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Homies with Aspirations and Positive Peer Network Ties: Associations with Reduced Frequent Substance Use among Gang-Affiliated Latino Youth

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ABSTRACT *In marginalized urban neighborhoods across the USA, Latino youth are disproportionately represented among the growing number of youth gangs. Substance use among gang-involved youth poses both immediate and long-term health risks and can threaten educational engagement, future socioeconomic stability, and desistance. Conventional assessments of gang-affiliated youth and their peer network overlook the possibility that positive peer ties may exist and can foster health promoting behavior norms. Drawing on a positive deviance framework, in this study, we examine the relationship between positive peer network characteristics tied to post-secondary educational aspirations and frequent alcohol and marijuana use among Latino, gang-affiliated youth from a neighborhood in San Francisco. Using generalized estimating equations regression models across 72 peer network clusters (162 youth), we found that having close friends who plan to go to a 4-year college was associated with a lower odds of frequent marijuana and alcohol use (OR 0.27, p=0.02; OR 0.29, p=0.14, respectively) and that this association persisted when adjusting for risk characteristics (OR 0.19, p<0.01; OR 0.25, p=0.12). Public health can advance gang intervention efforts by identifying protective and risk factors associated with non-criminal health outcomes to inform participatory research approaches and asset-based interventions that contribute to building healthy communities.*

KEYWORDS *Latino youth, Gangs, Social networks, Substance use, Positive deviance*

INTRODUCTION

Youth gangs in the USA are a prominent feature of the urban social landscape. Between 2002 and 2011, the number of youth gangs nationally increased by 37 %, from 21,800 to 29,900.[1,2] Most of this increase occurred in metropolitan areas. California, Illinois, and Arizona account for the highest number of gang members in the country, with Latino youth comprising the greatest percentage, 46.2 %, of the membership base nationwide.[3,4]

The association between youth gangs and violent and delinquent behavior is widely documented. It drives criminal justice, and more recently, public health efforts to prevent gang membership and devise suppressive measures, such as civil gang injunctions, that target individual gang members.[2,3,5] A primary focus on punitive approaches to address criminal behavior can inhibit a broader understand-

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ing of the gang peer network and mask the marginalization and health disparities gang-involved youth face.[6] Alcohol and illicit substance use have been associated with gang-involved youth and are correlated with other high-risk health behaviors among Latino adolescents.[7–9] Public health researchers can contribute to gang intervention efforts by identifying risk and protective factors in the social environment and taking a non-criminal approach to addressing negative health behaviors, including alcohol and drug use.[10]

Substance use plays a prominent role in health risk among US adolescents. By the time US adolescents are seniors in high school, 70 % have tried alcohol and 36 % use marijuana.[11] Compared to white and African American students, Latino students have the highest reported rates of alcohol use in 8th and 10th grade and of marijuana use in 12th grade.[11] In addition to implications for adult substance abuse, frequent marijuana and alcohol use during adolescence has been associated with high-risk sexual behavior (unprotected sex and multiple sexual partners) and disengagement from school, including lower odds of degree attainment and lower income in adulthood.[8,12–15] Conversely, having high educational aspirations with plans to go to college has been found to be associated with lower adolescent alcohol and illicit drug use.[11,16]

Various features of the social environment have been associated with the etiology of substance use among Latino youth in the USA. The interaction of family dynamics and immigrant adaptation, for instance, has been shown to affect substance use behaviors. Substance use risk may increase as Latino youth drift away from protective family cultural values tied to a sense of responsibility and respect for family, an influence that may mediate the roles of peer group selection and substance use norms on adolescent substance use.[17,18] However, immigrant families with limited US-based social support coupled with livelihood demands that impede time for parent–child involvement may experience isolation and stress that increase the likelihood of youth associating with peers who engage in high-risk health behaviors, including alcohol and drug use.[19] Further, Fagan et al. found that peer substance use was a stronger predictor of individual substance use among Latino youth than neighborhood socioeconomic disadvantage, though other neighborhood features, such as community norms related to use and availability of substances may mediate this relationship.[20] For Latino, gang-involved youth, contextual factors associated with frequent substance use may be particularly pronounced.

Substance use is associated with youth gang-involvement, and substance abuse treatment is often a key component of comprehensive gang intervention programs.[2,21–23] Amidst the proliferation of alcohol outlets in poor, urban neighborhoods, alcohol and drug use, including public consumption, is also a component of gang-culture.[24] For gang-involved youth, engaging in high-risk health behavior during adolescence that contributes to low educational attainment can threaten familial and financial stability as well as desistance from crime in adulthood.[25]

A public health approach can provide guidance in developing innovative ways to address concurrent adverse health outcomes among gang-involved youth, particularly outcomes that share common social environmental exposures. An important step in this process is reexamining dominant risk-based and penal approaches to assessing gang-involved youth and their peer networks. Positive deviance is a framework and a public health participatory research method that can help shape a broader understanding, including the potential for gang-involved youth to be agents of change. A positive deviance (PD) approach involves community mobilization to

collect and analyze data to inform interventions. PD interventions build on the actions of individuals in the community who have better outcomes than their peers given the same resource deficit.[26] PD directs attention to what is "right" rather than what is "wrong" to address social and behavioral change where there has been marginal success. While addressing health disparities may require extensive socioeconomic transformation, a PD approach emphasizes immediate solutions to improving health outcomes utilizing techniques that can lead to sustainable change overtime.[27] PD is best suited to situations in which there is a concentration of individuals with adverse health outcomes which can create an impetus for program planners and tailored interventions for vulnerable groups.[27,28] In essence, gang-involved youth who are also positive deviants may be able to facilitate the diffusion of protective behavioral norms across and within their peer networks.

