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The influence of neighborhood characteristics on the relationship between discrimination and increased drug-using social ties among illicit drug users

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Abstract

Objective—Social discrimination may isolate drug users into higher risk relationships, particularly in disadvantaged neighborhood environments where drug trade occurs.

Design—We used negative binomial regression accounting for clustering of individuals within their recruitment neighborhood to investigate the relationship between high-risk drug ties with various forms of social discrimination, neighborhood minority composition, poverty and education.

Results—Results show that experiencing discrimination due to drug use is significantly associated with more drug ties in neighborhoods with fewer blacks.

Conclusion—Future social network and discrimination research should assess the role of neighborhood social cohesion.

Keywords

Discrimination; drug use; social networks; neighborhood; segregation

Introduction

Research has demonstrated that having more social ties among drug users is linked to HIV risk behaviors including needle sharing and transactional sex [1]. For example, researchers show that drug users with greater social ties and social ties who use crack were more likely to share needles and participate in transactional sex than their counterparts with fewer social

ties [2, 3]. Moreover, because drug use is highly criminalized, many drug users experience discrimination including ostracism and rejection from social, housing and employment opportunities [4-7], which may result in isolation from positive social ties. In fact, Crawford and colleagues showed that drug users who experienced discrimination, particularly because of their race, had more high-risk social ties [6].

Social interactions are influenced by spatial patterns and proximity between individuals [8]. However, experiences of social discrimination within disadvantaged neighborhoods may isolate drug users into relationships with other drug users [4, 6, 9-11]. The interaction between discrimination and neighborhood conditions may be shaped by inadequate housing and employment opportunities, making the resources and social ties available pose an even greater risk for negative health consequences. However, there is a paucity of research assessing reports of discrimination by neighborhood characteristics, and further assessing how discrimination and neighborhood disadvantage influence health [12, 13] and possibly health behaviors. A study among non-drug using black women found an inverse relationship between racial discrimination and percent black in the neighborhood [13]. Thus, it is possible that individuals in poorer neighborhoods and those with higher minority composition or racial homogeneity have higher levels of cohesion and a smaller chance of experiencing racial discrimination or identifying experiences of racial discrimination [14, 15], whereas neighborhoods with fewer minorities may present an increased opportunity for discrimination. However, It is unclear whether experiences of discrimination due to non-racial (e.g., drug use and incarceration) attributes are also less likely to occur or be perceived less in these neighborhoods.

Researchers have argued that disproportionately fewer resources available in racially segregated neighborhoods promote stress and negative health behaviors [16] which could explain higher drug use and drug trade levels in these neighborhoods [16]. For example, previous studies using national data show lower levels of drug use among blacks (5, 6); however, racially segregated neighborhoods (7) and neighborhoods with higher concentrations of un-educated, black residents are associated with increases in injection drug use (8) and perceptions of drug trade (9) among black residents. Therefore, neighborhood conditions may pose an increased potential for developing relationships among drug users that facilitate drug-using behaviors and relationships [17] that enhance infectious disease risk.

Given the potential role of neighborhood characteristics on experiences of discrimination and the availability of and isolation into drug use relationships, this study will examine the role of neighborhood minority composition, poverty and education level on the relationship of discrimination due to race, drug use and prior incarceration with drug-using social ties. We hypothesize that drug users who perceive discrimination who are also members of neighborhoods with either high minority composition, low education levels or high levels of poverty would have more drug-using social ties.

Methods

We used data from the Social Ties Associated with Transition into injection drug use (START) study for reports of discrimination and social ties and the 2000 US Census data for characteristics of the participants' neighborhood. Between August 2005 to January 2009, 652 injection drug users (IDUs) and non-IDUs (NIDUs) were recruited into the START study through a 1) prospective study design among NIDUs and 2) a cross-sectional assessment among recently initiated IDUs. Only the baseline data collected from NIDUs and cross sectional data collected among IDUs were included in this analysis. Participants were recruited into START using targeted sampling strategies (TSS) and respondent driven

sampling (RDS). A description of the TSS employed for this study has been described elsewhere [18]. Briefly, TSS was completed in ethnographically mapped high drug activity New York City neighborhoods in Harlem, Lower East Side, South Bronx, Jamaica-Queens and Bedford-Stuyvesant-Brooklyn. RDS, a chain sampling referral strategy, was used to enhance generalizability of the final sample and reach drug users who are harder to reach [19, 20].

