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The Relationship Between Perceived Discrimination and High-Risk Social Ties Among Illicit Drug Users in New York City, 2006–2009

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Abstract

Discrimination can influence risk of disease by promoting unhealthy behaviors (e.g., smoking, alcohol use). Whether it influences the formation of high-risk social ties that facilitate HIV transmission is unclear. Using cross-sectional data from a cohort of illicit drug users, this study examined the association between discrimination based on race, drug use and prior incarceration and risky sex and drug ties. Negative binomial regression models were performed. Participants who reported discrimination based on race and drug use had significantly more sex and drug-using ties. But, after accounting for both racial and drug use discrimination, only racial discrimination was associated with increased sex, drug-using, and injecting ties. Drug users who experience discrimination and subsequently develop more sex and drug-using ties, increase their risk of contracting HIV. Future longitudinal studies illuminating the pathways linking discrimination and social network development may guide intervention development and identify drug-using subpopulations at high risk for disease transmission.

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Keywords

HIV risk; Discrimination; Illicit drug use; Risky social ties; Urban health

Introduction

Social network ties play a central role in shaping risk of contracting HIV [1, 2]. A preponderance of data among drug users has shown that social networks influence HIV risk behavior, and HIV transmission [3–7] beyond individual risk-taking behaviors. Social relationships are a function of similarities in individual characteristics and social experiences (e.g., discrimination) [1]. Therefore it is plausible that social experiences of marginalization might encourage the development of relationships between people who share those marginalizing social experiences [8]. In the context of illicit drug users, this may have substantial implications for HIV transmission.

Extant work has shown that drug users experience discrimination [9–12] because of their drug use, incarceration history, poverty status and race [10]. Discrimination is a social process that assigns differential treatment and opportunities to people because they exemplify a characteristic that is negatively viewed [13, 14]. Several studies have demonstrated the negative effects of discrimination on health among drug using and non-drug using populations. For example, discrimination is positively associated with cardiovascular disease [15], poor mental health [16], and a host of adverse health behaviors including illicit drug use mediated through depressive symptomatology [17]. Some authors argue that discrimination confines the sexual relationships among men who have sex with men by racial groups [18]. Indeed, it is plausible that some of the association between experiences of discrimination and poor health may be explained by risky social network ties that influence drug [6, 19] and sex [19] risk behaviors. Discrimination is a marginalizing experience. It may influence one's social position and, in so doing, limit the types of social and risk relationships available to develop with others [2, 20]. If the resultant social ties influence sexual or drug use risk behaviors, this process may increase the likelihood of HIV transmission. Discrimination may be particularly detrimental for drug users who are already highly marginalized by society [21] so the social ties available to them are likely marginalized and have the probability of being infected by HIV and a host of other diseases.

The mechanistic process relating experiences of discrimination and HIV transmission through high-risk social ties may be different based on the type of discrimination experienced. Drug users who are discriminated against because of their drug use may be more likely to develop relationships with other drug users thereby enhancing their opportunity to engage in risky behavior (e.g., transactional sex, needle sharing). But, they may also increase their likelihood of coming into contact with someone who has HIV because drug users have a higher burden of HIV compared with non-drug users [22, 23]. The latter may also be true for those who experience racial discrimination, as racial minorities experience harsher effects of social segregation [2, 24], and are significantly more likely to be affected by HIV [2, 25] than non-Hispanic whites. Racial discrimination may also act to influence available relationship ties by limiting access to important resources (i.e.,

education, employment and housing opportunities, medical and social services) needed for minority health and survival [26, 27]. Thus, those with whom marginalized racial/ethnic minorities establish relationships may also have poor access. Experiences of discrimination due to incarceration may influence available relationship ties because of limited job and housing opportunities for people with criminal records. These (often legal) restrictions likely result in clustering of individuals and development of social ties with poor access, limited social mobility and a higher probability of disease. Therefore, even without engaging in more individual risk behaviors (e.g., syringe sharing, unprotected sex), discrimination may influence disease transmission because of who these behaviors are engaged in with.

