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Shared Risk: Who Engages in Substance Use with American Homeless Youth?

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Abstract

Aims—To identify characteristics of social network members with whom homeless youth engage in drinking and drug use.

Design—A multi-stage probability sample of homeless youth completed a social network survey.

Setting—41 shelters, drop-in centers, and known street hangouts in Los Angeles County.

Participants—419 homeless youth, 13 to 24 years old ($M_{age} = 20.09$, $S.D. = 2.80$).

Measurements—Respondents described 20 individuals in their networks, including their substance use and demographics, and the characteristics of the relationships they shared, including with whom they drank and used drugs. Dyadic, multilevel regressions identified predictors of shared substance use.

Findings—Shared drinking was more likely to occur with recent sex partners ($OR = 2.64$, $CI = [1.67, 4.18]$), drug users ($OR = 4.57$, $CI = [3.21, 6.49]$), sexual risk takers ($OR = 1.71$, $CI = [1.25, 2.33]$), opinion leaders ($OR = 1.69$, $CI = [1.42, 2.00]$), support providers ($OR = 1.41$, $CI = [1.03, 1.93]$), and popular people ($OR = 1.07$, $CI = [1.01, 1.14]$). Shared drug use was more likely to occur with recent sex partners ($OR = 2.44$, $CI = [1.57, 3.80]$), drinkers ($OR = 4.53$, $CI = [3.05, 6.74]$), sexual risk takers ($OR = 1.51$, $CI = [1.06, 2.17]$), opinion leaders ($OR = 1.24$, $CI = [1.03, 1.50]$), support providers ($OR = 1.83$, $CI = [1.29, 2.60]$), and popular people ($OR = 1.16$, $CI = [1.08, 1.24]$).

Conclusions—Homeless youth in the United States were more likely to drink or use drugs with those who engaged in multiple risk behaviors and who occupied influential social roles (popular, opinion leaders, support providers, sex partners). Understanding these social networks may be helpful in designing interventions to combat substance misuse.

Keywords

homeless youth; social networks; substance use; peers; dyadic analysis

Introduction

Homeless youth are more likely than their housed peers to use alcohol and other drugs [1,2], and disproportionately experience the negative health and social consequences of these risky behaviors [2]. Increasing effectiveness of substance use prevention programs for this population is important to health workers, researchers, and policy makers. However, homeless youth are often disconnected from typical locations of substance use prevention programs: school and family. The use of peer-led interventions is an appealing, yet underutilized option.

Peer-led interventions harness social influence processes within established social networks to disseminate health information and promote behavior change, and have been applied in a range of behavior change initiatives [3] including substance use prevention among general

populations of youth [e.g., 4]. However, the potential for members of homeless youths' social networks to facilitate reduction of substance use is likely to be complex. Network members can be sources of social support [5], which may bolster peer-led efforts, yet homeless youth also engage in substance use with many of these peers [6], in particular with support providers and other close social ties [7]. Co-engagement in substance use with network members and the overall presence of substance users in their social networks, is associated with greater substance use among homeless youth [1,8–12]. Further, homeless youth are more likely to use substances if their networks include sex partners [11], older peers [9], and a greater proportion of homeless peers [12], but less likely if their networks include a greater proportion of adults in positions of responsibility and peers who attend school [1].

Although these studies provide insights into the identity of risky network members, associations between homeless youths' substance use and characteristics that *summarize* the composition of their social networks provide little evidence from which to base peer-led interventions, as they do not explicitly identify network members who engage in (or abstain from) substance use. Identifying the types of individuals with whom homeless youth use substances, and the nature of the relationship they share, would provide valuable insights into who among homeless youths' network members would be effective (or ineffective) behavior change agents. It is also important to contextualize these risky relationships in homeless youths' wider social networks. Recognizing that social roles and social status afford greater influence to some individuals, peer-led interventions often identify opinion leaders to act as behavior change agents [13]. Whether or not opinion leaders in the social networks of homeless youth are ideal targets for interventions depends on their level of risk, and the extent to which they engage in alcohol and drug use with these youth.

