



Published in final edited form as:

*J Child Adolesc Subst Abuse*. 2017 ; 26(3): 242–249. doi:10.1080/1067828X.2017.1299656.

## The Effects of Perceived Racial/Ethnic Discrimination on Substance Use Among Youths Living in the Cherokee Nation

Brady A. Garrett<sup>a</sup>, Bethany J. Livingston<sup>b</sup>, Melvin D. Livingston<sup>b</sup>, and Kelli A. Komro<sup>c</sup>

<sup>a</sup>Cherokee Nation Behavioral Health, Tahlequah, OK, USA

<sup>b</sup>University of North Texas Health Science Center, Fort Worth, TX, USA

<sup>c</sup>Emory University, Atlanta, GA, USA

### Abstract

We examined frequency and intensity of racial/ethnic discrimination and the longitudinal relationship to substance use. The sample included ( $N= 1,421$ ) American Indian, American Indian and White, and White adolescents. A high frequency of perceived racial discrimination was associated with an increased risk for heavy alcohol use, prescription drug misuse, and other illicit drug use. Experiences of perceived racial discrimination high in intensity were associated with further increased risk of prescription drug misuse and other illicit drug use. Race/ethnicity did not moderate the relationship between perceived racial discrimination and substance use. Interventions targeting the deleterious effects of racial discrimination may need to be designed to account for both the environment and the individual.

### Keywords

adolescence; American Indian; perceived racial discrimination; substance use

### Introduction

A growing body of literature has linked perceived racial discrimination to various negative health outcomes including alcohol and drug use during adolescence (Jones & Galliher, 2015; Tobler et al., 2013). A recent systematic review found racial discrimination to be an important social determinant of health for children and adolescents (Priest et al., 2013). However, knowledge of the causal order in adolescents between racial discrimination and negative health outcomes remains limited as most studies use cross-sectional designs rather than longitudinal designs. Given that discrimination is self-reported and subject to individual perceptions, it is feasible that the negative mental health and substance use outcomes associated with discrimination could also be affecting the level of reported discrimination within one time point. Priest and colleagues (2013) highlight the need for more research into moderators of racial discrimination, and few studies have been conducted with American Indian (AI) youths.

Racial discrimination can be conceptualized as an aspect of racism that functions as a psychological stressor and has serious implications for health disparities (Dion, 2002; Williams & Mohammed, 2009). Priest and colleagues (2013) described racial discrimination as a phenomenon that produces unfair inequalities in power, resources, and opportunities across racial or ethnic groups. The negative impact of racial discrimination on physical and mental health outcomes has been demonstrated across different racial and ethnic groups (e.g., Clark, Anderson, Clark, & Williams, 1999; Galliher, Jones, & Dahl, 2011; Lee, 2003; Okamoto, Ritt-Olson, Soto, Baezconde-Garbanati, & Unger, 2009). In African-American samples, a variety of cross-sectional and longitudinal studies have found associations between perceived racial discrimination and substance use (Clark et al., 1999). For example, Gibbons, Gerrard, Cleveland, Wills, and Brody (2004) found discrimination to be positively associated with psychological distress, favorable cognitions about substance use, and greater likelihood of affiliating with friends who use substances. Clark and colleagues (1999) found perceived racism among African-Americans to be associated with hypertension, cardiovascular disease, depression, and substance abuse. In a Latino adolescent sample, Okamoto and colleagues (2009) found an association between perceived discrimination and smoking, alcohol, marijuana, inhalants, and binge drinking. In the limited number of studies with diverse samples, discrimination was significantly associated with negative health outcomes, yet race was not a significant moderator (e.g., Choi, Harachi, Gillmore, & Catalano, 2006; Tobler et al., 2013).