Gang interventions are generally designed to help gang-involved youth break peer ties, particularly among former gang members who are hired as intervention-ists.[23,29,30] A defining characteristic of a youth gang is the very cohesion of the peer network. However, the implicit assumption that network ties must be broken for interventions to be successful may overlook an opportunity to identify positive aspects of peer ties that may serve as an intervention pathway to alter harmful normative behaviors and adverse health outcomes. Multiple disciplines have highlighted the potential role of social networks to enhance the spread of normative health behaviors, including among adolescents, and to serve as targets for neighborhood intervention.[31–34]

Drawing on a positive deviance framework, we explore two questions using data from a study with youth from an urban neighborhood with substantial gang presence. First, what are the asset and risk features of the close friend network of gang-affiliated youth? Second, how are these characteristics associated with frequent substance use among gang-affiliated youth? The assets include having network members with post-secondary educational aspirations and engagement. The risk characteristics include truancy, detention, and adolescent pregnancy.

METHODS

We analyzed baseline data from a randomized feasibility study of a sexual health intervention, *Yo Puedo*: Future Opportunities for Youth, conducted with Latino youth in San Francisco, California.[35,36] *Yo Puedo* was delivered to clusters of small peer networks and is part of a community-based research program, spanning the last 10 years, with Latino youth, community agencies, and high school Wellness Centers in San Francisco's Mission District.

During the last decade, poor and working class neighborhoods in San Francisco have undergone substantial economic and ethnic transformation. Among the most affected neighborhoods in the city, the Mission District has experienced stark gentrification driving residential upheaval, local business turnover, and an increase in health inequity and social exclusion.[37] Home to the largest Latino community in the city, the Mission District is also home to rival street gangs, *Norteños* and *Sureños*, that stem from Mexican American prison gangs. At the end of 2006, the City Attorney initiated a controversial civil gang injunction creating "safety zones" against five of San Francisco's street gangs.[38] The "*Norteño* Safety Zone" encompasses a large section of the southeast portion of the Mission and includes several public schools and parks. Local youth agencies and cultural centers remain

active in advocating for marginalized youth and families who contend with barriers related to housing instability, immigration status, and criminal justice involvement.

Participants

Latino youth, 16 to 21 years old, were recruited by bilingual study team members from street-based venues, such as parks, alleyways, and street corners, through community partner agency presentations and referrals, and from the two neighborhood high schools. For street-based recruitment, community partners assisted in the recruitment of out-of-school, gang-involved youth and their peers. Individuals who self-identified as Latino, spoke English or Spanish, were non-parenting, lived in San Francisco, and spent at least 4 days a week in the Mission District were eligible to participate and invite up to two same-gender friends (of any ethnicity) to join the study. Youth and their peers were screened for eligibility and written informed consent/assent was obtained prior to enrollment. Between June 2011 and January of 2012, 162 index recruits and their friends enrolled in the study comprising 72 small peer networks with average size of 2.3 youth. The Institutional Review Board at RTI International approved the study.

Measures

The measures used in this analysis have been piloted and validated through previous research activities as part of the community-based research program in the Mission.[7,39]

Gang-Affiliation. Gang-affiliation was defined as a self-reported "Yes" to current gang membership (*Do you currently belong to a gang* [*claim or wear a color*]?) and/or current affiliation in their social network (*Do you currently hang out with people who are associated with a gang or color but don't claim*?/*Do you currently hang out with people who bang or claim a color*?). This definition captures youth whose peer network is comprised of gang members and affiliates but who may not identify as a gang member because they have not formally been "jumped" (or initiated) into the gang. Second, this designation incorporates the peer group aspect of gang identity. Though we did assess familial gang affiliation, we chose not to incorporate that measure in our definition of gang-affiliation to better isolate both current gang involvement and youth selection of their social group.

Primary Dependent Variables: Frequent Alcohol and Marijuana Use. Frequent alcohol and marijuana use were assessed using the following questions: *In the last 6 months, how often did you drink more than a few sips of alcohol*?/*Over the past 6 months, how often did you use marijuana*? Response items included *every day, at least once a week, at least once a month,* and *less than once month.* "Alcohol" included beer, wine, hard liquor, and any mixed drinks containing alcohol. The 6-month time period was aligned with the follow-up period for the study. Frequent alcohol and marijuana use were assessed separately and coded as dichotomous variables (*at least once a week or more* vs. *at least once a month or less*).

Primary Independent Variables: Close Friend Network Characteristics. To assess close friend network characteristics, youth were asked a series of questions focused on various positive and risk behaviors of their peer network. "Close friends" was defined as "people you spend time with or kick it with more than others or trust more than others" and could include "blood relatives." Questions used in these analyses to assess

network assets included positive behaviors tied to education (e.g., *How many of your close friends plan to go to a 4-year college?/How many of your close friends are currently enrolled in a 4-year college?*) and three risk characteristics tied to criminal justice involvement, educational disengagement, and sexual behavior (*How many of your close friends have spent a night in juvenile detention or prison?/How many of your close friends skip or cut class about once a week or more?/How many of your close friends have been pregnant or gotten someone pregnant?*). Response items included *none*, *some*, *most*, and *all*. Each response item of interest was coded as a dichotomous variable (*at least some of them or more* vs. *none of them*).