To identify the peers with whom homeless youths drink and use drugs, we advocate for an *egocentric, or personal* social networks approach. This method involves sampling individuals from a population and capturing information on the social actors and relationships that surround them (or *ego*), as reported by the focal individual [14,15]. This information allows us to differentiate between members of youths' social networks based on their characteristics, such as behaviors or social role. Taking a dyadic perspective [16], the aim of this study is to characterize social network members who engage in *shared substance use* with the youth: an inherently relational behavior that provides opportunities for social influence and behavior modeling. Guided by the existing literature, we examine characteristics of the network members (e.g., gender, employment, school attendance, homelessness, risk behaviors) and characteristics of their relationship (e.g., how they met, frequency of contact, whether it is a sexual partnership). We also examine the extent to which homeless youth engage in substance use with influential members of their social network, such as those who are popular, provide social support, or occupy opinion leader roles that we believe may be associated with social status and influence in local networks. Identifying the types of individuals with whom homeless youth share risk behaviors can help inform peer-led substance use interventions for this population, identifying social network members that might be effective or ineffective change agents.

Method

Study participants and design

Data come from a larger study of homeless youth and were collected between October 2008 and August 2009. Potential participants were randomly sampled from 41 shelters, drop-in centers, and known street sites frequented by homeless youth in Los Angeles County (the multi-stage sampling design that yielded a probability sample is described elsewhere [1,7]). Trained research staff approached youth and invited them to participate if they met the

following criteria: a) between ages 13 and 24; b) not living with a parent or guardian; c) not getting most of their food and housing support from family or a guardian; d) spent the previous night in a shelter, outdoor or public place, hotel or motel room rented with friends (because they had no other alternative), or other place not intended as a domicile; and e) English speaking. Five hundred and eighty two youth were approached, 446 screened eligible, and 419 completed the interview and were included in the final sample (see Table 1). After providing informed consent, participants took part in a 60 minute, computer-assisted face-to-face interview, and were paid \$25 for their time. The research protocol was approved by the institutional review board of RAND and a certificate of confidentiality was also obtained from the National Institutes of Health.

Measures

Respondents completed a series of validated items assessing their own attributes and behaviors, and the characteristics of their personal social network. The personal network measures were based on well-established methods [14,17] and investigators' past experience with homeless populations [18–20]. Respondents enumerated the first names of 20 individuals aged 13 years and over who they knew, who knew them, *and* with whom they had contact (face-to-face, phone, mail, or online) in the previous 3 months. Eliciting 20 individuals (referred to hereafter as 'alters') allowed us to capture a broad range of social contacts and variability in the networks [15,18]. Respondents answered a series of questions about each of the 20 alters, including frequency of contact (in the previous three months) between each pair of alters (0 = no contact, 4 = often). Alters who interacted "often" were coded as having a relationship.

Dependent dyadic variables

Shared drinking and shared drug use—Respondents identified which of their 20 alters they drank alcohol with and used drugs with in the previous three months. Two dichotomous variables were created indicating "shared drinking" and "shared drug use" between respondents and each of their alters (i.e., for each ego-alter dyad).

Predictor variables

Alter characteristics—Respondents reported each alter's gender, and whether the alter attended school regularly, held a regular or steady job, or had been homeless in the previous three months. Respondents also identified which alters they believe engaged in the following behaviors during the past three months: a) consumed alcohol to the point of being drunk; b) used illegal drugs or over the counter drugs to get high; and c) engaged in risky sex, including having multiple sex partners, having sex with someone they didn't know, or not using a condom with a new partner.

Alters were labeled as "providing social support" if respondents identified them as someone who really cared about them no matter what and/or someone they could count on to provide them with money, food, or shelter without asking for something in return. Respondents also indicated which alters occupied the following opinion leader roles: a) who were among the core group of people they hang out with (core group members); b) whose opinions mattered a lot to them (personal opinion leader); and c) who were looked up to as a leader or role model by themselves or others (community role model). A composite measure was calculated by summing the number of roles (out of three) that each alter fulfilled in the network, as individuals with multiple roles were expected to be particularly influential.

