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The Social Context of Homeless Men's Substance Use

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Abstract

Background—Homeless men may be at particular risk for the negative health effects of substance use. This cross-sectional study investigates the individual and personal network risk factors associated with substance use in this vulnerable population.

Methods—Participants were a representative probability sample of 305 heterosexually active homeless men interviewed from meal programs in the Skid Row region of Los Angeles, California. Interviews assessed individual, personal network, and substance use characteristics. Logistic regression examined individual and personal network predictors of the three most prevalent substances.

Results—In the past six months, the three most prevalent substances were marijuana (56%), crack (40%), and alcohol to intoxication (38%). The mental health status of homeless men was associated with substance use, with PTSD more common among those who used crack. Riskier networks (comprised of a larger proportion of drug users) were associated with marijuana use, and normative social ties (family, employed and school/work contacts) were associated with a decreased likelihood of crack use.

Conclusions—Mental health problems and riskier personal networks are associated with homeless men's substance use. These findings underscore the importance of interventions that focus on improving mental health, mitigating the drug-using norms of personal networks, and helping men to maintain contact with normative, low-risk alters. Mental health care and peer-based, network interventions to reduce substance use should be a priority for heterosexually active homeless men.

Keywords

Homeless Men; Social Networks; Mental Health; Alcohol Use; Drug Use

1. INTRODUCTION

1.1. HOMELESS MEN and SUBSTANCE USE

Homeless populations are at significantly higher risk for substance dependence (Fazel et al., 2008), with rates of drug and alcohol abuse two to eight times higher than in the general population (Robertson et al., 1997). Drug and alcohol use is associated with multiple deleterious health consequences (Mann et al., 2003; National Institute on Drug Abuse, 2005, 2006, 2010a), and vulnerability factors associated with living on the street may create riskier patterns of substance use (Galea and Vlahov, 2002; Williams, 2003) and exacerbate the homeless population's already high rates of health problems (Hwang, 2001) and hospitalization (Salit et al., 1998). Men are more likely than women to be homeless (U.S. Conference of Mayors, 2007), to experience longer episodes of homelessness (Caton et al., 2007) and when homeless, more likely to be drug- and alcohol-dependent (Booth et al., 2002; Robertson et al., 1997). This study investigates key individual characteristics and social network risk and protective factors that may be associated with substance use among a highly vulnerable population of homeless men living in the Skid Row area of Los Angeles, California.

1.2. SOCIAL CONTEXT OF SUBSTANCE USE

Research has identified social network characteristics as important factors in understanding substance use among homeless (Gomez et al., 2010; Tyler, 2008) and other high-risk populations (Valente et al., 2004; Williams and Latkin, 2007). The composition of individual personal networks may have both direct and indirect effects on substance use (Valente et al., 2004). For example, other drug and alcohol users in the network may provide substances or paraphernalia to facilitate use, or may indirectly encourage substance use by displaying social norms supportive of drugs and alcohol (Arbour-Nicitopoulos et al., 2010; Frone and Brown, 2010; Valente et al., 2004; Williams and Latkin, 2007). The association between network composition and substance use has been supported by research among homeless populations. More alcohol and drug users in homeless women's personal networks were associated with binge drinking and drug use (Wenzel et al., 2009), and having used illicit drugs with network members (Tyler, 2008) or having peers who regularly use drugs (Gomez et al., 2010) were associated with increased severity of substance use among homeless young adults.

Quality of relationships with members of the network (also termed 'alters') has been associated with substance use. Increased social support from those in the network has been associated with decreased drug use in high-risk communities (Williams and Latkin, 2007), and the perception of increased social support was associated, via decreased levels of emotional distress, with reduced substance use among sheltered homeless in Skid Row (Stein et al., 2008). Social support from substance users, however, does not confer the psychosocial and health benefits provided by non-substance using networks among homeless women (Nyamathi et al., 2000). Social network density has also been associated with substance use (Latkin et al., 1995; Rice et al., 2011). It is hypothesized that increased network density may result in a 'spiral of silence,' wherein any discussion that runs contrary to network norms may be avoided for fear of disrupting the network (Latkin et al., 2003), resulting in the maintenance of risky behaviors within densely interconnected networks. Sub-groups of alcohol or drug using network members may be especially vulnerable to the maintenance of substance-using norms.