Covariates. Sociodemographic covariates included age (continuous), gender, socioeconomic status (based on use of social service benefits by someone in the participant's home in the last 6 months), and in what country the participant attended middle school. Where youth attended middle school (coded as *in the USA* vs. *not in the USA*) was used as proxy for time spent in the USA. This measure captures both US-born youth and youth that immigrated to the USA prior to adolescence and remained in the USA during the early years of puberty, including the peak years for joining gangs.[25,40] Social service benefits included WIC, Medi-Cal, unemployment benefits, and food stamps. Because youth are often uncertain of family income, family social service benefits use served as a proxy for socioeconomic status.[41]

Analysis

All analyses were conducted using STATA version 12. First, we used chi-square tests and *t* tests by gang-affiliation to examine variations in distributions of sociodemographic characteristics and distributions of educational norms, aspirations and barriers, substance use, and sexual health. Second, we examined peer social environmental factors based on close friend network composition characteristics by gang-affiliation. We assessed missing values with each test to assess any systematic differences by gang-affiliation.

Finally, we used generalized estimating equations (GEE) with a logit function (xtgee) for binary outcomes (frequent alcohol and marijuana use). GEE was chosen for all regression models to account for the effects of clustering introduced through the peer network recruitment approach. Using GEE logistic regression, we assessed marginal or population-averaged associations across peer networks using robust estimates that take into account correlations between individuals within networks to estimate the regression parameters and standard errors.[42,43]

To assess the relationship between network assets and frequent substance use we used main effects models. Assets are referred to as promotive or compensatory factors in main effects models when such factors operate in the opposite direction of risk factors.[44] Main effect models can inform asset-based intervention strategies focused on strengthening assets to counterbalance risk in the social environment.[45] First, for each individual substance use outcome, we examined each close friend characteristic separately to assess the direction of the association. For significant associations ($p<0.05$), we then paired characteristics in opposition two at a time (e.g., *having close friends who have been/gotten someone pregnant* and *having close friends who plan to go to a 4-year college*) to assess shifts in the direction of the association. Specifically, we wanted to examine if adjusting for a particular risk factor would increase the protective association (OR<1.0) of the positive characteristic. Finally, we examined a full model based on the initial set of

significant friend characteristics (positive and risk) to assess any difference in protective associations. Based on the distributions of the main parameters of interest, the GEE models were run with the entire sample (162 participants and 72 networks). For each model, we conducted a sensitivity analysis with gang-affiliated youth (78 participants and 50 networks) to determine whether the associations assessed across the whole sample persisted when examining only gang-affiliated youth. We also examined the models for gang-affiliated youth stratified by gender. We found no differences in the relationships between our primary exposures and substance use outcomes comparing males and females. Therefore, we chose to present combined results and adjust for gender to address any modest confounding.

RESULTS

Participant Characteristics by Gang Affiliation. Of the 162 youth enrolled in *Yo Puedo*, nearly half (48.1 %) was gang-affiliated (Table 1). Compared to non-affiliated youth, gang-affiliated youth were slightly older (mean age, 17.2 vs. 16.6 years; $p=0.01$) and more likely to be living in a home where a family member was receiving social service benefits (64.1 vs. 50.0 %, $p=0.02$). Though there were no significant differences by gender, nativity, or other sociodemographic measures, distributions suggest gang-affiliated youth to be more heavily represented for nearly every proxy of low socioeconomic status. With respect to sexual health, gang-affiliated youth were more likely to have ever been sexually active and have accessed reproductive health services in the last 6 months.

Though most youth overall were currently enrolled in school, gang-affiliated youth were less likely than non-affiliated youth to be in school (84.6 vs. 95.2 %, $p=0.02$) and more likely to be truant (34.6 vs. 3.1 %, $p<0.01$). There were no significant differences by gang-affiliation with respect to educational aspirations or barriers to reaching educational expectations. Most youth, nearly two-thirds, aspired to graduate from a 4-year college and nearly 50 % identified an inability to pay for their education as the most significant barrier to getting as far as they would like in school. Gang-affiliated youth were more than twice as likely to report weekly alcohol use (30 vs. 11.9 %, $p=0.01$) and weekly marijuana use (46.2 vs. 17.9 %, $p<0.01$). Of note, compared to non-affiliated youth, gang-affiliated youth were also significantly more likely to have affiliated family members (73.1 vs. 33.3 %, $p<0.01$; data not shown).

Close Friend Characteristics by Gang Affiliation. Compared to non-affiliated youth, gang-affiliated youth were more likely to report that their close friends lived in their neighborhood (75.6 vs. 51.2 %, $p=0.01$; Table 2). There were no significant differences between gang-affiliated and non-affiliated youth with respect to having close friends in school, currently enrolled in a 2-year or 4-year college or vocational training program. Furthermore, about 90 % of both groups reported having at least some close friends who aspired to go to a 4-year college. Compared to non-affiliated youth, gang-affiliated youth were more likely to have truant close friends (71.8 vs. 44.1 %, $p<0.01$), have close friends who have spent a night in juvenile detention or prison (73.1 vs. 28.6 %, $p<0.01$), and have close friends that have been or gotten someone pregnant (56.4 vs. 22.6 %, $p<0.01$).

