Interactions between Racism, Homophobia, Incarceration, and HIV Testing in HPTN 061: The Brothers Study

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Background: Black men and transgender women who have sex with men and (BMTWSM) disproportionately bear much of the HIV burden in the United States, so HIV testing among this population is critical for successful treatment and prevention of HIV transmission. Racial discrimination, homophobia, and incarceration may be barriers to HIV testing among BMTWSM, but research on how these interact is limited.

Purpose: The purpose of this study was to examine the joint influence of the experience of racism and homophobia, versus exposure to either of these factors alone, on HIV testing in a U.S. sample of HIV-negative BMTWSM (n=1,110) with and without history of incarceration.

Methods: We analyzed data from the HIV Prevention Trials Network (HPTN) 061 (BROTHERS) study. Prevalence ratios for the association between experienced racism, homophobia, and their interaction with HIV testing were generated, stratified by incarceration status.

Results: Racism was marginally associated with lower HIV testing (aPR=0.84, 95% CI: 0.70, 1.04), while homophobia was significantly associated with lower HIV testing (aPR: 0.79, 95%

CI: 0.63, 0.98) among those with a history of incarceration. The interaction between racism and homophobia was associated with unexpectedly higher HIV testing among those with a history of incarceration (Interaction aPR=1.40, 95% CI: 1.10, 1.78). Neither racism (aPR=0.88, 95% CI 0.63, 1.24) nor homophobia (aPR=0.83, 95% CI 0.55, 1.25) was significantly associated with testing among those with no incarceration history, though estimates were negative.

Conclusion: Among BMTWSM with a history of incarceration, racism and homophobia appear to pose as barriers to HIV testing. The finding that BMTWSM exposed to incarceration, racism, and homophobia have higher levels of HIV testing than other groups could be explained by a multitude of factors (e.g., resilience/coping that improves health care seeking, providers that perceive them to need HIV testing) and warrants further study.

Introduction

Human immunodeficiency virus (HIV) is a continuing epidemic both globally and in the United States (U. S.), with nearly 40,000 new cases nationally in 2017.[1] There are significant disparities in HIV burden along the lines of race and sexual orientation; Black men who have sex with men (BMSM) and Black transgender women (BTW) face disproportionate HIV incidence and prevalence.[1] Numerous social and structural factors contribute to HIV in this population, including socioeconomic factors, poor mental health, healthcare access, social support, and experiences of discrimination.[2-15] Efforts to reduce HIV incidence among BMTWSM, often through interventions addressing many of the aforementioned social and structural factors, have been a core component of HIV prevention efforts.[16-20] The stable rate of new HIV diagnoses among BMTWSM indicate that additional intervention targets for HIV prevention and early initiation of treatment are of great importance.

HIV testing is the first step of the HIV treatment cascade and is therefore critical to optimizing the clinical success of HIV positive individuals and to preventing onward HIV transmission;[21] improved identification of new cases and treatment as prevention (TasP) are core components of successful HIV prevention. Racial and sexual discrimination may be significant barriers to HIV testing among BMTWSM, though extant literature on the topic is limited and results are somewhat conflicting. A qualitative study of 31 young Black gay men by Arnold et al. found that racism, homophobia, and HIV-related stigma were all barriers to HIV testing in this group.[15] Likewise, a study of 2981 MSM globally found that both external and internalized homophobia were independently associated with lower odds of HIV testing. [22] However, the results of extant studies are mixed; a study by Irvin et al. found that perceived healthcare-specific

racism was positively associated with HIV testing, suspected to be due in part to increased exposure to the health care system.[23]