To be eligible for the START, individuals had to be between the ages of 18 and 40. IDUs had to report injecting heroin, crack or cocaine for four years or less and at least once in the past 6 months; NIDUs had to report non-injection use of heroin, crack or cocaine for one year or more at least 2-3 times a week in the past 3 months. Participant age was verified with a form of photo identification (e.g., driver's license, state identification). Drug use was verified with a rapid drug test which detected opiate and cocaine metabolites in the urine and injection status was verified by visual track marks (i.e. stigmata). All participants were provided informed consent for study participation. The study protocol and survey instruments were approved by the Institutional Review Boards at Columbia University and the New York Academy of Medicine. Participants were compensated \$30 and provided with public transit cards for travel to and from each interview.

Data collection

Participants completed face-to-face interviewer-administered survey instruments. Survey instruments collected demographic information, drug use patterns, sexual practices, mental health, discrimination experiences and a social network inventory history spanning five years prior to study entry. Participants were asked to retrospectively identify individuals who were a part of their social network year-by-year. For each year, participants identified an important event that occurred in their life to jog their memory of their social network during that year. Once all individuals in their network were identified for each year, detailed information about the drug and sexual practices of each network tie was asked. Recalling behavioral histories have been shown to yield valid responses (using construct validity techniques) among IDUs using a ten-year reconstruction of behavioral histories [21, 22]. This study uses a shorter period of recall of five years for the social network inventory history.

Individual-level variables

To define the outcomes, using the social network and behavioral history, we added the total number of drug ties (network ties that used crack, heroin, inject and network ties drugs are used with) and separately assessed the total number of heroin and injection drug using ties (network ties that use heroin and inject drugs) who pose a particularly increased HIV risk [23].

Discrimination was collected by asking "In your lifetime, have you ever been discriminated against, prevented from doing something, or been hassled or made to feel inferior because of any of the following?" Participants could respond "yes" or "no" to experiencing discrimination because of their age, race, sex (gender), sexual orientation, poverty, drug use, having been in jail or prison, religion, mental illness, physical illness or other. This discrimination measure was modified from previous discrimination studies [24, 25] for drug using populations [7]. Discrimination due to race, drug use and having been in jail or prison (hereafter referred to as incarceration) were the main exposures of interest as they are the three most prevalent forms of discrimination in drug using populations [26].

Consistent with previous studies [18, 27-29], the following covariates were assessed as confounders: age (continuous), gender (male/female), race (Hispanic, non-Hispanic black

and non-Hispanic whites/Other) education (<high school vs. high school or general equivalency degree [GED]), income (<\$5,000 vs. \$5,000) in the past six months, number of female sex partners and male sex partners (continuous), age at sexual debut (continuous), female condom use (always vs. infrequent), male condom use (always vs. infrequent), HIV testing (3 vs. 4 tests), lifetime depression measured using the CIDI [30] (yes vs. no), injection status (yes vs. no), primary type of drug used (cocaine, crack cocaine, heroin, and polytomous drug use including equal use of all three drug types) and sampling strategy (RDS vs. TSS). Racial/ethnic groups that were combined with non-Hispanic whites included Asian or Pacific Islander, Native American, Eskimo, or Aleutian, Black and Hispanic, Mixed and Other. Hispanics who identified as black (n=5) were combined with Hispanics rather than non-Hispanic blacks since their reports of discrimination were more similar to Hispanics (data not shown) suggesting that Hispanic ethnicity may confer different interpretations, meanings and experiences of discrimination [31].

Neighborhood-level variables

Participants were asked about the neighborhood including the cross streets in which they were recruited to participate in the study through TSS or RDS. These neighborhoods were chosen as opposed to home addresses because most participants spent at least half of their time or more (84.28%) hanging out, obtaining drugs and developing relationships with others in these neighborhoods [32]. Participant recruitment neighborhoods were geo-coded to the 2000 US census tract using ArcGIS.