Associations between Close Friend Characteristics and Frequent Substance Use. Across the 72 peer networks enrolled in *Yo Puedo*, the only significant

TABLE 1 Background characteristics of *Yo Puedo* participants by gang affiliation

	Gang-affiliated N = 78 N (%)	Non-affiliated N = 84 N (%)	p value
Sociodemographic characteristics			
Mean age	17.2	16.6	0.01
Female	35 (44.87)	48 (57.14)	0.12
Latino/a	71 (91.03)	68 (80.95)	0.07
Foreign-born	26 (33.33)	31 (36.90)	0.63
Attended middle school in the USA	63 (80.77)	58 (69.05)	0.10
Maternal education<high school	39 (50.00)	30 (35.61)	0.11
Crowded housing conditions[a]	42 (53.85)	35 (41.67)	0.12
Maternal first birth ≤18 years	25 (32.05)	24 (28.57)	0.54
Social services benefits use	50 (64.10)	42 (50.00)	0.02
School and education			
In school now	66 (84.62)	80 (95.24)	0.02
Skipped school >4 days in past month[b]	27 (34.62)	11 (3.10)	**
Educational aspirations			0.65
High school or equivalent	7 (8.97)	7 (8.33)	
Trade school, vocational school, or some college	21 (26.92)	19 (22.62)	
College graduate or advanced degree	49 (62.82)	58 (69.05)	
Educational barriers			
Don't know how to pay for it	37 (47.44)	47 (55.95)	0.28
Don't know requirements to apply	3 (3.85)	1 (1.19)	0.28
Don't have credits or grades	13 (16.67)	11 (13.10)	0.52
Motivation	17 (21.79)	16 (19.05)	0.66
Sexual health and history			
Sexually active (ever)	64 (82.05)	54 (64.29)	0.02
Mean age at first sex	14.36	14.57	0.42

TABLE 1 *Continued*

	Gang-affiliated	Non-affiliated	
	N = 78	N = 84	
	N (%)	N (%)	p value
Unprotected sex in the past 6 months[c]	18 (33.96)	17 (38.64)	0.66
Pregnancy intentions			
Definitely do not want to get pregnant in the next 6 months	73 (93.59)	79 (94.09)	0.90
Ideal age for a first child	25.44	25.58	0.84
Accessed reproductive health services in the past 6 months	50 (64.10)	35 (41.67)	**
Substance use			
Frequent alcohol use	24 (30.77)	10 (11.90)	0.01
Frequent marijuana use	36 (46.15)	15 (17.86)	**

[a]More than one person per room, US Census

[b]Among those currently in school

[c]Among those who have had sex in the past 6 months

** $p < 0.01$

TABLE 2   Close friend* network characteristics by gang affiliation

	Gang-affiliated	Non-affiliated	
	N=78	N=84	
	N (%)	N (%)	p value
Mean number of close friends (SD 3.79–5.57)	7	5	0.02
Foreign-born	59 (75.64)	57 (67.86)	0.43
Live in your neighborhood	59 (75.64)	43 (51.19)	0.01
Positive characteristics			
Currently in school	73 (93.59)	82 (97.62)	0.14
Currently in a 2-year college	30 (38.46)	21 (25.00)	0.14
Currently in a 4-year college	26 (33.33)	18 (21.43)	0.22
Currently in a job-training program	33 (42.31)	29 (34.52)	0.50
Plan to go to a 4-year college	69 (88.46)	76 (90.48)	0.20
Risk characteristics			
Skip or cut class at least once a week	56 (71.79)	37 (44.05)	**
Have spent a night in juvenile detention or prison	57 (73.08)	24 (28.57)	**
Have been pregnant/gotten someone pregnant	44 (56.41)	19 (22.62)	**

*"people you spend time with or kick it with more than others or trust more than others and can include blood relatives"

**$p<0.01$

positive characteristic associated with a lower odds of frequent substance use was having close friends who plan to go to a 4-year college (Table 3, Model 1). This characteristic was not significant for frequent alcohol use, but was significantly associated with a lower odds of frequent marijuana use (OR, 0.27; $p=0.02$). With respect to close friend risk characteristics, there was an increased odds of frequent marijuana use associated with having truant close friends (OR, 3.58; $p<0.01$), having close friends who have spent time in detention (OR, 4.77; $p<0.01$), and having close friends who have been/gotten someone pregnant (OR, 4.45; $p<0.01$). Having close friends who have spent time in detention (OR, 7.37; $p=0.01$) and who have been/gotten someone pregnant (OR, 2.74; $p=0.03$) were significantly associated with an increased odds of frequent alcohol use.

For the second series of GEE models (Table 3, Models 2–4), each of the three risk characteristics was examined paired with having close friends who plan to go to college as the primary exposure of interest. Overall, there was evidence for modest shifts in the protective association of having close friends with college plans when adjusting for risk behaviors. The lowest odds of frequent marijuana use associated with having close friends who plan to go to college was found when adjusting for having close friends who have been/gotten someone pregnant (OR, 0.16; $p<0.01$; Model 2). Adjusting for close friends who have spent time in detention also resulted in lower odds of frequent marijuana use (Model 4). Controlling for truant close friends rendered the protective association with having close friends who plan to go to college insignificant (Model 3). This finding is likely due to having a large number of close friends who are both truant and plan to go to college.

Finally, for the fully adjusted model (Model 5), which included the risk characteristics and the covariates, having close friends with higher education aspirations had a protective association in terms of frequent marijuana use (OR,

TABLE 3 Odds of frequent substance use across participant networks by close friend group characteristics ($N=162$, 72 networks)

