltimore, MD, USA. Participants in this study were enrolled in the CHAT program, an HIV prevention intervention for women and their social network members. CHAT, the intervention's acronym, represented the first letters of four communication skills: (1) Choose the right time and place; (2) Hear what the person is saying; (3) Ask questions; and (4) Talk with respect. Women (i.e., index participants) were recruited through street outreach and posted advertisements. Inclusion criteria for participants included 1) female; 2) did not inject drugs in the past 6 months, 3) self-reported sex with at least 1 male partner in the past 6 months, and 4) had at least one sexual risk factor including any of the following: a) more than 2 sex partners in the past 6 months; b) STD diagnosis in the past 6 months, and c) having a high risk sex partner in the past 90 days

(i.e., injected heroin or cocaine, smoked crack, HIV seropositive, or man who has sex with men). During the baseline visit, participants completed a social network inventory.

From this inventory, network members who were eligible to be referred to the study by the index participant were identified. Eligibility for social network members included: 1) being an injector of heroin or cocaine, 2) sex partners of the index participant; or 3) people the index participants felt comfortable talking to about HIV or STIs. Index participants were allowed to refer up to 5 network members to the study.

The present study includes 721 African Americans who completed a baseline visit, including both the index (56%) and social network (44%) participants. Data were collected during a baseline visit at a community-based research center. After providing written consent, participants took part in an interview. Part of the interview was administered by a trained interviewer and part was administered through Audio-Computer-Assisted Self-Interview (ACASI). Participants were compensated with \$35 for completion of the interview. Baseline data were collected September 2005 through July 2007. Study protocols were reviewed and approved by the Johns Hopkins Bloomberg School of Public Health Institutional Review Board prior to commencement of the study.

3. MEASURES

3.1 Alcohol dependence symptoms

were assessed through the Alcohol Use Disorders Identification Test (AUDIT; Saunders et al., 1993). The full AUDIT is a widely validated alcohol screening test, which has been used with a variety of populations and has excellent sensitivity and specificity from 95% to 100%. It consists of 10 questions, including three about alcohol consumption and seven about alcohol-related problems. Each AUDIT question is scored from 0 to 4 points and summed for a total possible AUDIT score ranging from 0 to 40 points. Having alcohol dependence symptoms was defined as AUDIT score ≥ 13 for females and AUDIT score ≥ 15 for males (Medical Education and Research Foundation, 2012).

3.2 Social network

Social network data were collected through a personal network inventory (Latkin et al., 1996). Participants were asked to nominate individuals who provided social support. Once the network was elicited, participants were asked about a variety of characteristics, such as their age, ethnicity, gender, and role relationship of the listed network members. Kin relationship was defined as any family member, such as parent, child, or sibling. Non-kin relationships included friends, acquaintances, godparents, and neighbors. Sexual partners included spouse, boy/girl friend/fiancé/partner, child's parent, sex partner and ex-partner. "Drinking buddies" were assessed by the question "Who are the people you drink alcohol with?" The present study examined the relationship between alcohol dependence symptoms and characteristics of social network members listed in the network inventory.

3.3 Participants' background

Participants' age, gender, education, current employment status, monthly income, and depressive symptoms were assessed. Depressive symptoms were assessed by the Centers for Epidemiological Studies Depression (CES-D) Scale, a 20-item, 4-point response scale, using 16 as cut-off point (Radloff L. S., 1977).

3.2 Data analysis

The current analyses were restricted to the participants self-identified as African American (N=721). The outcome of interest was alcohol dependence symptoms. Logistic regression models with generalized estimating equations (GEE) using network member as the unit of analysis were conducted to assess the associations between characteristics of the drinking buddies and the participants' alcohol dependence symptoms (Liang et al., 1992). GEE were used to account for the fact that individuals had multiple network partners that contributed to the analysis. For example, if the participant listed 10 network members, each of these network members was treated as an observation within a cluster of ten. Robust standard errors were used for estimation of the 95% confidence intervals. Variables that were associated with outcomes in the bivariate models ($p < 0.10$) were entered into a multivariate model. Separate analyses for male and female participants were conducted. All analyses were performed using Stata Version 10.0.

