

## THE ASSOCIATION BETWEEN PERCEIVED PROVIDER DISCRIMINATION, HEALTHCARE UTILIZATION AND HEALTH STATUS IN RACIAL AND ETHNIC MINORITIES

**Background and Objectives:** A commonly cited explanation of how racial discrimination impacts health is the biopsychosocial model. However, the biopsychosocial model does not allow for the effects of perceived provider discrimination on health behavior and utilization. In fact, researchers have directed relatively little attention toward the direct and indirect effects of perceived provider discrimination on both healthcare utilization and health status. We, therefore, compared the extent to which perceived provider discrimination explains racial/ethnic differences in healthcare utilization and subsequently health status.

**Methods:** The data came from the 2001 Survey on Disparities in Quality of Health Care. The final analytic sample was 5,642 adults living in the US. Structural equation modeling evaluated the relationship between perceived provider discrimination, healthcare utilization, and health status.

**Results:** African Americans, Hispanics and Asians reported significantly more perceived provider discrimination and poorer health compared to non-Hispanic whites. Poor health is significantly mediated by two paths: (1) by perceived provider discrimination and (2) by perceived provider discrimination through unmet need for healthcare utilization.

**Conclusions:** Perceived provider discrimination contributes to health disparities in African Americans, Hispanics and Asians. Perceived provider discrimination has a direct effect on self-reported health status. Additionally, because minorities perceive more provider discrimination, they are more likely to delay health seeking. In turn, this delay is associated with poor health. This enriches our understanding of how racial/ethnic health disparities are created and sustained and provides a concrete mechanism on how to reduce health disparities. (*Ethn Dis.* 2009;19:330-337)

**Key Words:** Provider Discrimination, Health Status, Health Disparities, Utilization

---

From Southwest Interdisciplinary Research Center, Arizona State University (CL, SLA); the Department of Sociology, Rutgers University (CL); and the School of Social and Family Dynamics, Arizona State University (JJK).

Chioun Lee, MA; Stephanie L. Ayers, PhD;  
Jennie Jacobs Kronenfeld, PhD

### INTRODUCTION

Some of the research on racial/ethnic disparities in health has focused on the relationship between racial discrimination across multiple dimensions, such as everyday discrimination and poor physical and mental health outcomes.<sup>1-5</sup> Specifically, perceiving or experiencing racial discrimination has been associated with giving birth to a low birth weight infant,<sup>1</sup> having higher levels of elevated blood pressure,<sup>2</sup> smoking,<sup>3</sup> experiencing higher rates of depression,<sup>4</sup> and consuming higher levels of alcohol.<sup>5</sup>

A commonly cited explanation of how racial discrimination affects health is the biopsychosocial model. Under the biopsychosocial model, experiencing racial discrimination causes stress, which in turn, produces ill health, both physically and psychologically.<sup>6-8</sup> Critiquing the biopsychosocial model, Bird and Bogart<sup>9</sup> note, "despite its strengths, the biopsychosocial model does not take into account the direct effects of perceived discrimination in health care on health-related decisions and behaviors," about which, less is known. It is posited<sup>9,10</sup> that perceived provider discrimination will have a direct negative impact on healthcare utilization and health outcomes because individuals who perceive provider discrimination will have more dissatisfaction and less trust with that provider and

with the overall healthcare system. These negative beliefs and experiences will, therefore, delay future healthcare utilization,<sup>9</sup> and will have important health consequences, which will continue to exacerbate racial/ethnic health disparities.<sup>10</sup> However, this line of research remains largely unexplored,<sup>11-13</sup> leading researchers to conclude that "identifying pathways between discrimination and health status and identifying ways to reduce experiences in healthcare settings that are perceived as discriminatory are two major tasks that remain for the field of health services research."<sup>14(p 913)</sup>

Therefore, it is our contention that perceived provider discrimination may contribute to health disparities through multiple pathways. Although the most commonly cited pathway is through the physiological and psychological stress produced from experiencing discrimination,<sup>6-8</sup> other pathways exist,<sup>9,10</sup> and researchers have directed relatively little attention toward these pathways. In fact, to our knowledge, no research has concurrently examined the direct and indirect effects of perceived provider discrimination on both healthcare utilization and health status. Studies have typically examined either the association between perceived provider discrimination and healthcare utilization<sup>10,12,13,15-19</sup> or the association between perceived provider discrimination and physical health status.<sup>14,20</sup> For both of these lines of research, many have mixed findings, have an inability to generalize, and do not examine multiple racial/ethnic groups in detail. For example, Van Houtven et al<sup>10</sup> and Blanchard and Lurie<sup>15</sup> found those who perceived healthcare discrimination were significantly more likely to delay