Close friends characteristics	Weekly marijuana use			Weekly alcohol use		
	OR	95 % CI	p value	OR	95 % CI	p value
Model 1*						
Plan to go to a 4-year college	0.27	(0.09–0.79)	0.02	0.29	(0.06–1.53)	0.14
Currently in a 2-year college	1.45	(0.75–2.79)	0.27	1.51	(0.58–3.92)	0.40
Currently in a 4-year college	0.95	(0.49–1.86)	0.88	0.52	(0.18–1.49)	0.22
Currently in a job-training program	1.48	(0.72–3.06)	0.29	1.03	(0.48–2.21)	0.93
Skip or cut class at least once a week	3.58	(1.63–7.88)	**	1.7	(0.58–4.99)	0.34
Spent a night in detention	4.77	(2.43–9.35)	**	7.37	(1.73–31.4)	0.01
Been pregnant/gotten someone pregnant	4.45	(2.23–8.90)	**	2.74	(1.10–6.83)	0.03
Model 2*						
Adjusting for pregnant close friends:						
Plan to go to a 4-year college	0.16	(0.05–0.47)	**	0.26	(0.48–1.40)	0.12
Model 3*						
Adjusting for close friends that skip/cut class:						
Plan to go to a 4-year college	0.32	(0.08–1.24)	0.10	0.24	(0.04–1.20)	0.08
Model 4*						
Adjusting for close friends in detention:						
Plan to go to a 4-year college	0.32	(0.13–0.83)	0.02	0.38	(0.05–2.57)	0.32
Model 5*						
Adjusting for all close friend risk characteristics:						
Plan to go to a 4-year college	0.19	(0.06–0.58)	**	0.25	(0.04–1.47)	0.12

*Covariates: age, gender, social services, US middle school

**$p<0.01$

0.19; $p<0.01$). The association between having close friends who plan to go to college and frequent alcohol use was marginal and in the expected direction (OR, 0.26; $p=0.12$). Of note, despite shifts in the protective association of having close friends who pan to go to college and frequent marijuana use, there were overlapping confidence intervals with all models. In addition, there was a consistent association between age and alcohol use in almost every model: a 1-year increase in age was associated with a 1.5-fold increased odds of frequent alcohol use.

DISCUSSION

Drawing on a positive deviance framework, this study examined whether urban, primarily Latino, gang-affiliated youth and their close friend networks exhibited positive behaviors and how such assets were related to individual frequent marijuana and alcohol use. Nationally, about one in five (19 %) large cities report having 1,000 or more youth gang members with a small percentage (about 8 %) of youth actually ever joining gangs.[4,46] Our findings suggest that gang-affiliated youth and the composition of their close friend network are more heterogeneous with respect to distributions of risk and positive behaviors than conventional assessments might suggest. Lustig and Sung encourage a "reframing of risk" and suggest that diverse peer networks may offer beneficial ties that can serve as bridges for resources for youth living in low-income communities.[47] Such ties may also counterbalance and offer protection against harmful behavior norms such as substance use that can lead to adverse health outcomes and, ultimately, compromise future opportunity for gang-involved youth and the well-being of the communities in which they live.

A large proportion of participants in this study reported gang affiliation. Despite significant differences by gang-affiliation in substance use, there were no differences by gang-affiliation in individual post-secondary educational aspirations. Nearly two-thirds (63 %) of gang-affiliated youth aspired to have, and thought they would attain, a college or advanced degree. Longitudinal data have demonstrated lower educational attainment of individuals who have been in a gang compared to those who have not, which is attributed, in part, to minimal exposure to a pro-social and future-oriented peer network.[46] A positive deviance approach would entail asking gang-involved youth about the presence of future-oriented peers in their social network and seeking those that have accessed post-high school opportunities to help others in their network to replicate their steps to educational attainment. Specifically, gang-involved positive deviants may offer insights into pursuing pathways to realize educational goals. To this end, the PD process entails engaging, untangling, and transforming the ways in which the social system of a community "holds intractable problems in place…to allow new behaviors and mind-sets to evolve."[26]

Our results suggest that having close friends who plan to go to a four-year college has a protective association against frequent marijuana and alcohol use. Eighty-eight percent of gang-affiliated youth in this study reported having close friends who plan to go to a 4-year college. In addition, one in three gang-affiliated youth reported having close friends currently enrolled in a 4-year college with 42 % enrolled in a vocational training program. Though these findings tied to the post-secondary educational engagement of their close friends did not produce significant results associated with substance use, tapping into the peer network may offer an opportunity for bridging resources and acquiring future-oriented behavior norms through such friend ties. A further understanding of how such ties, between friends

and across gang-affiliated individuals within the same neighborhood, might function to reduce substance use may offer a promising intervention strategy. Research on how to capitalize on adolescent peer ties to enhance intervention uptake suggests that networks in which members have direct connections to many individuals may prove more fruitful for intervention diffusion than a clustered network in which individuals have fewer friends outside of their own group.[33] Given that the structure of gangs encompasses a unique social organization with place-based dimensions, it may be essential to involve gang-affiliated youth as both partners and participants in research efforts to uncover these pathways and engage their future-oriented friends.

Another finding of interest that emerged was the relative strength of association of having close friends who have been or have gotten someone pregnant with increased odds of frequent substance use. Adjusting for this peer characteristic also increased the protective association of having close friends with college plans. Other research has also documented an inverse relationship between future orientation, including educational aspirations, and adolescent pregnancy.[48] This finding also highlights the importance of adolescent pregnancy prevention efforts with gang-involved youth to address both young women and young men and their partners. Though nationally young women constitute about one-fourth to one-third of gang members, many more may be affiliated and exposed to early childbearing peer network norms.[49] In this study, for instance, 45 % of gang-affiliated youth were female. Building youths' ties to future-oriented, goal-motivated peers may help to both prevent unintended pregnancy and reduce substance use. Further research is needed to explore the mechanisms underlying the connections between future-oriented peers and positive health outcomes among gang-involved youth.

