

# Racial Discrimination and Racial Identity Attitudes in Relation to Self-Rated Health and Physical Pain and Impairment Among Two-Spirit American Indians/Alaska Natives

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Research on lesbian, gay, bisexual, and other sexual-minority (two-spirit) American Indians/Alaska Natives is sparse. Existing epidemiologic data, however, indicate that the general American Indian/Alaska Native (AIAN) population is at disproportionately greater risk for poorer general health and physical pain and impairment.<sup>1–5</sup> According to the National Center for Health Statistics, in 2004 American Indians/Alaska Natives had the highest prevalence of respondent-rated fair or poor health (16.5%) of the racial/ethnic groups surveyed.<sup>5</sup> Moreover, American Indians/Alaska Natives had the highest prevalence of past-month severe headache or migraine (19.1%), low back pain (35.3%), neck pain (18.8%), and joint pain (39.6%).<sup>5</sup> American Indians/Alaska Natives were most likely to experience limitations in daily activities caused by chronic conditions than were other racial/ethnic groups (17.1%).<sup>5</sup> Two-spirit American Indians/Alaska Natives may also face serious public health problems. For example, research focused on two-spirit AIAN communities suggests a high prevalence of HIV infection and substance use.<sup>6,7</sup>

Moreover, studies on two-spirit American Indians/Alaska Natives indicate high levels of exposure to social hazards, including experiences of homophobia in mainstream and AIAN heteronormative contexts as well as racism within gay communities.<sup>7–11</sup> Research on minority groups suggests that such experiences may contribute to poor health. Experiences of discrimination, whether based on race, gender, sexuality, or other characteristics, have been shown to have negative implications for health, including mental health<sup>12–21</sup> and health behaviors.<sup>22–25</sup> Studies of Asian, Black, and Latino sexual minorities indicate that discrimination may be associated with higher levels of depression and HIV risk behavior.<sup>26–30</sup>

Research conducted with non-White groups suggests that discrimination may also have negative implications for physical health via stress-mediated

**Objectives.** We examined associations between racial discrimination and actualization, defined as the degree of positive integration between self-identity and racial group identity, and self-rated health and physical pain and impairment.

**Methods.** We used logistic regressions to analyze data from 447 gay, lesbian, bisexual, and other sexual-minority American Indians/Alaska Natives.

**Results.** Greater self-reported discrimination was associated with higher odds of physical pain and impairment (odds ratio [OR]=1.42; 95% confidence interval [CI]=1.13, 1.78); high levels of actualization were associated with lower odds of physical pain and impairment (OR=0.59; 95% CI=0.35, 0.99) and self-rated fair or poor health (OR=0.54; 95% CI=0.32, 0.90). Actualization also moderated the influence of discrimination on self-rated health ( $t=-2.33$ ;  $P=.020$ ). Discrimination was positively associated with fair or poor health among participants with low levels of actualization, but this association was weak among those with high levels of actualization.

**Conclusions.** Among two-spirit American Indians/Alaska Natives, discrimination may be a risk factor for physical pain and impairment and for fair or poor self-rated health among those with low levels of actualization. Actualization may protect against physical pain and impairment and poor self-rated health and buffer the negative influence of discrimination. (*Am J Public Health.* 2009;99:S144–S151. doi:10.2105/AJPH.2007.126003)

pathways.<sup>31–39</sup> For example, a recent national study of Asian Americans found that more self-reported experiences of discrimination were associated with higher odds of cardiovascular and respiratory health problems, as well as of chronic pain.<sup>38</sup> A study of sexual-minority Blacks also suggested that experiences of discrimination may have negative consequences for cardiovascular health.<sup>39</sup> Accordingly, biopsychosocial models of health posit that discrimination, as a source of psychosocial stress, may have more immediate effects on physiology through biological pathways, including its influence on autonomic nervous,<sup>40</sup> endocrine,<sup>41,42</sup> and immune<sup>43,44</sup> systems; cellular aging<sup>45</sup>; and gene expression.<sup>46,47</sup>

Other studies suggest that dimensions of racial group identity may be protective and may buffer the influence of discrimination on health. Research has shown that greater racial group identification and racial centrality (the degree to which race is salient to self-identification) moderated the effect of discrimination on mental

health among Black and Mexican American youth.<sup>19–21,48</sup> A study of Asian gay men found that endorsing positive evaluations of their own group protected against depression and moderated the influence of perceived devaluation by others on HIV risk behavior.<sup>49</sup>