---

Address correspondence and reprint requests to Stephanie Ayers, PhD; Southwest Interdisciplinary Research Center ASU Downtown Campus; 411 N. Central Ave., Suite 720; Phoenix, Arizona 85004-0693; (602) 496-0700; stephanie.l.ayers@asu.edu

---

*...the primary aim of our research is to explore different pathways that affect the health of racial and ethnic minorities.*

---

healthcare utilization, while Casagrande et al<sup>16</sup> did not find an association between perceived healthcare discrimination and delay in getting medical care. Similarly, Piette et al<sup>20</sup> found that individuals who perceived healthcare discrimination had worse overall health, while Hausman et al<sup>14</sup> found that for Hispanics, perceived healthcare discrimination was not associated with worse overall health.

Beyond these mixed findings, the ability to generalize is another limitation with some findings in this line of research. For example, many studies focus on a single location in the United States: Durham County, NC;<sup>10</sup> two census tracts in Baltimore City, MD;<sup>16</sup> or an AIDS organization in a Midwestern city.<sup>21</sup> Another limitation is the tendency to examine primarily African Americans in discrimination research,<sup>1,2,4,9,14,16</sup> which leaves out any ability to understand the importance and implication of discrimination felt by other racial/ethnic minorities. This understanding is important given the fast growing immigrant population and higher birth rates among racial/ethnic minorities in America. By 2025, it is estimated that racial/ethnic minorities will comprise 33% of the US population.<sup>22</sup> "As such, the health of minority Americans is a critical component of the nation's health."<sup>22</sup>

Our study is unique in two ways. First, we advance the line of research linking perceived provider discrimination with racial/ethnic health disparities. We accomplish this by undertaking a structural equation model that examines perceived provider discrimination and the direct and indirect effects on health-

care utilization and health status. Second, we address two limitations found in previous research by including four racial/ethnic groups in our analysis and using a nationally representative sample.

Thus, the primary aim of our research is to explore different pathways that affect the health of racial and ethnic minorities. Based on findings from previous research, we test three related hypotheses:

1. Perceived provider discrimination will have a positive direct effect on having an unmet need of healthcare utilization.
2. Perceived provider discrimination will have both a positive direct and indirect effect on poor health status.
3. Racial and ethnic minorities will perceive more provider discrimination, which will lead to having a poorer health status as compared to non-Hispanic whites.

