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Homeless Youths' HIV Risk Behaviors with Strangers: Investigating the Importance of Social Networks

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Abstract

The purpose of this study was to examine the relationship between homeless youths' HIV risk behaviors with strangers and risk and protective characteristics of their social networks. Data were from the Social Network and Homeless Youth Project. A total of 249 youth aged 14–21 years were interviewed over 15 months in three Midwestern cities in the United States using a systematic sampling strategy. Multivariate results revealed that homeless youth with a greater average number of network members who engaged in more drug risk behaviors and who pressured them into precarious behaviors at least once were more likely to have participated in a greater number of HIV risk behaviors with strangers compared to homeless youth without such network characteristics. Additionally, 19–21 year olds, gay, lesbian, bisexual, and transgendered youth, and those who have run away from home more frequently, participated in more HIV risk behaviors with strangers than 14–18 year olds, heterosexual youth, and those who have run away less often. The final model explained 43 % of the variance in homeless youths' HIV risk behaviors with strangers. It is important to identify network characteristics that are harmful to homeless youth because continued exposure to such networks and participation in dangerous behaviors may result in detrimental outcomes, including contraction of sexually transmitted infections and potentially HIV.

Keywords: HIV risk, social networks, risk factors, protective factors, homeless youth, sexual orientation

Introduction

In 2009, young people ages 13–29 years accounted for 39 % of all new human immunodeficiency virus (HIV) infections even though they comprised roughly 21 % of the U.S. population in 2010 (Centers for Disease Control and Prevention [CDC], *2011b*). Furthermore, an estimated 40,000 new HIV infections transpire each year (Kaiser Family Foundation, *2007*) and half of all new infections are believed to occur among those under age 25 (Office of National AIDS Policy, *2000*). Although HIV affects people in every sociodemographic group, homeless youth may be at greater risk compared with the general adolescent population given their exceptionally high rates of substance use, injection drug use, risky sexual behaviors (e.g., inconsistent condom use, early sexual onset), sexual contact with people at risk for HIV infection, and sexually transmitted infections (STIs) (Anderson, Freese, & Pennbridge, *1994*; Kral, Molnar, Booth, & Watters, *1997*), all of which are common risk factors for HIV infection (Allen et al., *1994*; CDC, *2011b*). The high risk nature of this population relative to other groups is also confirmed by HIV seroprevalence studies that report rates as high as 12 % among homeless youth (Pfeifer & Oliver, *1997*).

Within the homeless population, certain subgroups are expected to be at higher risk for HIV, including sexual minorities, females, and 19–21 year olds. For example, higher rates of survival sex and STIs have been reported among sexual minorities compared to all other demographic groups (Clatts & Davis, *1999*; Kipke, O'Connor, Palmer, & MacKenzie, *1995*; Moon et al., *2000*), adding to the potential for greater HIV risk compared to heterosexual youth. In terms of gender, homeless females have higher rates of STIs compared to males (Tyler, Whitbeck, Hoyt, & Yoder, *2000b*; Woods et al., *2002*) and because the presence of certain STIs greatly increase the likelihood of acquiring or transmitting HIV (CDC, *2011a*), females may be at greater risk compared to their male counterparts. Finally, older homeless youth

may be at greater risk for HIV given their greater participation in sexual and drug risk behaviors compared to their younger peers (Tyler, *2008*). Although homeless youth report participating in high risk behaviors (e.g., survival sex), less is known about how risk and protective characteristics of one's social network (e.g., frequency of interaction, closeness, sanctions and norms) increase or decrease the likelihood that homeless youth will engage in HIV risk behaviors, particularly with strangers. Accordingly, the purpose of the present study was to examine the relationship between risk and protective social network characteristics and homeless youths' HIV risk behaviors with strangers (i.e., someone other than a network member). Learning more about the risk and protective functions of social network characteristics of homeless youth, as well as the types of risky behaviors these young people engage in with strangers, are important for determining the scope and focus of intervention and prevention.