High levels of AIAN actualization, a dimension of racial identity attitude development, may protect against poor health.<sup>3,4,10,50</sup> Actualization identity attitude parallels the final stage of other models of racial identity developed for non-White populations<sup>51–53</sup> and is characterized as having a positive integration between self- and group identity attitudes, a commitment to AIAN interests, and an appreciation of being AIAN.<sup>4,10</sup> High levels of actualization attitudes among American Indians/Alaska Natives may have protective health properties and may also serve as a psychological buffer against stress associated with racial discrimination. Although no published studies have explicitly examined associations between actualization and health outcomes among

American Indians/Alaska Natives, the extant research has suggested that traditional practices and AIAN spirituality may be protective<sup>54,55</sup>; one study found that engagement in traditional practices buffered the influence of discrimination on depressive symptoms.<sup>56</sup>

Although research suggests that discrimination may have negative implications for mental and behavioral health outcomes, only a handful of studies have examined the influence of discrimination on health among American Indians/Alaska Natives. Even fewer have examined associations between discrimination and physical health outcomes, and no studies to our knowledge have examined discrimination in relation to physical health outcomes among two-spirit American Indians/Alaska Natives.

We contributed to the existing literature by studying the effect of racial microaggressions, a form of racial discrimination, and actualization. We examined whether actualization may moderate the influence of racial discrimination in this considerably understudied population. Although it is likely that two-spirit American Indians/Alaska Natives are also susceptible to other forms of discrimination (e.g., by gender or sexuality), we focused on racial discrimination because we hypothesized that racial actualization may serve as a buffer specifically for racial discrimination. We measured associations with 2 health outcomes: (1) self-rated general health status, which has been shown to be a predictor of actual health and mortality,<sup>57</sup> and (2) self-reported bodily pain and impairment, an explicit physical health outcome that may be directly influenced by stress and that is less susceptible than are other physical health measures to reporting bias caused by differences in knowledge or access to medical care. Our data were from the Honor Project (principal investigator, K.L.W.), a study of the health of two-spirit American Indians/Alaska Natives.

## METHODS

### Sample and Procedure

Participants in the Honor Project were recruited from 7 metropolitan areas in the United States: Seattle-Tacoma, Washington; San Francisco-Oakland and Los Angeles, California; Denver, Colorado; Tulsa, Oklahoma; Minneapolis-St. Paul, Minnesota; and New York, New York. Eligibility criteria included (1) self-identifying as American Indian, Alaska

**TABLE 1—Distribution of Demographic and Psychosocial Characteristics of Two-Spirit American Indians/Alaska Natives (N = 447), by Self-Reported General Health and Physical Pain and Impairment: The Honor Project, 2005–2007**