This study assessed the relationship between self-reported experiences of discrimination due to (1) race (2) drug use and (3) incarceration on membership in high-risk sex and drug-using social network relationships. We hypothesized that those who reported experiencing at least one type of discrimination (e.g., drug use, race, and incarceration) would have significantly more high-risk social network relationships compared to those who did not experience discrimination independent of their individual drug and sex behaviors. We further hypothesized that the HIV behavioral risk of social ties would differ between those who reported experiencing multiple forms of discrimination and those who experienced only a single form.

Methods

Study Overview

This analysis used baseline data from the Social Ties Associated with Risk of Transition (START) study, which has been described in detail elsewhere [28]. START is an 18-month prospective cohort of heavy non-injection drug users (NIDUs) and a cross-sectional assessment of recently initiated injection drug users (IDUs).

Recruitment

Between July 2006 and June 2009, 652 IDUs and NIDUs were recruited using two recruitment strategies: (1) targeted street outreach (TSO) and (2) respondent driven sampling (RDS). A more detailed description of the sampling strategies employed for this study can be found elsewhere [28]. Briefly, TSO was completed in ethno-graphically mapped high drug activity New York neighborhoods in Harlem, Lower East Side, South Bronx, Jamaica-Queens and Bedford-Stuyvesant-Brooklyn. RDS, a chain sampling referral strategy, was employed to enhance generalizability of the final sample and reach drug users who are harder to reach [29, 30].

Eligibility

START aimed to understand the process and social experiences individuals experienced before transitioning into injection drug use from non-injection drug use. Therefore, to be eligible for START, IDUs had to report injecting heroin, crack or cocaine for four years or less and at least once in the past six months to assess their transition to injection drug use in the past five years; and heavy NIDUs had to report non-injection use of heroin, crack or cocaine for one year or more at least two to three times a week in the past three months so

that their experiences while heavily using drugs with a high potential of transitioning to injection drug use could be assessed. Drug use was verified with a rapid drug test which detected opiate and cocaine metabolites in the urine. Injection status was verified by visual track marks. IDUs and NIDUs completed a 90-minute face-to-face interviewer-administered survey instrument. All participants were required to provide informed consent. The Institutional Review Boards of Columbia University and the New York Academy of Medicine approved the study protocol and instruments.

Outcomes

Participants completed a behavioral risk and social network history spanning five years prior to study entry. Recalling behavioral histories has been shown to yield valid responses (using construct validity techniques) among IDUs using a ten-year reconstruction of behavioral histories [31, 32]. However, a shorter period of recall was used for this study. Since our measures of discrimination (described below) were lifetime measures, we examined each unique individual listed in the past year of the baseline assessment. Using past year social ties we created four outcomes based on the type of risk the relationship could pose to influence HIV transmission: (1) number of high risk sex ties (female sex partners, male sex partners and ties that engage in transactional sex), (2) number of drug-using ties (those that used heroin, crack and/or cocaine and people drugs were used with), and (3) number of heroin using and injecting ties. Since some social ties may pose both a sexual and drug-using risk, we also created a total social risk ties outcome that measures the total amount of sex and drug transmission risk in the network. The total social risk ties outcome included all ties who had a sex or drug risk listed above, and ties that had spent time in jail, since this may increase disease risk due to network fluctuations, and their higher probability of disease.

Exposures

Self-reported discrimination was the main independent variable of interest. Discrimination was collected using a one item stem question and 12 response categories modified from previous discrimination studies [33, 34] for use with drug-using populations [10]: “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?” Available response categories included, age, race, sex (gender), sexual orientation, poverty, drug use, having been in jail or prison, religion, mental illness, physical illness, other, and, I have never been discriminated against. Participants could respond “yes” or “no” to each type of discrimination. For this analysis, the three most prevalent types of lifetime discrimination in drug-using populations [26] were assessed: race, drug use, and having been in jail or prison (hereafter referred to as incarceration). For discrimination due to incarceration, only persons who reported spending time in jail or prison in their lifetime were included (n = 468; 80.98 %).