1.3. MENTAL HEALTH AND SUBSTANCE USE

Previous research highlights the association of mental health problems with substance use (Conner et al., 2009) and the high prevalence of mental health problems among homeless

persons (Christensen et al., 2005; Fazel et al., 2008). While there is heterogeneity in specific study rates, a recent review of the literature suggests high rates of depression among homeless populations (Fazel et al., 2008). Because depression has been associated with alcohol and drug abuse (Conner et al., 2009), homeless men may be at increased risk of substance use related to depression.

Posttraumatic stress disorder (PTSD) has also been associated with substance use (Cornelius et al., 2010; Jacobsen et al., 2001), including the self-medication of PTSD symptoms with CNS depressants (such as alcohol, marijuana and opioids) (Jacobsen et al., 2001; Ouimette et al., 2010). Homeless persons are exposed to a variety of stressors that may make homelessness itself a risk factor for PTSD (Goodman et al., 1991; Kim and Ford, 2006). Most research on trauma and homelessness has focused on women and families (Kim and Ford, 2006), despite the fact that nearly 70% of homeless men with co-occurring mental health and substance use disorders report histories of trauma (Christensen et al., 2005). The co-occurrence of mental health problems and substance use suggests that both must be examined to fully understand substance use among homeless men.

1.4. THE PRESENT STUDY

This paper is motivated by social norms theory (Arbour-Nicitopoulos et al., 2010; Berkowitz, 2003, 2005; Frone and Brown, 2010; Perkins, 2002), which posits that individual substance use behavior is associated with the perceived behavior of social ties. Empirical research has confirmed that social networks represent a meaningful and important level of analysis for understanding the relationship between social norms and risk behavior (Latkin et al., 2009). Prior studies of substance use and social networks that have included homeless men in the study population have utilized small-scale, qualitative methods (Hawkins and Abrams, 2007; Singer, 1985) or convenience samples (Gomez et al., 2010; Tyler, 2008). To our knowledge, no previous study has conducted a thorough investigation of personal networks and their association with substance use in a representative probability sample of heterosexually active homeless men (the current sample is selected from those using meal lines). A comprehensive understanding of the social context may help to inform peer-based interventions to reduce the harmful effects of substance use in this highly vulnerable population. Previous research with similar populations directs us to hypothesize that network composition and structure, including greater network density, increased substance use in the network, and decreased social support, as well as key individual predictors (i.e., depression and PTSD), will be associated with increased substance use in this population.

2. METHODS

2.1. Participants

Participants in this study were 305 homeless men randomly sampled and interviewed in 13 meal programs in the Skid Row area of Los Angeles. This area is home to the highest concentration of homeless persons in Los Angeles County. Men were eligible if they were at least age 18, could complete an interview in English, and had experienced homelessness in the past 12 months (i.e., stayed at least one night in a place like a shelter, abandoned building, voucher hotel, vehicle, or outdoors because they didn't have a home to stay in). As this sample was collected as part of a study of heterosexual risk behavior, all participants had had vaginal or anal sex with a female partner in the past 6 months. Of the 338 men who screened eligible for the study, 320 men were interviewed (18 refusals). Of these 320: 4 named fewer than 20 alters, 7 were partial completes/break-offs (when interviews could not be completed because the respondent had to leave suddenly, refused to finish the interview, or otherwise did not fully complete the interview process), and 4 were later found to be repeaters. The final sample size was 305, for a completion rate of 91% (305/334).

Individual, computer-assisted face-to-face structured interviews (Egoweb, 2010) were conducted by trained male interviewers. Men were paid \$30 for participation in the interview, which lasted on average 83 minutes. The research protocol was approved by the institutional review boards of the University of Southern California and the RAND Corporation.