Intersectionality theory has been used to understand the life experiences of individuals with overlapping minority identities including BMTWSM.[8,24-29,30] According to this theory, social identities such as gender, race, and sexual identity have complex interactions that can jointly influence well-being and health above and beyond the influence of each identity individually. In line with intersectionality theory, a history of criminal justice involvement also may work in confluence with discrimination against other identities. Incarceration is a stressful and disempowering experience which also disrupts and leads to the dissolution of the support networks that buffer stress and promote resiliency.[31-33] Using intersectionality theory, Christian and Thomas found that discriminatory experiences related to the interaction of incarceration, gender, and race were common among Black women involved in the criminal justice system.[34] Further, criminal justice involvement interrupts community health care access which has implications for interruptions in HIV testing. Working through these paths, incarceration may work in confluence with racial and homophobic discrimination to affect HIV testing among BMTWSM. Research on the joint influence of race, sexuality, and criminal justice involvement on HIV testing is limited, representing a substantial gap in the field of HIV TasP among BMTWSM. This is of great significance given the disproportionate levels of criminal justice involvement in this population, which has occurred as a result of race disparities in policing, detainment, and sentencing practices.[35]

The purpose of our study was to examine the influence of the experience of racism and homophobia, versus exposure to either of these factors alone, on HIV testing in a U. S. sample of BMTWSM. Given the particular vulnerability of those who experience stigma not only due to

race and sexual minority status, but also due to a history of criminal justice involvement we measured associations between racism and/or homophobia, stratifying by recent incarceration status. We hypothesized that being exposed to racism and homophobia would be associated with lower levels of HIV testing and that these associations would be stronger among those additionally exposed to a history of incarceration. We also hypothesized that being doubly exposed to racism and homophobia would be associated with lower HIV testing.

Methods

Study Design

We analyzed data from the HIV Prevention Trials Network (HPTN) 061 (BROTHERS) study, a large multi-site longitudinal observational cohort study of Black MSM in the United States. The methodology of this study has been previously described in detail.[4,5] In brief, HPTN 061 was a study to determine the feasibility and acceptability of a multifaceted HIV prevention intervention among BMTWSM in six cities: Atlanta, Boston, Los Angeles, New York City, San Francisco, and Washington, DC. Between July 2009 and October 2010, BMTWSM were recruited directly from the community or as sexual network partners referred by index participants, who were identified as those who might be part of high-risk networks. Community recruitment methods included direct field-based outreach, engagement of key informants and community groups, advertising through various print and online media, and the use of chat room outreach and social networking sites. Eligibility criteria included self-identification as a man or being male at birth; self-identification as Black, African American, Caribbean Black, or multiethnic Black; and at least one self-reported instance of condomless anal sex with a man in

the past six months. Institutional review boards at the participating institutions approved the study.

Study Procedures

Study procedures were conducted at the baseline enrollment visit and at two subsequent follow-up visits that occurred 6 and 12 months post-enrollment, as previously described.[4,5] Participants provided demographic information including age and race/ethnicity at the enrollment visit during an interviewer-administered questionnaire. At all three visits, participants completed a behavioral assessment using audio computer-assisted self-interview (ACASI) technology that assessed sexual and gender identities and internalized homophobia. In addition, participants received HIV and sexually transmitted infection (STI) prevention risk-reduction counseling and testing (and referral for care if needed), and were offered the opportunity to work with a Peer Health Navigator to identify and obtain referrals for service needs such as substance use and mental health needs. The current study utilized baseline data only, as this was the only visit where testing behavior could be measured, due to all participants being tested subsequently as part of the cohort.

Measures

Racism was measured using self-reported questions on 28 experiences of racism, based on the Racism and Life Experiences Scales by Harrell.[36] These items covered several dimensions, including disrespectful treatment, belittling, harassment, fetishization, threats, and violence. For each item, participants could select if it “Happened to me because of my race” and select how much it bothered them. Responses were coded as 0=”Doesn’t bother me at all”/”Never happened”, 1=”Only bothers me a little”, 2=”Bothers me somewhat, 3=”Bothers me

a lot", 4="Bothers me extremely". Responses were then summed to create a scale ranging from 0 to 112. The individual items demonstrated high internal consistency (Cronbach's =.94).

Homophobia was measured using self-reported questions on 25 experiences of homophobia. These covered the same items as the racism scale, with the exception of three questions reflecting racism within gay settings (e.g. being asked for several forms of ID at a gay bar). For each item, participants could select if it "Happened to me because of my sexuality" and select how much it bothered them, using the same scaling as the racism questions. Responses were summed to create a scale ranging from 0 to 100. These items also demonstrated high internal consistency (Cronbach's =.96).