## METHODS

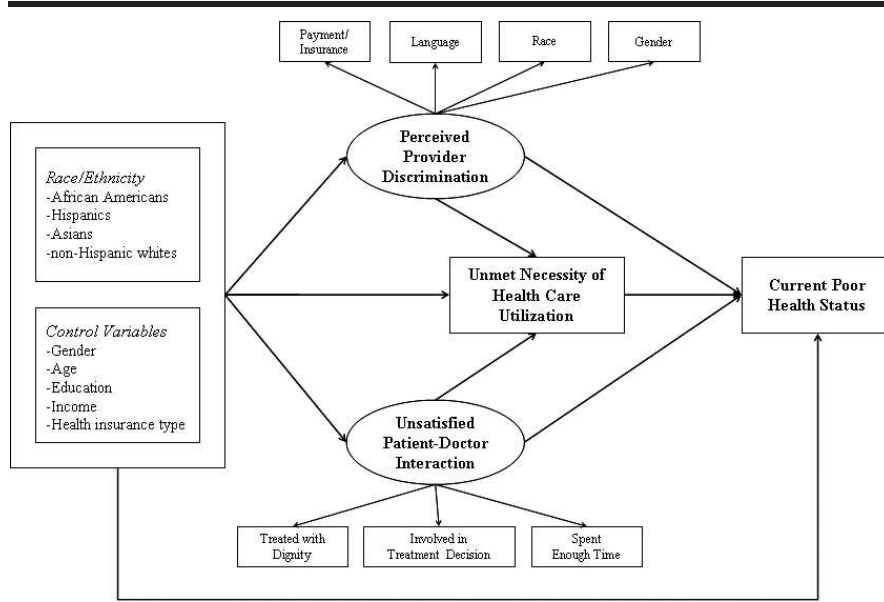
### Data

Our data come from the Survey on Disparities in Quality of Health Care, sponsored by the Commonwealth Fund (<http://www.commonwealthfund.org>). The data were collected using a random-digital-dialing telephone survey of adults aged  $\geq 18$  years in the continental United States in 2001, with African Americans, Hispanics and Asians over-sampled. Interviews were conducted in several languages based on respondents' preferences. Data were weighted to adjust for disproportionate sampling and demographic distortion due to non-response. The full sample size was 6,722; however, to narrow a sample to the four representative racial/ethnic groups, the analytic sample was limited to non-Hispanic White, African American, Hispanic, and Asian respondents who used any health services within the last two years. The final analytic sample size for this study was 5,642.

### Measures

*Perceived provider discrimination*, a latent variable, was measured through multiple questions. Respondents who had a healthcare visit in the last two years reported if they ever felt that the medical providers judged them unfairly or treated them with disrespect because of: a) racial/ethnic background; b) inability to pay for the care or the type of health insurance; c) language barrier; and d) sex. All of these variables were coded as 0=no and 1=yes. Although this article is specifically about racial/ethnic minorities perceiving provider discrimination, we have chosen to also include perceived discrimination due to the inability to pay for care, language, and sex. Previous research has demonstrated that individual's "perceptions of discrimination may be more global than some researchers may expect" because individuals experience the world holistically.<sup>20</sup> Thus, the distinction between perceived discrimination based on race, sex, and class may be meaningless for many individuals since they can experience all three at the same time.<sup>20</sup>

*Unsatisfying interaction with a doctor*, a latent variable, was measured through multiple author-selected questions. Respondents who had a healthcare visit in the last two years were asked if the provider: a) treated them with respect and dignity; b) involved them in decision making; and c) spent enough time with them. All of these questions were coded as 1=great deal to 4=not at all. *Unmet need of health service utilization* was assessed by a single question: "During the last 12 months, was there any time when you had a medical problem but put off, postponed or did not seek medical care when you needed it?" This variable was dichotomized into 0=no and 1=yes. *Current poor health* measured respondents' self-reported health status and was coded from 1=excellent to 5=poor. *Race/ethnicity* includes African American, Hispanic, and Asian. Non-Hispanic



**Fig 1. Theoretical model of provider discrimination, unsatisfying interaction with a doctor, and current poor health through unmet need of health service utilization**

White is the reference group. In addition, control variables include sex, age, education, income, and type of health insurance.

**Data Analysis**

Structural equation modeling was estimated on covariance matrices using *Mplus*, which allows for a model with complex design and multiple imputations.<sup>23</sup> A mixture of continuous, dichotomous and ordinal indicators were used for structural equation modeling with latent variables.<sup>24</sup> Although these data are cross-sectional, research can address inferring causation from correlation in cross sectional data.<sup>25</sup> In our case, perceived provider discrimination and unsatisfied interaction with a doctor are experienced in the last two years, unmet need of health service utilization is within the last one year, while poor health status is a current measure, thus we can infer some causation based on a rationale and theoretical background.

Figure 1 shows the causal structure of the theoretical model. To evaluate the statistical significance of the models, the following tests of model fit are reported: the model chi-square and

degrees of freedom ( $\chi^2$ ); normed chi-square ( $\chi^2/df$ ); comparative fit index (CFI); Tucker-Lewis index (TLI); the root mean square error of approximation (RMSEA). A significant  $\chi^2$  ( $P < .05$ ) indicates a poor fitting model, however the chi-square is sensitive to large (>200) sample sizes.<sup>25</sup> This sensitivity is minimized using the normed chi-square ( $\chi^2/df$ ). A model with a  $\chi^2/df$  ratio of 5.0 or less has an acceptable fit.<sup>26</sup> Furthermore, models that have a CFI and TLI greater than .96 indicate a very good fitting model.<sup>27</sup> Models that have an RMSEA less than .05 indicate a good fitting model.<sup>27</sup>

**RESULTS**

Table 1 presents the weighted percent of key variables in this study. Overall, 7.48% perceived provider discrimination due to inability to pay, 1.79% due to language, 2.92% due to race/ethnicity, and 3.31% due to sex. Almost one fifth (20.26%) of respondents reported having an unmet need for healthcare utilization. For health status, the majority of respondents report their health as excellent

(21.67%) or good (28.92%) with only 4.16% reporting poor health.