Literature Review

Social networks are an important part of normative adolescent development. These groups consist of a set of relationships that link social actors (Beaford, Gongaware, & Valdez, *2000*) and generally include those who are in close proximity to one another (Cairns, Leung, & Cairns, *1995*). Among normative adolescents, social networks are often homogeneous as youth select peers who are similar to themselves in terms of age, sex, race, personality, and behavior (Cotterell, *2007*; Ennett & Bauman, *1994*; Haynie & Osgood, *2005*; McPherson, Smith-Lovin, & Cook, *2001*). In contrast, homeless youth tend to be very diverse in terms of demographic characteristics: racial and ethnic minorities are over-represented among homeless youth (Cauce et al., *1994*; McCaskill, Toro, & Wolfe, *1998*; Owen et al., *1998*) and approximately 20 % of homeless youth are gay, lesbian, bisexual or transgender (GLBT) compared to 6–10 % in the general youth population (Center for American Progress, *2010*; Lambda Legal Defense & Education Fund, n.d.; National Coalition for the Homeless, *2009*). Because of this diversity, the social networks of homeless youth tend to be heterogeneous and consist of individuals from both home and the street (Ennett, Bailey, & Federman, *1999*; Johnson, Whitbeck, & Hoyt, *2005*).

The term social network refers to the range of social relationships available to an individual. Among homeless youth, social networks are the reference peer group with whom they associate and spend the majority of their time (Tyler, *2008*). Young people enter these specialized and supportive groups by choice, chance, coercion or for protection (Cairns et al., *1995*; Hagan & McCarthy, *1997*). Although some studies do not specifically define social networks but instead focus on asking housed or homeless youth about their "friends" (Haynie & Osgood, *2005*; Rice, Milburn, Rotheram-Borus, Mallet, & Rosenthal, *2005*), other works provide broad definitions which focus on people in the lives of homeless youth that they can count on for companionship, guidance, and support (cf. Johnson et al., *2005*; Milburn et al., *2005*; Smith, *2008*). The different etiological pathways that bind homeless youth to their social networks render certain behaviors, attitudes, and social norms either beneficial or detrimental to the homeless young person. According to Bauman and Ennett (*1996*), when youth are immersed in their peer reference group of other youth, highly observable behavioral standards for drug use can send the message that drugs are acceptable and considered important for survival. Modeling this standard of drug use slowly becomes a norm for youth and permeates their social milieu (Bauman & Ennett, *1996*). As such, when homeless youth conform to behaviors that engender risk (i.e., drug use), they place themselves at greater risk for HIV. In contrast, when behaviors are considered beneficial and help offset risk, they are regarded as protective. For example, homeless youth who stay in touch with family members (e.g., sibling, aunt/uncle) and/or home-based friends tend to engage in fewer risky behaviors (Ennett et al., *1999*; Johnson et al., *2005*; Rice, Milburn, & Monro, *2011*; Tyler, *2008*).

The Social Network as a Risk Factor

Homeless youth may feel a compulsion to avoid possible sanctions for non-conformity imposed by their peer group (Fisher, *1988*). As a result, they may concede to pressure or coercion by group members and engage in delinquent behavior (e.g., drug use) they otherwise might avoid (Tyler & Johnson, *2006a*). For instance, several studies report that homeless youth who use illicit drugs and engage in risky sexual practices generally have friends who engage in similar behaviors (Kipke, Unger, Palmer, Iverson, & O'Connor, *1998*; Rice et al., *2005*), thus reinforcing the importance of behavioral norms and modeling. Ennett et al. (*1999*) found that homeless youth who named a sex partner in their network also had an illicit drug user present and experienced pressure to use drugs and engage in prostitution. Additionally, having an illicit drug user present in the network was associated with having numerous sexual partners and participation in survival sex.

The Social Network as a Protective Factor

There is a dearth of literature on resiliency (protective factors) among runaway and homeless adolescents because resiliency is difficult to define for this population. Resilience is typically viewed as the ability to overcome serious and cumulative developmental risks. Some define resilience as the ability to draw upon certain resources to avoid negative outcomes, such as legal problems and psychological maladjustment (Rak & Patterson, *1996*). Resiliency for homeless youth may mean navigating life on the streets where successful adaptation involves daily survival and avoiding harm. The unique problem of homeless youth is that resilience includes to some degree the necessary skills and knowledge to remaining safe and these

skills engender risk (e.g., trading sex). This multitude of skills is somewhat incongruent with what is considered essential for successful adult development, such as employment, healthy relationships, and permanent housing (Tyler & Whitbeck, *2004*).