There were several limitations to this study. First, this was a cross-sectional analysis, and thus, the results do not permit causal inference. In addition, the relatively small and clustered sample size provided insufficient statistical power to examine interaction effects, which would have offered an exploration of moderated associations between the various close friend characteristics (risk and protective factors), gang-affiliation, and substance use. The non-random sample is from one neighborhood in one city that is predominantly Latino, and thus, may not be generalizable to other urban populations. However, a study involving a hidden and vulnerable population often requires a distinct understanding of the social fabric unique to a community, and thus, entails recruitment and participation of a non-representative sample. With respect to bias, gang members may not report individual gang membership due to social desirability bias during face-to-face interviews. We expanded our criteria for gang-affiliation designation to ameliorate such bias. Frequent marijuana and alcohol use were relatively common (31 and 21 %, respectively for the entire sample), so the magnitude of the odds ratios cannot be interpreted as relative risks.

Categorizing gang-involved youth as criminals can mask the social environmental factors that draw youth to gangs initially, the health inequities they face, and the potential for gang-involved youth to be partners in research and intervention design to improve their own lives and participate in building healthy communities. Youth gangs often emerge from neighborhoods with entrenched poverty and racial and health disparities, conditions that also shape access to present and future socioeconomic prospects.[6,50–53] These same contextual factors, including culture conflict, alienation from family and racial and ethnic discrimination, have also been associated with alcohol and drug use

among Latino youth and adults.[17],r[54] There is a need for novel intervention approaches that address structural exposures and can better tackle multiple health outcomes, including frequent substance use, with common pathways. The findings from this study encourage public health researches concerned with substance use among gang-affiliated youth to consider pursuing a better understanding of how gang-involved youth engage with future-oriented peers. However, if we wish to address fundamental causes of adverse health outcomes among gang-involved youth, then we must also consider ways to design interventions that create higher education opportunities for gang-affiliated youth to be able to realize post-secondary aspirations and the potential for socioeconomic stability.

A positive deviance approach can aid in reframing risk, in asking the non-intuitive questions, and in seeking to make the unconventional observations of what gang-affiliated youth are doing right. Positive deviance has been used to inform interventions almost exclusively outside the USA, primarily in nutrition and maternal-child health programs. Nonetheless, findings have highlighted ways to support positive deviants in becoming leaders to affect social network norms, including condom use uptake among Rwandan youth with high rates of HIV sero-prevalence and early sexual debut, increased responsibility for condom and contraceptive use among gang-affiliated youth in Rio de Janeiro, and strategies to stay HIV-negative among injection drug users in New York.[55–57]

Intervention designs that consider novel approaches, including participatory methods, to address structural and place-based inequities can impact a range of factors affecting the health and well-being of adolescents. To this end, building on positive social network ties that may lead to increased educational aspirations to decrease substance use may also, for instance, protect against unplanned pregnancy among gang-affiliated youth. To take a fresh approach to gang intervention requires unconventional efforts to reverse the toll of marginality and embrace the possibility that gang-affiliated youth, deviating from the norm, can be research partners in uncovering pathways to strengthen peer network assets that improve health outcomes, and in the process, build neighborhood and community capacity.

ACKNOWLEDGEMENTS

REFERENCES

1. Egley A, Howell J. *Highlights of the 2011 National Youth Gang Survey*. U.S. Department of Justice, Office of Justice Programs, Office of Juvenile and Delinquency Prevention; 2013. Available at: http://www.nationalgangcenter.gov/. Accessed 15 April 2014.
2. *Changing course: preventing gang membership*. Office of Justice Programs and Centers for Disease Control and Prevention; 2013. Available at: http://nij.gov/publications/changing-course/Pages/welcome.aspx. Accessed 15 April 2014.
3. *2011 National gang threat assessment: emerging trends*. National Gang Intelligence Center and National Drug Intelligence Center Available at: http://www.fbi.gov/stats-services/publications/2011-national-gang-threat-assessment. Accessed 15 April 2014.
4. *National Youth Gang Survey Analysis*. National Gang Center Available at: http://www.nationalgangcenter.gov/Survey-Analysis. Accessed 15 April 2014.
5. Maxson CL, Hennigan KM, Sloane DC. "It's getting crazy out there": can a civil gang injunction change a community? *Criminol Public Policy*. 2005; 4(3): 577–605. doi:10.1111/j.1745-9133.2005.00305.x.
6. Vigil JD. Urban violence and street gangs. *Annu Rev Anthropol*. 2003; 32(1): 225–42. doi:10.1146/annurev.anthro.32.061002.093426.
7. McCoy SI, Jewell NP, Hubbard A, et al. A trajectory analysis of alcohol and marijuana use among Latino adolescents in San Francisco, California. *J Adolesc Health*. 2010; 47(6): 564–74. doi:10.1016/j.jadohealth.2010.04.007.
8. Tapert SF, Aarons GA, Sedlar GR, Brown SA. Adolescent substance use and sexual risk-taking behavior. *J Adolesc Health*. 2001; 28(3): 181–9. doi:10.1016/S1054-139X(00)00169-5.
9. Prado G, Pantin H. Reducing substance use and HIV health disparities among Hispanic youth in the U.S.A.: the Familias Unidas Program of Research. *Interv Psicosoc*. 2011; 20(1): 63–73. doi:10.5093/in2011v20n1a6.
10. Haegerich T, Mercy J, Weiss B. *What is the role of public health in gang-membership prevention? In changing course: preventing gang membership*. Office of Justice Programs and Centers for Disease Control and Prevention; 2013. Available at: http://nij.gov/publications/changing-course/Pages/welcome.aspx. Accessed 15 April 2014.
11. Johnston L, O'Malley P, Bachman J, Schulenberg J. *Demographic subgroup trends among adolescents for forty-six classes of licit and illicit drugs, 1975–2012*. Ann Arbor, MI: Institute for Social Research Available at: http://www.monitoringthefuture.org/. Accessed 15 April 2014.
12. Simons JS, Maisto SA, Wray TB. Sexual risk taking among young adult dual alcohol and marijuana users. *Addict Behav*. 2010; 35(5): 533–6. doi:10.1016/j.addbeh.2009.12.026.
13. Widome R, Wall MM, Laska MN, Eisenberg ME, Neumark-Sztainer D. Adolescence to young adulthood: when socioeconomic disparities in substance use emerge. *Subst Use Misuse*. 2013; 48(14): 1522–9. doi:10.3109/10826084.2013.800885.
14. Fergusson DM, Boden JM. Cannabis use and later life outcomes. *Addiction*. 2008; 103(6): 969–76. doi:10.1111/j.1360-0443.2008.02221.x.
15. Macleod J, Oakes R, Copello A, et al. Psychological and social sequelae of cannabis and other illicit drug use by young people: a systematic review of longitudinal, general population studies. *Lancet*. 2004; 363(9421): 1579–88. doi:10.1016/S0140-6736(04)16200-4.
16. Schulenberg JE, Merline AC, Johnston LD, O'Malley PM, Bachman JG, Laetz VB. Trajectories of marijuana use during the transition to adulthood: the big picture based on national panel data. *J Drug Issues*. 2005; 35(2): 255–79.
17. Unger JB. Cultural influences on substance use among Hispanic adolescents and young adults: findings from Project RED. *Child Dev Perspect*. 2014; 8(1): 48–53. doi:10.1111/cdep.12060.
18. Telzer EH, Gonzales N, Fuligni AJ. Family obligation values and family assistance behaviors: protective and risk factors for Mexican–American adolescents' substance use. *J Youth Adolesc*. 2014; 43(2): 270–83. doi:10.1007/s10964-013-9941-5.