Because perceived provider discrimination and unsatisfying interaction with a doctor were latent factors, we first estimated the confirmatory factor analytic model. The factor loadings ranged from .63 to .85 and were statistically significant ( $P < .001$ ). The fit indices indicated a good fit of the confirmatory factor analytic model ( $\chi^2:23.721$  with 13 *df*;  $\chi^2/df=1.825$ ; CFI=.997; TLI=.995, RMSEA=.012). The correlation between two latent factors was moderate (.453) indicating that perceived provider discrimination and unsatisfying interaction with a doctor were separate factors.

For our proposed theoretical model, we added explanatory variables (ie, race/ethnicity), a mediating variable (ie, unmet need for healthcare utilization), and an ultimate outcome variable (current poor health) (Figure 1). The combined model shows a very good model fit to the data ( $\chi^2:307.952$  with 73 *df*;  $\chi^2/df=4.22$ ; CFI=.955; TLI=.919, RMSEA=.023). The standardized results of structure equation model are presented in Table 2. For a better understanding of the indirect effects, standardized linear regression coefficients for continuous outcomes (perceived provider discrimination, unsatisfying interaction with a doctor and current poor health status) and standardized probit regression coefficients for the dichotomous outcome (unmet need for healthcare utilization) are reported. *Mplus* correctly calculates indirect effects between standardized probit coefficients and standardized linear regression coefficients. In general, standard errors for standardized estimates are not reported in *Mplus*, which is typical when using the Maximum Likelihood method.<sup>26</sup>

**Impact of race and ethnicity on perceived provider discrimination & unsatisfying interaction with a doctor**

When examining perceived provider discrimination, compared to

**Table 1. Characteristics of respondents, N=5,642**

	Weighted %
<b>Race/Ethnicity</b>	
Non-Hispanic Whites	74.64
African Americans	11.78
Hispanics	9.96
Asians	3.61
<b>Perceived provider discrimination</b>	
Ability for pay/insurance	
Yes	7.48
Language barrier	
Yes	1.79
Race/Ethnicity	
Yes	2.92
Sex	
Yes	3.31
<b>Unsatisfying interaction with a doctor</b>	
Treated with dignity	
Great deal	76.04
A fair amount	21.66
Not too much	1.58
None at all	0.72
Involved in treatment decision	
As much as wanted	77.02
Almost as much as	17.07
Less than wanted	3.68
A lot less than wanted	2.23
Spent enough time	
As much as wanted	70.07
Almost as much as	18.95
Less than wanted	7.64
A lot less than wanted	3.34
<b>Unmet need for healthcare utilization</b>	
Yes	20.26
<b>Current Poor Health</b>	
Poor	4.61
Fair	11.68
Good	33.12
Very good	28.92
Excellent	21.67

non-Hispanic Whites, African Americans, Hispanics and Asians all report significantly more perceived provider discrimination. Compared to non-Hispanic Whites, African Americans report the greatest perceived discrimination (B=0.118,  $P<.001$ ). Race/ethnicity also has pronounced effects on doctor-patient interaction. Asians and Hispanics report having more unsatisfying interactions with a doctor (B=.103,  $P<.001$ ; B=0.057,  $P<.001$ ); however, African Americans do not have significantly more unsatisfying interactions than non-Hispanic Whites.

**Impact of perceived provider discrimination and unsatisfying interaction with a doctor on unmet need for healthcare utilization**

Perceiving provider discrimination and having an unsatisfying interaction with a doctor have significant positive relationships with having an unmet need for healthcare utilization. The more individuals perceive provider discrimination and experience an unsatisfying interaction, the less they use health services even when needed (B=0.304; B=.155,  $P<.001$ ). The evidence was

quite strong and statistically significant. Both perceived provider discrimination and unsatisfying interaction with a doctor positively affected having an unmet need for healthcare utilization, but the effect of perceived provider discrimination on unmet need for healthcare utilization was almost twice as strong as that of having an unsatisfying interaction with a doctor.