Covariates of Interest

Variables previously identified in the literature as associated with social network characteristics were assessed as potential confounders [6, 28, 35, 36]. Demographic variables included age (continuous), gender [male/female; transgender persons were

excluded (n = 5)] and race/ethnicity (Hispanic, non-Hispanic black and non-Hispanic whites/Other, which included Asian or Pacific Islander, Native American, Eskimo, or Aleutian, Mixed and Other). Hispanics who identified as black (n = 5) were combined with Hispanics rather than non-Hispanic blacks as Hispanic ethnicity may alter interpretations, meanings and experiences of discrimination [37]. Socioeconomic variables included education [< high school education vs. high school or general equivalency degree (GED) and some college or more] and income (<$5,000 vs. >$5,000). Behavioral variables included number of female and male sex partners (continuous), age at sexual debut (continuous), male and female condom use (infrequent vs. always) among those who reported female and male sex partners, injection status (yes/no), primary type of drug used (cocaine, crack, heroin, or polytomous drug use), HIV testing frequency (tested ≤ 3 vs.≥ 4 times) and HIV status (yes/no). Mental health status was derived from the Composite International Diagnostic Interview (CIDI) question, “In your lifetime, have you ever had a period of at least two weeks when nearly every day you felt, sad, depressed, or empty most of the time,” with available responses as “yes” and “no” [38]. Participants who reported “yes” were then asked to provide dates of their most recent mental health episode, which was used to determine whether the participant experienced a depressive symptom in the past year. Participants who did not experience a past year depressive symptom or lifetime depressive symptom were categorized as not having a past year depressive symptom. Finally, sampling strategy (RDS vs. TSS) was accounted for in the analysis.

Statistical Analysis

Descriptive characteristics, including frequencies for categorical variables and measures of location (median) and spread (inter-quartile range) for continuous variables, were calculated. To determine which variables to include in the final model, Mann-W hitney tests were calculated to determine whether statistically significant differences existed between the medians of social risk ties with covariates of interest. Characteristics that showed significance at the $P < 0.05$ level were included in the final model. Multivariate negative-binomial regression models were used to estimate the unadjusted and adjusted prevalence ratios between each separate type of discrimination (racial, drug use and incarceration) with each outcome. For the adjusted models where multiple types of discrimination remained important to the outcome, all types of discrimination were controlled for simultaneously to tease out the effect of the specific form of discrimination of interest. We also assessed interactions between forms of discrimination (race and drug use discrimination, drug use and incarceration discrimination, and race and incarceration discrimination) that remained important in the final models. All analyses were performed using SAS version 9.2 [39].

Results

Descriptive characteristics of the population are described in Table 1. The median age was 33. Most participants were male, Black or Hispanic, high school educated or more, made $5,000 or less/year, were un-married, NIDUs and used crack most frequently. They had a median of one female sex partner and zero male sex partners in the past two months. Over two-thirds had infrequent female and male condom use. The median age of sexual debut was 14, more than half the sample had four or more HIV tests in their lifetime and about nine

percent reported being HIV positive. About one-quarter (25.9 %) of the sample reported experiencing racial discrimination, 32.8 % reported experiencing drug use discrimination and 33.9 % experienced discrimination due to incarceration. Most participants who experienced discrimination, only reported an experience of one form of racial, drug use or incarceration discrimination (48.8 %; data not shown). About one-third (29.5 %) reported experiencing two forms and 21.6 % reported experiencing all three in their lifetime. While some participants experienced more than one form of discrimination, each form of discrimination was marginally correlated (r = 0.31–0.35; data not shown), with the exception of drug use and incarceration discrimination (r = 0.54) which were not assessed simultaneously in the final model. The median number of total social risk ties was five. The median number of sex ties was three, drug ties was two and participants had a median of zero heroin and injecting ties.