HIV testing behavior was measured via self-report using the question "How many times have you been tested for HIV in the last year?" Responses could include any integer. Because HIV testing was conducted as part of the study, HIV testing behavior could only be assessed at baseline. HIV status was also assessed at baseline via laboratory testing; because we measured HIV testing as our outcome, we restricted our sample to those who were HIV negative at baseline only.

Incarceration was measured via self-report with the question "How many times in your life have you spent one or more nights in jail or prison?" Responses could include any integer. For analysis, this variable was dichotomized as never having been incarcerated, and having been incarcerated at least once.

Analytic Sample

Starting with 1553 participants, we restricted the sample to include only HIV negative participants (excluding 382 HIV positive participants and 4 with no baseline HIV status data), leaving 1167 HIV-negative participants. We further restricted to those who reported testing data

(excluding 57 with no reported previous testing data), resulting in a sample of 1110 HIV negative participants. Intrascale stochastic imputation was used to impute missing values for missing racism and homophobia items within their respective scales. The large internal consistency of both of these scales (.94 and .96) supports the validity of this means of imputation.[37] Next, after imputation, we excluded any remaining observations with missing data (44 excluded). Finally, we excluded influential outliers (2 excluded). Our final analytic sample consisted of 1332 participants (96.7% of the HIV negative sample).

Statistical Analyses

All analyses were conducted using SAS 9.4.[38] We tested bivariate differences between participant characteristics and HIV testing in the last year stratified by incarceration status. We used Cochran-Armitage tests of trend for both ordinal and continuous variables, as our continuous variables were not normally distributed. We used chi-square tests for nominal variables. We generated log-binomial regression models to calculate prevalence ratios for ever having been HIV tested. Unadjusted and adjusted models were generated using terms for racism, homophobia, and their interaction. Adjusted models also included age, education level, income, and site location as confounders. Domain statements to account for site location were also included in all models. Models were stratified by incarceration status to capture differences between BMTWSM who were and were not incarcerated. Because those with high levels of racism and homophobia may engage in high levels of risk-taking and hence may have high levels of perceived risk which in turn may drive HIV testing, as a post-hoc analysis, we also generated models adjusting for number of sexual partners, any condomless receptive anal intercourse, and transactional sex in the past 6 months to account for these potential mediating factors. All analyses used a two-sided test of significance (α=.05).

Quality Assurance

Collinearity was tested by measuring the variance inflation factor (VIF) in each model. There was no evidence of collinearity in any of the models (All VIF<5). Leverages and Cook's distances were both used to assess outliers. Only 2 observations demonstrated unusually high Cook's distances and leverages; these were excluded from all analyses.

Results

In the overall sample, 59% of participants had been incarcerated at least once. Experiences of racism and homophobia were frequent, with a median 86% of the racism items experienced and a median 80% of the homophobia items experienced. Across nearly all racism and homophobia items, the mean impact of discrimination items was between 1 (Only bothers me a little) and 2 (Bothers me somewhat). The sample was relatively diverse across age, education level, and income. Only 3% of the sample identified as transgender.

Table 1 shows bivariate analysis results stratified by incarceration status. In bivariate analyses, neither racism nor homophobia were significantly associated with HIV testing. For participants with no incarceration history, higher education, higher income, and study site location was associated with HIV testing. For participants with a history of incarceration, younger age and study site location was associated with HIV testing.

Table 2 shows unadjusted and adjusted prevalence ratios for racism, homophobia, and their interaction, stratified by incarceration status, in association with having been tested for HIV in the past year. In adjusted models among those incarcerated, we observed lower proportions of HIV testing among those with higher racism and homophobia. After adjusting for confounders, those with the highest racism scores (Racism=100%) had 16% lower proportions of HIV testing

compared to those with the lowest (Racism=0%) (aPR = 0.84, 95% CI 0.70, 1.04), though this was marginally significant. Those with the highest homophobia scores (Homophobia=100%) had 21% lower proportions of HIV testing compared to those with the lowest (Homophobia=0%) (aPR = 0.63, 95% CI 0.63, 0.98). The product interaction between racism and homophobia was unexpectedly positive and statistically significant suggesting interaction between racism and homophobia (aPR = 1.40, 95% CI 1.10, 1.78). Neither racism (aPR=0.88, 95% CI 0.63, 1.24) nor homophobia (aPR=0.83, 95% CI 0.55, 1.25) was significantly associated with HIV testing among those who were not incarcerated, though estimates were negative. Post-hoc analyses indicated that these results were consistent even when also adjusting for number of sexual partners, any condomless receptive anal intercourse, and transactional sex (Supplement 1).

