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EMPIRICAL RESEARCH

Increased Substance Use and Risky Sexual Behavior Among Migratory Homeless Youth: Exploring the Role of Social Network Composition

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Abstract Travelers are a migratory subgroup of homeless youth who may be especially prone to engaging in risky behavior. This study compared the substance use and sexual behavior of young homeless travelers and non-travelers to evaluate the extent and possible sources of travelers' increased risk. Data came from face-to-face interviews with 419 homeless youth (36.6% female, 34.0% white, 23.9% African American, and 20.0% Hispanic) between the ages of 13 and 24 years ($M = 20.1$ years, SD = 2.5) who were randomly sampled from 41 shelters, drop-in centers, and street sites in Los Angeles. Travelers were almost twice as likely as non-travelers to exhibit recent heavy drinking, 37% more likely to exhibit recent marijuana use, and five times as likely to have injected drugs. Travelers also had more recent sex partners and were more likely to report having casual or need-based sexual partners and combining sex with substance use. Mediation analyses suggest that travelers' deviant peer associations and disconnection to conventional individuals and institutions may drive their elevated substance use. Differences in sexual risk behaviors are likely attributable to demographic differences between the two groups. Overall, these differences between travelers and non-travelers suggest different service needs and the need for different service approaches.

Keywords Homeless youth · Sexual behavior · Drug use · Alcohol use · Social networks

Introduction

As many as 1.7 million youth experience homelessness each year in the United States (Hammer et al. 2002; Toro et al. 2007). The population of homeless youth is diverse and different subgroups are known to have different risks and needs (De Rosa et al. 1999; Kipke et al. 1997a, b). A subgroup of homeless youth that may be at especially high risk is travelers, also known as "gutter punks" and "crusty punks"—these are homeless youth who migrate from place to place, often following common traveling routes across the United States (Lankenau et al. 2008). Popular media have documented the presence and activities of homeless travelers throughout the country for a little over a decade. These accounts invariably depict travelers as rebellious, sometimes hostile, drug-addicted, and living on the streets by choice (Boyce 2010; Chapman and Hays 2009; Fernandez 2006; Korn 2009; LeDuff 1997). Empirical data on travelers is, however, extremely limited. Our study aimed to fill that gap by comparing traveling and non-traveling homeless youth on their substance use and sexual behavior, and evaluating whether differences in the social networks of travelers and non-travelers may account for differences in their risky behavior. We also examined differences in the homelessness histories and service use preferences of these two groups to gain additional insight into the unique experiences and motivations of young homeless travelers.

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Most of what is known empirically about travelers comes from a small number of ethnographic studies. One of the first relevant studies was an investigation of service utilization patterns of homeless youth by De Rosa et al. (1999). They interviewed a small but diverse sample of youth in the Hollywood area of Los Angeles who had been on the streets for more than 3 months. A subset who self-identified as "punkers" indicated that they preferred to travel and that they were drawn to Hollywood because of an affinity toward its street youth culture. Unlike other youth in this study, punkers tended not to use shelters but did use other services such as drop-in centers that meet immediate subsistence needs. It is unclear whether the punkers in DeRosa's study are a subset of homeless travelers or what size subset they may represent, but their demographic and stylistic features fit both with characterizations of travelers in the popular press, and with the descriptions of travelers provided by others (e.g., Des Jarlais et al. 2005; Hyde 2005; Lankenau et al. 2008; Sanders et al. 2008).

Hyde (2005) interviewed 50 homeless youth in Los Angeles to understand the circumstances surrounding their departure from home. Nearly a quarter of these youth, drawn from social service agencies and outdoor areas of Los Angeles, claimed that they left home because they wanted to travel and experience new opportunities. Often self-labeling as "travelers," these youth alternately expressed their enthusiasm, ambivalence, and disillusion with living on the streets and moving from place to place. Additional insights come from a study of 213 young injection drug users recruited from the streets of Los Angeles, New Orleans, and New York City (Lankenau et al. 2008; Sanders et al. 2008), of whom 62% were identified as "homeless travelers" based on questions about housing status and history of homelessness. These youth did not remain in a city for longer than a month and reported regularly moving to towns and cities outside the recruitment area. Ethnographers' notes described style attributes that make travelers easily distinguishable from local homeless youth, including unique hairstyles, visible tattoos, numerous facial and body piercings, and military or punk-style clothing. Travelers were largely white, male, and heterosexual, in their early twenties, and drug users (e.g., 82% were marijuana users and half were heroin users). Because no data were presented on local homeless youth, however, the degree to which these travelers differ from other homeless youth is uncertain. Finally, a study of "urban nomads" in New York City interviewed 139 homeless youth who had traveled to at least three different cities in the past year (Des Jarlais et al. 2005). High levels of drug use were observed (e.g., 75% were injection drug users); however, similar to the work of Lankenau and Sanders, the recruitment criteria included recent illicit drug use and no comparison data were presented on local (i.e., non-nomadic) homeless youth.

Although these ethnographic studies provide a rich picture of traveling homeless youth, suggesting unique stylistic features, heavy substance use, and distinct service use preferences, it is difficult to generalize from them given their convenience samples, select recruitment criteria, and lack of comparison groups. A recent study avoided some of these limitations by comparing homeless youth with different levels of transience on measures of drug abuse and dependence (Ferguson et al. 2010). Youth with moderate and high levels of transience were marginally *less* likely to exhibit drug abuse and dependence than were youth with low levels of transience. These findings are at odds with the studies of homeless youth previously described (although youth in those studies were selected on the basis of their high-risk substance use), as well as studies of homeless adults showing that transience is positively associated with risky sexual behavior (Weir et al. 2007), HIV risk behavior (German et al. 2007) and depression (Davey-Rothwell et al. 2008). Ferguson et al. (2010) caution readers about drawing conclusions about the link between transience and substance use from their study, given its focus on abuse and dependence rather than use per se and considering that their data came from small, convenience samples of homeless youth (e.g., the Los Angeles sample consisted of 50 youth sampled mainly from emergency shelters in Hollywood). Thus, although this study improves upon prior research on travelers by incorporating a comparison sample of non-traveling homeless youth, it leaves open the questions of whether homeless travelers have a greater inclination towards risky behavior, and if so, why.

More research is therefore required to understand the characteristics and needs of homeless travelers. Especially needed is research that compares representative samples of homeless travelers and non-travelers on a range of risky behaviors known to be prevalent among the general population of homeless youth, including high risk drug use and risky sexual behavior (Bailey et al. 1998; Johnson et al. 2005a; Kral et al. 1997; Rosenthal et al. 2008). Such comparisons should control for demographic characteristics (e.g., age, gender, and ethnicity) that are likely to confound associations between traveler status and risky behavior. Also needed are efforts to identify factors that explain differences in risky behavior between traveling and non-traveling homeless youth.

One explanation may lie in the social networks of these youth. Social networks are crucial determinants of a range of risk-taking behaviors among homeless youth, including drug and alcohol use, unprotected sex, and other HIV risk-taking behaviors (Ennett et al. 1999; Rice et al. 2005, 2007; Tyler 2008; Wenzel et al. 2010). Typically, research on homeless youth has focused on the problematic influence of peers on risk-taking behaviors, with little attention given to positive impacts of social support or affiliation with

pro-social peers. The risk amplification model provides one explanation for the problematic influence of peers on risk behaviors of homeless youth, arguing that when youth leave home they are derailed from typical adolescent developmental pathways and become increasingly imbedded in social networks dominated by problematic peers (Whitbeck et al. 1999; Whitbeck and Hoyt 1999). Affiliation with these problematic youth provides modeling of and reinforcement for risk-taking and deviant behaviors (Bauman and Ennett 1996; Ennew 1994; Hagan and McCarthy 1997; Rice et al. 2005).