Research examining the effect of perceived racial discrimination on health among AIs is relatively sparse. AIs are often dropped from more diverse samples or combined with other racial-ethnic minorities groups due to limited representation (Choi et al., 2006). Despite this, findings demonstrate a consistent relation between perceived discrimination and problem health outcomes among AIs (Cheadle & Whitbeck, 2011; Galliher et al., 2011; Whitbeck, Chen, Hoyt, & Adams, 2004). Whitbeck, McMorris, Hoyt, Stubben, and LaFromboise (2002), for example, found perceived discrimination to be positively associated with depressive symptoms among an AI adult sample. In another study, Whitbeck and colleagues (2004) found no direct association between perceived discrimination and alcohol abuse among their adult AI sample. The relationship between perceived discrimination and alcohol abuse was, however, significantly mediated by perceptions of historical loss. In short, perceived discrimination was found to trigger historical loss, which was then found to be related with alcohol abuse (Whitbeck et al., 2004). While these studies add to our understanding of the relationship between discrimination and health outcomes among AIs, they consisted of either reservation-based tribal samples and/or adult tribal samples. In a sample of AI fifth- through eighth-graders, Whitbeck, Hoyt, McMorris, Chen, and Stubben (2001) found experiences of discrimination to be significantly associated with somatic, withdrawn, and anxious/depressed internalizing psychological symptoms. These internalizing symptoms were not linked to substance use during this period of development. However, perceived discrimination predicted substance use through the mediating pathway of anger and delinquency. LaFromboise, Hoyt, Oliver, and Whitbeck (2006) found a significant negative relation between perceived discrimination and resiliency among a sample of AI youths. More recently, Galliher and colleagues (2011) found discrimination to

be linked with lower self-esteem, poor psychosocial functioning, and substance use among Navajo adolescent males living on/near reservation lands.

To date, relatively little focus has been directed toward examining perceived racial discrimination among rural, non-reservation-dwelling AI youths. The current study sought to target this deficit in knowledge by including a sample of AI, AI and White, and White adolescents from small communities located within the Cherokee Nation Tribal Jurisdictional Service Area (CNTJSA). Within the context of the previous literature, we hypothesized that perceived racial discrimination would predict the use of substance use.

## Method

### Participants

Sample characteristics are presented in Table 1. Data were part of a group-randomized controlled trial to prevent alcohol use among youths located in the 14-county CNTJSA (Komro et al., 2015). See Komro and colleagues (2015) for a complete description of the trial design. The present sample included ( $N = 1,421$ ) self-identified American Indian (24.5%), American Indian and White (22.4%), and White (53.1%) adolescents attending four high schools in small, rural communities within the CNTJSA. The four high schools are racially and ethnically diverse, with primarily White and AI populations. The sample was drawn from the baseline period of the prevention trial prior to the implementation of the intervention (Komro et al., 2015). The sample was 49.8% male and primarily low income (56.9%), with a mean age of 15.9. Other racial/ethnic groups were excluded from analyses due to insufficient sample sizes.

The Cherokee Nation is a sovereign, federally recognized tribe located in northeast Oklahoma. As with many Oklahoma-based tribes, the Cherokee Nation is not a reservation but rather a 7,000-square-mile jurisdictional service area covering eight counties and portions of six counties. The Cherokee Nation has approximately 317,000 tribal members and is considered one of the largest tribes in the country. Cherokee Nation provides tribal citizens with a variety of services including, but not limited to, housing assistance, employment, health care, and career/vocational guidance programs.

### Procedure

The students completed two self-report surveys approximately six months apart. Each survey was given a unique study ID number to protect the confidentiality of the student participants. All of the school-based surveys were administered by trained research teams using standardized protocols. Institutional Review Boards at the University of Florida and the Cherokee Nation approved data collection procedures, protocols, and analyses. For more survey procedure details, see Komro and colleagues (2015).

### Independent variable

**Perceived discrimination**—Frequency of perceived discrimination and intensity of discrimination experiences were assessed by two items drawn from the National Youth Risk Behavior Survey (YRBS; Centers for Disease Control and Prevention [CDC], 2010).

Frequency of perceived discrimination was assessed by asking, “How often have you experienced any kind of discrimination due to your race/ethnicity?” Response options were “never,” “hardly ever,” “a few times a year,” “monthly,” and “daily.” “Hardly ever” and “a few times a year” were combined into a “seldom” category. “Monthly” and “daily” responses were combined into an “often” category. Intensity of discrimination was assessed by asking, “How would you describe the discrimination you have experienced?” Response options were “I have not experienced any kind of discrimination due to my race/ethnicity,” “not very disturbing,” “somewhat disturbing,” or “very disturbing.”