	Total	Self-Rated General Health		Physical Pain and Impairment	
		Excellent, Very Good, Good	Fair or Poor	No	Yes
Self-rated health, no. (%)					
Excellent/very good/good	289 (64.7)				
Fair/poor	158 (35.3)				
Physical pain/impairment, no. (%)					
No	193 (43.2)				
Yes	254 (56.8)				
Self-reported racial discrimination score, <sup>a</sup> mean (SD)	1.55 (1.08)	1.50 (1.07)	1.64 (1.08)	1.36 (1.08)	1.69 (1.06)
Actualization attitudes score, <sup>b</sup> mean (SD)	3.48 (0.45)	3.51 (0.43)	3.41 (0.46)	3.50 (0.44)	3.46 (0.45)
Gender, no. (%)					
Men	189 (42.3)	135 (46.7)	54 (34.2)	93 (48.2)	96 (37.8)
Women	130 (29.1)	82 (28.4)	48 (30.4)	51 (26.4)	79 (31.1)
Other	128 (28.6)	72 (24.9)	56 (35.4)	49 (25.4)	79 (31.1)
Age, mean (SD)	39.79 (10.76)	38.22 (10.88)	42.66 (9.95)	36.99 (10.35)	41.92 (10.59)
Percentage of Indian blood, no. (%)					
<25	31 (7.0)	21 (7.3)	10 (6.3)	18 (9.3)	13 (5.1)
25–49	124 (27.8)	79 (27.4)	45 (28.5)	48 (24.9)	76 (30.0)
50–74	101 (22.6)	60 (20.8)	41 (25.9)	40 (20.7)	61 (24.1)
≥75	190 (42.6)	128 (44.4)	62 (39.2)	87 (45.1)	103 (40.7)
Sexual orientation, no. (%)					
Lesbian/gay	202 (45.8)	143 (50.5)	59 (37.3)	103 (53.6)	99 (39.8)
Bisexual	129 (29.3)	78 (27.6)	51 (32.3)	52 (27.1)	77 (30.9)
Two-spirit	70 (15.9)	41 (14.5)	29 (18.4)	28 (14.6)	42 (16.9)
Other	40 (9.1)	21 (7.4)	19 (12.0)	9 (4.7)	31 (12.4)
Has a current partner, no. (%)					
No	250 (56.1)	156 (54.2)	92 (59.0)	107 (55.7)	143 (56.3)
Yes	196 (43.9)	132 (45.8)	64 (41.0)	85 (44.3)	111 (43.7)
Monthly household income, \$, no. (%)					
≤1000	235 (54.3)	126 (45.8)	109 (69.0)	79 (42.9)	88 (35.3)
1001–2000	83 (19.2)	60 (21.8)	23 (14.6)	41 (22.3)	23 (9.2)
>2001	115 (26.6)	89 (32.4)	26 (16.5)	64 (34.8)	17 (6.8)
Education, no. (%)					
<High School (<12 y)	82 (18.3)	43 (14.9)	39 (24.7)	27 (14.0)	55 (21.7)
High School (12 y)	129 (28.9)	75 (26.0)	54 (34.2)	54 (28.0)	75 (29.5)
Some College (13–15 y)	147 (32.9)	104 (36.0)	43 (27.2)	61 (31.6)	86 (33.9)
≥College (≥16 y)	89 (19.9)	67 (23.2)	22 (13.9)	51 (26.4)	38 (15.0)
Health insurance, no. (%)					
Private	74 (16.6)	65 (22.5)	9 (5.7)	44 (22.8)	30 (11.8)
Public	165 (36.9)	81 (28.0)	84 (53.2)	39 (20.2)	126 (49.6)
Other	103 (23.0)	72 (24.9)	31 (19.6)	57 (29.5)	46 (18.1)
None	105 (23.5)	71 (24.6)	34 (21.5)	53 (27.5)	52 (20.5)

Continued

TABLE 1—Continued

Employment status, no. (%)					
Not working	265 (59.3)	147 (50.9)	118 (74.7)	86 (44.6)	179 (70.5)
Working	182 (40.7)	142 (49.1)	40 (25.3)	107 (55.4)	75 (29.5)
Disability status, no. (%)					
Not disabled	236 (53.0)	193 (67.0)	43 (27.4)	146 (75.6)	90 (35.7)
Disabled	209 (47.0)	95 (33.0)	114 (72.6)	47 (24.4)	162 (64.3)
HIV status, no. (%)					
Negative	301 (67.5)	201 (69.8)	100 (63.3)	132 (68.8)	169 (66.5)
Positive	96 (21.5)	57 (19.8)	39 (24.7)	36 (18.8)	60 (23.6)
Unknown	49 (11.0)	30 (10.4)	19 (12.0)	24 (12.5)	25 (9.8)

<sup>a</sup>Self-reported stress attributable to routine experiences of discrimination, including episodes of physical and verbal violence and harassment or mistreatment, was assessed as the mean of 33 items composing the Microaggressions Distress Scale. See "Methods" section for details.

<sup>b</sup>Actualization was measured as the mean of 17 items from the Urban American Indian Identity scale actualization subscale. See "Methods" section for details.

Native, or First Nation and being enrolled in a tribal nation or reporting having at least 25% American Indian blood; (2) self-identifying as gay, lesbian, bisexual, transgender, or two-spirit or engaging in same-sex sexual behaviors in the past 12 months; (3) being 18 years or older; (4) speaking English; and (5) residing, working, or socializing in the area of the study site.