**Combined impact of perceived provider discrimination and unsatisfying interaction on current poor health mediated by unmet need of healthcare utilization**

Controlling other variables, unmet need for healthcare utilization directly influences poor health status (B=.157,  $P<.001$ ). The indirect effects of perceived provider discrimination on poor health status through unmet need for utilization was significantly positive (B=.048,  $P<.001$ , not shown in Table 2). *Mplus* calculates the indirect effect by multiplying coefficients on the pathway. *Mplus* offers coefficients and *P* values of indirect effects. The direct effect of perceived provider discrimination on poor health status was also positively significant (B=.093,  $P<.001$ ). The indirect effect of unsatisfying interaction with a doctor on current poor health through unmet need for health service utilization was significantly positive discrimination (B=.024,  $P<.01$ , not shown in Table 2), but not as strong as the indirect effect of perceived provider. The direct effect of unsatisfying interaction with a doctor on current poor health was also positively significant (B=.052,  $P<.05$ ). Interestingly, we found not only significant indirect effects of perceived provider discrimination and unsatisfying interaction mediated by unmet need for healthcare utilization, but also direct effects of these variables on health status, which were almost twice as strong as the indirect effects. In addition, controlling other explanatory var-

**Table 2. Parameter Estimates<sup>a</sup> for the Structural Equation Model (N=5,642)**

Variables (Reference group)	Perceived Provider Discrimination	Unsatisfying Interaction with a Doctor	Unmet Need for Health Service Utilization	Current Poor Health Status
	Estimates	Estimates	Estimates	Estimates
<b>Exogenous</b>				
Race (non-Hispanic Whites)				
African Americans	0.118 ‡	-0.011	-0.092 ‡	0.032
Hispanics	0.099 †	0.057 ‡	-0.082 †	0.045 †
Asians	0.071 †	0.103 ‡	-0.076 ‡	0.042 †
<b>Control Variables</b>				
Sex (Male)	0.034	-0.01	0.07 *	-0.033
Age (18-44)				
44-54	-0.013	-0.007	0.025	0.083 ‡
55 or more	-0.157 †	-0.127 ‡	-0.113 †	0.234 ‡
Income	-0.125 †	-0.062 *	-0.037	-0.109 ‡
Education	-0.009	0.004	0.012	-0.177 ‡
Insurance (private)				
Medicaid	0.097 ‡	0.067 †	0.029	0.054 †
Medicare	-0.095 *	-0.003	0.016	0.115 ‡
None	0.202 ‡	0.123 ‡	0.095 †	0.034
<b>Endogenous</b>				
Perceived provider discrimination			0.304 ‡	0.093 *
Unsatisfying interaction with a doctor			0.155 ‡	0.052 *
Unmet need for health service utilization				0.157 ‡
<b>R<sup>2</sup></b>	0.186	0.061	0.227	0.234

Note:  $\chi^2(df)=307.959(73)$ ;  $\chi^2/df=4.22$  RMSEA=.023; CFI=.955; TLI=.919.

<sup>a</sup> Standardized coefficients are displayed.

\*  $P<.05$ ; †  $P<.01$ ; ‡  $P<.001$ .

ables, perceived provider discrimination was a stronger predictor of poor health status than unsatisfying interaction with a doctor ( $B=.093$  vs  $B=.052$ ,  $P<.05$ ).

**Indirect effects of race/ethnicity on current poor health mediated by perceived provider discrimination and unmet need for healthcare utilization**

Finally, based on outcomes in Table 2, we estimated the indirect effects of race/ethnicity on current poor health through perceived provider discrimination and unmet need for health service utilization (not shown in Table 2). The relationship between racial/ethnic minorities and poor physical health was mediated by perceived provider discrimination. That is, African Americans, Hispanics and Asians had poorer health status mediated by

perceived provider discrimination (African Americans:  $B=.011$ ; Hispanics:  $B=.009$ ; Asians:  $B=.007$ ,  $P<.05$ ). Likewise, the path from racial/ethnic minorities through perceived provider discrimination and then through unmet need for healthcare utilization to poor health status was significant for all racial/ethnic minorities (African Americans:  $B=.006$ ; Hispanics:  $B=.005$ ; Asians:  $B=.003$ ,  $P<.05$ ).