### Dependent variables

**Alcohol use**—Alcohol use was assessed with two items drawn from the YRBS (CDC, 2010). Monthly alcohol use was assessed by asking, “During the last 30 days, on how many days did you have at least one drink of alcohol?” Heavy episodic alcohol use was assessed by asking, “During the past 30 days, on how many days did you have five or more drinks of alcohol in a row; that is, within a couple of hours?” Responses to the alcohol use items were dichotomized to reflect “Yes” and “No” categories.

**Tobacco use**—Tobacco use was assessed by two items drawn from the YRBS (CDC, 2010): cigarette use and smokeless tobacco use. Cigarette use was assessed by asking, “During the past 30 days, on how many days did you smoke cigarettes?” Smokeless tobacco use was assessed by asking, “During the past 30 days, on how many days did you use chewing tobacco, snuff, or dip, such as Red Man, Levi Garrett, Beech-Nut, Skoal, Skoal Bandits, or Copenhagen?” Responses to all tobacco use items were dichotomized to reflect “Yes” and “No” categories.

**Illicit drug use**—Illicit drug use was assessed with three items drawn from the YRBS (CDC, 2010): marijuana use, illicit prescription drug use, and other drug use. Marijuana use was assessed by asking, “During the past 30 days, how many times did you use marijuana (grass, pot)?” Illicit prescription drug use was assessed by asking, “During the past 30 days, how many times did you take a prescription drug (such as OxyContin, Percocet, Vicodin, codeine, Adderall, Ritalin, Xanax, or sleeping pills) without a doctor’s prescription?” Other drug use was assessed by asking, “During the past 30 days, how many times have you used any other illegal drug (not including alcohol, tobacco, marijuana, or prescription drugs)?” Responses to all illicit drug use items were dichotomized to reflect “Yes” and “No” categories.

### Analyses

We used logistic regression analysis in SAS PROC LOGISTIC to examine the influence of perceived discrimination on later substance use. We assessed the effects of discrimination frequency in three stages. First, the presence of any differences by discrimination frequency was assessed with a series of regression models of the following form:

$$E(Y_{2i}) = \beta_0 + \beta_1 X_{1i}$$

where  $Y_{1i}$  represents the outcome variable for participant  $i$  at time 2, and  $X_{1i}$  represents discrimination frequency for participant  $i$  at time 1. Second, we attempted to estimate the causal effect of discrimination on later substance use with regression of the following form:

$$E(Y_{2i}) = \beta_0 + \beta_1 X_{1i} + \beta_2 Y_{1i} + \beta_3 Z_{1i}$$

where  $Y_{2i}$  represents the substance use outcome variable for participant  $i$  at time 2,  $X_{1i}$  represents discrimination frequency for participant  $i$  at time 1,  $Y_{1i}$  represents the baseline value of the outcome variable for participant  $i$ , and  $Z_{1i}$  represents a set of time invariant selection factors for participant  $i$  (race, gender, and socioeconomic status). Controlling for baseline values of the outcome variable provided greater control of selection factors compared to the demographic controls present in many studies. Third, we estimated whether discrimination frequency effects were differential by race/ethnicity with regressions of the following form:

$$E(Y_{2i}) = \beta_0 + \beta_1 X_{1i} + \beta_2 Y_{1i} + \beta_3 Z_{1i} + \beta_4 X_{1i} * \text{Race}_i$$

where  $Y_{2i}$  represents the substance use outcome variable for participant  $i$  at time 2,  $X_{1i}$  represents discrimination frequency for participant  $i$  at time 1,  $Y_{1i}$  represents the baseline value of the outcome variable for participant  $i$ ,  $Z_{1i}$  represents a set of time invariant selection factors for participant  $i$  (gender and socioeconomic status), and  $X_{1i} * \text{Race}_i$  is the interaction term for race and discrimination frequency.