Participants were recruited through 3 methods designed to minimize selection biases and maximize inclusion of all elements of the heterogeneous target population: targeted, partial-network, and respondent-driven sampling techniques. At all sites, coordinators identified 6 to 8 first-wave seeds (initial recruits) of various ages and genders, who referred second-wave participants. Targeted sampling generated a total of 36 first-wave seeds, of whom 33 participated. All respondents were asked to provide information about members of their social networks who might be eligible for the study. At the Seattle site, participants were given coupons to pass on to each person they had listed; at other sites, participants received coupons for approximately 4 nominees randomly chosen from their network lists. Two additional coupons were provided to each respondent to give to other potential participants they might later encounter or recall. Coupons were coded anonymously to indicate the source respondent.

Of 58 second-wave network or nominee respondents who were identified, 50 participated. In addition, of 469 volunteers who were solicited through newsletters, brochures, and posters, 369 participated. We achieved a total

response rate of 80.1%. There were no significant differences between respondent-driven (i.e., seeds and nominees) and volunteer respondents for the cohort overall or by site on key socio-demographic variables (i.e., gender, education, employment, income, or housing) that might reflect regional or sampling differences.

A total of 451 participants were interviewed between July 2005 and March 2007. Of these, 4 participants who did not meet eligibility criteria were later excluded, leaving a total of 447 participants who composed the analytic data set of the Honor Project. Each respondent received \$65.00 for completing a 3- to 4-hour computer-assisted interview in a private location chosen by the participant or at the study site. In addition, participants were compensated \$10.00 for each additional respondent they referred to the study.

### Measures

**Self-rated health.** Self-rated health was measured with a single item: "In general, would you say your health is excellent, very good, good, fair, or poor?" Participants who responded fair or poor were classified as having fair or poor self-rated health.

**Physical pain and impairment.** Physical pain and impairment was measured with 2 items assessing (1) whether participants had experienced mild, moderate, or severe bodily pain in the past 4 weeks and (2) whether this pain interfered with normal work either outside or inside the home (none, a little, moderately, quite a bit, or extremely). For our study, we categorized participants as having experienced physical pain

and impairment if they reported any physical pain that interfered at all with normal activities.

**Discrimination.** Self-reported stress attributable to routine experiences of discrimination, including episodes of physical and verbal violence and harassment or mistreatment, was assessed as the mean of 33 items composing the Microaggressions Distress Scale, developed by Walters ( $\alpha=0.97$ ).<sup>58</sup> Microaggressions are defined as everyday encounters of discrimination based on race, including verbal, behavioral, and environmental encounters that implicitly or explicitly invalidate, diminish, or assault racial heritage, identity, culture, or experiences.<sup>59</sup> The Microaggressions Distress Scale is designed to measure instances of overt as well as subtle forms of discrimination specific to the experiences of American Indians/Alaska Natives and was developed with AIAN community-based focus groups and reviewed for coherence and clarity by AIAN researchers.

Consistent with perspectives from stress and coping theories that posit that the effects of discrimination are contingent on appraisals and responses to stressors, the items in the Microaggressions Distress Scale contain an integrated perceived stress component. Participants were asked how "distressed or bothered" they were in their lifetime because of each instance of discrimination, such as, because of "unfair treatment by bosses or supervisors because you are Native"; "in schools, police, social services, or immigration because you are Native"; because of "anti-Indian statements"; and "by being told to 'lighten up' or 'get a sense of humor' about Indian mascots or logos." Each item was measured on a Likert-type scale ranging from 0 (not at all) to 5 (extremely).

**Actualization.** Actualization was measured as the mean of 17 items from the Urban American Indian Identity scale actualization subscale.<sup>50,60</sup> Items assessed the degree to which respondents had a positive integration between self and group identity with regard to political, ethnic, racial, cultural, and spiritual dimensions of being Indian ( $\alpha=0.85$ ). The scale was based on the Urban American Indian Identity Model.<sup>60</sup> Items included "I feel good about my Indian identity," "Traditional Indian ways are not for me," "I have many strengths because I am Indian," "I often think I would rather be a White person," and "I am proud to be Indian." Respondents chose a value on a Likert-type scale ranging from 1 (strongly disagree) to 4 (strongly

**TABLE 2—Results of Logistic Regressions Predicting Self-Reported Fair or Poor General Health Status Among Two-Spirit American Indians/Alaska Natives (N=477): The Honor Project, 2005–2007**