19. Cox RB, Burr B, Blow AJ, Parra Cardona JR. Latino adolescent substance use in the United States: using the bioecodevelopmental model as an organizing framework for research and practice. *J Fam Theory Rev.* 2011; 3(2): 96–123. doi:10.1111/j.1756-2589.2011.00086.x.

20. Fagan AA, Wright EM, Pinchevsky GM. Racial/ethnic differences in the relationship between neighborhood disadvantage and adolescent substance use. *J Drug Issues.* 2013; 43(1): 69–84. doi:10.1177/0022042612462218.

21. Bjerregaard B, Smith C. Gender differences in gang participation, delinquency, and substance use. *J Quant Criminol.* 1993; 9(4): 329–55. doi:10.1007/BF01064108.

22. Fagan J. The social organization of drug use and drug dealing among urban gangs. *Criminology.* 1989; 27(4): 633–70. doi:10.1111/j.1745-9125.1989.tb01049.x.

23. *Best practices to address community gang problems: OJJDP's comprehensive gang model, second edition.* Office of Justice Programs, Office of Juvenile Justice and Delinquency Prevention Available at: http://www.ojjdp.gov/publications/PubAbstract.asp?-pubi=253257. Accessed 15 April 2014.

24. Herd D. Voices from the field: the social construction of alcohol problems in inner-city communities. *Contemp. Drug Probl.* 2011;38 (1)

25. Krohn MD, Ward JT, Thornberry TP, Lizotte AJ, Chu R. The cascading effects of adolescent gang involvement across the life course. *Criminology.* 2011; 49(4): 991–1028. doi:10.1111/j.1745-9125.2011.00250.x.

26. Pascale R, Sternin J, Sternin M. *The power of positive deviance: how unlikely innovators solve the world's toughest problems.* Boston, Massachusetts: Harvard Business Press; 2010.

27. Walker LO, Sterling BS, Hoke MM, Dearden KA. Applying the concept of positive deviance to public health data: a tool for reducing health disparities. *Public Health Nurs.* 2007; 24(6): 571–6.

28. Sanders B, Schneiderman JU, Loken A, Lankenau SE, Bloom JJ. Gang youth as a vulnerable population for nursing intervention. *Public Health Nurs.* 2009; 26(4): 346–52. doi:10.1111/j.1525-1446.2009.00789.x.

29. Klein MW. Comprehensive gang and violence reduction programs. *Criminol Public Policy.* 2011; 10(4): 1037–44. doi:10.1111/j.1745-9133.2011.00758.x.

30. Arciaga M, Gonzalez V. *Street outreach and the OJJDP comprehensive gang model.* Office of Justice Programs, Office of Juvenile Justice and Delinquency Prevention. Tallahassee, FL: Institute for Intergovernmental Research on behalf of the National Gang Center; 2012.

31. Christakis N, Fowler J. Connected the surprising power of our social networks and how they shape our lives. In: *Connected the surprising power of our social networks and how they shape our lives.* New York, NY: Little, Brown and Company; 2009:1–32.

32. Christakis NA, Fowler JH. Social contagion theory: examining dynamic social networks and human behavior. *Stat Med.* 2013; 32(4): 556–77. doi:10.1002/sim.5408.

33. Rulison KL, Gest SD, Osgood DW. Adolescent peer networks and the potential for the diffusion of intervention effects. *Prev. Sci.*:1–12. doi:10.1007/s11121-014-0465-3.

34. Galea S, Freudenberg N, Vlahov D. Cities and population health. *Soc Sci Med 1982.* 2005; 60(5): 1017–33. doi:10.1016/j.socscimed.2004.06.036.