Using Summary Tape Files 2 and 3 from the 2000 US Census, we obtained data on neighborhood minority composition (percent black and percent Latino), poverty (percent living below 100% of the poverty threshold), and education (percent with less than a high school degree) for each census tract represented in the data. We chose to assess minority composition using a proxy (percent black and Latino) rather than formal measure of segregation (dissimilarity index) to be consistent with previous studies [12, 13] assessing discrimination reports in neighborhood environments.

All neighborhood variables (percent black, percent Latino, percent <high school education and social cohesion) were categorized into tertiles based on the distribution of the variable. Cut-points for neighborhood variables were, <44.04%, 44.04 – 75.78% and >75.78% for percent black, <20.09%, 20.09 – 49.77% and >49.77% for percent Latino, <31.46%, 31.46 – 49.12% and >49.12% for percent poverty, and <70.61%, 70.61 – 78.41%, and >78.41% for percent less than a high school education. The neighborhoods in this sample have higher levels of minority residents and socioeconomic disadvantage compared to an average New York City neighborhood between 2000 and 2010 which was 25.5% black, 28.6% Latino, and 18.6% of residents at the poverty level [33].

We excluded participants who identified as transgendered (n=5) and who were missing information on their census tract (n=9). These exclusions yielded an analytical sample of 638 distributed across 143 census tracts (interquartile range of 1-3 participants per census tract).

Statistical Analysis

Descriptive statistics of the sample were calculated and included median and inter-quartile range (IQR) for continuous variables and frequencies for categorical variables. Chi-square tests were performed to determine if significant differences in the prevalence of discrimination according to tertiles of each neighborhood characteristic was present. Unadjusted associations of each form of discrimination (e.g., race, incarceration and drug use), neighborhood characteristics and covariates of interest were assessed with respect to

high-risk drug and heroin/ injecting ties using negative-binomial regression model to obtain the prevalence ratio. Variables with a statistically significant association with each outcome at $p < 0.05$ level were included in the adjusted model. Each neighborhood variable was assessed separately as the estimates barely changed when they were included together.

Two-way interactions between discrimination and each neighborhood characteristic identified as important in the bivariate analysis ($p < 0.05$) were tested in the fully adjusted models. If an interaction was observed, final models were presented showing the relationship between each form of discrimination (e.g., race, drug use, and incarceration) with drug and heroin/injection ties stratified by the neighborhood characteristic of interest, after accounting for individual drug (e.g., injection drug use and primary drug used) and sexual risk behaviors (e.g., lack of condom use, infrequent HIV testing and multiple sex partners).

Population average models specifying a negative binomial distribution were employed using the SAS GENMOD procedure, which took into account clustering of individuals within census tracts. Population average models avoid failure in meeting assumptions of independence between and within individual and hierarchical level observations needed for employing mixed models [34]. All analyses were performed using SAS version 9.2 [35].

Results

Descriptive characteristics of the sample are described in Table 1. The median age was 33 (IQR: 23- 37). Most participants were more likely to be black and Hispanic, male, lower socio-economic status and un-married. The majority of the sample did not inject drugs and used crack cocaine. In terms of sexual behaviors, the median number of female and male sex partners was 1 (IQR: 0 – 2) and 0 (IQR: 0 -1), respectively. Most participants used condoms infrequently regardless of the partner's gender. The median age at sexual debut was 14 (IQR: 12 – 16) and most participants received four or more HIV tests in their lifetime. Most experienced depression in their lifetime and were recruited through RDS.

Participants were more likely to hang out in neighborhoods characterized with medium percentages of blacks, Latinos and residents living below the poverty threshold and low percentages of people without a high school education (Table 1). About 25.9% reported racial discrimination, 32.8% reported discrimination due to drug use and 25% reported discrimination due to incarceration. Participants had a median of 4 drug using ties and 0 heroin/ injection ties. Lower levels of discrimination were reported among members of neighborhoods with a higher percent of blacks, lower percent of Latinos and lower percent poverty. Although no significant differences were seen, there was not a clear pattern of discrimination reports by neighborhood education.