2.2. Sample Design

To obtain a representative sample of heterosexually active homeless men from the Skid Row area of LA, we implemented a probability sample of men recruited from meal lines in the area. The list of operating meal lines in Skid Row was developed using existing directories of services for homeless individuals and performing interviews with services providers. Our final list contained 13 meal lines: 5 breakfasts, 4 lunches and 4 dinners offered by 5 different organizations. Each of the meal lines was extensively investigated to obtain an estimate of the average number of men served daily. This information was used to assign an overall quota of completes to each site, approximately proportional to the size of the meal line. We then drew a probability sample of homeless men from the 13 distinct meal lines. When the assigned quota could not be achieved in a single visit, the quota was divided approximately equally across the number of visits for each meal line. The interview team randomly selected potential recruits for screening by their position in line using statistician-generated random number tables. Tables were generated such that the site-daily quota could be achieved before the meal line was exhausted. Once the field director selected a potential recruit, an interviewer would wait for him to finish his meal before screening him.

The adopted sample design deviates from a proportionate-to-size stratified random sample because of changes in sampling rates during the fielding period, differential response rates of men across meal lines, and variability in how frequently men use meal lines. This last factor means that some men are more likely to be included in the sample. We accounted for the differential frequency of using meal lines by asking respondents how often they had breakfast, lunch and dinner at a meal line in the Skid Row area in the past 30 days, and how much of the past 6 months they had been homeless. This information was used to develop and implement sampling weights to correct for departures from a proportionate-to-size stratified random sample and potential bias due to differential inclusion probabilities (Elliott et al., 2006).

2.3. Measures

2.3.1. Substance use—Binge drinking was assessed through a question asking men how often during the prior six months they had 5 or more drinks containing any kind of alcohol within a 2 hour period (0 = ‘not at all’ to 9 ‘every day’). Use of other substances was assessed using separate questions for marijuana, crack, cocaine, prescription drugs, heroin, methamphetamine and ‘other’ substances. For each substance, the men were asked: “During the past six months, how often did you use <substance> (0 = ‘not at all’ to 9 ‘every day’).” Dichotomous indicators of any binge drinking and substance use were created from these measures. Binge drinking items and response scales were modified from NIAAA Task Force recommendations (National Institute on Alcohol Abuse and Alcoholism, 2003), and all substance use items have been previously vetted with a population of homeless women (Wenzel et al., 2009).

2.3.2. Personal network characteristics—We used established procedures for conducting personal network interviews (McCarty, 2002; McCarty et al., 1997) and our experiences in a prior study of homeless women (Tucker et al., 2009; Wenzel et al., 2009) to develop the instrument. We asked respondents to provide the first names of 20 individuals that they knew, who knew them, and that they had contact with sometime during the past six

months (alters had to be at least 18 years or older). Contact could be face-to-face, by phone, mail or through the Internet. We constrained network size to be the same across respondents to maximize comparability of network structure measures (Mehra et al., 2001). Twenty alters has been shown to capture structural and compositional variability present in personal networks (McCarty and Killworth, 2007); four men who were not able to name 20 alters were excluded from the sample to maintain comparability across cases.

We measure characteristics of networks in terms of alter types and behaviors, how alters were met, and the overall structure of each respondent's personal network. Types of alters that we inquired about form mutually exclusive categories: sex partners, relatives, persons in positions of responsibility, and peers and acquaintances. For all non-relative alters, we asked how the respondent met these individuals (e.g., in shelters, drop-in centers, on the street, places of employment). "Persons in positions of responsibility" refer to service providers (e.g., mental health or substance abuse counselor, doctor, nurse, social worker, case manager), teachers, bosses or supervisors, and probation officers. Other non-family, non-sex partner alters were categorized as "peers and acquaintances." We assessed behaviors of the 20 alters as perceived by the respondents: heavy drinking, drug use, and regular employment.

To measure the frequency contact with alters, respondents were asked how often they contacted each named alter, and an average was calculated across all alters. We calculated proportions of total alters whom respondents reported feeling "emotionally close" to and those from whom the respondent received tangible or advice/informational support in the prior six months. Network structure was operationalized as density: an index varying between 0 and 1 that represents the proportion of ties among a group of alters relative to the total number of possible ties. For the purposes of calculating density, respondents were asked how often each pair of named network alters "had contact with each other sometime during the past year or so – either face-to-face, by phone, mail, or e-mail? Never, rarely, sometimes or often?" Measures of network density were calculated among all network alters and among those alters who were reported by the respondents as being likely to use drugs or alcohol to intoxication.