Based on respondents' reports of relationships between members of their network, alters' structural position in the network was characterized by their degree (i.e., the number of

relationships they shared with other alters) and if they were a network isolate (i.e., if they shared no relationships with other alters).

Dyadic characteristics—The origin of the relationship was assessed by two mutually exclusive dichotomous items: dyads were coded as being family members if the alter was identified as a relative or guardian; and among non-kin alters, relationships that originated from “meeting on the street” were also identified. Frequency of contact was captured on a 5-point scale (0 = almost never, 4 = daily or almost daily). Non-kin sex partners in the previous three months were also identified.

Control variables

Respondent characteristics—Analyses controlled for a range of respondent characteristics associated with substance use, risk behaviors, and social network structure among homeless youth. These included age (in years), gender, race/ethnicity, sexual orientation, education level (1 = high school education or higher), employment status (1 = employed part time or full time), and length of homelessness (in years). We also controlled for depression based on a 4-item version of the CES-D ($\alpha = 0.80$) [21], and experience of verbal, physical or sexual abuse from a family member or caregiver. Lifetime use of alcohol and drugs was based on respondent reports of having ever consumed a full drink of alcohol (can of beer, glass of wine, shot of hard liquor), and whether or not they had ever used illegal or legal drugs to get high.

Personal network characteristics—Analyses controlled for differences in personal network structure and composition, because these network features have been associated with individual risk behaviors [12,22]. Network structure was defined by two measures: density, an index between 0 and 1 that represents the number of connections among alters relative to the total number of possible connections among alters; and the number of isolates (i.e., the number of alters with no ties to other alters). The composition of respondents' personal networks was characterized using summary measures based on alters' attributes. Network composition variables were calculated for the total number of alters (out of 20) in the respondent's network who a) drank to intoxication, b) used drugs, c) engaged in risky sex, d) were core group members, e) were personal opinion leaders, f) were community role models, g) provided social support, h) were family members, and i) were met on the street. To capture interconnectivity among “risky” network members, density among alters who drank alcohol to the point of intoxication was computed (alcohol in-group density).

Analytic approach

The aims of the current study were to identify alter and relational attributes that predicted shared drinking and shared drug use between respondents and their network members, controlling for respondent demographics and differences in the structure and composition of their networks. The personal networks approach to data collection applied here allows us to differentiate between these various levels of data (respondent, alter, dyad, network).

Because of the one-to-many design, where each ego appears in 20 dyads, the dependent dyadic variables (shared drinking, shared drug use) are clearly not independent and a multilevel analytic approach that nests dyads in individuals was required [16,23]. Personal network data is grouped into two levels for these multilevel models [23]: Level I, the level of the relationship, includes attributes of dyads and attributes of alters in these dyads. Level II, the level of the individual (ego), includes personal attributes and summary characteristics of personal networks. Hierarchical linear models for multilevel analysis, implemented in the `gllamm` component of Stata 11 [24] can accommodate both individual (level II) and dyadic/alter (level I) explanatory variables in predicting dyadic (level I) outcomes, and offer

the best estimation procedure when sampling weights are required. Assumptions are that egos are randomly sampled from a population, and that there is minimal overlap between ego's personal networks [23].

Models were specified using a forward selection approach outlined in Hosmer and Lemeshow [25] and employed in other published studies [e.g., 1,20]. In the first step, to limit collinearity, predictor variables were removed if they displayed moderate to strong correlations with other predictor variables (where $r > 0.4$), retaining alter- and dyad-level variables over corresponding network-level variables when necessary. Preliminary bivariate models were then fit within blocks of similar independent variables: alter demographics, alter risk behavior, dyadic attributes, network structure, and network composition. Variables associated with dependent outcomes at $p < .20$ in these models were retained and estimated in a final model. All level II ego attributes (demographics) were included as controls in final models.