Some studies indicate homeless youth may benefit from certain protective social network effects. Ennett et al. (*1999*) found that homeless youth who reported a greater level of closeness to their network members were less likely to have numerous sexual partners. Positive functions of social networks also included members protecting homeless youth from out-group victimization (Hagan & McCarthy, *1997*) and providing various forms of social support (Johnson et al., *2005*; Molina, *2000*; Smith, *2008*; Unger et al., *1998*), which may mitigate homeless youths' routine feelings of alienation and loneliness (Molina, *2000*; Smith, *2008*). Furthermore, network members are often instrumental in homeless individuals' survival strategies as they may provide money and/or information on where to obtain food, clothing or shelter (Smith, *2008*). Finally, certain network members benefit homeless youth by introducing them to pro-social experiences (Rice et al., *2011*). Thus, in order to better understand this relationship, the current study was guided by the following research question: What social network characteristics are associated with homeless youths' HIV risk behaviors with strangers?

Method

Participants

Data were from the Social Network and Homeless Youth Project, a study designed to examine the effect of social network characteristics on homeless youths' HIV risk behaviors. The sample included 249 homeless youth (137 females; 112 males). Just over half (53 %) of the sample was comprised of older aged participants (19–21 years old), Whites (49 %), and heterosexuals (82 %).

Procedure

Experienced interviewers who have worked on past homeless youth projects, who have served for several years in agencies and shelters that support at-risk youth, and who were very familiar with local street cultures, such as knowing where to locate youth and where they congregate, conducted the interviews. All interviewers had completed the Collaborative Institutional Review Board (IRB) Training Initiative course for the protection of human subjects. Interviewers approached shelter residents and located other eligible participants in areas of the cities where homeless youth congregate. They varied the times of the day on both weekdays and weekends that they went to these locations. This sampling protocol was conducted repeatedly over the course of 15 months. All participants were administered informed consent. While some participants were not age of majority, they were treated as mature minors with IRB permission. All participants were told that their responses would remain confidential and that their participation was voluntary. The structured interviews were typically conducted in shelter conference rooms or quiet corners of fast food restaurants if taking the youth back to the shelter was not feasible because of distance or safety concerns. The interview lasted approximately 45 min and all participants received $25 for their involvement and $5 for a meal. Referrals for shelter, counseling services, and food services were also offered to youth at the time of the interview. All youth present were screened for eligibility and invited to participate. The response rate was 97 % based on the number of initial contacts.

Youth were interviewed in shelters and on the streets from January 2008 to March 2009 in three Midwestern cities in the United States. The IRB at the author's institution approved this study. The sample for this study included youth ages 14–21 years who were considered homeless or a runaway on the night prior to the screening. Homeless youth refers to those who have spent the previous night with a stranger, in a shelter or public place, on the street, in a hotel room, staying with friends (e.g., couch surfing), or other places not intended as their resident domicile. The term runaway refers to youth under age 18 who have spent the previous night away from home without the permission of parents or guardians (Ennett et al., *1999*).

Measures

Dependent Variable

HIV risk behaviors included eight behaviors that youth may have engaged in (0 = No, 1 = Yes) with a stranger (i.e., someone other than a social network member), including ever traded sex for food, shelter, money or drugs, had more than 10 lifetime sexual partners, had sex with an IV drug user, had a one-time sexual partner, had anal sex, had sex without a condom in the past 6 months, had sex after having too much to drink, and had sex after having used drugs. An index was created using the eight items where a higher score indicated engaging in a greater number of HIV risk behaviors with a stranger (M = 2.41).

To ensure youth kept social network members and strangers separate when responding, youth were handed back a card with the initials of their network members that they listed at the beginning of the structured interview and were asked to think about the following questions for those not listed on their card. Not only did interviewers remind youth a second time to think about only people other than those listed on their card when answering the questions on HIV risk behavior but each question also ended with, "not including those listed on your card." As a third precaution, the structured interview had an "interviewer check" which again prompted the interviewer to reiterate that we are asking about only those individuals not listed in their network.