The unadjusted prevalence ratios between each form of discrimination and social ties are shown in Table 2. Those who reported experiencing racial discrimination, compared to those who did not, were significantly more likely to have greater total social risk ties. Those who reported drug use discrimination, compared to those who did not, also had more total social risk ties. When each type of social tie was examined based on sex or drug risk, racial discrimination was statistically significant for having increased sex ties; and both racial and drug use discrimination were important for increased drug-using ties. All three forms of discrimination (racial, drug use and incarceration) were important for having more heroin and injecting ties.

Results from the adjusted analysis are shown in Table 3. After adjustment, there was a significant association between those who experienced racial discrimination (PR: 1.32; 95 % CI: 1.12–1.55) and discrimination due to drug use (PR: 1.41; 95 % CI: 1.22–1.63) with more total social risk ties. After adjusting for racial discrimination and discrimination due to drug use simultaneously, both remained important for total number of social risk ties.

When sex ties and drug ties were investigated separately, the associations with discrimination due to race and increased sex ties remained significant after adjustment. Discrimination due to race and drug use were significantly associated with more drug ties, but after simultaneously adjusting for both, only racial discrimination remained important. For injecting ties, the association with discrimination due to drug use did not persist after adjusting for socio-demographic characteristics and racial discrimination. But, the association between racial discrimination and injecting ties (PR: 1.61; 95 % CI: 1.19–2.19) did remain significant after adjustment for socio-demographic characteristics, and simultaneous adjustment of drug use discrimination. Significant interactions between the various forms of discrimination (race and drug use discrimination, drug use and incarceration discrimination, and race and incarceration discrimination) did not exist.

Discussion

We found that discrimination due to race and drug use were significantly associated with increased numbers of total social risk ties. When stratifying total social risk ties by the type of risk posed, it is clear that racial discrimination specifically is driving the relationship with

increased sex and drug ties among illicit drug users. Racial discrimination has been noted as an important characteristic on several health outcomes [15–18]. To our knowledge, this is the first study to examine the relationship between self-reported experiences of various forms of discrimination and social ties characterized by elevated sex and drug use risk behaviors. These findings suggest that experiences of racial-discrimination may be an important determinant of social network risk, and may indicate a key pathway contributing to the risk of HIV transmission.

In this study, those who perceived racial discrimination were more likely to interact with more people who posed some sex or drug-using risk. Larger sex and drug networks have been shown to heighten the likelihood of infectious disease transmission, particularly HIV [2, 35, 40, 41]. One explanation for these findings is that discrimination can limit access to critical resources (e.g., health care, jobs, housing, etc.). Because of the need to survive and navigate with fewer resources, such individuals may establish sexual, and many times survival [42, 43] relationships with others who also have poor access to health-promoting resources.

A more commonly explored pathway between racial discrimination and health is through psychological stressors (e.g., depression and self-esteem) that have been shown to influence physical health and behavioral outcomes [17, 26]. Although rates of HIV are higher among persons of black race/ethnicity compared to other racial/ethnic groups [23, 25, 44], many reports indicate that blacks have lower rates of depression [10, 45, 46], and similar or lower rates of both sexual risk [47] and drug-using risk behavior [48, 49] than do members of other groups. It has been suggested that lower rates of depression in the black community are due to poor diagnostic tools for black populations [50], or that blacks “give up” positive physical health behaviors to maintain better mental health [24]. It is also plausible that development of relationships with people who share a similar social position acts as a buffer against stress by providing comfort, promoting self-esteem, and increasing coping responses when dealing with negative interpersonal treatment [8].