4. RESULTS

4.1 Characteristics of the participants and the nominated network member

Table 1 presents the characteristics of the participants and nominated social network members. The mean age of the participants was 42 ($SD=9$) and 76% participants were females. Half had at least high school or GED. The unemployment rate was 81% and 55% had monthly income more than \$500. Almost three-quarters of the participants (74%) reported CES-D score 16 or higher.

The mean of AUDIT score was 7 ($SD=9$), with a range from 0 to 38. Approximately 22% of the participants had alcohol dependence symptoms. Less than one-third (31%) reported never drinking, 19% drank monthly or less, 15% drank 2-4 times a month, 19% drank 2-3 times a week and 15% drank 4 or more times a week. Among those who were alcohol drinkers ($n=498$), 41% had 1 or 2 drinks a day, 26% had 3-4 drinks a day, 10% had 5-6 drinks a day, 7% had 7-9 drinks a day and 15% had 10 or more drinks a day. Among those who were alcohol drinkers, 14% had 6 or more drinks daily or almost daily. The participants reported an average 1.1 ($SD=1.5$) drinking buddies in their social network with a range from 0 to 13. More than half of the participants (53%) had at least one drinking buddy in their social network

A total of 5,837 network members were nominated. The mean age of the networks was 39 years old ($SD=17$), and 97% were African American. Over half of the network members (58%) were female. Almost half of the networks (47%) were kin, 11% were sex partners, and 42% were non-kin; 14% of network members were drinking buddies. Among those drinking buddies ($n=789$), over half (52%) were sex partners, 23% were sex partners, and

25% were kin. Among those drinking buddies (n=789), 53% were males and 47% were females.

Table 2 presents the results of unadjusted and adjusted analyses of alcohol dependence. There were no statistical differences ($p > .05$) between male and female participants with regard to education level, mean AUDIT score, the alcohol dependence prevalence, the composition of networks in terms of ethnicity, relationship, proportion of drinking buddies or the relationship of the drinking buddies. As compared to male participants, female participants were younger, more likely to be unemployed and to have high levels of depressive symptoms. Compared to male participants, female participants had more younger and female social network members and were more likely to have female drinking buddies.

4.2 Bivariate and multivariate analyses of alcohol dependence symptoms

Table 2 presents the results of unadjusted and adjusted GEE logistic regression with the outcome of alcohol dependence. Results from the multivariate logistic regression model indicated that alcohol dependence symptoms were associated with the presence of drinking buddies in the network (AOR: 2.54, 95%CI: 2.02, 3.20). In the whole sample, the association between alcohol dependence symptoms and the presence of drinking buddy did not depend on the relationship or the gender of the drinking buddy.

4.3 Gender difference in the association between alcohol dependence symptoms and the characteristics of drinking buddies

Compared to those who did not have a drinking buddy, male participants were more likely to have alcohol dependence symptoms in the presence of drinking buddies who were sex partners (AOR: 2.41, 95%CI: 1.32, 4.39). Having drinking buddies who were non-kin was marginally associated with male participants' alcohol dependence symptoms (AOR: 2.05, 95%CI: 0.93, 4.49). Having drinking buddies who were kin was not associated with male participants' alcohol dependence symptoms (AOR: 0.79, 95%CI: 0.22, 2.80).

Compared to those who did not have a drinking buddy, male participants were more likely to have alcohol dependence symptoms if they had female drinking buddies (AOR: 2.29, 95%CI: 1.29, 4.05). Having male drink buddies was not associated with male participants' alcohol dependence symptoms (AOR: 1.54, 95%CI: 0.81, 2.93).

Among female participants, association between the presence of drinking buddy and alcohol dependence symptoms did not depend on the types of relationships or the gender of the drinking buddy. Both genders of drinking buddies were associated with alcohol dependence. Sex partner, kin, and non-kin drinking buddies were all associated with alcohol dependence.