Independent Variables

Network Selection. Participants were asked to provide initials for up to five people in their social network; that is, those they "see a lot or spend most of their time with now." Interviewers then queried youth about each individual network person starting with network member #1 and asked them about their relationship, interaction, conflict, network behavior regarding drug use, condom beliefs, and so forth. This procedure was done for each individual network person that the youth listed. Youth indicated having, on average, almost four people in their social network (M = 3.88; range, 1–5). Though youth could potentially list up to eight social network members (including three sexual partners), for the purposes of the current analyses, the following network variables were based on those network members (range, 1–5) who were not sexual partners.

Protective Factors. **Family member present** was a dummy coded variable to assess whether at least one family member was present in the youth's network (0 = No, 1 = Yes). Over one-half of youth (54 %) reported at least one family member present in their social network.

Frequency of interaction was the average time the youth spent with members of his/her social network over the past month, ranging from 1 = Every day to 4 = Once or twice during the month. Scores were reverse coded such that higher values indicated more frequent interaction.

Network closeness was the average feeling of closeness the youth had with his/her social network members ranging from 1 = Very close to 4 = Not close at all. Scores were reverse coded such that higher values indicated greater closeness.

Risk Factors. **Condom beliefs among network members** included three items where youth were asked if each of their network members, for example, believed that they should "always use condoms" and "always try to persuade their partners to practice safer sex" (0 = No, 1 = Yes). An index was created where the items were first reverse coded, summed, and then averaged across all network members such that higher values indicated higher risk (i.e., less likely to endorse condom use).

Average sexual risk with network members included eight items where youth were asked, for example, if they had ever had vaginal and/or anal sex with each network member and whether they did so without a condom (0 = No, 1 = Yes). To create this index, the eight items were first summed and then averaged across all network members where higher values indicated greater sexual risk behavior.

Average drug risk with network members included four items where youth were asked if they had ever "gotten drunk," "used drugs," "injected drugs," and "used the same needle" with each network member (0 = No, 1 = Yes). To create this index, the four items were first summed and then averaged across all network members where higher values indicated greater drug risk behavior.

Sanction risk among network members included five items that asked youth if they have ever been pressured to "use drugs," "trade sex," "inject drugs," "have sex with a network member", or "have sex with anyone else" (0 = No, 1 = Yes). Though an index was originally created, it was dichotomized due to skewness into 0 = Never pressured and 1 = Pressured to do at least one of the above behaviors at least one time.

Demographic Controls

Gender was coded 0 = male and 1 = female and sexual orientation was coded 0 = gay, lesbian, bisexual, transgendered and 1 = heterosexual. In terms of race 49.4 % of the sample was White, 23.7 % Black, 8 % Hispanic, 4.8 % American Indian or Alaskan native, 1.2 % Asian, 8.8 % biracial, and 4 % multiracial. Due to the small N's in each of these groups, race was coded 0 = non-White and 1 = White. Although youths' age ranged from 14 to 21 years (M = 18.5 years), given this wide developmental period, age was collapsed into: 0 = 14–18 year olds and 1 = 19–21 year olds. Total number of times run was a single item measure which asked youth how many times they had run from home. Response categories were collapsed due to skewness into 1 = 1 time to 7 = 21 or more times.

Results

χ^2 comparisons of HIV risk behaviors by gender, sexual orientation, and age are shown in Table 1. Females were significantly more likely to have traded sex with a stranger and to have had sex with an IV drug user unknown to them compared to males. In contrast, males were more likely to have had more than 10 sexual partners, to have had anal sex, and to have had sex while using drugs, all with someone unknown to them. GLBT youth were more likely to have engaged in six of the eight HIV risk behaviors with a stranger compared to heterosexual youth. Finally, 19–21 year olds were more likely to have engaged in all eight of the HIV risk behaviors compared to 14–18 year olds.

The correlation analyses in Table 2 showed that significant correlates of having engaged in a greater number of HIV risk behaviors with strangers included being 19–21 year olds, White, GLBT, and running from home more frequently. Additionally, social network members' condom beliefs, average sex and drug risk behaviors, and network sanctions were all positive correlates of HIV risk behaviors. Finally, having a family member present in one's network was negatively associated with HIV risk behaviors.