Most measures of network composition were included as continuous proportions of the total network. However, two specific measures (network alters in positions of responsibility and alters met at a bar/club) were skewed, in that many respondents had no network alters meeting these criteria, and so these measures were included in analyses as binary indicators, rather than total network proportions.

2.3.3. Depression and PTSD—Depression (Y/N) was measured using a 3-item screening instrument (Rost et al., 1993) that has been previously used to assess depression in homeless persons (Tucker et al., 2009). PTSD was measured with the Primary Care PTSD Screen, a 4-item screener used with veterans (Prins et al., 2003). Respondents are defined as experiencing symptoms of PTSD if they answer 'yes' to any three of four items.

2.3.4. Background characteristics—Background characteristics included in all models are age in years, education (having at least a high school education or GED), being employed part- or full-time, being currently married, having been in jail, prison or on parole in the prior 6 months and race/ethnicity.

2.4 Analyses

Overall rates of substance use during the past 6 months were calculated for binge drinking, and use of marijuana, crack, cocaine, heroin, prescription drugs, methamphetamines and 'other' substances. We elected to include the three substances having the highest prevalence

rates among homeless men in this study: binge drinking (38.09%), marijuana (55.52%), and crack (39.56%). Other substances had prevalence rates ranging from 4.77% to 16.79%. We first examined the bivariate association between each individual and personal network characteristic and each of the three measures of substance use. Each candidate predictor variable associated with any substance use measure at $p < .10$ in the bivariate analyses was retained in initial multivariate models for all outcomes. We then trimmed from the multivariate models all variables that were not significant at $p < .10$ for at least one of the three outcomes (Hosmer and Lemeshow, 1989).¹ Individual demographic characteristics (age, race/ethnicity, education, marital status, and incarceration history) were retained in all models as control variables.

3.0. RESULTS

3.1. Sample characteristics

3.1.1. Individual characteristics—As shown in Table 1, African Americans were the largest racial/ethnic group in our sample (71.69%), followed by men self-identified as white (non-Hispanic, 11.52%), Hispanic (10.43%) and other or multiracial (6.35%). Most respondents (73.31%) had a high school diploma/GED, but only 18% were currently employed. Few were currently married (6.08%), 37.31% were incarcerated in the prior six months, and 18.64% had ever been in the military. The average total months of lifetime homelessness was 64.61 ($SD = 72.60$), representing an average of 11.07% ($SD = 11.28$) of men's lifetimes; 94.5% of men had spent at least one night on the street, in a garage, or an abandoned building. Nearly half the sample had experienced symptoms of depression (past year, 46.36%) or PTSD (past month, 42.85%).

3.1.2. Personal network characteristics—The majority of men's networks were comprised of peers; among the 20 named alters, there was an average of 58% peers, 22% relatives, and 15% sex partners. The remaining 5% were "persons in positions of responsibility," though only 33.93% of the total sample reported any of these alters. Most network alters were met on the street (19% of an individual's network, on average), followed by at a shelter (12%), and at employment or school (11%). Less than a quarter of the respondents (22.21%) had met any of their network alters in a bar or club. An average of 48% of an individual's personal network was comprised of alters with regular employment. About one-third of network alters drank alcohol to intoxication (32%) or used drugs (30%) in the past six months, and 20% had engaged in risky sex. On average, respondents felt emotionally close to 32% of their alters, and received support or advice from 36%. The average frequency of contact among network alters was 2.07, representing 1-3 contacts each month. The average density of men's personal networks was 0.13, which can be interpreted as a network in which 13% of all possible ties are present (a network where every person knows one another would have a density of 1.0, or 100% of possible ties). The average percentages of possible ties present in substance-using subgroups were lower, at 11% in alcohol-using subgroups, 9% in drug-using subgroups, and 8% in subgroups who used both alcohol and drugs. Substance-using subgroups appear to have less integration between network members than the overall network; however, these densities were not statistically significantly associated with substance use.

¹The variable measuring any night spent on the street, in a garage, or abandoned building (94.5% of the sample responded 'yes') was not included in multivariate models, despite having bivariate significance with crack use, because there was only one respondent who had used crack in the prior six months and had NOT spent a night on the street.

3.2. Multivariate logistic regression models

Table 2 presents the results of multivariate logistic regression modeling any binge drinking and any use of marijuana or crack in the past 6 months. Each substance is modeled separately, and trimmed models are presented. Odds ratios can be interpreted as the increase in odds of using the particular substance in the past six months attributable to a unit increase in the associated predictor.