5. DISCUSSION

In the current study, we examined gender differences in the relationship between social network characteristics and alcohol dependence. Previous research has found that the influence of social network characteristics varies by gender (Homish and Leonard, 2008; Lewis et al., 2009). However, this study is the first to examine the association between social network characteristics and alcohol dependence symptoms and gender differences

among inner-city African Americans. Findings of the current study support the notion that the association between the presence of drinking buddies in the social network and alcohol dependence symptoms depends on the gender or relationship of drinking buddies. We found that alcohol dependence symptoms were more prevalent among men who drank alcohol with their sex partners or female network members. Much less network differentiation was observed among women. Among women, having any drinking buddy regardless of gender or relationship was associated with alcohol dependence. Potential explanations for this finding could include that men's drinking buddies who were sex partners or female might be more supportive of drinking and drinking-related activities as compared to drinking buddies who were family or non-kin or male drinking buddies. Alternatively, males who are alcohol dependent may be more likely to seek sex partners or female network members who also drink, or to encourage their female partners and network members to drink. These associations may also be a result of homophily (i.e., similar individuals in the same network) and shared environment, rather than social influence from network members (McPherson et al., 2001).

Findings of the current study confirm that drinking alcohol is a social behavior among African Americans, as over half of the participants reported at least one drinking buddy in their social network. In contrast to previous findings of men being more likely to have drinking buddies compared with women (Borsari and Carey, 2001), the proportions of network members in this sample who were drinking buddies were not different between men and women in the current study.

There are several limitations to the current study that should be considered when interpreting the findings. The data are cross-sectional. Alternative explanations for the current findings besides potential causality between alcohol dependence symptoms and characteristics of drinking buddies have been mentioned above. The face-to-face assessment of high risk behaviors may have the potential for heightened social desirability response bias. The sampling strategy may also limit the generalizability to people at higher risk for HIV.

The present study extends previous research on social network literature by demonstrating that presence of drinking buddies in the social network is associated with alcohol dependence symptoms among impoverished African Americans. Moreover, these results suggest the importance of the specificity of the characteristics of referent groups, such as drinking buddies, in examining the association between social networks and alcohol dependence symptoms among men and women. Future interventions and treatment efforts should be gender specific and identify important referent groups in social networks to promote norms that discourage excessive alcohol use. Our findings suggest the potential application of couple-based alcohol treatment, which may provide an opportunity for both man and female alcohol drinkers to recognize their mutual responsibilities and to work together to control their alcohol use (Klostermann et al., 2011).

Acknowledgments

Role of Funding Source

This work was funded by the National Institute on Mental Health (Grant#R01 MH66810); the NIMH had no further role in study design; in the collection, analysis and interpretation of data; in the writing of the report; or in the decision to submit the paper for publication.

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Table 1

Characteristics of the participants and nominated social networks: CHAT study in Baltimore, MD

	Whole sample (n=721)	Male (n=173)	Female (n=548)	<i>p</i>
Participant characteristics				
Age: mean (SD)	42(9)	45(10)	41(8)	<.001
Gender: female	548(76)	--	--	--
Education: at least HS or GED ^a	367(50)	93(54)	268(49)	0.29
Unemployed	583(81)	118(68)	465(85)	<.001
Monthly income more than \$500	392(55)	127(73)	265(49)	<.001
Depressive symptom: C-ESD>16	535(74)	97(56)	438(80)	<.001
AUDIT score: mean (SD)	7(9)	8(9)	7(9)	0.43
Alcohol dependence symptoms	157(22)	37(21)	120(22)	0.89
Number of drinking buddies: mean(SD)	1.1(1.5)	0.9(1.2)	1.2(1.5)	<.05
Nominated network characteristics				
Age ^b mean(SD)	39(17)	41(18)	39(17)	<.001
African American	5662(97)	1169(97)	4493(97)	0.98
Gender: female	3384 (58)	658(55)	2726(59)	0.01
Relationship				
Sex partner	617(11)	143(12)	474(10)	
Kin	2728(47)	573(48)	2155(47)	
Non-kin	2492(42)	489(40)	2003(43)	0.12
Drinking buddy	789(14)	157(13)	632(14)	0.58
<i>Relationship of the drinking buddy</i>				
Sex partner	181(23)	44(28)	127(22)	
Kin	198(25)	33(21)	165(26)	
Non-kin	410(52)	80(51)	330(52)	0.29
<i>Gender of the drinking buddy</i>				
Male	417(53)	96(61)	321(51)	
Female	372(47)	61(39)	33(49)	0.06