This study suggests that discrimination may increase the likelihood of HIV transmission simply by encouraging the development of social networks in which risk is elevated. For example, it is not necessarily what an individual does, but with whom it is done, under what social circumstances, and within what socio-environmental setting that is driving HIV transmission. Thus, our data suggest that discrimination may act on a social level (as opposed to psychological) by influencing the level of risk within one’s social environment. Discrimination due to race and drug use may restrict the availability of “healthy” relationships with respect to HIV risk and foster formation of higher risk or “unhealthy” social relationships. While these social ties may serve a comforting role as described above [8], these same relationships may inadvertently increase risk for HIV transmission.

In this analysis, we attempted to hone in on temporality by assessing lifetime discrimination with past year social ties. However, this assessment is limited and could be strengthened in future studies by ascertaining the exact time point of discrimination experiences. Since temporality and, therefore, causality of this relationship cannot be determined in this analysis, it is possible that socializing with more drug users makes one a target for

discrimination. Thus, it may not be discrimination that influences development of high-risk social ties, but that the development of high-risk social ties increases risk for discrimination. Given the higher potential of experiencing discrimination due to race or drug use among drug users [10], and the independent association discrimination has on a host of other health behaviors and health outcomes [17], future studies investigating this plausible pathway, in either direction, are warranted so that more impactful prevention and intervention strategies can be implemented.

This study may also be limited by self-report and selection biases. Specifically, due to the sensitive nature of the questions asked during this study, social desirability may have contributed to under-reporting of discrimination and risky social tie participation, while acquiesce bias may have resulted in over-reporting of discrimination. Though the discrimination item asked about “lifetime” experiences, there is also the possibility of recall bias if participants who reported discrimination were more likely to have experienced it recently. Therefore, in a sub-analysis (not shown due to the small sample size), we removed those who reported recent (past 6-month) discrimination due to race, drug use or incarceration and found that the relationship between lifetime discrimination and risky social ties persisted. Self-selection bias may have affected the final sample obtained through TSS vs. RDS methods; however, we found no significant differences in the outcome by recruitment method. Measurement bias may have also been present due to the one item measure of discrimination that may not suitably capture the construct of discrimination among drug users that could be over or under-estimated. Dissimilarities in what participants define as discrimination may also lead to differences in reporting experiences of discrimination. Future studies on discrimination among drug users could benefit from examining the perpetrator of the discrimination, as negative encounters from family members or social service providers may be more detrimental than negative encounters from strangers. Examination of structural discrimination that may not be as apparent as interpersonal experiences of discrimination (i.e., disproportionate distribution of safe syringe sources in low-need, non-minority neighborhoods) may also be important to understand how material resources are negatively impacted [51]. Moreover, the measure of social ties in this study serves as an average of each type of risk (sex and/or drug) the social tie could pose to the participant over the past year. The potential overlap in social ties may limit interpretation for understanding the complete social network makeup, but specificity of understanding each type of risk the participant was aware that the social tie could pose is important for understanding the magnitude of risk these relationships may pose. Future studies should however, specifically assess the degree of risk that different (non-overlapping) types of networks hold on individual risk of disease acquisition. Measurement error may also result from the broad, non-clinical, one-item measure used to assess a depressive symptom. However, this measure has been validated and used worldwide [28], thus we expect any bias to be minimal.

A consistent body of evidence supporting a clear role of discrimination on risky social tie formation will directly inform critically needed intervention and prevention strategies aimed at eliminating differential risk and burden of HIV among racial minorities in the U.S. Future work to confirm these findings using a longitudinal approach and one that further explicates the social process between discrimination and social tie development should be conducted.