	Model 1, OR (95% CI)	Model 2, OR (95% CI)	Model 3, OR (95% CI)
Self-reported racial discrimination	1.14 (0.95, 1.37)	1.15 (0.92, 1.44)	1.16 (0.93, 1.46)
Actualization attitudes			0.54 (0.32, 0.90)
Gender			
Men (Ref)		1.00	1.00
Women		1.04 (0.58, 1.89)	1.11 (0.61, 2.03)
Other		1.49 (0.85, 2.62)	1.58 (0.89, 2.80)
Age		1.03 (1.01, 1.05)	1.03 (1.01, 1.06)
Percentage of Indian blood			
<25 (Ref)		1.00	1.00
25–49		1.08 (0.40, 2.89)	1.11 (0.42, 2.97)
50–74		1.24 (0.45, 3.42)	1.33 (0.48, 3.66)
≥75		0.95 (0.36, 2.48)	1.04 (0.40, 2.73)
Sexual orientation			
Gay/lesbian (Ref)		1.00	1.00
Bisexual		1.04 (0.58, 1.84)	1.02 (0.57, 1.83)
Two-spirit		1.52 (0.77, 3.02)	1.61 (0.81, 3.20)
Other		1.04 (0.46, 2.33)	1.13 (0.50, 2.56)
Current partner			
Yes (Ref)		1.00	1.00
No		0.88 (0.56, 1.40)	0.89 (0.56, 1.42)
Household income		0.96 (0.83, 1.11)	0.96 (0.83, 1.12)
Education, y			
<12 (Ref)		1.00	1.00
12		0.73 (0.39, 1.37)	0.69 (0.36, 1.30)
13–15		0.43 (0.22, 0.84)	0.46 (0.23, 0.90)
≥16		0.51 (0.21, 1.23)	0.54 (0.22, 1.32)
Insurance status			
Private (Ref)		1.00	1.00
Public		2.83 (1.10, 7.29)	2.83 (1.09, 7.34)
Other		1.79 (0.68, 4.71)	1.77 (0.67, 4.67)
None		2.26 (0.86, 5.90)	2.36 (0.89, 6.22)
Employment status			
Not working (Ref)		1.00	1.00
Working		0.79 (0.46, 1.37)	0.78 (0.45, 1.34)
Disability status			
Not disabled (Ref)		1.00	1.00
Disabled		3.65 (2.23, 5.97)	3.76 (2.29, 6.18)
HIV status			
Negative (Ref)		1.00	1.00
Positive		0.86 (0.47, 1.57)	0.87 (0.47, 1.61)
Unknown		1.35 (0.65, 2.79)	1.36 (0.65, 2.82)

Note. OR=odds ratio; CI=confidence interval. Model 1 represented the unadjusted association between discrimination and self-reported fair or poor general health status. Model 2 adjusted for sociodemographic characteristics. Actualization attitude scores were added to model 3.

agree). Items that reflected a negative integration between self- and group identity were reverse coded, such that higher scores reflected greater actualization identity attitudes.

**Sociodemographic covariates.** Sociodemographic variables were self-reported gender (men, women, or other, which included transgender), age, percentage of Indian blood (<25, 25–49, 50–74, or ≥75), sexual orientation (lesbian or gay, bisexual, two-spirit, or other); current partner status, household income, education (less than high school or <12 years, high school or 12 years, some college or 13–15 years, or college or more or ≥16 years), health insurance (private, public, other, or none), employment status (working or not working), disability status (any disability or none), and HIV status (negative, positive, or unknown).

### Analyses

Missing data on items assessing discrimination and actualization were first handled with a mean-substitution technique: the within-participant mean value of remaining items was used to substitute for missing values in cases in which at least 80% of items were complete.<sup>61</sup> After we applied this technique, the number of participants with missing data for each variable ranged from 0 to 14 (the latter for income).

In logistic regression models predicting self-rated general health status and physical pain and impairment, multiple imputation generated 5 imputations for any remaining missing values; we used a Markov chain Monte Carlo method that assumed an arbitrary missing data pattern.<sup>62,63</sup> Imputed values were truncated to fit within possible values but were not rounded, which could bias estimates.<sup>64,65</sup> Multiple imputation has been shown to lead to valid statistical inferences by properly taking into account the uncertainty inherent in missing data.<sup>66</sup>

We examined the main effects of discrimination on self-rated health and physical pain and impairment, first determining an unadjusted estimate of the magnitude of discrimination and then controlling for sociodemographic covariates. Actualization was added to the model to examine its main effect on our outcomes. We then investigated whether actualization moderated the influence of discrimination by adding the corresponding interaction terms to each model. For all analyses, we used SAS statistical software, version 9.1 (SAS Institute Inc, Cary, NC).