**DISCUSSION**

This study investigated how perceived provider discrimination affects health status through healthcare utilization and expands the understanding of how discrimination affects health disparities through multiple pathways. Although one pathway is the biopsychosocial model,<sup>6-8</sup> this current study

finds support that more pathways exist through which discrimination affects health. Although researchers hypothesize the importance of these additional pathways, namely perceived provider discrimination on healthcare utilization and health status,<sup>9,10</sup> no research, to our knowledge, has examined or demonstrated this impact concurrently with empirical data. Our research examines multiple racial/ethnic groups, as well as those pathways previously speculated to affect health disparities with several significant findings.

First, individuals who perceive more provider discrimination have higher unmet needs for healthcare utilization, which supports Hypothesis 1. Individuals who have negative experiences within the healthcare setting will be less likely to continue to seek healthcare services, even when they report a recognized need for care. This supports

previous research that perceiving discrimination in health care has a direct negative effect on healthcare access and utilization.<sup>10,12,13,15,16,19</sup>

Second, individuals who perceive more provider discrimination are more likely to have poor health, which supports Hypothesis 2. This relationship remains true whether examining the direct effect of perceived provider discrimination on health or the indirect effect of perceived provider discrimination on health mediated by healthcare utilization. Simply stated, the more provider discrimination an individual perceives, the less they will utilize healthcare services and subsequently, the poorer their overall health. This finding expands our knowledge and understanding regarding how discrimination affects health status. Although previous research has found significant direct effects of discrimination on poor health status,<sup>14,20</sup> this study finds both a direct and an indirect pathway to poor physical health, which supports the notion that perceived provider discrimination creates dissatisfaction and less trust and, in turn, delays future healthcare utilization creating poor health for those perceiving provider discrimination.<sup>9,10</sup>

Finally, perceived provider discrimination creates health disparities in African Americans, Hispanics and Asians through numerous pathways, which supports Hypothesis 3. Because these racial/ethnic groups perceive more provider discrimination than non-Hispanic Whites, they are more likely to delay health care. In turn, this delay leads to poor health for African Americans, Hispanics and Asians. Also, perceived provider discrimination has a direct effect on poor health for African Americans, Hispanics and Asians. Simply stated, negative experiences within the healthcare setting will create additional vulnerabilities in an already vulnerable population, and acts as one mechanism for creating and sustaining health dis-

parities in African Americans, Hispanics and Asians.

Several possible mechanisms underlie the relationship between perceived provider discrimination and health outcomes. Providers may both intentionally or unintentionally treat patients differently because of patients' disadvantaged social positions due to their race/ethnicity, income, education, and insurance type.<sup>28</sup> Providers may "bring assumptions and expectations about what previous patients 'like this one' have been like and how those patients have understood and complied with explanations and instructions."<sup>29</sup> Other research supports the idea that providers who work with predominantly disadvantaged patients will experience more stress, fatigue and inadequate support, which lead patients to report more bias in their health care.<sup>30</sup> Another possible explanation is that providers work as powerful gatekeepers for advanced treatments, which may influence health disparities via such mechanisms as differential access to treatments or services and loss of benefits and rights.<sup>31</sup> Our findings, of course, do not illuminate which of these possible mechanisms is at work; however, it is important to highlight the complex nature of perceived provider discrimination's impact on health and the need to further refine our understanding of these mechanisms in future studies.

This study has several implications for future research, which are rooted in the limitations. First, there was no specific question to represent why individuals had limited healthcare utilization. Although we controlled for potential reasons, such as access through health insurance and income status, future research needs to control the additional conditions, such as generational status or acculturation level, which influence the relationship between quality of medical care and health outcomes. Because there were no questions that asked about immigrant or generational status or acculturation

---

*...individuals who perceive more provider discrimination have higher unmet needs for healthcare utilization...*

---

level, we were unable to control for this. In addition, due to the nature of using secondary data, this analysis is limited to general questions about perceived discrimination in the healthcare system and do not fully measure and likely underestimate the perceptions and experiences of minorities. The use of cross-sectional data limits our ability to causally relate and to capture how poor interaction with a doctor and perceived provider discrimination influences health outcomes. Because this is cross-sectional data, we do not exclude the possibilities that there may be a recall bias or that people who have poor health may be more likely to report that they experienced provider discrimination and unsatisfied interaction. Thus, a major challenge in future research is to apply this concept to longitudinal data, which will allow us to analyze more exact pathways and cumulative effects of perceived provider discrimination, revealing underlying mechanisms between perceived provider discrimination and health disparities among racial/ethnic groups.