Final multivariate models tested for significant alter and dyad-level predictors of shared drinking and shared drug use, controlling for level I individual and personal network attributes. For models predicting shared drinking, we limited our analyses to respondents with any lifetime alcohol use (92.4% of sample); and for the analyses of shared drug use we restricted our analyses to respondents with any lifetime drug use (92.8% of sample). To evaluate possible interactions and confounding relationships, final models were compared to models that retained all predictor variables. As there were negligible differences, we present the more parsimonious models.

Results

Descriptive characteristics of alters and relationships

Table 2 shows that co-engagement in substance use occurred with a substantial proportion of network alters. Perceived risk behaviors among alters were also prevalent. Nearly half of alters provided the respondent with social support and many occupied opinion leader roles. On average, alters held approximately one of these roles. The average number of relationships alters shared with other alters (i.e., their *degree*) was about 3. Many network alters were family members or contacts who respondents had met on the street. Contact with these alters averaged between once a month and a few times a week. One in 20 of these alters had been a sex partner in the 3 months prior to the survey. Table 2 also summarizes the characteristics of respondents' personal networks, highlighting the diversity in their structural features (density, number of isolates) and network composition.

Multilevel models predicting co-engagement in substance use

Predictors of shared drinking—Table 3 shows that respondents were more likely to drink with alters who were male (vs. female) ($OR = 1.40$), homeless (vs. housed) ($OR = 2.93$), and perceived by the respondent to use drugs or engage in risky sex (vs. abstaining from these risk behaviors) ($OR = 4.57$ and $OR = 1.71$, respectively). Shared drinking was also more likely with alters who were support providers (vs. did not provide support) ($OR = 1.41$), who occupied more of the three opinion leader roles ($OR = 1.69$), and who had higher network degrees ($OR = 1.07$). At the level of the dyad, relationships were more likely to entail shared drinking if they originated from meeting on the street (vs. non-kin dyads that met elsewhere) ($OR = 1.54$), had a history of sex partnership (vs. non-kin dyads that did not entail a sexual partnership) ($OR = 2.64$), and entailed more frequent contact ($OR = 1.43$). Respondents were less likely to drink with family members compared to other network members ($OR = 0.40$).

Predictors of shared drug use—Table 3 also shows that shared drug use among respondents and network members was predicted by similar factors as shared drinking. Homeless youth were more likely to engage in drug use with alters who were male (vs. female) ($OR = 1.75$), homeless (vs. housed) ($OR = 3.35$), and who were perceived to drink to intoxication ($OR = 4.53$) and engage in risky sex ($OR = 1.51$). They were less likely to engage in drug use with alters who were employed (vs. unemployed) ($OR = 0.49$), or with family members (vs. non-kin) ($OR = 0.32$). Respondents were likely to use drugs with alters who occupied particular social roles, including support providers (vs. those who provided no support) ($OR = 1.83$), alters who occupied multiple opinion leader roles ($OR = 1.24$), and alters who were structurally popular (i.e., higher degree) ($OR = 1.16$). At the level of the dyad, relationships were more likely to involve shared drug use if they had a history of sexual partnership ($OR = 2.44$), and if there was more frequent contact ($OR = 1.56$).

Discussion

Results from this study emphasize the importance of accounting for social networks in efforts to reduce homeless youths' substance use. Homeless youth reported recent shared alcohol or drug use with approximately 25% of the members of their social networks. Although research has associated certain characteristics of social networks with increased substance use in homeless young people [9,11,12], the identity of network members that engage in or abstain from substance use remained unclear. This is the first study to identify attributes of social network members and characteristics of relationships that youth have with these network members associated with shared substance use.

Homeless youth were found to use alcohol and drugs with members of their network who engaged in a range of risky behaviors: they were likely to drink with network members who engaged in drug use and risky sex, and they were likely to use drugs with network members who drank to intoxication and engaged in risky sex. Thus, they used alcohol and drugs with network partners who were likely to promote *numerous* risky behaviors. Alcohol and drug use was also likely to occur with social network members who were also homeless, whom they had met on the street, and who were male, whereas they were unlikely to engage in these behaviors with family members and individuals who were employed. While these findings identify the most “risky” members of these youths' social networks, they also highlight the potentially protective influences of family members and employed individuals. This lends support to microenterprise interventions [19], that assist homeless youth in building relationships with positive role models who do not endorse risk behaviors.