To estimate the effect of discrimination intensity on later substance use we first restricted the sample to those reporting some frequency of discrimination. We performed an analogous set of analyses to those described for discrimination frequency with this subset and the discrimination intensity item.

## Results

Race/ethnicity did not moderate the effects of frequency and intensity of perceived racial discrimination on substance use outcomes. Given this, the results were presented for the combined sample. Twenty-two percent of the sample reported experiencing racial discrimination. Of those that experienced racial discrimination, 9% reported that the discrimination was somewhat or very disturbing.

The effects of frequency of discrimination on substance use outcomes are presented in Table 2. Compared to students reporting no perceived racial discrimination, those who reported moderate frequency of perceived racial discrimination had twice the odds of reporting marijuana use and almost 3 times the odds of reporting other drug use. The effect on marijuana, however, was no longer statistically significant when controlling for potential confounders. Compared to those who reported experiencing no perceived racial discrimination, those who reported high frequency of perceived racial discrimination were significantly more likely to report alcohol use, heavy alcohol use, prescription drug misuse, and other drug use. After controlling for potential confounders, large and statistically

significant effects were seen on heavy alcohol use (OR: 2.48 95% CI: [1.01, 6.13]), prescription drug misuse (OR: 4.67 95% CI: [1.87, 11.69]), and other drug use (OR: 6.66 95% CI: [2.05, 21.64]).

The effect of intensity of discrimination on substance use is presented in Table 3. Compared to those who reported low levels of perceived discrimination intensity, those who reported moderate intensity were more likely to report smoking cigarettes in the past 30 days. However, this effect was no longer statistically significant when accounting for potential confounders. Compared to those who reported low levels of perceived discrimination intensity, those reporting perceived discrimination high in intensity were more likely to report prescription drug misuse and other drug use regardless of adjustments for potential confounders.

## Discussion

Previous research has shown perceived racial discrimination to be a significant detriment to health outcomes for racial-ethnic minority populations (Williams, Neighbors, & Jackson, 2003). There have been relatively few studies looking at AI populations in relation to perceived racial discrimination and problematic behaviors such as substance use. Generally, most studies include AI adults living on or near reservation land, with little work directed toward AI youths living in non-reservation areas. This study intended to address this gap in the literature by examining the effects of perceived racial discrimination on alcohol and drug use among AI adolescents in small, rural communities located within the CNTJSA.

We found that experiencing perceived racial discrimination likely contributed to substance use among the youths in our sample, particularly non-normative substance use such as prescription drug misuse and other illicit drug use (e.g., amphetamines, cocaine, etc.). As a whole, our findings support our hypothesis and are consistent with prior research examining the effects of perceived discrimination on substance use (Galliher et al., 2011; Williams et al., 2003). It is important to highlight that use of non-normative substances was predicted by both the frequency and intensity of perceived racial/ethnic discrimination. That is, students who reported high frequency and high perceived discrimination intensity were at much greater risk of reporting prescription drug misuse and other illicit drug use relative to those who reported a low frequency of perceived discrimination and low levels of perceived discrimination intensity. Students who frequently perceive discrimination and also experience intense negative reactions to these perceptions may be more likely to use substances that are typically not used by their peers. This is important because it suggests that students reporting high frequency and high intensity of racial discrimination are more likely to use substances that are highly addictive and especially harmful. The stress of frequent and intense experiences of racial discrimination may compromise coping mechanisms and diminish the capacity for good judgment to the point where a student may use any substance that is most easily accessible in order to mute or dampen the negative affect associated with racial discrimination (e.g., Clark et al., 1999; Galliher et al., 2011; Gibbons et al., 2004).

The combination of high frequency and high intensity of perceived racial discrimination, access to alcohol and illicit drugs common to rural communities, and limited prevention/intervention resources may place the youths in our sample at particular risk for substance use behavior. Using YRBS data, Rutman, Park, Castor, Taulii, and Forquera (2008) found higher rates of illicit drug use among urban AI youths. However, data for rural AI youths were not included in the results. Atav and Spencer (2002) found rural adolescents were more than twice as likely to report other drug use compared to suburban and urban youths. Lambert, Gale, and Hartley (2008) found higher alcohol and methamphetamine prevalence rates among youths living in rural areas, although race/ethnicity was not explored. Our findings seem consistent with other studies examining substance use patterns of rural adolescents.