## RESULTS

We found a high prevalence of fair or poor self-rated health (35.3%). More than half of participants (56.8%) reported physical pain and impairment. Descriptive characteristics of participants by self-rated health and physical pain and impairment are presented in Table 1.

### Self-Rated Health

Logistic regressions predicting fair or poor self-rated health are presented in Table 2. In bivariate analyses, we did not find evidence that discrimination was significantly associated with self-rated health (models 1 and 2). When we added actualization to the model, we found evidence for a statistically significant protective effect (model 3). Each unit increase in actualization was associated with approximately half the odds of reporting fair or poor health (odds ratio [OR]=0.54; 95% confidence interval [CI]=0.32, 0.90). In this model, we also found that greater age was associated with higher odds of fair or poor self-rated health; having 13 to 15 years of education was associated with significantly lower odds of reporting fair or poor health compared with respondents with less than 12 years of education; having public forms of insurance was associated with higher odds of fair or poor self-rated health compared with having private insurance. Participants who were disabled had higher odds of reporting fair or poor health than did those who were not disabled.

We examined whether associations between discrimination and self-rated health varied by actualization by adding the interaction between actualization and discrimination. We found evidence that actualization significantly moderated the influence of discrimination ( $t=-2.33$ ;  $P=.020$ ). The association between discrimination and self-rated health was lower among participants with high levels of actualization than among those with low levels of actualization. We illustrate predicted probabilities of fair or poor self-rated health by actualization and discrimination in Figure 1. Values of 1 standard deviation below and above the mean actualization score represent low versus high levels of actualization, respectively. We set all other covariates not being graphed to their mean to represent these relationships for the average respondent.<sup>67</sup> Choosing alternative values to represent low and high actualization did not substantively alter the shape of the graph.

### Physical Pain and Impairment

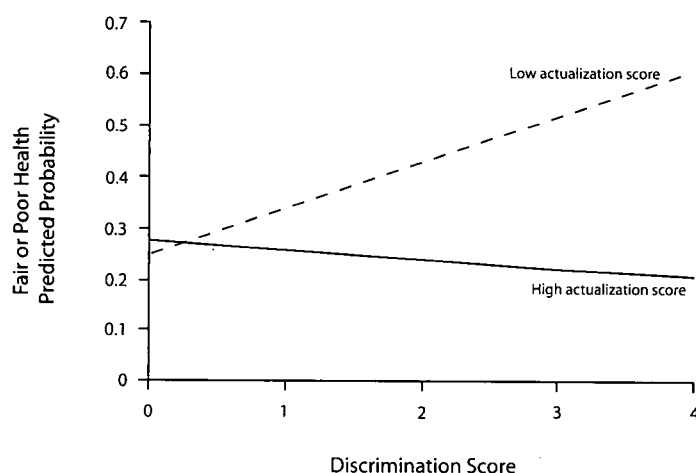
Logistic regressions predicting physical pain and impairment are presented in Table 3. After adjusting for covariates, we found a significant association between discrimination and physical pain and impairment; each unit increase in discrimination was associated with 1.39 times the odds of reporting physical pain and impairment (95% CI=1.11, 1.74). Adding

actualization to the model (model 3) revealed a significant protective effect; each unit increase in actualization was associated with 0.59 times the odds of reporting physical pain and impairment (95% CI=0.35, 0.99). Significant covariates in this model were age (increasing age was associated with higher odds of physical pain and impairment), education (having  $\geq 16$  years of education was associated with lower odds of physical pain and impairment compared with having  $<12$  years of education), employment (participants who were working had significantly lower odds of physical pain and impairment than did those who were not working), and disability (respondents who reported a disability had significantly higher odds of reporting physical pain and impairment than did nondisabled participants).