Men's personal network characteristics were associated with binge drinking, marijuana and crack use. Homeless men's odds of binge drinking were increased when their networks included alters whom they met at a bar or club (OR=2.23; 95% CI=1.07, 4.63). Men with more drug users in their networks had increased odds of marijuana use (OR=7.53; 95% CI=2.30, 24.66). Men had decreased odds of using crack if they had more family members in their social network (OR=0.04; 95% CI=0.00, 0.48), met more network alters at a job or school (OR=0.03; 95% CI=0.00, 0.44), met alters at a bar or club (OR=0.33; 95% CI=0.15, 0.72), or had more employed alters (OR=0.30; 95% CI=0.09, 0.96).

Several individual characteristics were also associated with binge drinking and drug use. Younger men were more likely to binge drink (OR=0.96; 95% CI=0.94, 0.99) and use marijuana (OR=0.95; 95% CI=0.92, 0.98). White men were significantly more likely than African American (OR=0.31; 95% CI=0.10, 0.97), Hispanic (OR=0.19; 95% CI=0.05, 0.72) or other and multiracial men (OR=0.20; 95% CI=0.05, 0.86) to use marijuana, whereas Hispanic men had nearly 8 times greater odds of using crack than white men (OR=7.76; 95% CI=1.16, 52.11). Prior 6 months incarceration was associated with increased crack use (OR=4.94; 95% CI=2.43, 10.02). Mental health status was also associated with substance use, as homeless men with symptoms of PTSD had significantly increased odds of using crack (OR=3.27; 95% CI=1.55, 6.89).

4.0. DISCUSSION

Binge drinking, marijuana and crack use were each associated with different aspects of individual social networks. Consistent with findings from prior studies of homeless women (Wenzel et al., 2009), social network features appear to confer both protective benefits and risks for substance use among heterosexually active homeless men living in the Skid Row area.

A higher proportion of drug users in one's network was significantly associated with marijuana use, confirming prior research that drug using ties are associated with individual drug use (Wenzel et al., 2009; Williams and Latkin, 2007). Having drug-using members in the social network may provide direct support for marijuana use, perhaps by providing drugs or paraphernalia, or may indirectly support use through social norms accepting of marijuana (Valente et al., 2004). This relationship may also be the product of homophilous network selection, wherein substance users associate with other substance users because they frequent the same locations or use the same substances. Social selection may work in concert with attitudinal influences (Go et al., 2010; Wenzel et al., 2010), such that selection of similar alters reinforces network norms and vice versa. The limitations of cross-sectional data make it difficult to parse out the causal direction between norms and network selection in this study.

The context of relationship formation may also influence homeless men's substance use via pathways dependent upon the substance in question. Having met network alters at a bar or club was associated with increased binge drinking, but this measure was also associated with decreased crack use. The normative behavior of alters whom homeless men met at a bar or club may encourage alcohol use, which is readily available and legal in these settings, but

may discourage the use of illegal or stigmatized substances like crack. A similar pattern was seen in prior research among homeless women, where heavy drinking networks were less likely to use crack, suggesting that social normative influences differ between drug and alcohol using networks (Wenzel et al., 2009). Crack use was also more likely among men with fewer family, employed, and school/work network ties. These patterns support prior research findings that normative social ties, such as family members and employment or educational contacts, may have social norms protective against the use of stigmatized drugs (Wenzel et al., 2009).

Increased social support has been shown to affect substance use in other communities (Stein et al., 2008; Williams and Latkin, 2007), but was not significantly associated with substance use among homeless men in this study. Prior studies of homeless women have suggested that social support alone may not be sufficient for recovery in the face of addictive substances such as crack (Wenzel et al., 2009). Additionally, social support measures in this study did not specifically pertain to drug use; other forms of social support, such as assistance navigating barriers to substance abuse treatment, may be of specific importance for homeless men.