Crude and adjusted associations between discrimination and recruitment neighborhood characteristics with drug and heroin/ injecting ties are shown in Table 3 and 4. With respect to drug using ties (Table 3), a significantly increased number of drug ties was seen among those who reported racial and drug use discrimination. Neighborhoods characterized by medium and high proportions of black residents were less likely to have drug ties. On the other hand, neighborhoods with medium and high proportions of residents without a high school education had significantly more heroin/ injecting ties. In the adjusted models, experiencing racial discrimination (PR:1.41 (95%CI:1.14 – 1.73)), drug use discrimination (PR:1.40 (95%CI:1.17 – 1.67)) and having a neighborhood with high proportions without a high school education (PR:1.26 (95%CI: 1.01 – 1.59)) remained significantly associated with higher drug ties. With respect to heroin/ injecting ties (Table 4), those who reported discrimination due to their race, drug and previous incarceration had significantly more

heroin/ injecting ties. Similar to the drug ties, neighborhoods characterized by medium and high proportions of black residents had fewer drug ties and neighborhoods with medium and high proportions of residents without a high school education had more heroin/ injecting ties. In the adjusted model, only racial discrimination (PR:1.62 (95% CI:1.04 – 2.51)) and neighborhood education (PR-medium: 2.17 (95% CI:1.43 – 3.29); PR-high: 2.22 (95% CI: 1.30 – 3.79)) remained significantly associated with higher heroin/ injecting ties.

Heterogeneity of the association between drug use discrimination with fewer drug using ties ($p=0.012$) and heroin/ injecting ties ($p=0.0962$) was significant for high proportion black neighborhoods. When stratifying by percent black (Table 5), those who reported drug use discrimination in low and medium proportion black neighborhoods had significantly more drug ties than their counterparts reporting no discrimination. The relationship between drug use discrimination and heroin/injecting ties while not significant across the percent of blacks in neighborhood suggests that when compared to those reporting no discrimination, those reporting drug use discrimination in low and medium proportion of black neighborhoods had greater heroin/injecting ties while the opposite was true for those residing in neighborhoods with high proportion of black residents. No significant interactions between racial discrimination and incarceration discrimination with drug nor heroin/ injecting ties and neighborhood education level were observed.

Discussion

We found that neighborhood social characteristics including minority composition and education are important in the relationship between discrimination and high-risk drug and heroin/injecting ties. Neighborhood minority composition was a significant modifier in the relationship between drug use discrimination with drug and heroin/ injecting ties, where individuals who experienced drug use discrimination in neighborhoods with more blacks had significantly fewer high-risk drug and heroin/injecting ties. This suggests that ideals of propriety that could isolate drug users in largely racial minority neighborhoods do not do so [36]. It is possible that these neighborhoods are more respectful and less judgmental of other members of the neighborhood, which may buffer against discrimination and the development of high-risk relationships. Neighborhood education level was not a significant modifier in the relationship between each form of discrimination with drug and heroin/ injecting ties.

To our knowledge, this is the first study to investigate the influence of neighborhood on the relationship between discrimination and high-risk social ties. Our findings were consistent with the findings by Dailey and Hunt [12, 13], namely that members of neighborhoods with more blacks were less likely to report racial and drug use discrimination. Moreover, those who experience racial discrimination in neighborhoods with fewer blacks reported more drug networks than those who did not experience racial discrimination. Since being a member of a more racially integrated (i.e. fewer minorities) neighborhood may increase the chances of encountering a racist or other discriminatory event and provide fewer social supports to buffer against these negative experiences, further examination of the role of social cohesion in neighborhoods with a higher concentration of minority residents [14] should be further explored to support or challenge this plausible explanation [37].

Although neighborhood education was not a significant modifier in the relationship between discrimination and risk ties, participants who were a part of neighborhoods characterized by lower education had significantly more drug and heroin/injecting ties. In a study assessing the social and environmental factors important in the drug use system, having low educational attainment followed by being black and having low income were important indicators of living in a neighborhood where one could see drugs being sold, see people

“high” frequently and marijuana could be easily obtained [38]. Therefore, given potential differences in exposure to drug activity by education level, the role of discrimination in neighborhoods where residents have lower education still warrants further investigation, particularly in a study with more variation and power to detect significant differences across neighborhood characteristics.