^a 3 cases missing in the whole sample^b 8 cases missing in the whole sample

Table 2

Unadjusted and adjusted analyses of alcohol dependence symptoms: CHAT study in Baltimore, MD

	Whole sample				Male		Female	
	OR(95%CI)	AOR(95%CI)	AOR(95%CI)	AOR(95%CI)	AOR(95%CI)	AOR(95%CI)	AOR(95%CI)	
Participant characteristics								
Age: mean (SD)	0.99(0.96,1.01)	--	--	--	--	--	--	
Gender: female	1.00(0.64,1.55)	--	--	--	--	--	--	
Education: at least HS or GED	0.60(0.40,0.90)*	0.60(0.39,0.92)*	0.60(0.39,0.91)*	0.60(0.39,0.92)*	1.54(0.65,3.65)	0.46(0.28,0.74)**	0.46(0.28,0.74)**	
Unemployed	1.22(0.72,2.08)	--	--	--	--	--	--	
Monthly income more than \$500	0.75(0.50,1.10)	--	--	--	--	--	--	
Depressive symptom: C- ESD> 16	4.20(2.41,7.36)***	4.22(2.40,7.44)***	4.20(2.39,7.41)***	3.84(2.20,6.72)***	3.72(1.48,9.34)**	5.11(2.33,11.20)***	5.12(2.33,11.22)***	
Nominated network characteristics								
Age	1.00(0.99,1.01)	--	--	--	--	--	--	
African American	0.95(0.50,1.79)	--	--	--	--	--	--	
Gender: female	0.84(0.74,0.95)*	0.91(0.79,1.02)	0.91(0.79,1.03)	--	1.12(0.79,1.58)	0.83(0.72,0.97)*	--	
Relationship:								
Sex partner	Reference	--	--	--	--	--	--	
Kin	0.85(0.69,1.04)	--	--	--	--	--	--	
Non-kin	0.96(0.76,1.22)	--	--	--	--	--	--	
Drinking buddy	2.35(1.93,2.95)***	2.54(2.02,3.20)***	--	--	--	--	--	
Relationship of the drinking buddy								
Not a drinking buddy	Reference	--	Reference	--	Reference	Reference	--	
Sex partner	2.27(1.67,3.08)***	--	2.54(1.83,3.51)***	2.41(1.32,4.39)**	2.33(1.57,3.46)***	2.07(1.37,3.14)***	--	
Kin	1.60(1.10,2.33)*	--	1.74(1.19,2.54)**	0.79(0.22,2.80)	2.07(1.37,3.14)***	2.07(1.37,3.14)***	--	

	Whole sample				Male		Female	
	OR(95%CI)	AOR(95%CI)	AOR(95%CI)	AOR(95%CI)	AOR(95%CI)	AOR(95%CI)	AOR(95%CI)	AOR(95%CI)
Non-kin	2.83(2.09,3.82)**	3.02(2.22,4.09)***		2.05(0.93,4.49)+		3.46(2.48,4.81)**		
Gender of the drinking buddy								
Not a drinking buddy	Reference		Reference	--	Reference	--	Reference	Reference
Male	2.46(1.89,3.19)***		2.64(2.01,3.48)***		1.54(0.81,2.93)		3.09(2.30,4.17)***	
Female	2.22(1.71,2.88)***		2.51(1.91,3.28)***		2.29(1.29,4.05)**		2.59(1.92,3.50)***	