We also tested whether associations between discrimination and physical pain and impairment varied by actualization by adding the corresponding interaction term. Although the association between discrimination and physical pain and impairment was lessened among participants with high levels of actualization, this interaction was not significant ( $t=-1.14$ ;  $P=.255$ ).

## DISCUSSION

We found evidence of a negative influence of discrimination on health. Our data extended previous research findings by (1) examining these relationships in an understudied population, two-spirit American Indians/Alaska Natives; (2) investigating discrimination in relation to self-rated general health as well as self-reported physical pain and impairment, thereby providing evidence for the negative influence of social hazards on physical health; and (3) examining actualization, a dimension of AIAN identity, in relation to these outcomes and assessing whether actualization buffered the influence of discrimination in this vulnerable population subgroup. Our findings suggest that the effect of discrimination on self-reported health in this population may vary by actualization levels. Specifically, the negative influence of discrimination on self-reported general health may depend on levels of actualization: among two-spirit American Indians/Alaska Natives with low levels of actualization, discrimination was associated with worse self-rated health, and among those with high levels of actualization, discrimination had little relationship with self-rated health.



Note. See "Methods" section for details on discrimination and actualization measures.

**FIGURE 1—Predicted probability of self-reported fair or poor general health status among two-spirit American Indians/Alaska Natives (N = 447), by interaction between discrimination and racial identity: The Honor Project, 2005–2007.**

**TABLE 3—Results of Logistic Regressions Predicting Self-Reported Physical Pain and Impairment Among Two-Spirit American Indians and Alaska Natives (N=477): The Honor Project, 2005–2007**

	Model 1, OR (95% CI)	Model 2, OR (95% CI)	Model 3, OR (95% CI)
Self-reported racial discrimination	1.31 (1.09, 1.56)	1.39 (1.11, 1.74)	1.42 (1.13, 1.78)
Actualization attitudes			0.59 (0.35, 0.99)
Gender			
Men (Ref)		1.00	1.00
Women		0.95 (0.53, 1.70)	1.00 (0.55, 1.81)
Other		1.04 (0.59, 1.83)	1.07 (0.61, 1.89)
Age		1.03 (1.01, 1.06)	1.03 (1.01, 1.06)
Percentage of Indian blood			
< 25 (Ref)		1.00	1.00
25–49		1.95 (0.76, 5.02)	2.04 (0.79, 5.23)
50–74		1.89 (0.71, 5.04)	1.98 (0.75, 5.27)
≥ 75		1.71 (0.68, 4.31)	1.91 (0.76, 4.81)
Sexual orientation			
Gay/lesbian (Ref)		1.00	1.00
Bisexual		1.08 (0.61, 1.92)	1.05 (0.59, 1.87)
Two-spirit		1.74 (0.90, 3.36)	1.78 (0.92, 3.45)
Other		1.78 (0.71, 4.48)	1.90 (0.75, 4.80)
Current partner			
Yes (Ref)		1.00	1.00
No		1.15 (0.72, 1.81)	1.15 (0.72, 1.82)
Household income		0.96 (0.82, 1.11)	0.96 (0.83, 1.12)
Education, y			
< 12 (Ref)		1.00	1.00
12		0.59 (0.30, 1.16)	0.58 (0.29, 1.13)
13–15		0.69 (0.34, 1.39)	0.73 (0.36, 1.47)
≥ 16		0.36 (0.15, 0.87)	0.38 (0.16, 0.92)
Insurance status			
Private (Ref)		1.00	1.00
Public		1.37 (0.60, 3.15)	1.39 (0.60, 3.20)
Other		0.54 (0.24, 1.20)	0.52 (0.23, 1.17)
None		0.69 (0.31, 1.54)	0.71 (0.32, 1.59)
Employment status			
Not working (Ref)		1.00	1.00
Working		0.60 (0.35, 1.02)	0.58 (0.34, 0.99)
Disability status			
Not disabled (Ref)		1.00	1.00
Disabled		3.59 (2.20, 5.85)	3.67 (2.24, 6.00)
HIV status			
Negative (Ref)		1.00	1.00
Positive		0.73 (0.39, 1.36)	0.73 (0.39, 1.37)
Unknown		0.87 (0.43, 1.78)	0.86 (0.42, 1.77)

Note. OR = odds ratio; CI = confidence interval. Analysis included 447 respondents. Model 1 represented the unadjusted association between discrimination and self-reported physical pain and impairment. Model 2 adjusted for sociodemographic characteristics. Actualization attitude scores were added to model 3.