In Table 3, ordinary least squares (OLS) multiple regression models for HIV risk behaviors are shown. The

Table 1. χ^2 comparisons of HIV risk behaviors by gender, sexual orientation, and age

HIV risk behaviors	Gender					Sexual orientation					Age				
	Female		Male			Heterosexual		GLBT			14–18		19–21		
	N	%	N	%	χ^2	N	%	N	%	χ^2	N	%	N	%	χ^2
Ever traded sex	25	18.2	9	8.1	5.33*	22	10.8	12	27.3	8.32**	8	6.9	26	19.7	8.55**
>10 sexual partners	27	19.7	38	33.9	6.46*	47	22.9	18	40.9	6.07*	7	14.7	48	36.1	14.76**
Sex with IV drug user	19	14.3	7	6.4	3.86*	14	7.0	12	28.6	16.84**	6	5.2	20	15.7	6.98**
One time sex partner	84	61.8	72	64.3	.17	124	60.8	32	72.7	2.21	59	51.3	97	72.9	12.36**
Anal sex	20	14.6	28	25.0	4.28*	33	16.1	15	34.1	.54**	10	8.6	38	28.6	15.85**
Sex without a condom	33	24.1	22	19.6	.71	35	17.1	20	45.5	16.96**	16	13.8	39	29.3	8.68**
Sex while drunk	60	43.8	62	55.4	3.30	96	46.8	26	59.1	2.18	43	37.1	79	59.4	12.36**
Sex while high	43	31.4	51	45.5	5.25*	68	33.2	26	59.1	10.36**	34	29.3	60	45.1	6.58**

All items refer to HIV risk behaviors with a stranger (i.e., someone other than a network member)
** $p < .01$; * $p < .05$

variables for all models were entered into the equation in four separate blocks so the individual effect of demographic controls, role relationship, affective and interactional characteristics, and network sanctions and norms could be observed. Standardized beta coefficients are reported in all OLS models. Model 1 showed that, with the exception of race, all the other demographic controls were significant: females and heterosexual youth participated in fewer HIV risk behaviors with strangers compared to their male and GLBT counterparts ($\beta = -.13$ and $\beta = -.26$, respectively). Additionally, 19–21 year olds ($\beta = .26$) and those who had run from home more often ($\beta = .21$) engaged in a greater number of HIV risk behaviors compared to 14–18 year olds and those with fewer runs, respectively. The control variables accounted for 20 % of the variance in Model 1. The significant results in Model 2 were similar to Model 1 with the exception of gender, which was no longer significant. In addition, though youth who had at least one family member present in their social network engaged in fewer HIV risk behaviors with strangers this variable failed to reach significance. In Model 3, age, sexual orientation, and total number of times run remained significant. The addition of the affective and interactional variables did not explain additional variance in HIV risk behaviors and neither variable was significant. The results for Model 4 mirrored those of Model 3: age, sexual orientation, and total number of time run remained significant whereas relationship and affective and interactional variables were non-significant. The addition of the network sanction and norms variables revealed that youth who engaged in more drug use behaviors ($\beta = .38$) with their network members and those who have been pressured into at least one precarious behavior on at least one occasion by their network members ($\beta = .17$) were more likely to have engaged in a greater number of HIV risk behaviors with strangers. The addition of the last block of variables more than doubled the explained variance to 43 %.

Discussion

This study examined the association between risk and protective social network characteristics and homeless youths' HIV risk behaviors with strangers. Little research exists on the role that different network characteristics play in the lives of homeless youth, and even less is known about specific types of HIV risk behaviors that homeless youth participate in, particularly with strangers. Learning more about the risk and protective functions of social networks and HIV risk behaviors with strangers is important for determining the scope and focus of intervention and prevention. Though previous research demonstrates that numerous homeless youth are at high risk for contracting HIV due to their lifestyles and participation in risky behaviors, such as trading sex (Anderson et al., *1994*; Beech, Myers, & Beech, *2002*; Clatts & Davis, *1999*; Kral et al., *1997*; Tyler, Hoyt, & Whitbeck, *2000a*; Tyler & Johnson, *2006a*, *b*), certain segments of the homeless population, such as sexual minority youth and females, are noted to be at even greater risk (CDC, *2011a*). Failure to identify network characteristics that are harmful to homeless youth may result in continued exposure and participation in dangerous behaviors, which may have detrimental effects, including contraction of STIs and potentially HIV (Beech et al., *2002*; Clatts & Davis, *1999*; Tyler et al., *2000b*).