Although the social networks of homeless youth are often presumed to be comprised primarily of other homeless youth in similar circumstances (Whitbeck and Hoyt 1999), recent work suggests that this is not necessarily the case (Johnson et al. 2005b; Rice et al. 2007, 2008). Rice et al. (2007), for example, found that 73% of their sample of newly homeless youth in Los Angeles claimed that most or all of their friends attended school regularly, and 24% claimed most or all of their friends had jobs. Moreover, the presence of such individuals predicted less HIV sex risk behavior and drug use and less anti-social behavior (Rice et al. 2007, 2008). These and other studies suggest that the presence of prosocial peers (i.e., those engaged in prosocial institutions such as school, work, and family) in the networks of homeless youth may serve a protective role by discouraging risky practices (Hagan and McCarthy 1997; Ennett et al. 1999; Rice et al. 2007; Tyler 2008).

The presence of family members in homeless youth's social networks also may have implications for risk-taking behavior. Although homeless youth by definition have disrupted family relationships, many maintain ties to family members even once they are out of the home (Ek and Steelman 1988; Rice et al. 2010; Rotheram-Borus et al. 1991). Social control theory (Hirschi 1977), which suggests that bonds to conventional others may have a constraining effect on risky and antisocial behavior, suggests that the presence of family members in one's social network may inhibit substance use and risky sexual behavior (Latkin et al. 1995; Rice et al. 2010). However, because many homeless youth have fled abusive family circumstances where parental deviance, including substance use, is common, maintaining family ties may be more hurtful than helpful (Greene and Ringwalt 1996; Greene et al. 1998; Rotheram-Borus et al. 1996).

Characteristics of homelessness and engagement in street life are known to impact the composition of homeless youths' social networks. For example, it is well established that as youth spend more time on the streets their engagement with nontraditional and high-risk peers increases (Ennew 1994; Hagan and McCarthy 1997; Johnson et al. 1996; Whitbeck and Hoyt 1999; Tyler et al. 2000). Traveler status may likewise impact youths' engagement with nontraditional and high-risk individuals. Transience, apart from homelessness, is associated with having less supportive networks and fewer connections to prosocial, potentially stabilizing influences (Johnson et al. 1996; McCarthy and Hagan 1995; Kipke et al. 1997a). Given their increased transience, it may be that homeless travelers, compared with non-travelers, have fewer connections to family and other stabilizing influences and greater connections to problematic peers who model and reinforce risky behavior. Such differences in the social networks of travelers and non-travelers may contribute to differences in risky behavior between the two groups.

However, increased mobility may not necessarily impede travelers from maintaining prosocial, stabilizing influences, like home-based peers and family members. Recent research has shown that the majority of homeless youth maintain their relationships with family and home-based peers through use of the internet, especially email and social networking technologies (Rice et al. 2010; Young and Rice 2011). In a recent survey of homeless youth in Los Angeles, Rice et al. (2010) found that 84% of their sample accessed the internet at least weekly, typically at libraries and youth service agencies. Almost half of those who access the internet regularly reported use of email and social networking websites to communicate with family members and friends from home. Thus, although there is reason to believe that travelers, as a function of their transience, may have fewer connections to prosocial, stabilizing influences, this is not necessarily the case, as travelers may maintain such connections via the internet.

Current Study

The primary goal of our study was to compare young homeless travelers with non-travelers on demographic and homelessness characteristics, service utilization, substance use, and risky sexual behavior. Secondarily, we explored whether differences in the composition of travelers and non-travelers' social networks may account for differences in their substance use and risky sexual behavior. Because of their transience, we expected travelers to have fewer family ties than non-travelers, a lower likelihood of being employed or in school, and fewer ties to individuals who are employed or in school. We expected that travelers would report being in their current location for a shorter time and that they would therefore report a greater percentage of homeless individuals as network members. Finally, we expected that travelers would exhibit more substance use and risky sexual behavior than non-travelers, and that this difference in behavior would be associated with differences in the composition of their social networks.

Methods

Study Design

We recruited a probability sample of homeless youth from shelters, drop-in centers, and street venues in Los Angeles County between October 2008 and August 2009. Because a list or sampling frame of all the homeless youth in the study area is not available, we adopted a multi-stage design. The first stage involved the selection of sites. We developed two sampling frames: one for the shelters and drop-ins and one for the street venues. The first sampling frame was developed using local directories of services for homeless persons. Service sites were considered eligible if they were located in the study area and the majority of their clientele was ages 13–24 and English speaking. Service sites not limited to that age group were eligible if they had a specific program geared toward youth. For short-term transitional housing programs, the average length of stay had to be at most 1 year. Our final list of service sites consisted of 15 shelters and seven drop-in centers. The second sampling frame was developed with the help of service providers and outreach agencies. The research team identified 19 street sites (e.g., street corners, parks, and alleys) in the study area where homeless youth congregate. All sites were investigated multiple times and at various times of day to obtain an estimate of the average number of youth served daily by the service sites and the average number of youth that "hang out" at the street venues in a given day. Information collected through site investigations was used to assign a quota for the number of completed interviews to be achieved at each site which was approximately proportional to the size of a site. The second stage of the sampling design consisted of drawing a probability sample of homeless youth from the 41 study sites. Strategies specific to the type of site were developed to randomly select the youths to be approached, screened and interviewed.

Study Participants and Procedures

Study participants were 419 homeless youth in Los Angeles County between the ages of 13 and 24 years ($M = 20.1$ years, SD = 2.5) who were randomly sampled from the 41 shelters, drop-in centers, and street sites described above. Youth were eligible if they (a) were between the ages of 13–24; (b) were not currently living with a parent or guardian; (c) were not getting significant support for food and housing 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 of nowhere else to go), or other place not intended as a domicile; and (e) were English speaking. Of the 446 youth who screened eligible for the study, 437 were interviewed and 18 of these were later found to be ineligible and excluded (due to not meeting age or homelessness eligibility criteria, or completing the interview previously). Computer-assisted structured interviews lasting 60 min on average were conducted by trained interviewers. Youth received $25 for their participation. This research was approved by RAND's institutional review board and a Certificate of Confidentiality was obtained from the US Department of Health and Human Services.

Measures

Traveler Status

No standard method exists for defining a young homeless traveler. They have been variously defined as youth who traveled to at least 3 cities in the past year (Des Jarlais et al. 2005), youth who did not remain in a city for more than a few weeks or a month and who reported regularly moving to different towns or cities (Lankenau et al. 2008; Sanders et al. 2008), and youth who made multiple moves since initially leaving home (Ferguson et al. 2010). In our study, we defined travelers as homeless youth who had lived in at least two states besides California (the state in which they were interviewed), with at least one of those states being a non-neighboring state to California (i.e., a state other than Arizona, Nevada, or Oregon). With this definition, we hoped to capture homeless youth who had traveled extensively over significant distances in the United States.

Demographic Characteristics

These characteristics included age, gender, sexual orientation, race and ethnicity (coded as White, African American, Hispanic, and other or mixed race), income from all sources (legal or not) in the past 30 days, as well as whether the youth had a high school diploma or GED, attended school regularly in the past year, and was currently employed either full- or part-time.

Homelessness Characteristics

Youth reported the age at which they first left home and their main reason for doing so. For the latter, youth provided open-ended responses that we coded into one of five categories: "family conflict or problems (including physical or sexual abuse)," "desire to be on one's own," "family or housing instability," "emancipated/aged out of foster care," and a residual category that included responses that did not fit clearly into another category. Youth reported whether since leaving home the first time they had returned to living with a parent or guardian. Youth who had returned to living

with a parent or guardian were asked to report the age at which they left home the *last* time. For these youth, we calculated length of time homeless (in weeks) by subtracting their age at the time they last left home from their age at the time of the survey. For youth who had not returned to living with a parent or guardian, we calculated length of time homeless by subtracting their age at the time they first left home from their age at the time of the survey. Youth reported which areas of California (e.g., San Francisco Bay Area, Orange County) they had stayed in since last leaving home and which states besides California (if any) they had stayed in (as described above). Finally, youth reported whether in the past 30 days they had spent a night in any of the following places because they had nowhere else to stay: (a) outdoors, on the street, or in a park; (b) car, camper, or van; (c) garage, attic, or basement; (d) backyard or storage facility; (e) abandoned building; (f) emergency shelter; or (g) transitional housing.