Individual characteristics are also important factors in the substance use of homeless men, including symptoms of psychological distress associated with PTSD. Prior research has linked symptoms of PTSD to substance abuse among homeless and other populations (Jacobsen et al., 2001; Leeies et al., 2010; Ouimette et al., 2010). While this study does not differentiate between casual use and abuse of drugs, PTSD was associated only with crack, the most stigmatized of the substances we examined and one that carries high potential for abuse due to its psychopharmacological properties (National Institute on Drug Abuse, 2010b).

In addition to the causality limitations inherent in a cross-sectional design, other limitations exist in this study. Men who are currently residing in shelters or treatment facilities may be subject to policies of substance abstinence, which could have impacted the level of substance use reported. Self-reported substance use may raise concerns about bias; however, self-reported measures have been found to be highly correlated with objective measures of substance use among homeless women (Nyamathi et al., 2001), and have been successfully used in other studies investigating substance use among homeless persons (Tucker et al., 2009; Wenzel et al., 2009; Wenzel et al., 2004). This population was part of a study of heterosexually active homeless men, and while there was representation of men who have sex with men and women (7.26% of the sample), these results may not be generalizable to populations comprised exclusively of men who have sex with men. Sampling from meal lines may further limit the generalizability of the findings, as all men in this study were accessing services, at least to receive meals. However, we believe that probability sampling from meal lines, which serve a wide population, is an innovative approach for generating a more representative sample when compared to other methods, such as convenience sampling, which are traditionally utilized in this population.

Despite these limitations, this study has successfully identified important aspects of homeless men's social networks and mental health status that are associated with binge drinking and drug use. Social network interventions, particularly peer-based educational models, have been successful in reducing the risk behavior of intravenous drug users (Latkin et al., 2009; Tobin et al., 2010); while this study did not examine intravenous drug use, the findings that social network peers may be important determinants of other substance use suggests that similar interventions could reduce substance use among homeless men. Findings that environmental factors, such as where alters were met, were associated with substance use also speaks to the potential efficacy of venue-based interventions to encourage

risk reduction. Family, employment and school-based alters were also associated with decreased substance use, so other interventions might facilitate the maintenance of such contacts; increased availability of Internet and phone access might be one way to encourage contact with these pro-social alters, who are less likely to be street-based. Further, the co-occurrence of PTSD and substance use in this study suggests that mental health needs should be addressed concurrently with substance abuse, and that network interventions to reduce substance use might also encourage help-seeking for mental health problems. These findings underscore the importance of substance abuse interventions that take into account both mental health and the context of the social network.

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Table 1

Descriptive statistics (weighted): Respondent background characteristics, social network characteristics, and substance use, N= 305.

Variables	%	Mean	S.D.
Individual characteristics			
Age	~~~	45.56	10.33
Race/ethnicity			
African American	71.69	~~~	~~~
White	11.52	~~~	~~~
Hispanic	10.43	~~~	~~~
Other or multiracial	6.35	~~~	~~~
Education			
Less than high school	26.69	~~~	~~~
High school or equivalent	73.31	~~~	~~~
Married	6.08	~~~	~~~
Incarceration in past 6 mos	37.31	~~~	~~~
Currently employed	18.01	~~~	~~~
Homelessness severity			
Homeless months in lifetime	~~~	64.61	72.60
Percent of lifetime homeless	~~~	11.07	11.28
Any night on street, in garage or abandoned bldg	94.50	~~~	~~~
Depression	46.36	~~~	~~~
PTSD	42.85	~~~	~~~
Military service	18.64	~~~	~~~
Personal network characteristics			
Network composition			
<i>Type of alter</i>			
Relative (non-partner)	~~~	0.22	0.23
Sex partner	~~~	0.15	0.17
Peer	~~~	0.58	0.25
Person in position of responsibility (binary)	33.93	~~~	~~~
<i>How (non-relative alter was met):</i>			
At a shelter	~~~	0.12	0.17
At employment or school	~~~	0.11	0.17
On the street	~~~	0.19	0.23
At bar or club (binary)	22.21	~~~	~~~
Alter has regular employment	~~~	0.48	0.29
Alter is in a position of responsibility (binary)	33.93	~~~	~~~
<i>Perceived behavior of alters in past 6 mos</i>			
Drank alcohol to intoxication	~~~	0.32	0.29
Used drugs	~~~	0.30	0.29
Engaged in risky sex	~~~	0.20	0.27