The social influence effect, described by Bearman, explains that spatial context influence network relationships that infectiously transmit information about disease and social resources [39]. This concept may be useful for understanding how context influences the development of high-risk relationships among drug users and the social (e.g., information, resources), physical (e.g., drug and sex) and health (e.g., HIV) risks that are transmitted because of these relationships. Understanding how the context of space, place and social experiences shape disease risk is needed to better understand the progression of the HIV epidemic among this marginalized, high-risk population and the progression of racial disparities in HIV.

This study has several limitations. Self-report bias of drug use, sexual practices and experiences of discrimination may have resulted in under-reporting, and thus, underestimating the associations we observed. Moreover, the accuracy with which participants identified the drug and sex practices of their network ties and identified all high-risk members of their network is unknown. Participants were likely to be different in terms of risk networks by recruitment strategy [40], but we adjusted for sampling strategy to isolate any effect based on differences in recruitment. The use of RDS sampling weights was also assessed in this sample, but made no difference between the RDS and TSO populations. Measurement biases may have also affected reports of discrimination. Specifically, discrimination was asked using one question, which may not have been suitable to accurately capture experiences of discrimination. Further, this measure of discrimination has not been validated among illicit drug users and therefore may be over or under-estimated.

Also, related to measurement error, this study utilizes 2000 US Census neighborhood data while the individual data was collected between 2005 and 2009. Therefore, these neighborhood characteristics may not accurately reflect the composition of neighborhoods participants in this sample were a part of from 2005-2009, especially given rapid neighborhood changes due to gentrification. While Geronimus and Bound found that bias related to changes in neighborhood socioeconomic predictors including education over a 10-year period is minimal [41], it is also likely that drug users who re-locate are most likely to re-locate from deprived neighborhoods to similarly deprived neighborhoods [42]. Therefore, the neighborhoods these participants are currently a part of, likely reflect the same type of neighborhood in an earlier period. Other neighborhood limitations include the use of neighborhood tracts to delineate neighborhood boundaries that may not be accurate and congruency in parallel neighborhoods may have resulted in dependency and shared risk between neighborhoods [37]. Further, because participants were recruited in high drug activity neighborhoods, it may have limited our ability to detect important contextual effects. Also, the use of participant hangout rather than home address may be a limitation, but because these neighborhoods were such that participants spent most of their time and felt more connected to, hangout neighborhoods are likely the most appropriate for a highly transient drug using population. Lastly, since this analysis was performed on cross-sectional data, we are unable to determine temporality. Investigation of drug users' experiences of discrimination and development of high-risk social ties over time and over the entire life course would provide temporality and strengthen this investigation. Few discrimination [43], social network [44] or neighborhood [37] studies have properly addressed issues of temporality nor examined the ways these social phenomenon may be related.

The results of this study suggest that neighborhood context may be important to consider when assessing discrimination and development of high-risk relationships. A better understanding of how these relationships work will help in the development of tailored interventions that counteract the negative effects of social discrimination and ultimately HIV.

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Table 1

Distribution of selected characteristics for participants in the START Study: 2006-2009 (n=638)

Demographic characteristics			
	n	Median	(IQR)
Age	638	33	28 – 37
Female sex partners	635	1.0	0 – 2
Male sex partners	632	0	0 – 1
Age at sexual debut	633	14	12 – 16
Social tie composition			
Number of drug using ties	636	4	2 – 7
Number of heroin/ injecting ties	629	0	0 – 2

	n	%
Race/ ethnicity		
Hispanic	233	36.52
Black	314	49.22
White/ Other	91	14.26
Sex		
Female	190	29.78
Male	448	70.22
Education		
< High school Education	316	49.61
High school	321	50.39
Income		
\$5,000	104	17.22
>\$5,000	500	82.78
Marital status		
Married	95	14.98
Un-married (single, divorced)	539	85.02
Primary Drug used		
Powder cocaine	61	10.17
Crack cocaine	313	52.17
Heroin	161	26.83
Poly drug use	65	10.83
Injection status		
Injector	498	78.43
Non-injector	137	21.57
Female condom use (past two months)		
Always	104	28.65
Infrequent	259	71.35
Male condom use (past two months)		
Always	65	31.10