These findings lend support that, in addition to the biopsychosocial model explanation for how racial discrimination affects health, provider discrimination appears to have a salient and deleterious effect on health as well. Because previous research has typically not turned its attention toward other mechanisms that create and sustain health disparities in racial/ethnic minority groups, the aspects of perceived provider discrimination on health disparities have been neglected. These research findings, that African Americans, Hispanics and Asians all perceive

provider discrimination, which negatively affects their health, suggest that perceiving provider discrimination affects individuals utilizing medical care. This delay in obtaining medical care then negatively affects the health of racial and ethnic minorities, thereby exacerbating health disparities.

This study makes unique contributions to the literature on perceived provider discrimination and lends itself well to policy implications. These findings illustrate the need to reduce discrimination in health care. This reduction, which could take place through cultural awareness for providers,<sup>13</sup> culturally competent interventions in the healthcare setting,<sup>13</sup> and culturally concordant patient-physician matching,<sup>32</sup> would target those populations who are most at-risk both for perceiving provider discrimination and poor health. Because perceived provider discrimination has been linked to negative health outcomes, a reduction in perceived provider discrimination could play a role in reducing health disparities experienced by racial and ethnic minorities. In conclusion, by understanding how perceived provider discrimination affects health status, these findings will enrich our understanding of how racial/ethnic health disparities are created and sustained, and thus provide a concrete mechanism for future policy interventions with healthcare providers who can help to reduce these health disparities.

#### ACKNOWLEDGMENTS

This project was supported by Grant Number P20MD002316 from the National Center on Minority Health and Health Disparities. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Center on Minority Health and Health Disparities or the National Institutes of Health.

#### REFERENCES

- Collins JW, Jr., David RJ, Symons R, Handler A, Wall SN, Dwyer L. Low-income African-