The risk for substance use behavior increased for students who perceived high levels of racial discrimination, and these risks did not appear to differ by any racial-ethnic group affiliation. Tobler and colleagues (2013) found perceived racial-ethnic discrimination to be associated with multiple high-risk behaviors among an urban, racial-ethnic minority youth sample. Similar to our findings, race/ethnicity was not a significant moderator of the observed associations. Tobler and colleagues (2013) attributed this to perceptions and intensity of discrimination potentially being experienced equivalently across races/ethnicities in more multiracial communities and schools.

There were differences in the frequency of reported discrimination among the racial/ethnic groups in our sample (i.e., White 18%, American Indian 26%, American Indian and White 25%). While the relationship between discrimination and substance use did not differ by race/ethnicity, the AI-only and the AI and White students reported experiencing perceived racial discrimination more often than the students identifying as White only. A non-adherence to mainstream cultural standards and a divergent worldview may explain why the AI students experienced perceived racial discrimination. For the students identifying as both AI and White, perhaps the unique process of developing a bicultural identity presents its own challenges and complexities where sensitivity to perceptions of racial discrimination persist.

The White students in our sample also experienced perceived racial discrimination, but at a lower rate than those identifying as AI only and those identifying as both AI and White. Not much is currently known about the effects of perceived racial discrimination among Whites. Bower, Thorp, and Laveist (2013) found higher rates of perceived racial discrimination among a low-income, urban-dwelling White sample. The White participants were the racial-ethnic minority within their particular neighborhood and experienced discrimination and social inequity similar to African-Americans who live in comparable neighborhoods. As Priest and colleagues (2013) assert racial discrimination can be understood as the inequity of access to resources across racial-ethnic populations. The Cherokee Nation is a non-reservation jurisdictional service area that provides tribal citizens with various services and access to important resources including (but not limited to) housing assistance, education assistance, scholarships, employment assistance and youth work programs, job training, elder care, and comprehensive health care. With this understanding, White students living

within the CNTJSA may feel discriminated against due to their non-tribal status and lack of access to tribally provided services and resources.

### **Limitations, strengths, and conclusions**

The present research has several limitations. First, our measure of perceived racial discrimination consisted of only two items. The inclusion of additional measures would likely enhance understanding of the experience of racial discrimination and the dose-response relationship between perceived racial discrimination and substance use. Second, there are no data as to those perpetrating the racial discrimination or where it took place. Identifying sources and settings of discrimination is crucial for designing prevention and implementation strategies that aim to reduce and eradicate it (Krieger, 2012; Priest et al., 2013). Third, other predictors of risky substance use, such as other stressful life events or depression, were not examined. Inclusion of such related predictors would likely tease apart possible confounding or interactive effects. Last, our data were collected from rural locations in northeast Oklahoma and therefore may not generalize to other regions of the country.

With regard to strengths, our study used longitudinal data that included a diverse mix of AI, AI and White, and White students attending schools in rural communities within the Cherokee Nation. A majority of AI research in this area has been limited to cross-sectional designs and mostly adult samples recruited from, or in close proximity to, a reservation. This study is thus unique in that it focuses on health-related outcomes for AI, AI and White, and White youths who live in diverse, small, non-reservation communities. Future studies should continue to explore possible health differences and similarities between reservation and non-reservation-dwelling AI youths.

Another distinct aspect of this study was that White youths were found to be susceptible to perceived racial discrimination and its negative effects despite making up the dominant racial/ethnic population within the CNTJSA. Little is currently known about the possible effects of racial discrimination on Whites or the settings and circumstances in which such discrimination may occur (e.g., Bower et al., 2013; Williams, Yu, Jackson, & Anderson, 1997). Future research should examine perceived racial discrimination of Whites who live in non-reservation-based communities to improve our understanding of this phenomenon.