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Table 1

Sample characteristics, START 2006–2009 (n = 647)

Demographic characteristics	*n*	Median	(IQR)
Age	647	33	28–37
Female sex partners	644	1.0	0–2
Male sex partners	641	0	0–1
Age at sexual debut	641	14	12–16
Number of total social risk ties	645	5	3–8
Number of sex ties	610	3	1–5
Number of drug using ties	645	2	0–4
Number of injecting ties	610	0	0–1
	n		**%**
Race/ethnicity			
Hispanic	240		37.09
Black	316		48.84
White/other	91		14.06
Sex			
Female	191		29.52
Male	456		70.48
Education			
< High school education	320		49.54
≥ High school	326		50.46
Income			
≤$5,000	507		82.71
>$5,000	106		17.29
Marital status			
Married	98		15.24
Un-married (single, divorced)	545		84.76
Primary drug used			
Powder cocaine	62		10.20
Crack cocaine	315		51.81
Heroin	166		27.30
Poly drug use	65		10.69
Injection status			
Injector	141		21.89
Non-injector	503		78.11
Female condom use (past two months)			
Always	104		28.11
Infrequent	266		71.89
Male condom use (past two months)			
Always	66		31.43
Infrequent	144		68.57

Demographic characteristics	*n*	Median	(IQR)
HIV testing frequency (lifetime)			
≤3		271	45.32
≥4		327	54.68
Past year depressive symptom		201	31.41
HIV		53	8.92
Sampling			
RDS		421	65.07
TSS		226	34.93
		n	**%**
Forms of discrimination			
Racial			
Yes		165	25.94
No		471	74.06
Drug use			
Yes		209	32.86
No		427	67.14
Incarceration[a]			
Yes		159	33.97
No		309	66.03

[a]Only includes those who reported spending time in jail or prison in their lifetime (n = 468)

Table 2

Unadjusted prevalence ratios (and 95 % CI) for the association between forms of discrimination and total, sex, drug and heroin and injecting risk ties over the past year, START 2006–2009

	Total social risk ties Prevalence ratio (95 % CI)	Sex ties	Drug using ties	Injecting ties
Racial discrimination	1.33 (1.13–1.56) *	1.28 (1.09–1.50) *	1.37 (1.12–1.68) *	1.47 (1.06–2.05) **
Drug use discrimination	1.21 (1.04–1.41) **	1.13 (0.97–1.31)	1.26 (1.05–1.53) **	1.79 (1.32–2.42) *
Incarceration discrimination[a]	1.00 (0.84–1.20)	0.99 (0.83–1.18)	0.97 (0.77–1.21)	1.37 (0.96–1.95) ***

* $P < 0.01$,

** $P < 0.05$,

*** $P < 0.10$

[a] Only includes those who reported spending time in jail or prison in their lifetime (n = 468)

Table 3

Adjusted prevalence ratios (95 % CI) between various forms of discrimination and total, sex, drug and heroin and injecting risk social ties over the past year, START 2006–2009

	Total social risk ties[b]		Sex ties[c]		Drug using ties[d]		Injecting ties[e]	
	Entered separately	Entered simultaneously	Entered separately	Entered simultaneously	Entered separately	Entered simultaneously	Entered separately	Entered simultaneously
Forms of discrimination								
Racial	1.32 (1.12–1.55) *	1.33 (1.13–1.56) *	1.23 (1.05–1.45) **	-	1.36 (1.11–1.67) *	1.29 (1.04–1.60) **	1.61 (1.19–2.19) *	1.52 (1.10–2.09) **
Drug use	1.41 (1.22–1.63) *	1.31 (1.12–1.52) *	-	-	1.27 (1.04–1.54) **	1.18 (0.96–1.44)	1.35 (1.02–1.80) **	1.20 (0.89–1.62)
Incarceration[a]	-	-	-	-	-	-	-	-

*P<0.01,

**P<0.05,

***P<0.10

[a]Only includes those who reported spending time in jail or prison in their lifetime (n = 468)

[b]Adjusted for gender, marital status, number of male sex partners and HIV status

[c]Adjusted for race, marital status, number of female sex partners, number of male sex partners, primary drug used, injection status and HIV status

[d]Adjusted for race, sex, marital status, number of male sex partners, male condom use and HIV status

[e]Adjusted for race, age, number of male sex partners, male condom use, primary drug used, injection status and recruitment strategy