Infrequent	144	68.90
HIV testing frequency (lifetime)		
3	264	44.82
4	325	55.18
Lifetime depression	369	57.84
HIV	52	8.89
Sampling		
RDS	419	65.67
TSS	219	34.33
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<u>Forms of discrimination</u>		
<hr/>		
Racial		
Yes	163	26.00
No	464	74.00
Drug use		
Yes	206	32.85
No	421	67.15
Incarceration		
Yes	159	25.32
No	469	74.68
<hr/>		
<u>Neighborhood characteristics ^a</u>		
<hr/>		
Percent Black		
Low	211	33.07
Medium	239	37.46
High	188	29.47
Percent Latino		
Low	187	29.31
Medium	240	37.62
High	211	33.07
Percent Poverty		
Low	213	33.39
Medium	242	37.93
High	183	28.68
Percent < High School Education		
Low	276	43.26
Medium	217	34.01
High	145	22.73

^a Cut-points for neighborhood variables are as follows: percent black - <44.04%, 44.04 – 75.78% and >75.78%, percent Latino - <20.09%, 20.09 – 49.77% and >49.77%, percent poverty - <31.46%, 31.46 – 49.12% and >49.12%, and percent less than a high school education - <70.61%, 70.61 – 78.41%, and >78.41%.

Table 2

Prevalence of discrimination experiences by neighborhood characteristics^a, START 2006-2009

	Discrimination					
	Racial		Drug use		Incarceration	
	Median	IQR	Median	IQR	Median	IQR
Social tie composition						
Number of drug using ties	5	2 – 9	5	3 – 9	4	2 – 8
Number of heroin/injecting ties	1	0 – 2	1	0 – 3	0	0 – 2
	%	p-value	%	p-value	%	p-value
Percent Black						
Low	29.61	0.2446	39.32	0.0138	28.99	0.0528
Medium	25.85		33.05		27.12	
High	22.16		25.41		18.92	
Percent Latino						
Low	26.09	0.2882	28.80	0.1192	20.65	0.0059
Medium	22.88		31.36		22.03	
High	29.47		38.16		33.17	
Percent Poverty						
Low	31.10	0.0913	36.36	0.3685	27.27	0.3269
Medium	22.08		32.08		26.67	
High	25.28		29.78		21.23	
Percent Less than High School Education						
Low	25.09	0.2176	38.83	0.1680	24.00	0.7874
Medium	23.44		34.45		26.67	
High	31.37		37.76		25.87	

^aLow, medium and high represent the following tertile categories: percent black - <44.04%, 44.04 - 75.78% and >75.78%, percent Latino - <20.09%, 20.09 - 49.77% and >49.77%, percent poverty - <31.46%, 31.46 - 49.12% and >49.12%, and percent less than a high school education - <70.61%, 70.61 - 78.41%, and >78.41%.

Table 3

Unadjusted and adjusted prevalence ratios (and 95% confidence interval) for the association between various forms of discrimination and neighborhood characteristics ^a with drug risk ties over the past five years, START 2006-2009

	Drug using ties ^b				
	PR (95% confidence interval)				
	Crude	Model 1	Model 2	Model 3	Model 4
Racial discrimination	1.43 (1.20 – 1.71)	1.39 (1.14 – 1.70)	-	1.41 (1.14 – 1.73)	-
Drug use discrimination	1.45 (1.23 – 1.71)	-	1.38 (1.16 – 1.65)	-	1.40 (1.17 – 1.67)
Incarceration discrimination	1.13 (0.93 – 1.38)	-	-	-	-
Percent Black					
Low	1.00	1.00	1.00		
Medium	0.80 (0.67 – 0.97)	0.87 (0.70 – 1.07)	0.88 (0.71 – 1.10)		
High	0.79 (0.64 – 0.96)	0.81 (0.65 – 1.00)	0.86 (0.69 – 1.06)		
Percent Latino					
Low	1.00				
Medium	0.93 (0.77 – 1.14)				
High	1.00 (0.82 – 1.23)				
Percent with Less than High School Education					
Low	1.00			1.00	1.00
Medium	1.23 (1.03 – 1.48)			1.16 (0.94 – 1.43)	1.12 (0.92 – 1.37)
High	1.44 (1.18 – 1.76)			1.30 (1.04 – 1.62)	1.26 (1.01 – 1.59)
Percent Poverty					
Low	1.00				
Medium	0.94 (0.78 – 1.13)				
High	0.88 (0.72 – 1.08)				

^aCensus tracts = 143

^bAdjusted for sex, marital status, lifetime depression, HIV status and number of male sex partners.