The results indicated that, on average, having more network members who engaged in drug risk behaviors was strongly associated with homeless youth participating in more HIV risk behaviors with strangers. In other words, homeless youth were not only engaging in drug risk behaviors with some of their network members but what was unique was that some network sanctions and norms were positively associated with homeless youth engaging in similar HIV risk behaviors with strangers, suggesting that there are multiple ways homeless young people may be at risk for HIV. One risk was through using drugs irre-

Table 2. Correlations between all study variables (*N* = 247)

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Female	–												
2. Older age	−.06	–											
3. White	−.03	.21**	–										
4. Heterosexual	−.23**	−.06	−.03	–									
5. Total times run	.11	.01	.05	−.01	–								
6. Family member present	.21**	−.12	−.16*	.06	−.01	–							
7. Interaction with SNM	.05	.08	−.08	.00	−.02	.19**	–						
8. Closeness to SNM	−.08	.11	.02	.09	−.03	−.22**	.21**	–					
9. SNM condom belief [a]	−.03	.10	.10	−.03	.09	−.08	.00	−.02	–				
10. SNM aver sex risk [a]	.10	.21**	.15*	−.14*	.02	−.18**	.05	.01	.38**	–			
11. SNM aver drug risk [a]	−.24**	.22**	.03	−.04	−.06	−.11	.02	.08	.27**	.33**	–		
12. SNM sanction[a]	.00	.06	−.01	−.05	.02	.01	.17**	.13*	.10	.23**	.29**	–	
13. HIV risk behavior[b]	−.07	.31**	.15*	−.25**	.21**	−.17**	.03	.09	.25**	.32**	.51**	.32**	–
M	.55	.53	.49	.82	3.18	.54	1.90	1.51	.79	.51	.65	.16	2.41
SD	.50	.50	.50	.38	1.89	.50	.66	.47	.76	.64	.65	.37	2.29

SNM = social network members; aver = average
a. Refers to behaviors with social network members
b. Refers to HIV risk behaviors with a stranger
** $p < .01$; * $p < .05$

Table 3. OLS regression models for correlates of HIV risk behaviors (*N* = 248)

	Model 1 β	Model 2 β	Model 3 β	Model 4 β
Demographic controls				
Female	−.13*	−.11	−.11	−.02
Older age group (19–21 years)	.26**	.26**	.25**	.16**
White	.07	.06	.06	.06
Heterosexual	−.26**	−.25**	−.26**	−.21**
Total times run	.21**	.21**	.21**	.22**
Role relationship				
Family member present		−.08	−.07	−.05
Affective & interactional chars				
Frequency of interaction			.02	−.01
Closeness to network members			.06	.03
Network sanctions & norms				
Condom beliefs[a]				.06
Average sex risk[a]				.05
Average drug risk[a]				.38**
Sanction risk[a]				.17**
Adjusted R^2	.20	.20	.20	.43

a. Refers to behaviors with social network members
** $p < .01$; * $p < .05$

spective of their networks. A second risk was using drugs with their social network members, which may have been done to avoid sanctions for non-conformity imposed by members of their peer group (Fisher, *1988*), which is consistent with previous research on homeless youth (Ennett et al., *1999*; Kipke et al., *1998*; Rice et al., *2005*). A third risk was participation in precarious behaviors (i.e., trading sex) with strangers, all of which increases homeless youths' chances of contracting HIV.

The current study also found that having network members who pressure homeless youth into precarious activities was associated with engaging in more HIV risk behaviors with strangers. It is possible that youth who succumb to the pressure of participating in risky behaviors imposed

upon them by network members are more likely to engage in similar risk behaviors in other situations. For example, research finds that youth who have been coerced into trading sex by a peer eventually gave into that pressure (Tyler & Johnson, *2006b*). Thus, engaging in drug risk behaviors may make subsequent participation more likely, especially when pressure, coercion, and/or threats are involved. Due to sheer necessity, some homeless youth who lack food and/or shelter may succumb to trading sex with a stranger in exchange for items they deem necessary for their survival (Hagan & McCarthy, *1997*).