In conclusion, perceived racial discrimination is a significant detriment to the development and wellness of youths (Priest et al., 2013). Our findings demonstrate the harmful effects of discrimination regardless of one's race/ethnicity. Students reporting more frequent perceived racial discrimination reported higher rates of alcohol use, prescription drug misuse, and illicit drug use. Students reporting discrimination experiences high in intensity were at greater risk for prescription drug misuse and illicit drug use. As mentioned, discrimination did not differ by race/ethnicity. Further work is needed to clarify the role of perceived racial discrimination in relation to substance use specifically among AI youths living in rural, culturally integrated areas. In addition to racial-ethnic group membership, future researchers may also want to consider whether perceived racial discrimination differs by strength of cultural identification among non-reservation-based AI youths. Although previous studies have demonstrated moderating/mediating effects of the level of cultural identity on



experiences of perceived discrimination and substance use patterns among AIs (e.g., Galliher et al., 2011; Jones & Galliher, 2015; Whitbeck et al., 2001), relatively little work has been undertaken with respect to AI youths living in rural, non-reservation areas. Finally, other related predictors of substance use, such as other stressful life events or depression, should be included in future work to understand how these factors potentially interact with perceived discrimination to explain risky substance use among AI, AI and White, and White youths living in this context. The results of the current study suggest that implementation of interventions targeting racial discrimination may not need to target any specific racial/ethnic subgroup particularly in the Cherokee Nation where there is arguably a greater merge of AI and White culture relative to reservation contexts. This study provides further evidence of the link between perceived racial discrimination and substance use and serves as a starting point in an area of research that warrants additional attention to non-reservation, integrated AI communities.

## Acknowledgments

We wish to acknowledge and thank Dr. Terrence K. Kominsky and Jessica Douthitt for their leadership and management of data collection efforts.

### Funding

This study was supported by National Institute on Alcohol Abuse and Alcoholism (NIAAA) Grant Number R01AA020695. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health, the Cherokee Nation, the University of North Texas Health Science Center, or Emory University.

## References

- Atav S, Spencer GA. Health risk behaviors among adolescents attending rural, suburban, and urban schools: A comparative study. *Family & Community Health*. 2002; 25(2):53–64. [PubMed: 12010115]
- Bower KM, Thorpe RJ, LaVeist TA. Perceived racial discrimination and mental health in low-income, urban-dwelling Whites. *International Journal of Health Services*. 2013; 43(2):267–280. [PubMed: 23821905]
- Centers for Disease Control and Prevention. Youth risk behavior surveillance—United States, 2009. *MMWR*. 2010; 59:1–142.
- Cheadle JE, Whitbeck LB. Alcohol use trajectories and problem drinking over the course of adolescence: A study of North American indigenous youth and their caretakers. *Journal of Health and Social Behavior*. 2011; 52(2):228–245. [PubMed: 21558489]
- Choi Y, Harachi TW, Gillmore MR, Catalano RF. Are multiracial adolescents at greater risk? Comparisons of rates, patterns, and correlates of substance use and violence between monoracial and multiracial adolescents. *American Journal of Orthopsychiatry*. 2006; 76(1):86. [PubMed: 16569131]
- Clark R, Anderson NB, Clark VR, Williams DR. Racism as a stressor for African Americans: A biopsychosocial model. *American Psychologist*. 1999; 54(10):805. [PubMed: 10540593]
- Dion KL. The social psychology of perceived prejudice and discrimination. *Canadian Psychology/Psychologie-canadienne*. 2002; 43(1):1.
- Galliher RV, Jones MD, Dahl A. Concurrent and longitudinal effects of ethnic identity and experiences of discrimination on psychosocial adjustment of Navajo adolescents. *Developmental Psychology*. 2011; 47(2):509. [PubMed: 21142373]
- Gibbons FX, Gerrard M, Cleveland MJ, Wills TA, Brody G. Perceived discrimination and substance use in African American parents and their children: A panel study. *Journal of Personality and Social Psychology*. 2004; 86(4):517. [PubMed: 15053703]