Discussion

This study indicates BMTWSM face frequent experiences of homophobia and racism, and that these experiences are impactful stressors that influence HIV testing among BMTWSM with a history of incarceration. In this sample, we found that racism and homophobia were each individually linked to lower HIV testing as has been observed in prior samples of BMSM. [15 22] However, among those with a history of incarceration, the interaction of homophobia and racism was associated with unexpectedly higher rates of HIV testing, a finding which contradicts some prior research[15 22] yet which corroborates other studies.[23] For participants who were not incarcerated, neither racism nor homophobia was associated with HIV testing, and there was no interaction between the two, highlighting the importance of criminal justice involvement as a social determinant of health. Being exposed either to racism or to homophobia as well as interacting with the criminal justice system may be a highly impactful barrier to healthcare

utilization by facilitating distrust of healthcare services, negative impact on mental health, and general social isolation. A positive association between being triply exposed -- to racism, homophobia, and criminal justice involvement -- and higher levels of HIV testing may reflect greater coping mastery in the face of multiple adverse life events (e.g. BMTWSM who have developed strategies for coping with racism successfully may have developed strategies for coping with homophobia as well) [23] Exposure to adversity is a key component needed to develop resilience and hence BMTWSM who have been incarcerated may develop successful coping strategies that ultimately drive ability to engage in care seeking.

In addition, given exposure to racism and homophobia was linked to increased odds of testing only among those exposed to the criminal justice system suggests high levels of resilience with access to care provided through criminal justice involvement may have played a role in higher levels of HIV testing A large proportion of correctional facilities offer HIV testing, as well as other HIV-related educational and care resources, and hence individuals who have developed resilience in the face of intersecting racism and homophobia may be able to combine that with the HIV prevention knowledge obtained in the criminal justice system to seek out testing at a higher rate.

While literature on how incarceration affects HIV testing post-release is limited, there is some research showing that leaving incarceration presents challenges in other forms of HIV-related healthcare engagement, including linkage to HIV care.[39] Receipt of ART among people living with HIV is much lower after release from incarceration (37%) compared to before (54%) and during (65%) that incarceration. Similarly, rates of virological suppression return to the very low levels seen pre-incarceration within six months following release.[40] There are no criminal justice system-based HIV prevention or testing interventions tailored specifically for BMTWSM,

despite evidence that a culturally tailored seek, test, treat, and retain intervention for BMTWSM exposed to the criminal justice system could reduce HIV incidence and mortality rates.[41,42] The fact that the majority of the BMTWSM in our sample had been incarcerated at least once underscores the relevance of incarceration as a social determinant of health among BMTWSM.

Our study fills a notable gap in the literature on how racism and homophobia intersect to affect testing outcomes among BMTWSM and how incarceration intersects with discrimination to affect healthcare utilization outcomes among BMTWSM. Through the use of our combined racism and homophobia variable, we were able to demonstrate the value of an intersectionally-focused analytic approach; among those who had not experienced incarcerations, there was no association with testing when either racism or homophobia alone was present. Testing these factors individually does not provide a complete picture of the discrimination faced by BMTWSM and may underestimate their impact on health-related outcomes. We also utilized a multicenter cohort that covers several areas of the United States, providing more geographic generalizability. Finally, this study uses large multi-item measures of both discrimination and homophobia, covering approximately 30 items for each. This allows us to capture a holistic assessment of a person's experiences of discrimination, including microaggressions, harassment, violence, and employment discrimination.