35. Minnis AM, vanDommelen-Gonzalez E, Luecke E, Dow W, Bautista-Arredondo S, Padian NS. Yo Puedo—a conditional cash transfer and life skills intervention to promote adolescent sexual health: results of a randomized feasibility study in San Francisco. *J. Adolesc. Health.* doi:10.1016/j.jadohealth.2013.12.007.

36. Minnis AM, vanDommelen-Gonzalez E, Luecke E, et al. Social network recruitment for Yo Puedo: an innovative sexual health intervention in an underserved urban neighborhood—-sample and design implications. *J. Prim. Prev.* 2014:1–14. doi:10.1007/s10935-014-0375-y.

37. Mirabal NR. Geographies of displacement: Latina/os, oral history, and the politics of gentrification in San Francisco's Mission District. *Public Hist.* 2009; 31(2): 7–31.

38. Rocca CH, Hubbard AE, Johnson-Hanks J, Padian NS, Minnis AM. Predictive ability and stability of adolescents' pregnancy intentions in a predominantly Latino community. *Stud Fam Plann.* 2010; 41(3): 179–92.

39. Minnis AM, Moore JG, Doherty IA, et al. Gang exposure and pregnancy incidence among female adolescents in San Francisco: evidence for the need to integrate reproductive health with violence prevention efforts. *Am J Epidemiol*. 2008; 167(9): 1102–9. doi:10.1093/aje/kwn011.

40. Howell J. *Gang prevention: an overview of research programs*. Washington, DC: U.S. Department of Justice, Office of Justice Programs, Office of Juvenile and Delinquency Prevention; 2010.

41. Office ACS. Income questions. Available at: http://www.census.gov/acs/www/about_the_survey/income_questions/. Accessed 15 April 2014.

42. Hubbard AE, Ahern J, Fleischer NL, et al. To GEE or not to GEE: comparing population average and mixed models for estimating the associations between neighborhood risk factors and health. *Epidemiology*. 2010; 21(4): 467–74. doi:10.1097/EDE.0b013e3181caeb90.

43. Hanley JA, Negassa A, Edwardes MD DB, Forrester JE. Statistical analysis of correlated data using generalized estimating equations: an orientation. *Am J Epidemiol*. 2003; 157(4): 364–75. doi:10.1093/aje/kwf215.

44. Fergus S, Zimmerman MA. Adolescent resilience: a framework for understanding healthy development in the face of risk. *Annu Rev Public Health*. 2005; 26(1): 399–419. doi:10.1146/annurev.publhealth.26.021304.144357.

45. Masten AS. Ordinary magic: resilience processes in development. *Am Psychol*. 2001; 56(3): 227–38. doi:10.1037/0003-066X.56.3.227.

46. Pyrooz DC. From colors and guns to caps and gowns? The effects of gang membership on educational attainment. *J Res Crime Delinquency*. 2014; 51(1): 56–87. doi:10.1177/0022427813484316.

47. Lustig DF, Sung KK. Dissolving borders: reframing risk, delinquent peers, and youth violence. *Child Youth Serv Rev*. 2013; 35(8): 1197–205. doi:10.1016/j.childyouth.2013.02.013.

48. Driscoll AK, Sugland BW, Manlove J, Papillo AR. Community opportunity, perceptions of opportunity, and the odds of an adolescent birth. *Youth Soc*. 2005; 37(1): 33–61. doi:10.1177/0044118X04267493.

49. Chesney-Lind M. *How can we prevent girls from joining gangs? In changing course: preventing gang membership*. Office of Justice Programs and Centers for Disease Control and Prevention; 2013. Available at: http://nij.gov/publications/changing-course/Pages/welcome.aspx. Accessed 15 April 2014.

50. Conchas GQ, Vigil JD. Multiple marginality and urban education: community and school socialization among low-income Mexican-descent youth. *J Educ Stud Placed Risk JESPAR*. 2010; 15(1–2): 51–65. doi:10.1080/10824661003634963.

51. Freng A, Esbensen F. Race and gang affiliation: an examination of multiple marginality. *Justice Q*. 2007; 24(4): 600–28. doi:10.1080/07418820701717136.

52. Miller HV, Barnes JC, Hartley RD. Reconsidering Hispanic gang membership and acculturation in a multivariate context. *Crime Delinquency*. 2011; 57(3): 331–55. doi:10.1177/0011128709348460.

53. Krohn MD, Schmidt NM, Lizotte AJ, Baldwin JM. The impact of multiple marginality on gang membership and delinquent behavior for Hispanic, African American, and White male adolescents. *J Contemp Crim Justice*. 2011; 27(1): 18–42. doi:10.1177/1043986211402183.

54. Savage JE, Mezuk B. Psychosocial and contextual determinants of alcohol and drug use disorders in the National Latino and Asian American Study. *Drug Alcohol Depend*. doi:10.1016/j.drugalcdep.2014.03.011.

55. Babalola S, Awasum D, Quenum-Renaud B. The correlates of safe sex practices among Rwandan youth: a positive deviance approach. *Afr. J. AIDS Res*. 2002;1 (1):11–21 (11).

56. Barker G. Gender equitable boys in a gender inequitable world: reflections from qualitative research and programme development in Rio de Janeiro. *Sex Relatsh Ther*. 2000; 15(3): 263–82. doi:10.1080/14681990050109854.

57. Friedman SR, Mateu-Gelabert P, Sandoval M, Holly Hagan, Des Jarlais DC. Positive deviance control–case life history: a method to develop grounded hypotheses about successful long-term avoidance of infection. *BMC Public Health* 2008;8 (94).