^cLow, medium and high represent the following tertile categories: percent black - <44.04%, 44.04 – 75.78% and >75.78%, percent Latino - <20.09%, 20.09 – 49.77% and >49.77%, percent poverty - <31.46%, 31.46 – 49.12% and >49.12%, and percent less than a high school education - <70.61%, 70.61 – 78.41%, and >78.41%.

Unadjusted and adjusted prevalence ratios (and 95% confidence interval) for the association between various forms of discrimination and neighborhood characteristics ^a with heroin/ injecting risk ties over the past five years, START 2006-2009

Table 4

Heroin and injecting ties ^b						
PR (95% confidence interval)						
	Crude	Model 1	Model 2	Model 3	Model 4	Model 5
Racial discrimination	1.39 (1.04 – 1.84)	1.70 (1.08 – 2.65)	-	-	1.62 (1.04 – 2.51)	
Drug use discrimination	1.99 (1.54 – 2.58)	-	1.29 (0.81 – 2.07)	-		1.30 (0.83 – 2.02)
Incarceration discrimination	1.52 (1.12 – 2.06)			1.21 (0.67 – 2.19)		1.20 (0.70 – 2.03)
Percent Black						
Low	1.00	1.00	1.00	1.00		
Medium	0.58 (0.43 – 0.77)	0.74 (0.46 – 1.16)	0.70 (0.45 – 1.11)	1.14 (0.65 – 2.00)		
High	0.41 (0.30 – 0.56)	0.77 (0.45 – 1.29)	0.74 (0.42 – 1.30)	0.96 (0.48 – 1.91)		
Percent Latino						
Low	1.00					
Medium	0.89 (0.65 – 1.21)					
High	1.36 (0.99 – 1.87)					
Percent with Less than High School Education						
Low	1.00				1.00	1.00
Medium	1.42 (1.06 – 1.90)				2.17 (1.43 – 3.29)	2.02 (1.16 – 3.52)
High	2.16 (1.57 – 2.97)				2.22 (1.30 – 3.79)	2.37 (1.42 – 3.96)
Percent Poverty						
Low	1.00					
Medium	1.13 (0.84 – 1.52)					
High	0.78 (0.56 – 1.09)					

^aCensus tracts = 143

^bAdjusted for age, race, primary drug used, injection status, male condom use, lifetime depression and recruitment strategy.

^cLow, medium and high represent the following tertile categories: percent black - <44.04%, 44.04 – 75.78% and >75.78%, percent Latino - <20.09%, 20.09 – 49.77% and >49.77%, percent poverty - <31.46%, 31.46 – 49.12% and >49.12%, and percent less than a high school education - <70.61%, 70.61 – 78.41%, and >78.41.

Table 5

Adjusted prevalence ratios (and 95% confidence interval) for the association between drug use discrimination with heroin/ injecting ties over the past five years stratified by neighborhood percent black, START 2006–2009

	Drug using ties ^a		Heroin/ injecting ties ^b	
	Discrimination			
	Yes	No	Yes	No
Percent Black ^c				
Low	1.77 (1.26 – 2.49)	1.00	1.66 (0.76 – 3.59)	1.00
Medium	1.32 (1.01 – 1.71)	1.00	1.37 (0.74 – 2.53)	1.00
High	1.03 (0.77 – 1.37)	1.00	0.55 (0.25 – 1.20)	1.00

^a Adjusted for sex, marital status, lifetime depression, HIV status and number of male sex partners.

^b Adjusted for age, race, primary drug used, injection status, male condom use, lifetime depression and recruitment strategy.

^c Low, medium and high represent the following tertile categories: percent black - <44.04%, 44.04 – 75.78% and >75.78%.