Additionally, homeless youth were likely to use substances with peers who occupied influential roles within their social networks. Shared drinking or drug use was more prevalent in relationships that entailed frequent contact, a sexual partnership, or that provided social support, emphasizing multifaceted relationship dynamics that may be both protective and risky. Respondents were also more likely to use substances with alters who occupied multiple opinion leader roles (as core group members, personal opinion leaders, and community role models), and were popular within their network. Overall, the likelihood of shared substance with a particular network partner increased incrementally for each of these support, opinion leader, and structurally popular roles. Recruiting peer leaders for interventions based on these potentially “influential” social roles may not be as clear-cut in homeless populations, given the tendency for these individuals to endorse the behaviors we hope they will prevent.

Study limitations include the reliance on respondents' reports of the attributes and behaviors of their network members that may introduce bias, and that the findings may not generalize to population of homeless youth outside of Los Angeles County. A description of additional

analytical limitations can be found in de la Haye et al. [7]. Chief among them is that forward model selection may limit the ability to detect confounding effects or interactions that a different modeling approach may have revealed.

These findings identify the types of network members that share risky relationships with homeless youth and highlight complexities in identifying potential peer leaders for substance use interventions. Although “influential” peers may promote substance use by modeling multiple risky behaviors, their participation in these behaviors *with* homeless youth combined with their social status is likely to put them in a unique position to promote more responsible substance use. How this might be achieved should be explored in future research. Targeting these risky dyads (i.e., both homeless youth and their risky network members) may also be important so that successful behavior change in homeless youth is not compromised by opportunities for substance use and influence to use substances within these relationships. Given the appeal of peer-led interventions for reducing substance use among homeless youth, these findings provide useful insights into the identity of network members that might be risky vs. effective behavior change agents, and suggest avenues for future intervention work.

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Declaration of Interest

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References

1. Wenzel SL, Tucker JS, Golinelli D, Green HD, Zhou A. Personal network correlates of alcohol, cigarette, and marijuana use among homeless youth. *Drug Alcohol Depend.* 2010; 112:140–9. [PubMed: 20656423]
2. Baer JS, Peterson PL, Wells EA. Rationale and design of a brief substance use intervention for homeless adolescents. *Addict Res Theory.* 2004; 12:317–34.
3. Mellanby AR, Rees JB, Tripp JH. Peer-led and adult-led school health education: A critical review of available comparative research. *Health Educ Res.* 2000; 15:533–45. [PubMed: 11184213]
4. Campbell R, Starkey F, Holliday J, Audrey S, Bloor M, Parry-Langdon N, et al. An informal school-based peer-led intervention for smoking prevention in adolescence (ASSIST): A cluster randomised trial. *Lancet.* 2008; 371:1595–602. [PubMed: 18468543]
5. Unger JB, Kipke MD, Simon TR, Johnson CJ, Montgomery SB, Iverson E. Stress, coping, and social support among homeless youth. *J Adolesc Res.* 1998; 13:134–57.
6. Roy E, Haley N, Leclerc P, Cédras L, Boivin JF. Drug injection among street youth: The first time. *Addiction.* 2002; 97:1003–9. [PubMed: 12144603]
7. de la Haye K, Green HD, Kennedy D, Zhou A, Golinelli D, Wenzel S, et al. Who is supporting homeless youth? Predictors of support in personal networks. *J Adolesc Res.* 2012; 22:604–16.
8. Baron SW. Street youths and substance use. *Youth Soc.* 1999; 31:3–26.
9. Tyler KA. Social network characteristics and risky sexual and drug related behaviors among homeless young adults. *Soc Sci Res.* 2008; 37:673–85. [PubMed: 19069065]
10. Gomez R, Thompson SJ, Barczyk AN. Factors associated with substance use among homeless young adults. *Subst Abuse.* 2010; 31:24–34.