These results accord with previous studies suggesting that the nature of the relationship between discrimination and health outcomes may depend on dimensions of racial/ethnic identity.<sup>19–21,47,48</sup> Studies on other racial-minority populations suggested that the negative influence of discrimination on mental and behavioral outcomes may be buffered among those with high levels of racial centrality,<sup>21</sup> as well as among those with more positive personal evaluations of their racial group.<sup>49</sup> Our findings extended the existing literature by examining discrimination, racial/ethnic identity, and health outcomes among two-spirit American Indians/Alaska Natives and by providing evidence that, in this population, actualization identity attitudes may mitigate the effects of discrimination on self-rated health.<sup>54,55</sup>

We found that higher reports of discrimination were associated with significantly greater odds of reporting physical pain and impairment and that high levels of actualization were associated with significantly lower odds of reporting physical pain and impairment. Studies have increasingly shown that stressors may directly affect physical health through biological mechanisms.<sup>40–46</sup> Our findings suggest that self-reported pain and impairment may reflect the embodiment of stressful events.<sup>68</sup> For example, stressful events may manifest in pain by disrupting normal functioning of the neuroendocrine hypothalamic–pituitary–adrenal stress axis, which has been implicated in common forms of inflammatory and neuropathic pain.<sup>40,69–71</sup> Psychosocial stressors may also adversely affect physical health through other biological mechanisms<sup>43–46</sup> or through their association with maladaptive health behaviors.<sup>22–25</sup> Our results on pain and impairment are consistent with previous studies linking discrimination and physical health outcomes; they also suggest that actualization may be protective, possibly by helping to regulate biological mechanisms involved in physical pain and impairment.

### Limitations

The cross-sectional nature of our data limited our ability to infer causal direction. For example, it is possible that participants who reported physical pain and impairment were more likely to report discrimination. In addition, our findings may have been artifacts of underlying factors that were not assessed, such as social desirability bias, that may have been associated with both reports

of discrimination and our outcomes. However, our findings are consistent with the existing literature on the negative influence of discrimination on health outcomes and are largely concordant with our theoretical framework.

Our findings may not be generalizable to other racial- and sexual-minority populations or to two-spirit American Indians/Alaska Natives in rural areas. In addition, although participants were recruited from 7 cities, we were unable to perform stratified analyses because of the small number of participants recruited from some areas. For example, differences in associations by study site were not examined because of limitations in power.

## Conclusions

Our results suggest directions for further research on discrimination and health, as well as for policies that may improve health outcomes among two-spirit American Indians/Alaska Natives. Given that multiply oppressed or marginalized populations may be more likely to experience various forms of discrimination, future studies should consider discrimination based on sexuality as well as race and should investigate intersections between racial and sexual orientation identity attitudes.<sup>72</sup> In addition, the effects of discrimination on biological mechanisms involved in physical health could be explicitly examined through the collection of biomarker data.<sup>73-76</sup> Our findings also suggest that programs and policies should be developed and enforced to address issues of discrimination and, in particular, racial microaggressions, faced by two-spirit American Indians/Alaska Natives. The health implications of experiencing violent hate crimes are obvious, but our findings suggest that more-subtle forms of racial discrimination, which occur at the interpersonal level, also have negative health effects and should also be addressed.

Our results also indicate that efforts to improve levels of actualization among two-spirit American Indians/Alaska Natives may be effective in promoting health or mitigating the consequences of racial discrimination. American Indian/Alaska Native communities have historically emphasized the salience of identity in sustaining and promoting spiritual, mental, affective, and physical health and wellness.<sup>7-11,49,59</sup> For two-spirit American Indians/Alaska Natives, a positive identity in the face of discrimination may be critical to physical health and well-being. Our

findings suggest that we should also be concerned with the health implications of internalized racism, which may subsequently lead to poorer self- and group evaluation.<sup>77,78</sup> ■

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## Contributors

D.H. Chae had primary responsibility for the analysis of data and writing of the article. K.L. Walters acquired the data and contributed to the writing of the article. Both authors conceptualized the study and interpreted findings.

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## Human Participant Protection

All study procedures and protocols were approved by the institutional review board of the University of Washington.

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