Service Use

Youth reported whether they used any of the following services in the past 30 days: (a) drop-in or access center; (b) food pantry or meal line; (c) alcohol or drug counseling; (d) mental health counseling; (e) job training; (f) legal assistance; or (g) medical or dental care.

Social Network Characteristics

We used established procedures to assess characteristics of youths' social networks (McCarty 2002; McCarty et al. 1997). We asked respondents to provide the first names of 20 individuals (hereafter referred to as "alters") aged 13 or older that they knew, who knew them, and with whom they had contact during the past 3 months. Contact with alters could be face-to-face, by phone or mail, or via the internet. We constrained network size to be the same (20 alters) across respondents to maximize comparability of network characteristics across respondents (Mehra et al. 2001). Twenty alters has been shown to capture structural and compositional variability present in personal networks (McCarty et al. 2007). We then asked about each alters' behavior and relationship to the respondent. We classified alters into the following mutually exclusive categories: relatives or guardians, non-relative sex partners, adults in position of responsibility (e.g., service provider, teacher, boss), and all others who did not fit these categories. For each alters, we asked whether the individual was regularly in school or employed, and whether the individual was homeless in the past 3 months. Finally, we asked respondents to identify which alters they believe drank alcohol to the point of drunkenness in the past 3 months, used drugs in the past 3 months, and engaged in risky sexual behavior (i.e., had multiple sex partners, had sex with someone they did not know, or did not use a condom with a new partner) in the past 3 months.

Substance Use

We assessed heavy alcohol, marijuana, and other drug use for a 30-day period with items from the Youth Risk Behavior Survey (CDC 2008). Heavy alcohol use was defined as having 5 or more drinks of alcohol (a can of beer, a glass of wine, or a shot of hard liquor) in a row. In addition to heavy alcohol and marijuana use, youth reported on their use of each of the following substances (hereafter referred to collectively as "other drug use"): crack, cocaine, heroin, ecstasy, hallucinogens, and prescription drugs or "over-the-counter" medications to get high. Finally, youth reported whether they had used a needle to inject any illegal drug. Using these data, we computed indices of current (past month) heavy alcohol use, marijuana use, other drug use, and injection drug use.

Sexual Behavior

We calculated the number of sexual partners in the past 3 months by summing the number of different male and female partners that youth reported. We calculated the percentage of sexual events that were condom-protected by dividing the number of times a youth reported using condoms during intercourse by the total number of times the youth reported having sexual intercourse in the past 3 months. During the social network assessment, we asked whether each alter identified as a sexual partner was a spouse, boyfriend or girlfriend, casual partner (defined as "not steady like a boyfriend or girlfriend but more like once-in-a-while or in the moment or maybe just for fun"), or a need-based partner ("someone a person has sex with because they need money, food, a place to stay, drugs or alcohol, or something like that"). We also asked youth to report, for up to four alters who were recent sex partners, whether they and the alter used alcohol or drugs before or during sex in the past 3 months. From this information, we computed dichotomous indices of having any casual or need-based sexual partner in the past 3 months and using alcohol or drugs prior to sex in the past 3 months.

Statistical Analysis

We developed and used sampling weights to correct for deviations from proportionate-to-size random sampling (where a constant proportion of the population is sampled from every site) due to changes in the sampling rates

during the fielding period, differential non-response rates across sites, and differential rates of visits to shelters, drop-ins and street sites. All analyses incorporate these weights and account for the modest design effect that they induce using the linearization method (Skinner 1989).

We first used *t* tests and chi-square tests to compare travelers and non-travelers on demographic and homelessness characteristics, service use, social network characteristics, substance use, and risky sexual behavior. Next, we estimated bivariate associations between each of the social network characteristics and both substance use and risky sexual behavior. Finally, we conducted multivariable analyses of substance use and sexual behavior variables on which travelers and non-travelers differed at the bivariate level. We performed logistic regressions to model multivariable associations between traveler status and our dichotomous measures of substance use and risky sexual behavior. We used negative binomial regression analysis to model the multivariable association between traveler status and count variables such as number of sexual partners. We present adjusted odds ratios for the logistic regression analyses and adjusted incidence rate ratios for the negative binomial regression analyses. Predictor variables were entered into the regression models in two steps. First, we entered traveler status and demographic characteristics found to differ between travelers and non-travelers in the bivariate analyses. This allowed us to determine whether bivariate associations between traveler status and substance use or risky sexual behavior were due simply to confounding of traveler status and demographic characteristics. We also added length of homelessness at this first step, as this variable is known to be associated with levels of risk behavior among homeless youth (Ennett et al. 1999) and is also likely to be associated with traveler status. At the second step, we added social network characteristics that we hypothesized as potential mediators of the association between traveler status and risky behavior, i.e., absence of ties to individuals in conventional roles, and presence of ties to peers engaged in relevant risky behaviors. However, we only added these hypothesized mediator variables to the model if we found them to be associated ($p < .05$) with traveler status at the bivariate level of analysis. Evidence of mediation would be present if (a) the dependent variable (substance use, sexual behavior) was significantly associated with traveler status at the first modeling step, (b) traveler status significantly predicted the mediating variable, controlling or demographics and weeks homeless (tested in separate multivariable models), and (c) the association between traveler status and the dependent variable were significantly reduced when the mediators were entered into the model (Baron and Kenny 1986).

Results

Bivariate Comparison of Travelers and Non-Travelers on Background Characteristics

As expected, travelers ($n = 106$) were more likely than non-travelers ($n = 313$) to be older, male, and white, and less likely to be African American or Hispanic (see Table 1). Travelers were more likely to have a high school diploma/GED and less likely to have attended school in the past year. Sexual orientation, employment status, and income did not differ between the two groups.

Bivariate Comparison of Travelers and Non-Travelers on Housing History and Service Use

As Table 2 shows, travelers left home for the first time at a younger age than non-travelers and were more likely to report a desire to be on their own and less likely to report family conflict or problems as the main impetus for leaving home. Travelers and non-travelers were just as likely to have returned home to live with their parents after having left home initially, but the length of time since last leaving home was considerably greater among travelers than among non-travelers. Consistent with their transient lifestyles, travelers had stayed in their current location for approximately half as long as non-travelers and had stayed in more areas of California, as well as (by definition) more states outside California. Travelers were more likely than non-travelers to report spending the night outdoors, in a motor vehicle, in a backyard or storage structure, or in an abandoned building. Travelers were less likely than non-travelers, however, to have spent the night at an emergency shelter or in transitional housing. Finally, travelers were more likely than non-travelers to have recently visited a drop-in or access center and used a food pantry or meal line, and less likely to have recently used alcohol or drug counseling.

Bivariate Comparison of Travelers and Non-Travelers on Social Network Characteristics

Compared with non-travelers, travelers reported social networks comprised of fewer relatives and people who were employed or in school, but more people who were homeless (see Table 3). Travelers' networks also included more individuals perceived to engage in heavy alcohol use, drug use, and risky sexual behavior. Travelers and non-travelers did not differ, however, on the percentage of their network members who were sex partners.