11. Ennett ST, Bailey SL, Federman EB. Social network characteristics associated with risky behaviors among runaway and homeless youth. *J Health Soc Behav.* 1999; 40:63–78. [PubMed: 10331322]
12. Rice E, Milburn NG, Rotheram-Borus MJ. Pro-social and problematic social network influences on HIV/AIDS risk behaviours among newly homeless youth in Los Angeles. *AIDS Care.* 2007; 19:697–704. [PubMed: 17505933]
13. Valente TW, Pumpuang P. Identifying opinion leaders to promote behavior change. *Health Educ Behav.* 2007; 34:881–96. [PubMed: 17602096]
14. McCarty C. Structure in personal networks. *Journal of Social Structure.* 2002; 3(1)
15. McCarty C, Killworth PD, Rennell J. Impact of methods for reducing respondent burden on personal network structural measures. *Soc Networks.* 2007; 29:300–15.
16. Kenny, DA.; Kashy, DA.; Cook, WL. *Dyadic Data Analysis.* Guilford Press; New York: 2006.
17. McCarty C, Bernard H, Killworth P, Shelley GA, Johnsen EC. Eliciting representative samples of personal networks. *Soc Networks.* 1997; 19:303–23.
18. Tucker JS, Kennedy D, Ryan G, Wenzel SL, Golinelli D, Zazzali J. Homeless women's personal networks: Implications for understanding risk behavior. *Hum Organ.* 2009; 68:129–40. [PubMed: 20351796]
19. Green HD, Tucker JS, Wenzel SL, Golinelli D, Kennedy DP, Zhou A. Association of childhood abuse with sheltered homeless women's social networks. *Child Abuse Negl.* 2012; 36:21–31. [PubMed: 22265902]
20. Kennedy D, Wenzel S, Tucker J, Green H, Golinelli D, Ryan G, et al. Unprotected sex of homeless women living in Los Angeles county: An investigation of the multiple levels of risk. *AIDS Behav.* 2010; 14:960–73. [PubMed: 19876728]
21. Perreira KM, Deeb-Sossa N, Harris KM, Bollen K. What are we measuring? An evaluation of the CES-D across race/ethnicity and immigrant generation. *Soc Forces.* 2005; 83:1567–601.
22. Latkin CA, Mandell W, Oziemkowska M, Celentano D, Vlahov D, Ensminger M, et al. Using social network analysis to study patterns of drug use among urban drug users at high risk for HIV/AIDS. *Drug Alcohol Depend.* 1995; 38:1–9. [PubMed: 7648991]
23. Snijders TAB, Spreen M, Zwaagstra R. The use of multilevel modeling for analysing personal networks: Networks of cocaine users in an urban area. *J Quant Anthropol.* 1995; 5:85–105.
24. StataCorp. *Stata Statistical Software: Release 11.* StataCorp LP; College Station, TX: 2009.
25. Hosmer, DW.; Lemeshow, S. *Applied Logistic Regression.* Wiley; New York: 1989.

Table 1Characteristics of Participating Homeless Youth ($N = 419$)

Respondent characteristic	Percent (N)	M (SD)	Range
Age (years)		20.09 (2.80)	13 – 24
Gender (male)	63.4 (266)		
Race/ethnicity			
African American	23.9 (100)		
Hispanic	20.0 (84)		
White	34.0 (142)		
Asian/Other/Multiracial	22.1 (93)		
Sexual orientation			
Heterosexual	66.8 (280)		
Homosexual	11.2 (47)		
Bisexual	21.9 (92)		
At least high school education/GED	46.6 (195)		
Employed part-time or full time	14.3 (60)		
Number of years homeless		4.57(3.25)	0 – 18
Depression score (CES-D)		0.95 (0.77)	0 – 3
Experienced abuse from caregiver	68.8 (288)		
Any lifetime drinking	92.4 (387)		
Any lifetime drug use	92.8 (389)		