- American mothers' perception of exposure to racial discrimination and infant birth weight. *Epidemiology*. 2000;11(3):337-339.
- Krieger N, Sidney S. Racial discrimination and blood pressure: The CARDIA study of young black and white adults. *Am J Public Health*. 1996;86(10):1370-1378.
- Landrine H, Klonoff EA. The schedule of racist events: A measure of racial discrimination and a study of its negative physical and mental health consequences. *J Black Psychology*. 1996;22(2):144-168.
- Ren XS, Amick BC, Williams DR. Racial/Ethnic disparities in health: The interplay between discrimination and socioeconomic status. *Ethn Dis*. 1999;9(2):151-165.
- Yen IH, Ragland DR, Greiner BA, Fisher JM. Discrimination and alcohol consumption: Findings from the San Francisco Muni Health and Safety Study. *Ethn Dis*. 1999;9:70-80.
- Clark R, Anderson NB, Clark VR, Williams DR. Racism as a stressor for African Americans. A biopsychosocial model. *Am Psychol*. 1999;54(10):805-816.
- Williams DR. Racism and health: A research agenda. *Ethn Dis*. 1996;6(1-2):1-8.
- Williams DR. Race and health: Basic questions, emerging directions. *Annals of Epidemiology*. 1997;7(5):322-333.
- Bird ST, Bogart L. Perceived race-based and socioeconomic status (SES)-based discrimination in interactions with healthcare providers. *Ethn Dis*. 2001;11(3):554-563.
- Van Houtven CH, Voils CI, Oddone EZ, et al. Perceived discrimination and reported delay of pharmacy prescriptions and medical tests. *J Gen Intern Med*. 2005;20(7):578-583.
- Blanchard JC. *Discrimination and Health Care Utilization*. [Policy Analysis]. Santa Monica, CA: Pardee Rand Graduate School; 2006.
- Crawley LM, Ahn DK, Winkleby MA. Perceived medical discrimination and cancer screening behaviors of racial and ethnic minority adults. *Cancer Epidemiol Biomarkers Prev*. 2008;17:1937-1944.
- Burgess DJ, Ding Y, Hargreaves M, et al. The association between perceived discrimination and underutilization of needed medical and mental health care in a multi-ethnic community sample. *J Health Care Poor Underserved*. 2008;19:894-911.
- Hausmann LRM, Jeong K, Bost JE, Ibrahim SA. Perceived discrimination in health care and health status in a racially diverse sample. *Medical Care*. 2008;46(9):905-914.
- Blanchard J, Lurie N. R-E-S-P-E-C-T: Patient reports of disrespect in the healthcare setting and its impact on care. *J Fam Pract*. 2004;53(9):721-730.
- Casagrande SS, Gary TL, LaVeist TA, Gaskin DJ, Cooper LA. Perceived discrimination and adherence to medical care in a racially integrated community. *J Gen Intern Med*. 2007;22(3):389-395.
- Trivedi AN, Ayanian JZ. Perceived discrimination and use of preventive health services. *J Gen Intern Med*. 2006;21(6):553-558.
- De Marco M, Thorburn S, Zhao W. Perceived discrimination during prenatal care, labor, and delivery: an examination of data from the Oregon Pregnancy Risk Assessment Monitoring System, 1998-1999, 2000, and 2001. *Am J Public Health*. 2008;98:1818-1822.
- Schuster M, Collins R, Cunningham W, et al. Perceived discrimination in clinical care in a nationally representative sample of HIV-infected adults receiving health care. *J Gen Intern Med*. 2005;20:807-813.
- Piette JD, Bibbins-Domingo K, Schillinger D. Healthcare discrimination, processes of care, and diabetes patients' health status. *Patient Educ Couns*. 2006;60(1):41-48.
- Bird ST, Bogart LM, Delahanty DL. Health-related correlates of perceived discrimination in HIV care. *AIDS Patient Care STDS*. 2004;18(1):19-26.
- Lillie-Blanton M, Brodie M, Rowland D, Altman D, McIntosh M. Race, ethnicity, and the healthcare system: Public perceptions and experiences. *Med Care Res Rev*. 2000;57(3):218-234.
- Muthen LK, Muthen BO. *Mplus User's Guide*. 3rd ed. Los Angeles, CA: Muthen & Muthen; 2004.
- Muthen BO. A general structural equation model with dichotomous, ordered categorical and continuous latent indicators. *Psychometrika*. 1984;49:115-132.
- Kline RB. *Principles and Practice of Structural Equation Modeling*. 2nd ed. New York: Guilford; 2005.
- Byrne BM. *A Primer of LISREL: Basic Applications and Programming for Confirmatory Factor Analytic Models*. New York: Springer-Verlag; 1989.
- Yu C. *Evaluating Cutoff Criteria of Model Fit Indices for Latent Variable Models with Binary and Continuous Outcomes* University of California, Los Angeles; 2002.
- Farmer MM, Ferraro KF. Distress and perceived health: Mechanisms of health decline. *J Health Soc Behav*. 1997;38(3):298-311.
- Coleman-Miller B. A physician's perspective on minority health. *Health Care Finance Rev*. 2000;21:45-56.
- Stepanikova I, Cook KS. Effects of poverty and lack of insurance on perceptions of racial and ethnic bias in health care. *Health Serv Res*. 2008;43(3):915-930.

31. LaVeist TA, Arthur M, Morgan A, Plantholt S, Rubinstein M. Explaining racial differences in receipt of coronary angiography: The role of physician referral and physician specialty. *Med Care Res Rev.* 2003;60(4):453-466.
32. Ryan AM, Gee GC, Griffith D. The Effects of Perceived Discrimination on Diabetes Man-

agement. *J Health Care Poor Underserved.* 2008;19:149-163.

**AUTHOR CONTRIBUTIONS**

*Design concept of study:* Lee, Ayers, Jacobs Kronenfeld  
*Acquisition of data:* Lee, Ayers

*Data analysis and interpretation:* Lee, Jacobs Kronenfeld

*Manuscript draft:* Lee, Ayers, Jacobs Kronenfeld

*Statistical expertise:* Lee

*Administrative, technical, or material assistance:* Ayers, Jacobs Kronenfeld