Table 1 Bivariate comparison of travelers ($n = 106$) and non-travelers ($n = 313$) on background characteristics

Characteristic	Traveler	Non-traveler	χ^2 or t Value	p Value
Age in years [*M* (SD)]	20.8 (2.0)	19.7 (2.6)	−4.36	<0.01
Male gender (%)	70.5	59.7	3.15	0.08
Sexual orientation (%)			5.60	0.13
Heterosexual	65.3	64.6		
Homosexual	5.9	13.6		
Bisexual	25.7	19.8		
Not sure/other	3.1	2.0		
Race/ethnicity (%)			46.80	<0.01
African American	10.8	30.5		
Non-Hispanic White	57.4	22.2		
Hispanic	8.8	25.6		
Other or mixed	23.0	21.6		
Education				
At least 12 years or GED (%)	56.2	41.7	5.45	0.02
Attended school regularly in past year (%)	6.9	44.8	26.90	<0.01
Employment and income				
Unemployed (%)	90.2	83.4	2.53	0.11
Past month income in dollars [*M* (SD)]	582.7 (1,298.5)	390.9 (594.5)	−1.47	0.14

Chi-square is reported for tests of percentage differences. t values are reported for tests of mean differences

Bivariate Comparison of Travelers and Non-Travelers on Substance Use and Risky Sexual Behavior

As Table 4 indicates, travelers consistently exhibited more substance use than non-travelers. Travelers were almost twice as likely as non-travelers to exhibit heavy drinking in the past month, 37% more likely to have used marijuana, 70% more likely to have used other drugs, and five times as likely to have injected drugs. Differences between travelers and non-travelers on risky sexual behavior were in the expected direction, but only two associations were statistically significant. Travelers had more sex partners in the past 3 months than did non-travelers. They were also more likely to combine alcohol and/or drug use with sex in the past 3 months. Travelers and non-travelers did not differ in their condom use or in the likelihood of having had casual or need-based sexual partners.

Bivariate Associations Between Social Network Variables and Substance Use and Risky Sexual Behavior

Table 5 shows bivariate associations between each of the social network characteristics that differed between travelers and non-travelers (i.e., all but the percentage of sex partners) and each indicator of substance use and risky sexual behavior that differed between travelers and non-travelers. Mean comparisons are presented for the dichotomous substance use variables. For example, we show the mean percentage of family members in one's social network among participants who did and did not exhibit current heavy alcohol use. Correlation coefficients are shown for associations involving number of sex partners. As this table shows, there were consistent, and typically strong, associations between social network characteristics and risky behavior. Moreover, all associations were in the predicted direction. In particular, participants engaged in versus not engaged in current heavy alcohol use, marijuana use, injection and other drug use, and who used versus did not use substances prior to sex had social networks comprised of fewer family members, fewer individuals in school, fewer employed individuals, more people who were homeless, and greater percentages of heavy alcohol users, drug users, and individuals thought to engage in risky sexual behavior. Likewise, number of sex partners was positively associated with the percentage of network members who were homeless, heavy alcohol users, drug users, and engaged in risky sexual behavior, and negatively associated with the percentage of network members who were family members and students.

Multivariable Models Predicting Substance Use

As Table 6 shows, all associations between substance use and traveler status remained after controlling for demographics and length of homelessness (Model 1). The only social network variable that significantly predicted current heavy alcohol use in the final multivariable model

Table 2 Bivariate comparison of travelers ($n = 106$) and non-travelers ($n = 313$) on homelessness history and service use

Variable	Traveler	Non-traveler	χ^2 or t Value	p Value
Age (in years) left home first time [*M* (SD)]	14.8 (2.96)	15.9 (2.92)	3.16	<0.01
Main reason for initially leaving home (%)				
Family conflict or problems	42.2	60.2	8.41	<0.01
Desire to be on my own	24.8	13.2	6.02	0.01
Family or housing instability	6.9	5.0	0.46	0.50
Emancipated/aged out of foster care	7.6	4.7	1.12	0.29
Other	18.5	16.9	0.10	0.75
Ever returned home to live with parents (%)	51.2	52.2	0.03	0.87
# of years since last left home [*M* (SD)]	4.1 (2.8)	2.4 (2.5)	−5.63	<0.01
# of weeks where living now [*M* (SD)]	38.0 (111.1)	71.2 (176.6)	2.26	0.02
# of different areas of California stayed [*M* (SD)]	2.6 (1.4)	1.5 (0.8)	−7.68	<0.01
# of states stayed in outside California [*M* (SD)]	8.9 (11.4)	0.2 (0.4)	*	
Places spent night in past 30 days (%)				
Outdoors, on the street, or in a park	82.6	51.2	30.1	<0.01
In a car, van, or camper	41.3	19.8	15.2	<0.01
Garage, attic, or basement	28.8	9.3	20.27	<0.01
Backyard or storage structure	25.2	9.6	13.33	<0.01
Abandoned building	44.0	21.2	16.6	<0.01
Emergency shelter	15.1	28.9	7.62	<0.01
Transitional housing	4.3	30.1	29.95	<0.01
Service use, past 3 months (%)				
Drop-in or access center	73.9	55.1	9.27	<0.01
Food pantry or meal line	46.1	26.6	11.32	<0.01
Alcohol or drug counseling	6.2	15.6	6.63	0.02
Mental health counseling	15.0	23.8	2.89	0.09
Job training	10.0	12.4	0.37	0.54
Legal assistance	10.1	14.2	1.03	0.31
Medical or dental care	21.5	26.5	0.93	0.34

Chi-square is reported for tests of percentage differences. t values are reported for tests of mean differences

* Significance test not conducted, as traveler status is defined based on this variable

Table 3 Bivariate comparison of travelers ($n = 106$) and non-travelers ($n = 313$) on social network characteristics

Social network characteristic	Traveler *M* (SD)	Non-traveler *M* (SD)	t Value	p Value
Percentage relative or guardian	13.9 (1.4)	20.5 (1.8)	3.82	<0.01
Percentage sex partners	9.6 (10.3)	7.6 (8.9)	−1.74	0.08
Percentage students	11.3 (14.0)	26.6 (24.3)	−7.47	<0.01
Percentage employed	27.6 (21.6)	34.2 (23.7)	2.64	<0.01
Percentage homeless in past 3 months	47.3 (31.6)	23.3 (25.2)	−7.08	<0.01
Percentage perceived to engage in heavy drinking	57.6 (33.7)	37.1 (31.7)	−5.49	<0.01
Percentage perceived to engage in drug use	69.8 (30.6)	40.0 (32.3)	−9.07	<0.01
Percentage perceived to engage in risky sexual behavior	31.0 (31.5)	18.3 (22.9)	−3.81	<0.01

(Model 2) was the percentage of alcohol users in one's social network. A separate multivariable regression analysis that controlled for demographics and length of time homeless showed traveler status to be a reliable predictor of the percentage of alcohol users in one's social network ($b = 1.29$, SE $= 0.42$, $p = .002$). Baron and Kenny (1986) provide a direct test of whether the reduction of an association due to a hypothetical mediator is statistically

Table 4 Bivariate comparison of travelers ($n = 106$) and non-travelers ($n = 313$) on substance use and risky sexual behavior

Characteristic	Traveler	Non-traveler	χ^2 or t Value	p Value
Substance use in past 30 days				
Any heavy drinking (%)	56.6	31.9	16.43	<0.01
Any marijuana use (%)	80.9	59.1	14.46	<0.01
Any other drug use (%)[a]	57.5	33.0	15.78	<0.01
Any injection drug use (%)	19.4	3.8	16.97	<0.01
Sexual behavior in past 3 months				
Number of sex partners [M (SD)]	2.2 (3.1)	1.5 (2.1)	−2.34	0.02
Percentage of sexual events that were condom protected [M (SD)]	37.6 (44.9)	31.4 (43.5)	−0.70	0.49
Any casual sex partners (%)	41.0	32.2	2.23	0.14
Any need-based sex partners (%)	6.7	4.0	1.27	0.26
Any alcohol and/or drug use prior to sex (%)	69.9	41.9	20.2	<0.01

Chi-square is reported for tests of percentage differences. t values are reported for tests of mean differences

[a] Includes use of crack, cocaine, heroin, ecstasy, hallucinogens, and prescription drugs or "over-the-counter" medications to get high

significant. Using this test, we found that the reduction in the association between traveler status and current heavy alcohol use due to the percentage of alcohol users in one's social network is statistically significant ($z = 2.55$, $p = .01$).

The only social network variable that significantly predicted current marijuana use in the final multivariate model (Model 2) was the percentage of drug users in one's social network. A separate multivariable regression analysis that controlled for demographics and length of time homeless showed traveler status to be a reliable predictor of the percentage of drug users in one's social network ($b = 2.15$, SE = 0.42, $p < .001$). Using Baron and Kenny's test of mediation, we found that the reduction in the association between traveler status and current marijuana use due to the percentage of drug users in one's social network is statistically significant ($z = 4.59$ $p < .0001$).

In the final multivariable model (Model 2) of current use of other drugs, the percentage of students, employed individuals, alcohol users, and drug users in one's social network were all significant predictors. Each of these social network characteristics was reliably predicted by traveler status (predicting percent students: $b = -7.70$, SE = 1.99, $p < .0001$) predicting percent of employed individuals: $b = -0.60$, SE = 0.29, $p = .04$; predicting percentage alcohol users: $b = 1.29$, SE = 0.42, $p = 0.002$); predicting percentage drug users: $b = 2.15$, SE = 0.42, $p < .001$). A joint test of significance (MacKinnon 2000) showed that jointly these hypothetical mediators explained a significant amount of the association between traveler status and current other drug use ($z = 2.59$, $p < .01$).

In the final multivariable model (Model 2) of current injection drug use, the percentage of family members, homeless individuals, and alcohol users in one's social network were all significant predictors. Only the percentage of homeless individuals and alcohol users were reliably predicted by traveler status (predicting percent of homeless individuals: $b = 1.55$, SE = 0.37, $p < .001$; predicting percentage alcohol users: $b = 1.29$, SE = 0.42, $p = .002$). Together these variables explained a significant amount of the association between traveler status and current injection drug use ($z = 2.76$, $p = .006$).

Multivariable Models Predicting Sexual Behavior

Table 7 shows that the association between traveler status and number of sex partners was eliminated once demographic differences and length of time homeless were taken into account (Model 1). In particular, the bivariate association between traveler status and number of sex partners seems to have been due to Hispanics' lower likelihood of being travelers and their inclination to have fewer sex partners. Finally, Table 6 shows that the association between traveler status and the likelihood of using alcohol or drugs prior to sex remained after controlling for demographic factors (Model 1), but was accounted for by the percentage of students and the percentage of alcohol users in one's social network ($z = 2.09$, $p = .04$).

Discussion

Evidence of the heterogeneity of homeless youth across the United States is mounting. Studies suggest that homeless youth tend to identify with one or more subgroups of homeless youth, and that their service needs may be driven in part by subgroup membership (Kipke et al. 1997a, b). Our study adds to this literature by focusing on travelers, a migratory population of homeless youth that has received little empirical attention. Although the size of this subpopulation is unknown, our study suggests that it may

Table 5 Bivariate associations between social network characteristics and substance use and risky sexual behavior

Social network composition	Current heavy alcohol use		Current marijuana use		Current use of other drugs		Current injection drug use	
	Yes	No	Yes	No	Yes	No	Yes	No
Percentage family	14.7	20.7**	16.4	22.1**	13.5	21.7**	15.1	18.6
	(14.3)	(18.3)	(15.6)	(19.0)	(14.3)	(18.0)	(16.7)	(17.1)
Percentage students	16.6	24.7**	18.3	27.6**	14.5	26.3**	7.3	22.8**
	(19.7)	(23.8)	(21.3)	(23.8)	(16.8)	(24.8)	(9.8)	(23.0)
Percentage employed	30.7	32.8	28.8	38.2**	24.9	36.9**	22.9	32.9*
	(22.9)	(23.4)	(23.2)	(22.0)	(19.6)	(24.2)	(21.6)	(23.2)
Percentage homeless	38.7	26.4**	38.7	16.8**	43.7	22.7**	60.5	28.4**
	(28.7)	(29.5)	(31.0)	(20.6)	(31.3)	(25.3)	(30.0)	(28.2)
Percentage heavy alcohol users	60.0	33.2**	51.8	28.5**	58.6	33.7**	74.0	41.0**
	(33.4)	(29.5)	(34.0)	(27.5)	(34.7)	(29.0)	(27.1)	(32.9)
Percentage drug users	62.4	41.6**	61.3	27.5**	67.8	37.4**	72.6	47.7**
	(32.4)	(33.8)	(33.1)	(25.7)	(30.7)	(31.8)	(32.4)	(34.2)
Percentage who engage in risky sexual behavior	27.3	19.4*	26.1	15.7**	28.6	18.4**	44.6	20.4**
	(27.6)	(25.7)	(29.0)	(19.9)	(29.4)	(23.9)	(35.5)	(24.8)

Social network composition	Any substance use prior to sex		Number of sex partners
	Yes	No	
Percentage family	14.6	22.17**	−0.10*
	(15.1)	(18.1)	
Percentage students	14.5	28.8**	−0.18**
	(16.6)	(25.5)	
Percentage employed	27.9	36.2**	−0.02
	(21.6)	(24.1)	
Percentage homeless	41.1	21.0**	0.10*
	(30.9)	(24.7)	
Percentage heavy alcohol users	55.8	31.5**	0.11*
	(33.2)	(29.7)	
Percentage drug users	62.1	37.1**	0.14**
	(32.4)	(32.5)	
Percentage who engage in risky sexual behavior	29.4	15.4**	0.23**
	(29.1)	(21.8)	

Entries in all but the "number of sex partners" column are means with standard deviations in parenthesis. Entries in the "number of sex partners" column are correlation coefficients

* $p < .05$; ** $p < .01$

comprise as many as a quarter of homeless youth in cities that are established stopping points for homeless travelers, such as Los Angeles (Lankenau et al. 2008). Both travelers and non-travelers most commonly mentioned family conflict or problems as the main reason why they left home the first time. However, compared to non-travelers, the travelers left home for the first time at a younger age and they did so less often because of family conflict and more often out of a desire to be on their own. The notion that most travelers are primarily driven to leave home by a desire for independence is overly simplistic. Nonetheless, results from both this study and qualitative data presented by Hyde (2005) suggest that travelers may be more likely than other homeless youth to view their homelessness as an adventure to some extent, at least at first.

Although travelers and non-travelers face many of the same challenges in living on their own, the travelers in our sample were less likely to access certain services that could help them stabilize their lives. Travelers were much more likely to report spending the night in risky places, and much less likely to report staying in shelters or transitional housing. Though this may reflect their desire for geographic mobility, it may also be the case that traditional homeless youth services and programs hold less appeal

Table 6 Multivariable regression analyses predicting current (past month) substance use

Predictor	Current heavy alcohol use				Current marijuana use			
	Model 1		Model 2		Model 1		Model 2	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Traveler status	**2.07**	1.16, 3.73	1.55	0.79, 3.04	**2.21**	1.17, 4.18	1.06	0.50, 2.25
Male gender	1.60	0.94, 2.74	**1.84**	1.04, 3.28	1.21	0.72, 2.02	1.44	0.82, 2.54
Age in years	1.00	0.89, 1.13	1.04	0.91, 1.20	0.95	0.85, 1.06	0.97	0.85, 1.10
Race/ethnicity								
African American	**0.25**	0.12, 0.52	**0.42**	0.18, 0.97	**0.37**	0.19, 0.72	0.84	0.39, 1.82
Hispanic	0.78	0.39, 1.56	1.32	0.59, 2.94	**0.38**	0.19, 0.75	0.67	0.31, 1.48
Other or mixed	0.89	0.46, 1.74	1.49	0.74, 3.02	0.71	0.35, 1.43	1.25	0.54, 2.87
High school education or higher	1.16	0.68, 1.99	0.81	0.46, 1.44	1.07	0.65, 1.79	0.94	0.52, 1.71
Number of years homeless	0.99	0.89, 1.10	0.99	0.88, 1.11	0.99	0.89, 1.10	0.98	0.87, 1.11
Social network composition[a]								
Percentage family			0.97	0.83, 1.14			1.11	0.95, 1.30
Percentage students			0.92	0.78, 1.07			0.98	0.86, 1.12
Percentage employed			0.99	0.86, 1.13			0.94	0.82, 1.08
Percentage homeless			0.94	0.83, 1.08			1.14	0.98, 1.33
Percentage heavy alcohol users			**1.27**	1.15, 1.40			1.08	0.97, 1.20
Percentage drug users			1.03	0.93, 1.14			**1.30**	1.17, 1.43

Predictor	Current use of other drugs				Current injection drug use			
	Model 1		Model 2		Model 1		Model 2	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Traveler status	**2.07**	1.16, 3.70	1.16	0.58, 2.31	**3.80**	1.40, 10.34	2.29	0.69, 7.61
Male gender	0.94	0.56, 1.57	1.13	0.65, 1.97	0.74	0.26, 2.15	0.82	0.26, 2.62
Age in years	0.96	0.85, 1.07	0.97	0.84, 1.12	0.92	0.71, 1.19	0.92	0.64, 1.31
Race/ethnicity					**6.17**[b]	2.29, 16.66	**4.31**[b]	1.33, 14.00
African American	**0.25**	0.13, 0.49	0.51	0.23, 1.14				
Hispanic	**0.43**	0.22, 0.84	0.82	0.40, 1.69				
Other or mixed	0.53	0.27, 1.03	0.92	0.41, 2.07				
High school education or higher	1.28	0.74, 2.22	1.09	0.59, 2.02	2.50	0.87, 7.19	1.95	0.63, 6.04
Number of years homeless	0.98	0.88, 1.08	0.94	0.84, 1.06	0.99	0.82, 1.19	0.94	0.75, 1.18
Social network composition[a]								
Percentage family			0.98	0.82, 1.16			**1.68**	1.21, 2.33
Percentage students			**0.87**	0.76, 0.99			0.63	0.34, 1.17
Percentage employed			**0.84**	0.73, 0.97			1.04	0.77, 1.39
Percentage homeless			0.99	0.87, 1.13			**1.31**	1.06, 1.63
Percentage heavy alcohol users			**1.13**	1.02, 1.24			**1.23**	1.02, 1.49
Percentage drug users			**1.16**	1.05, 1.28			0.94	0.77, 1.15

Coefficients in bold are statistically significant, $p < .05$

[a] Odds ratios for social network characteristics have been adjusted so that they correspond to increments of 10% points. This adjustment has no effect on the statistical significance of the odds ratio

[b] Odds ratio for non-Hispanic whites compared with all others. We were not able to further differentiate between racial/ethnic groups, as we did in all other models, because there was little reported injection drug use in groups other than non-Hispanic whites

for travelers, who are distinct from other homeless youth in terms of demographics, behavior, and appearance. Travelers may be more likely to bristle at the strict rules and regulations often imposed by shelter providers, or may simply feel that they do not "fit in" at these settings (Hyde 2005). Travelers were also less likely than non-travelers to obtain substance use counseling, despite their significantly higher rates of use. Just as studies have identified barriers

Table 7 Multivariable regression analyses predicting risky sexual behavior in the past 3 months

Predictor	Number of sex partners				Any substance use prior to sex			
	Model 1		Model 2		Model 1		Model 2	
	IRR	95% CI	IRR	95% CI	OR	95% CI	OR	95% CI
Traveler status	1.15	0.61, 2.18	1.17	0.68, 2.01	**2.48**	1.38, 4.44	1.52	0.78, 2.95
Male gender	0.80	0.50, 1.28	0.79	0.51, 1.22	0.93	0.55, 1.55	1.08	0.63, 1.88
Age in years	1.08	0.95, 1.22	1.06	0.94, 1.20	**1.18**	1.06, 1.33	**1.22**	1.06, 1.39
Race/ethnicity								
African American	0.68	0.31, 1.49	0.68	0.36, 1.29	**0.43**	0.24, 0.83	0.96	0.45, 2.06
Hispanic	**0.51**	0.27, 0.97	0.61	0.35, 1.08	0.52	0.26, 1.02	1.00	0.48, 2.09
Other or mixed	0.76	0.36, 1.59	0.93	0.50, 1.71	0.58	0.29, 1.14	1.01	0.48, 2.14
High school education or higher	1.48	0.91, 2.41	1.20	0.78, 1.87	1.11	0.65, 1.88	0.90	0.51, 1.61
Number of years homeless	1.06	0.95, 1.17	1.02	0.93, 1.12	0.92	0.83, 1.02	**0.89**	0.79, 0.99
Social network composition[a]								
Percentage family			1.11	0.95, 1.30			0.97	0.83, 1.13
Percentage students			0.91	0.80, 1.04			**0.86**	0.74, 0.99
Percentage employed			**1.14**	1.01, 1.29			0.89	0.78, 1.02
Percentage homeless			1.08	0.97, 1.19			1.00	0.88, 1.13
Percentage heavy alcohol users			1.02	0.95, 1.10			**1.16**	1.05, 1.28
Percentage drug users			0.96	0.89, 1.04			1.07	0.97, 1.19
Percentage who engage in risky sexual behavior			**1.15**	1.04, 1.27			1.11	0.98, 1.26

Coefficients in bold are statistically significant, $p < .05$

[a] Odds ratios for social network characteristics have been adjusted so that they correspond to increments of 10 percentage points. This adjustment has no effect on the statistical significance of the odds ratio

to care among homeless youth in general (e.g., Hudson et al. 2008), it is important to understand better such barriers among travelers as it may be necessary to target services specifically to the unique needs and preferences of this population.

A key aim of this study was to compare the social networks of travelers and non-travelers to understand travelers' increased involvement in risk behavior. Travelers were more likely than non-travelers to be connected to similarly unconventional individuals exhibiting risky behaviors, and less likely to have conventional social ties such as to family members, students, and stably employed individuals. Our results suggest that some of these differences in network composition are important in that they relate to the considerable differences between travelers and non-travelers in injection drug use and other forms of substance use that were found in this study and have been reported by others. If these relationships can be shown to be causal, then alcohol and drug prevention programs that focus on the individual will be less effective than ones that also help youth to establish and strengthen conventional social ties while also minimizing the negative impact of associating with high-risk peers (see Latkin and Knowlton 2005; Nygaard 2001; Winett et al. 1995).

Although in most of the multivariable models only one or two social network variables emerged as significant predictors of youths' behavior, all of the social network characteristics were linked to risky behavior in the bivariate models and always in the predicted direction. Typically, the social network characteristics that emerged as significant predictors in the multivariable models were ones clearly relevant to the dependent variable. For example, heavy alcohol use was associated with the percentage of heavy alcohol users in one's network, and the number of sex partners was associated with the percentage of network members perceived to engage in risky sexual behavior. These findings are consistent with the notion of peer modeling and reinforcement of risky behavior among homeless youth (Bauman and Ennett 1996; Ennew 1994; Hagan and McCarthy 1997; Rice et al. 2005). However, we also uncovered in our multivariable models associations that are consistent with the notion that connections to individuals engaged in conventional roles may constrain homeless youths' engagement in risky behavior (Hagan and McCarthy 1997; Ennett et al. 1999; Rice et al. 2007; Tyler 2008). For example, we found that youth with networks that included more individuals who are employed and in school had a lower likelihood of using drugs other

than marijuana. Given the degree of correlation among the network variables, it is not surprising that only some emerged as significant predictors in the multivariable models. That these network variables fully account for the differences in risky behaviors between travelers and non-travelers adds greatly to what is known about homeless travelers and their increased proclivity toward risky behavior, and is compatible with prior studies of how social network characteristics are associated with risky behavior in this population (e.g., Ennett et al. 1999; Kipke 1997b; Rice et al. 2005; Tyler et al. 2000). We note a few anomalous associations that emerged in the multivariable models: youth with more family in their network were more likely to inject drugs, those with more employed individuals in their network had more sex partners, and those with less time homeless were more likely to engage in substance use. Since these associations emerged only after youth were equalized (statistically) on a variety of social network characteristics, they should be interpreted with caution.