Table 2

Characteristic	Percent (N)	M (SD)	Range
<i>Alter attributes (level 1) (N = 8380)</i>			
Gender (male)	57.7 (4835)		
Attends school	21.4 (1793)		
Employed part-time or full time	32.0 (2682)		
Homeless	31.3 (2623)		
Drinks to intoxication	44.0 (3687)		
Uses drugs	50.0 (4190)		
Engages in risky sex	21.4 (1793)		
Provides social support	43.8 (3670)		
Core group member	36.0 (3017)		
Personal opinion leader	32.3 (2707)		
Community leader	19.2 (1609)		
Sum of functional roles (0–3)		0.88 (0.94)	0–3
Degree		3.06 (3.98)	0–19
Network isolate	32.2 (2698)		
<i>Dyadic attributes (level 1) (N = 8380)</i>			
Family members	18.3 (1534)		
Met on the street	23.5 (1969)		
Frequency of contact ^a		2.51 (1.42)	0–4
Current sex partner	5.0 (419)		
Shared drinking	24.6 (2061)		
Shared drug use	26.7 (2237)		
<i>Personal network attributes (level 2) (N = 419)</i>			
Density		0.16 (0.17)	0–1
Number of isolates		6.43 (5.26)	0–20
Number of alters:			
Family members		3.66 (3.41)	0–20
Met on the street		4.70 (5.82)	0–20
Drank to intoxication		8.79 (6.74)	0–20
Used drugs		9.99 (6.93)	0–20
Engaged in risky sex		4.52 (5.34)	0–20
Provided social support		8.76 (5.93)	0–20
Core group members		7.19 (4.97)	0–20
Personal opinion leader		6.46 (5.12)	0–20
Community role model		3.85 (4.06)	0–20
Density of alcohol use (ingroup density)		0.17 (0.21)	0–0.95

Characteristics of Dyadic Relationships and Personal Networks of Homeless Youth (N = 149)

^a0=Almost never, 1=Less than 1 time a month, 2=One to three times a month, 3=1 to 3 times a week, 4=Daily or almost daily

Table 3

Odds Ratios from Multinomial Logistic Regressions Identifying Alter and Dyadic Factors that Predict Shared Substance Use

Parameter	Shared drinking (N = 7,740 dyads) 30 Parameters -2LL= -2491.38		Shared drug use (N = 7,780 dyads) 32 Parameters -2LL= -2491.38	
	OR	95% CI	OR	95% CI
<i>Alter attributes (level 1)</i>				
Gender (male)	1.40 **	1.10, 1.79	1.75 **	1.42, 2.17
Attends school	n.s.		0.90	0.66, 1.23
Employed part-time or full time	n.s.		0.49 **	0.38, 0.63
Homeless	2.93 **	2.17, 3.95	3.35 **	2.39, 4.69
Drinks to intoxication	-	-	4.53 **	3.05, 6.74
Uses drugs	4.57 **	3.21, 6.49	-	-
Engages in risky sex	1.71 **	1.25, 2.33	1.51 *	1.06, 2.17
Provides social support	1.41 *	1.03, 1.93	1.83 **	1.29, 2.60
Core group member	n.s.		n.s.	
Personal opinion leader	n.s.		n.s.	
Community role model	n.s.		n.s.	
Sum of opinion leader roles (0–3)	1.69 **	1.42, 2.00	1.24 *	1.03, 1.50
Network isolate	n.s.		n.s.	
Degree	1.07 *	1.01, 1.14	1.16 **	1.08, 1.24
<i>Dyadic attributes (level 1)</i>				
Family member	0.40 **	0.23, 0.68	0.32 **	0.21, 0.49
Met on the street	1.54 *	1.11, 2.14	n.s.	
Frequency of contact	1.13 **	1.28, 1.59	1.56 **	1.35, 1.80
Sex partner	2.64 **	1.67, 4.18	2.44 **	1.57, 3.80

Note. All models controlled for respondent-level attributes (age, gender, race/ethnicity, sexual orientation, education, employment, years homeless, depression, family abuse), and attributes of the respondent's social network (density, number of isolates, network composition, density of alcohol use). N.S. indicates that the parameter was not statistically significant during the forward selection model process, and so was not included in the final model.

* $p < .05$

** $p < .10$