In terms of protective social network characteristics, though previous research finds that having a family member in one's network is associated with participating in fewer HIV risk behaviors (Ennett et al., *1999*; Rice et al., *2011*; Tyler, *2008*), this variable failed to reach significance in the current study. One possible explanation for why this variable was not significant may be attributed to the relationship type of the family member in one's network. For example, having more relatives in one's network (e.g., aunt or uncle) who possess numerous resources they are willing to share (e.g., money or housing for the night so the youth does not have to resort to trading sex) may provide more of a protective function than a relative (e.g., younger sibling) with limited resources. As such, it is possible that even though current study youth may have listed multiple relatives as being in their network, these individuals may lack (or be unwilling to share) certain resources. The unavailability of resources from a family member is a plausible explanation given that some participants listed a child as a network member.

Contrary to expectations, frequency of interaction and closeness to network members were not significantly associated with HIV risk behaviors. It is possible that, because many youth lead transient lifestyles (Tyler & Whitbeck, *2004*), they have fewer opportunities to interact and to develop close emotional ties with some of their network members on a long-term basis. As such, these characteristics may not be as important as network sanctions and norms, which may translate into engaging in more risk behaviors (Kipke et al., *1998*; Rice et al., *2005*). The different relationships that bind homeless youth to their social networks (e.g., subgroups that trade sex or use drugs) may solidify certain behaviors, attitudes, and norms, regardless of the amount of closeness or interaction and may, in some cases, send the message that these risk behaviors are acceptable and considered important for survival (Kral et al., *1997*; Martinez et al., *1998*; Tyler & Johnson, *2006a*, *b*).

Demographic results showed that 19–21 year olds, GLBT youth, and those who had run from home more frequently were more likely to engage in a greater number of HIV risk behaviors with strangers compared to their counterparts. Among 19–21 year-olds, it is likely that they have had more time, compared to 14–18 year-olds, to engage in precarious activities, including more HIV risk behaviors, which is consistent with previous research (Tyler, *2008*). The fact that GLBT youth engaged in more HIV risk behaviors compared to their heterosexual counterparts may be explained by their higher rates of survival sex and STIs (Clatts & Davis, *1999*; Kipke et al., *1995*; Moon et al., *2000*), both of which are risk factors for HIV (CDC, *2011a*). Finally, youth who run from home more frequently are likely to spend more time on the streets and this exposure is associated with participation in deviant subsistence strategies (Hagan & McCarthy, *1997*), including trading sex. That is, being on the street, youth quickly learn survival strategies in order to cope with their current situation. These strategies may include trading sex as well as other drug and sexual risk behaviors.

In terms of limitations, because all data were based on self-report, it is possible that some youth may be over- or underreporting on their risky behaviors and/or on that of their network members. Relatedly, even though youth were queried about each individual network members' behavior and attitudes, social network variables were only measured at the individual level and reported on by the participant, which should be kept in mind when interpreting the findings. Additionally, this study was cross-sectional; therefore, inferences about causality cannot be made. Finally, although positive attributes of the network were examined (e.g., frequency of interaction and closeness) these measures were not significant. Though it is probable that the negative attributes of the network (e.g., drug use) outweigh any positive attributes, it is also possible that additional protective measures of social network members are needed. Despite these limitations, this study had numerous strengths. First, both risk and protective social network characteristics were examined, including role relationship, affective and interactional, and network sanctions and norms using multivariate analyses, which allows for a better understanding of homeless youths' social networks. Second, HIV risk behaviors of both social network members as well as those of strangers were examined. In other words, the wording of questions allowed for mutual exclusivity between the two groups, which provides a more complete picture of youth's risky involvement with both network and non-network members. Third, the effects of various social network characteristics on HIV risk behaviors was examined by gender, age, race, and sexual orientation, which is important for targeting specific subgroups of the homeless population who may be at greater risk for HIV.

The findings of this study also have important implications for service providers. Clinicians who serve homeless youth should be aware of multiple ways that these young people are at risk for HIV infection, including individual, peers/network members, and strangers. Thus, intervention should be targeted at multiple levels to reduce the risk of participation in HIV-related behaviors. Additionally, older individuals and GLBT youth participate in more HIV risk behaviors than their counterparts so these are subgroups within the homeless youth popula-

tion that may require additional counseling and intervention. Finally, although the presence of a family member in one's social network was not significant at the multivariate level, it is potentially a relationship role that should be further explored as a potential protective function and possibly as a way to educate youth about the risks of certain behaviors. Focusing on role relationships of family members and creating additional ways to increase family and home-based peers in one's network may be one method for preventing homeless youth from engaging in HIV risk behaviors.

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