Our study has several limitations that must be considered when interpreting its results. First, our results may not generalize beyond the population of homeless youth living in Los Angeles County. Almost all of what is known about travelers is based on data from youth recruited in Los Angeles and New York City. Thus, there is a clear need for data that is more widely representative of the US homeless youth population. Second, the cross-sectional design makes it impossible to tease apart selection versus social learning processes, although both are likely to operate among homeless youth (Whitbeck and Hoyt 1999). Neither can we rule out that affiliation with unconventional peers leads youth to adopt a transient lifestyle (rather than vice versa), or that substance use differences between travelers and non-travelers are not due to differences in their proclivities toward risk or tendencies to be sensation-seeking rather than social network influences. Finally, although our operational definition of traveler status resembles that of others who have studied this population and clearly distinguishes travelers from non-travelers on characteristics known to vary between these two groups, it is nonetheless a logical definition rather than one based on self-definition by homeless youth.

Our study extends prior research by investigating a more representative sample of homeless travelers and comparing them to non-travelers from the same locations, investigating a wider range of risky behaviors, and attempting to provide clues about the source of travelers' elevated risk. Although more research is needed to understand the processes that drive homeless traveling youths' elevated substance use, our research suggests that the risk is potentially attributable to their deviant peer associations and disconnection to conventional institutions and individuals. Our research also suggests that, despite high levels of substance use and risky sexual behavior, travelers are less likely to access certain services and programs targeting these behaviors. In some cases, the issue is lack of availability; for example, homeless youth services in Los Angeles County are concentrated primarily in Hollywood (Brooks et al. 2004), but travelers are less likely to be found in Hollywood than other areas of the County (unpublished data). In addition to access issues, travelers may be resistant to seeking services if they do not perceive a need for them or if the available services are not appealing. It may be necessary to better "market" homeless services to travelers so that they feel less compelled to quickly establish ties with other high-risk travelers when they arrive in a new city in order to meet their basic needs for survival. Finally, because travelers are on the move, interventions may need to be shorter and less traditional. Greater integration of services would likely also be beneficial so that when they are ready for help, the first "service door" travelers enter can connect them to multiple services.

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References

Bailey, S. L., Camlin, C. S., & Ennett, S. T. (1998). Substance use and risky behavior among homeless and runaway youth. *Journal of Adolescent Health, 23*, 378–388.

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*, 1173–1182.

Bauman, K., & Ennett, S. T. (1996). On the importance of peer influence for adolescent drug use: Commonly neglected considerations. *Addiction, 91*, 185–198.

Boyce, G. (2010, May 12). *Life on the streets as a New Orleans gutter punk*. Retrieved November 29, 2010, from http://www.examiner.com/progressive-in-new-orleans/life-on-the-streets-as-a-new-orleans-gutter-punk.

Brooks, R. A., Milburn, N. G., Rotheram-Borus, M. J., & Witkin, A. (2004). The system-of-care for homeless youth: Perceptions of service providers. *Evaluation & Program Planning, 27*, 443–451.

Centers for Disease Control and Prevention. (2008). Youth risk behavior surveillance–United States, 2007. Surveillance Summaries, June 6, 2008. *MMWR*, 57 (No. SS-4).

Chapman, B., & Hays, E. (2009, July 14). Punks invade Williamsburg as heroin-addicted hobos set up shop in trendy Brooklyn neighborhood. *New York Daily News*. Retrieved November 29, 2010, from http://www.nydailynews.com/ny_local/brooklyn/2009/07/15/2009-07-15_hordes_of_hobos_set_up_shop_in_williamsburg_punks_invade_neighborhood.html.

Davey-Rothwell, M. A., German, D., & Latkin, C. A. (2008). Residential transience and depression: Does the relationship exist for men and women? *Journal of Urban Health, 85*, 707–716.

De Rosa, C. J., Montgomery, S. B., Kipke, M. D., Iverson, E., Ma, J. L., & Unger, J. B. (1999). Service utilization among homeless and runaway youth in Los Angeles, California: Rates and reasons. *Journal of Adolescent Health, 24*, 449–458.

Des Jarlais, D. C., Perlis, T. E., & Settembrino, J. M. (2005). The use of electronic debit cards in longitudinal data collections with geographically mobile drug users. *Drug and Alcohol Dependence, 77*, 1–5.

Ek, C. A., & Steelman, L. C. (1988). Becoming a runaway: From the accounts of youthful runners. *Youth and Society, 19*, 334–358.

Ennett, S. T., Bailey, S. L., & Federman, E. (1999). Social network characteristics associated with risky behaviors among runaway and homeless youth. *Journal of Health and Social Behavior, 40*, 63–78.

Ennew, J. (1994). Parentless friends: A cross-cultural examination of networks among street children and street youth. In F. Nestmann & K. Hurrelmann (Eds.), *Social networks and social support in childhood and adolescence* (pp. 409–426). New York: Walter de Gruyter, Inc.

Ferguson, K. M., Jun, J., Bender, K., Thompson, S., & Pollio, D. (2010). A comparison of addiction and transience among street youth: Los Angeles, California, Austin, Texas, and St. Louis, Missouri. *Community Mental Health Journal, 46*, 296–307.

Fernandez, A. (2006, November 29). Homeless youth: New York City's nomadic subculture. *Pace Press.* Retrieved November 4, 2010, from http://www.pacepress.org/2.3829/homeless-youth-new-york-city-s-nomadic-subculture-1.450613.

German, D., Davey, M. A., & Latkin, C. A. (2007). Residential transience and HIV risk behaviors among injection drug users. *AIDS and Behavior, 11*(Suppl 2), 21–30.

Greene, J. M., & Ringwalt, C. L. (1996). Youth and familial substance use's association with suicide attempts among runaway and homeless youth. *Substance Use and Misuse, 31*, 1041–1058.

Greene, J. M., Ringwalt, C. L., & Robertson, M. J. (1998). Familial background and risk behaviors of youth with thrownaway experiences. *Journal of Adolescence, 21*, 241–252.

Hagan, J., & McCarthy, B. (1997). *Mean streets: Youth crime and homelessness*. New York: Cambridge University Press.

Hammer, H., Finkelhor, D., & Sedlak, A. (2002). *Runaway/thrownaway children: National estimates and characteristics*. Washington, DC: Office of Juvenile Justice and Delinquency Prevention.

Hirschi, T. (1977). Causes and prevention of juvenile delinquency. *Sociological Inquiry, 47*, 322–341.

Hudson, A. L., Nyamathi, A., & Sweat, J. (2008). Homeless youths' interpersonal perspectives of health care providers. *Issues in Mental Health Nursing, 29*, 1277–1289.

Hyde, J. (2005). From home to street: Understanding young people's transitions into homelessness. *Journal of Adolescence, 28*, 171–183.

Johnson, T. P., Aschkenasy, J. R., Herbers, M. R., & Gillenwater, S. A. (1996). Self-reported risk factors for AIDS among homeless youth. *AIDS Education and Prevention, 8*, 308–322.