There are important limitations to acknowledge. First, our study is specific to BMTWSM in relatively urban areas, so generalizability is limited. This population is our focus because BMTWSM are among the highest risk populations for HIV infection. Second, due to the small number of transgender women in the sample, we could not identify differences based on transgender identity. Third, there are inherent limitations in the reporting of discrimination, as this is likely to be affected by social desirability bias, most likely resulting in the underreporting

of discrimination. There is also variability in reporting of discrimination across participants, even when the experiences themselves are similar. Additionally, this study uses a purposive sample, so selection bias may be present. Despite these limitations, our research has significant implications for how racism and homophobia may impact HIV testing. Though we found a significant positive interaction between the two (among those experiencing incarceration), the main negative effects of racism and homophobia indicate this may be an important target for intervention. Approaches to better address racism and homophobia as barriers to testing include culturally competent HIV testing promotion, and development of resilience and coping skills. Given that more regular HIV testing leads to earlier diagnosis and initiation of treatment, efforts to more effectively address racism and homophobia are an important component of larger efforts to improve early treatment initiation and reduce HIV transmissions among BMTWSM.

Conclusions

We found that the racism and homophobia were individually associated with lower prevalence of testing among BMTWSM with a history of incarceration, but that their interaction produced unexpectedly greater proportions of testing. Given the disproportionate burden of HIV in this population, further understanding of racism and homophobia as social and structural barriers to HIV testing are of critical importance. Previously incarcerated BMTWSM populations should be an especially prioritized focus of HIV testing promotion. Future studies on the mechanisms of the association between discrimination and HIV testing in this population are recommended, as there are likely to be several complex mediators of this association. This may also inform targeted interventions to improve linkage to HIV testing services. As HIV testing is the initial step of the treatment cascade, and thus of TasP, by impact testing discrimination

impacts HIV prevention. Racism and homophobia have a complex, multifaceted impact on the HIV epidemic among BMTWSM that cannot be understated.

Acknowledgements

HPTN 061 grant support provided by the National Institute of Allergy and Infectious Disease (NIAID), National Institute on Drug Abuse (NIDA) and National Institute of Mental Health (NIMH): Cooperative Agreements UM1 AI068619, UM1 AI068617, and UM1 AI068613.

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Table 1. Proportions of racism, homophobia, and demographics across HIV testing history within past year, stratified by incarceration history (n=1110).				
	Never Incarcerated (n=455)		Previously Incarcerated (n=655)	
	Not HIV tested within past year (n=78)	HIV tested within past year (n=377)	Not HIV tested within past year (n=130)	HIV tested within past year (n=525)
Median Racism Scale[1]	46	45	45	46
Median Homophobia Scale[1]	36	33	35	32
Age[1]				
18 to 30	48.7%	55.2%	**20.0%**	**28.8%**
31 to 40	17.9%	16.5%	**16.9%**	**16.0%**
41 to 50	23.1%	17.5%	**42.3%**	**40.8%**
51 and older	10.2%	10.9%	**20.8%**	**14.5%**
Highest Education[2]				
High school or less	**47.4%**	**35.8%**	60.8%	61.5%
More than high school	**52.6%**	**64.2%**	39.2%	38.5%
Household Income[1]				
Less than $10,000	**37.7%**	**25.1%**	49.0%	42.3%
$10,000 to $29,999	**31.2%**	**32.3%**	32.7%	37.9%
$30,000 or more	**31.2%**	**42.7%**	18.4%	19.8%
Site Location[2]				
New York	**7.7%**	**21.0%**	**16.9%**	**19.8%**
Washington, DC	**19.2%**	**27.6%**	**3.9%**	**5.7%**
Massachusetts	**9.0%**	**15.7%**	**15.4%**	**18.5%**
California	**43.6%**	**21.1%**	**33.1%**	**36.0%**
Georgia	**20.5%**	**14.6%**	**30.8%**	**20.0%**

Significant ($p<.05$) differences in the association between racism, homophobia, and sociodemographics with HIV testing status within incarceration category bolded.
[1]Tested using Cochran-Armitage test of trend.
[2]Tested using Chi-Square test.

Table 2. Log-binomial regression prevalence ratios and 95% confidence intervals of probability of having been HIV tested within the past year and interaction with incarceration (n=1110).				
	No Incarceration History		**Incarcerated**	
Measure	**Unadjusted PR (95% CI)**	**Adjusted[1] PR (95% CI)**	**Unadjusted PR (95% CI)**	**Adjusted[1] PR (95% CI)**
100% Racism (0% Homophobia)*	1.02 (0.76, 1.38)	0.88 (0.63, 1.24)	0.91 (0.83, 1.01)	0.84 (0.70, 1.04)
100% Homophobia (0% Racism)*	0.89 (0.64, 1.24)	0.83 (0.55, 1.25)	0.84 (0.69, 1.05)	**0.79 (0.63, 0.98)**
Age				
18 to 30		Reference		Reference
31 to 40		0.96 (0.89, 1.03)		**0.91 (0.84, 0.99)**
41 to 50		0.92 (0.77, 1.08)		**0.92 (0.84, 0.99)**
51 and older		1.01 (0.91, 1.13)		**0.86 (0.84, 0.88)**
Highest Education				
High school or less		Reference		Reference
More than high school		**1.07 (1.01, 1.15)**		1.00 (0.93, 1.08)
Annual Household Income				
Less than $10,000		Reference		Reference
$10,000 to $29,999		**1.17 (1.04, 1.33)**		**1.08 (1.04, 1.13)**
$30,000 or more		**1.07 (1.00, 1.15)**		0.99 (0.86, 1.13)
Site Location				
New York		**1.22 (1.16, 1.27)**		**1.11 (1.07, 1.16)**
Washington, DC		**1.15 (1.04, 1.25)**		**1.20 (1.00, 1.22)**
Massachusetts		**1.19 (1.12, 1.27)**		**1.14 (1.10, 1.19)**
California		**0.91 (0.86, 0.96)**		**1.12 (1.08, 1.16)**
Georgia		Reference		Reference
Interaction Term and Calculated Estimates				
	No Incarceration History		**Incarcerated**	
Measure	**Unadjusted OR (95% CI)**	**Adjusted[1] OR (95% CI)**	**Unadjusted OR (95% CI)**	**Adjusted[1] OR (95% CI)**
Association between 100% Racism versus 0% racism (referent) among those Exposed to 100% Homophobia [1]*	1.21 (0.90, 3.20)	1.26 (0.90, 1.77)	1.25 (1.14, 1.38)	1.18 (0.98, 1.46)
Association between 100% Homophobia versus 0% Homophobia	1.06 (0.76, 1.48)	1.19 (0.79, 1.79)	1.15 (0.95, 1.44)	1.11 (0.88, 1.37)

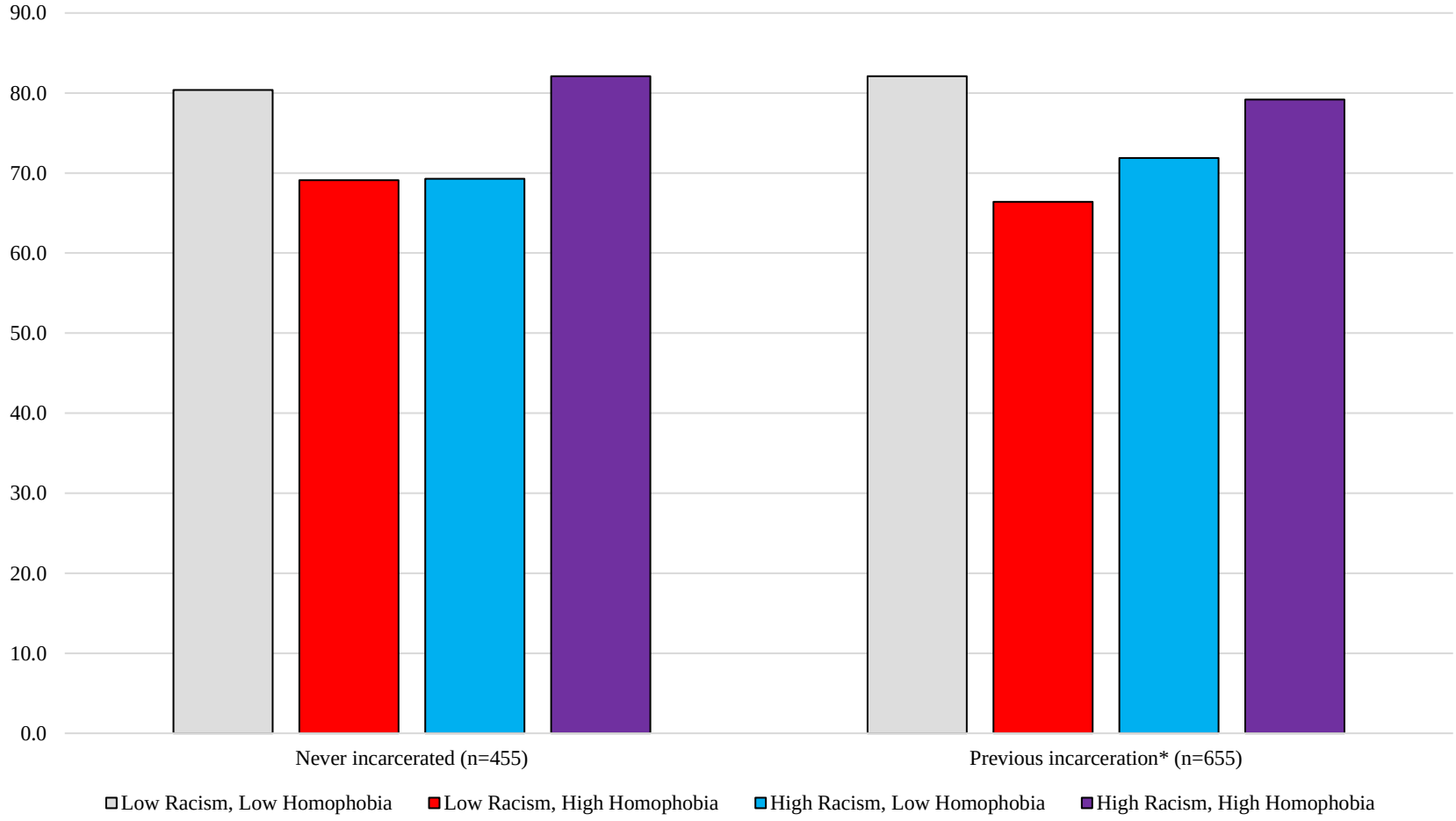
(referent) among those Exposed to 100% Racism [1]*				
Significant (p<.05) confidence intervals bolded. *Prevalence ratios were calculated using continuous measures scaled to a range of 0 to 100%. [1]Calculated using main association*interaction term (Non-Incarcerated aPR = 1.43, 95% CI 0.70, 2.90), (Incarcerated aPR = **1.40**, 95% CI **1.10, 1.78**). Adjusted for age, education level, annual household income, and site location.				

Supplement 1. Log-binomial regression prevalence ratios and 95% confidence intervals of probability of having been HIV tested within the past year and interaction with incarceration (n=1110).

	No Incarceration History		**Incarcerated**	
Measure	**Adjusted for Sociodemographics Only[1]**	**Adjusted for Sociodemographics and Sexual Behaviors[2]**	**Adjusted for Sociodemographics Only[1]**	**Adjusted for Sociodemographics and Sexual Behaviors[2]**
100% Racism (0% Homophobia)*	0.88 (0.63, 1.24)	0.87 (0.61, 1.26)	0.84 (0.70, 1.04)	0.82 (0.68, 1.01)
100% Homophobia (0% Racism)*	0.83 (0.55, 1.25)	0.83 (0.53, 1.27)	**0.79 (0.63, 0.98)**	**0.78 (0.61, 0.98)**

[1]Adjusted for age, education level, annual household income, and site location.
[2]Adjusted for age, education level, annual household income, site location, any condomless receptive anal intercourse, number of sexual partners, and any transactional sex.

Figure 1. Adjusted proportion[1] (%) of HIV testing in past year stratified by racism scale tertile[2], homophobia scale tertile[2], and history of incarceration (n=1110).



[1]Adjusted for age, education level, annual household income, and site location.
[2]Low and high refer to the first and third tertile of the racism (0 to 28, 59 to 112) and homophobia (0 to 15, 43 to 100) scales.
*Significant interaction ($p<.05$) between racism and homophobia among previously incarcerated participants only.