- Jones ML, Galliher RV. Daily racial microaggressions and ethnic identification among Native American young adults. *Cultural Diversity and Ethnic Minority Psychology*. 2015; 21(1):1. [PubMed: 25090153]
- Komro KA, Wagenaar AC, Boyd ML, Boyd BJ, Kominsky TK, Pettigrew D, Molina MMM. Prevention trial in the Cherokee Nation: Design of a randomized community trial. *Prevention Science*. 2015; 16(2):291–300. [PubMed: 24615546]
- Krieger N. Methods for the scientific study of discrimination and health: An ecosocial approach. *American Journal of Public Health*. 2012; 102(5):936–944. [PubMed: 22420803]
- LaFromboise TD, Hoyt DR, Oliver L, Whitbeck LB. Family, community, and school influences on resilience among American Indian adolescents in the upper Midwest. *Journal of Community Psychology*. 2006; 34(2):193–209.
- Lambert D, Gale JA, Hartley D. Substance abuse by youth and young adults in rural America. *The Journal of Rural Health*. 2008; 24(3):221–228. [PubMed: 18643798]
- Lee RM. Do ethnic identity and other-group orientation protect against discrimination for Asian Americans? *Journal of Counseling Psychology*. 2003; 50(2):133.
- Okamoto J, Ritt-Olson A, Soto D, Baezconde-Garbanati L, Unger JB. Perceived discrimination and substance use among Latino adolescents. *American Journal of Health Behavior*. 2009; 33(6):718. [PubMed: 19320620]
- Priest N, Paradies Y, Trenerry B, Truong M, Karlsen S, Kelly Y. A systematic review of studies examining the relationship between reported racism and health and wellbeing for children and young people. *Social Science & Medicine*. 2013; 95:115–127. [PubMed: 23312306]
- Rutman S, Park A, Castor M, Taulii M, Forquera R. Urban American Indian and Alaska native youth: Youth risk behavior survey 1997–2003. *Maternal and Child Health Journal*. 2008; 12(1):76–81. [PubMed: 18483839]
- Tobler AL, Maldonado-Molina MM, Staras SA, O’Mara RJ, Livingston MD, Komro KA. Perceived racial/ethnic discrimination, problem behaviors, and mental health among minority urban youth. *Ethnicity & Health*. 2013; 18(4):337–349. [PubMed: 23043428]
- Whitbeck LB, Chen X, Hoyt DR, Adams GW. Discrimination, historical loss and enculturation: Culturally specific risk and resiliency factors for alcohol abuse among American Indians. *Journal of Studies on Alcohol*. 2004; 65(4):409–418. [PubMed: 15376814]
- Whitbeck LB, Hoyt DR, McMorris BJ, Chen X, Stubben JD. Perceived discrimination and early substance abuse among American Indian children. *Journal of Health and Social Behavior*. 2001; 42(4):405–424. [PubMed: 11831140]
- Whitbeck LB, McMorris BJ, Hoyt DR, Stubben JD, LaFromboise T. Perceived discrimination, traditional practices, and depressive symptoms among American Indians in the upper Midwest. *Journal of Health and Social Behavior*. 2002; 43(4):400–418. [PubMed: 12664673]
- Williams DR, Mohammed SA. Discrimination and racial disparities in health: Evidence and needed research. *Journal of Behavioral Medicine*. 2009; 32(1):20–47. [PubMed: 19030981]
- Williams DR, Neighbors HW, Jackson JS. Racial/ethnic discrimination and health: Findings from community studies. *American Journal of Public Health*. 2003; 93(2):200–208. [PubMed: 12554570]
- Williams DR, Yu Y, Jackson JS, Anderson NB. Racial differences in physical and mental health socio-economic status, stress and discrimination. *Journal of Health Psychology*. 1997; 2(3):335–351. [PubMed: 22013026]

**Table 1**

Sample percentages for demographic and outcome variables.