Johnson, K. D., Whitbeck, L. B., & Hoyt, D. R. (2005a). Substance use disorders among homeless and runaway adolescents. *Journal of Drug Issues, 35*, 799–816.

Johnson, K. D., Whitbeck, L. B., & Hoyt, D. R. (2005b). Predictors of social network composition among homeless and runaway adolescents. *Journal of Adolescence, 28*, 231–248.

Kipke, M. D., Montgomery, S. B., Simon, T. R., Unger, J., & Johnson, C. (1997a). Homeless youth: Drug use patterns and HIV risk profiles according to peer group affiliation. *AIDS and Behavior, 1*, 247–259.

Kipke, M. D., Unger, J. B., O'Connor, S., Palmer, R. F., & LaFrance, S. R. (1997b). Street youth, their peer group affiliation and differences according to residential status, subsistence patterns, and use of services. *Adolescence, 32*, 655–669.

Korn, P. (2009, April 30). Sidewalk ordinance extended. *Portland Tribune*. Retrieved November 29, 2010, from http://www.portlandtribune.com/news/print_story.php?story_id=124103963609100000.

Kral, A. H., Molnar, B. E., Booth, R. E., & Watters, J. K. (1997). Prevalence of sexual risk behaviour and substance use among runaway and homeless adolescents in San Francisco, Denver and New York City. *International Journal of STD and AIDS, 8*, 109–117.

Lankenau, S. E., Sanders, B., Bloom, J. J., Hathazi, D., Alarcon, E., Tortu, S., et al. (2008). Migration patterns and substance use among young homeless travelers. In Y. F. Thomas, D. Richardson, & I. Cheung (Eds.), *Geography and drug addiction* (pp. 65–83). Guilford, UK: Springer.

Latkin, C. A., & Knowlton, A. R. (2005). Micro-social structural approaches to HIV prevention: A social ecological perspective. *AIDS Care, 17*(Suppl 1), 102–113.

Latkin, C. A., Mandell, W., Oziemkowska, M., Celentano, D., Vlahov, D., Ensminger, M., et al. (1995). Using social network analysis to study patterns of drug use among urban drug users at high risk for HIV/AIDS. *Drug and Alcohol Dependence, 38*, 1–9.

LeDuff, C. (1997, September 21). Making it work; Runaway girl. *New York Times*. Retrieved November 29, 2010, from http://www.nytimes.com/1997/09/21/nyregion/making-it-work-runaway-girl.html.

MacKinnon, D. P. (2000). Contrasts in multiple mediator models. In J. Rose, L. Chassin, C. C. Presson, & S. J. Sherman (Eds.), *Multivariate applications in substance use research: New methods for new questions* (pp. 141–160). Mahwah, NJ: Erlbaum.

McCarthy, B., & Hagan, J. (1995). Getting into street crime: The structure and process of criminal embeddedness. *Social Science Research, 24*, 63–95.

McCarty, C. (2002). Measuring structure in personal networks. *Journal of Social Structure, 3*(1).

McCarty, C., Bernard, H. R., Killworth, P. D., Johnsen, E. C., & Shelley, G. A. (1997). Eliciting representative samples of personal networks. *Social Networks, 19*, 303–323.

McCarty, C., Killworth, P. D., & Rennell, J. (2007). Impact of methods for reducing respondent burden on personal network structural measures. *Social Networks, 29*, 300–315.

Mehra, A., Kilduff, M., & Brass, D. (2001). The social networks of high and low self-monitors: Implications for workplace performance. *Administrative Science Quarterly, 46*, 121–146.

Nygaard, P. (2001). Intervention in social networks: A new method in the prevention of alcohol related problems. *Addiction Research & Theory, 9*, 221–237.

Rice, E., Milburn, N. G., & Rotheram-Borus, M. J. (2007). Pro-social and problematic social network influences on HIV/AIDS risk behaviors among newly homeless youth in Los Angeles. *AIDS Care, 19*, 697–704.

Rice, E., Milburn, N. G., Rotheram-Borus, M. J., Mallett, S., & Rosenthal, D. (2005). The effects of peer-group network properties on drug use among homeless youth. *American Behavioral Scientist, 48*, 1102–1123.

Rice, E., Monro, W., Barman-Adhikari, M. A., & Young, S. D. (2010). Internet use, social networking, and HIV/AIDS risk for homeless adolescents. *Journal of Adolescent Health, 47*, 610–613.

Rice, E., Stein, J. A., & Milburn, N. (2008). Countervailing social network influences on problem behaviors among homeless youth. *Journal of Adolescence, 31*, 625–639.

Rosenthal, D., Mallett, S., Milburn, N., & Rotheram-Borus, M. J. (2008). Drug use among homeless young people in Los Angeles and Melbourne. *Journal of Adolescent Health, 43*, 296–305.

Rotheram-Borus, M. J., Mahler, K. A., Koopman, C., & Langabeer, K. (1996). Sexual abuse history and associated multiple risk behavior in adolescent runaways. *American Journal of Orthopsychiatry, 66*, 390–400.

Rotheram-Borus, M. J., Rosario, M., & Koopman, C. (1991). Minority youths at high risk: Gay males and runaways. In M. E. Colton & S. Gore (Eds.), *Adolescent stress: Causes and consequences* (pp. 181–200). New York: Aldine de Gruyter.

Sanders, B., Lankenau, S. E., Bloom, J. J., & Hathazi, D. (2008). Multiple drug use and polydrug use among homeless traveling youth. *Journal of Ethnicity in Substance Abuse, 7*, 23–40.

Skinner, C. J. (1989). Domain means, regression and multivariate analyses. In C. J. Skinner, D. Holt, & T. M. F. Smith (Eds.), *Analysis of complex surveys* (pp. 59–88). Chichester, UK: Wiley.

Toro, P. A., Dworsky, A., & Fowler, P. J. (2007). *Homeless youth in the United States: Recent research findings and intervention approaches*. Retrieved November 4, 2010, from http://aspe.hhs.gov/hsp/homelessnesssymposium07/toro/.

Tyler, K. A. (2008). Social network characteristics and risky sexual and drug related behaviors among homeless young adults. *Social Science Research, 37*, 673–685.

Tyler, K. A., Whitbeck, L. B., Hoyt, D. R., & Yoder, K. A. (2000). Predictions of self-reported sexually transmitted diseases among homeless and runaway adolescents. *Journal of Sex Research, 37*, 369–377.

Weir, B. W., Bard, R. S., O'Brien, K., Casciato, C. J., & Stark, M. J. (2007). Uncovering patterns of HIV risk through multiple housing measures. *AIDS and Behavior, 11*(Suppl 2), 31–44.

Wenzel, S. L., Tucker, J. S., Golinelli, D., Green, H. D., Jr, & Zhou, A. (2010). Personal network correlates of alcohol, cigarette, and marijuana use among homeless youth. *Drug and Alcohol Dependence, 112*, 140–149.

Whitbeck, L. B., & Hoyt, D. R. (1999). *Nowhere to grow: Homeless and runaway adolescents and their families*. Hawthorne, NY: Aldine de Gruyter.

Whitbeck, L. B., Hoyt, D. R., & Yoder, K. A. (1999). A risk-amplification model of victimization and depressive symptoms among runaway and homeless adolescents. *American Journal of Community Psychology, 27*, 273–296.

Winett, R. A., Anderson, E. S., Desiderato, L. L., Solomon, L. J., Perry, M., Kelly, J. A., et al. (1995). Enhancing social diffusion theory as a basis for prevention intervention: A conceptual and strategic framework. *Applied and Preventive Psychology, 4*, 233–245.

Young, S. D., & Rice, E. (2011). Online social networking technologies, HIV knowledge, and sexual risk and testing behaviors among homeless youth. *AIDS and Behavior, 15*, 253–260.

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