Variables	%	Mean	S.D.
<i>Quality of relationship with alters past 6 mos</i>			
Emotional closeness to alter	~~~	0.32	0.28
Received tangible support or advice	~~~	0.36	0.32
Frequency of contact with alters	~~~	2.07	0.81
Network structure			
Density	~~~	0.13	0.01
Alcohol sub-group density	~~~	0.11	0.01
Drug sub-group density	~~~	0.09	0.01
Drug and alcohol sub-group density	~~~	0.08	0.01
Substance use outcomes (any use in past 6 months)			
Alcohol to intoxication	38.09	~~~	~~~
Marijuana	55.52	~~~	~~~
Crack	39.56	~~~	~~~
Cocaine	11.89	~~~	~~~
Prescription drugs	16.79	~~~	~~~
Heroin	7.48	~~~	~~~
Methamphetamine	10.74	~~~	~~~
Other	4.77	~~~	~~~

Table 2

Multivariate binary logistic regression models predicting binge drinking, marijuana, and crack use (weighted)
⁺, N=305.

	Substance use past 6 months [#]		
	Binge drinking	Marijuana	Crack
Predictor Variables			
Individual characteristics			
Age	0.96 (0.94 – 0.99) *	0.95 (0.92 – 0.98) **	1.02 (0.98 – 1.06)
Race/ethnicity (white is omitted category)			
African American	0.81 (0.32 – 2.05)	0.31 (0.10 – 0.97) *	3.14 (0.65 – 15.13)
Hispanic	0.84 (0.24 – 2.91)	0.20 (0.05 – 0.91) *	7.76 (1.16 – 52.11) *
Other or multiracial	0.65 (0.15 – 2.91)	0.21 (0.05 – 0.91) *	0.49 (0.07 – 3.70)
High school or more (vs. <HS)	1.40 (0.71 – 2.75)	1.40 (0.72 – 2.74)	2.21 (1.12 – 4.37) *
Married	0.65 (0.16 – 2.71)	0.73 (0.15 – 3.65)	0.29 (0.08 – 1.13)
Incarceration in past 6 mos	1.64 (0.92 – 2.92)	1.67 (0.91 – 3.05)	4.94 (2.43 – 10.02) **
Depression past 12 mos	1.87 (0.98 – 3.57)	1.13 (0.58 – 2.20)	0.63 (0.31 – 1.32)
PTSD	0.88 (0.46 – 1.70)	1.31 (0.66 – 2.60)	3.27 (1.55 – 6.89) **
Personal network characteristics			
Network composition			
<i>Type of alter</i>			
Relative (non-partner)	0.38 (0.05 – 3.10)	1.02 (0.10 – 10.64)	0.04 (0.00 – 0.48) *
Peer	0.22 (0.04 – 1.12)	3.47 (0.59 – 24.66)	0.17 (0.02 – 1.65)
<i>How (non-relative alter was met):</i>			
At a shelter	0.16 (0.02 – 1.21)	0.52 (0.08 – 3.47)	0.22 (0.04 – 1.41)
At employment or school	0.20 (0.03 – 1.56)	0.36 (0.05 – 2.39)	0.03 (0.00 – 0.44) *
On the street	0.85 (0.19 – 3.81)	0.77 (0.14 – 4.16)	0.18 (0.03 – 1.06)
At bar or club (binary)	2.23 (1.07 – 4.63) *	0.76 (0.35 – 1.64)	0.33 (0.15 – 0.72) **
Alter has regular employment	0.67 (0.23 – 1.95)	0.41 (0.14 – 1.20)	0.30 (0.09 – 0.96) *
<i>Perceived behavior of alters in past 6 mos</i>			
Used drugs	1.62 (0.57 – 4.61)	7.53 (2.30 – 24.66) **	1.21 (0.29 – 5.04)
Network structure			
Density	0.26 (0.04 – 1.87)	1.60 (0.31 – 8.19)	0.61 (0.11 – 3.33)

[#] Models predicting the odds of any substance use in the past 6 months; odds ratios and 95% confidence intervals depicted.

⁺ Table depicts results from final, trimmed models. Characteristics not associated with any outcome at $p < .10$ in bivariate or initial multivariate models are excluded from final, trimmed models.

* $p < .05$,

** $p < .01$