	Overall (N = 1421)	White (N = 755)	AI/White (N = 318)	AI (N = 348)
Age				
19	0.42	0.66	0	0.29
18	11.05	11.39	9.12	12.07
17	22.24	21.99	21.07	23.85
16	26.18	26.36	26.42	25.57
15	28.43	26.23	32.08	29.89
14	11.68	13.38	11.32	8.33
Gender				
Male	49.89	50.2	50.63	48.56
Female	50.11	49.8	49.37	51.44
Reduced-Price Lunch				
Yes	43.06	39.50	44.20	50.00
Past-Month Alcohol Use				
Yes	19.90	18.45	22.08	21.04
Past-Month Heavy Alcohol Use				
Yes	12.03	10.65	12.70	14.45
Past-Month Cigarette Use				
Yes	12.46	12.02	13.52	12.46
Past-Month Marijuana Use				
Yes	8.14	7.89	8.83	8.07
Past-Month Prescription Misuse				
Yes	6.16	6.02	6.94	5.76
Past-Month Other Drug Use				
Yes	2.2	2.14	2.85	1.73
Discrimination Frequency				
None	78.49	82.43	73.44	74.4
Moderate	19.33	15.54	23.61	23.81
High	2.17	2.03	2.95	1.79
Discrimination Intensity				
N/A	73.29	76.95	72.04	66.36
Not very disturbing	13.94	12.89	14.47	15.76
Somewhat disturbing	8.66	6.31	11.18	11.52
Very disturbing	4.11	3.84	2.3	6.36

Note. AI = American Indian.

**Table 2**

Effect of discrimination frequency.

Discrimination Frequency	Crude		Adjusted	
	OR	95% CI	OR	95% CI
Past-Month Alcohol Use				
Mod vs. None	0.89	0.64–1.24	0.81	0.55–1.20
High vs. None	2.33	1.11–4.91	1.80	0.61–5.36
Past-Month Heavy Alcohol Use				
Mod vs. None	1.12	0.78–1.62	0.99	0.63–1.54
High vs. None	2.80	1.28–6.09	2.48	1.01–6.13
Past-Month Cigarette Use				
Mod vs. None	1.26	0.88–1.8	0.99	0.60–1.62
High vs. None	1.18	0.45–3.13	0.88	0.20–3.90
Past-Month Marijuana Use				
Mod vs. None	2.02	1.38–2.95	1.55	0.97–2.47
High vs. None	2.49	0.99–6.24	1.30	0.40–4.19
Past-Month Prescription Misuse				
Mod vs. None	1.55	0.94–2.56	0.99	0.52–1.89
High vs. None	5.02	2.07–12.16	4.67	1.87–11.69
Past-Month Other Drug Use				
Mod vs. None	2.88	1.53–5.42	2.70	1.40–5.21
High vs. None	8.47	3.0–23.97	6.66	2.05–21.64

*Note.* OR = odds ratio; CI = confidence interval; Mod = moderate; Adjusted measure controlled for gender, reduced-price lunch, race, and baseline behavior.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

**Table 3**

Effect of discrimination intensity.

Discrimination Intensity	Crude		Adjusted	
	OR	95% CI	OR	95% CI
Past-Month Alcohol Use				
Mod vs. Low	1.4	0.70–2.5	1.3	0.60–2.50
High vs. Low	1.1	0.40–3.20	0.9	0.30–3.0
Past-Month Heavy Alcohol Use				
Mod vs. Low	1.5	0.50–4.60	1.5	0.70–3.10
High vs. Low	1.7	0.90–3.30	1.2	0.40–4.20
Past-Month Cigarette Use				
Mod vs. Low	2.0	1.10–4.0	2.0	0.90–4.40
High vs. Low	1.3	0.40–4.30	1.5	0.40–5.50
Past-Month Marijuana Use				
Mod vs. Low	1.6	0.80–3.20	1.5	0.70–3.20
High vs. Low	1.2	0.40–3.90	1.2	0.30–4.40
Past-Month Prescription Misuse				
Mod vs. Low	2.1	0.90–5.0	2.3	0.90–6.40
High vs. Low	3.8	1.20–12.2	5.3	1.40–19.8
Past-Month Other Drug Use				
Mod vs. Low	2.9	1.0–8.40	2.8	0.90–8.70
High vs. Low	7.2	2.0–26.1	9.1	2.20–37.5

*Note.* OR = odds ratio; CI = confidence interval; Mod = moderate; Adjusted measure controlled for gender, reduced-price lunch, race, and baseline behavior.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript