Research Report

Psychological Science
23(7) 734–739

DOI: 10.1177/0956797612439720
http://pss.sagepub.com

Poverty and Health: The Mediating Role of Perceived Discrimination

Thomas E. Fuller-Rowell[1], Gary W. Evans[2,3], and Anthony D. Ong[3]

[1]Population Health Sciences Department, University of Wisconsin–Madison; [2]Department of Design and Environmental Analysis, Cornell University; and [3]Department of Human Development, Cornell University

Abstract

Social-class discrimination is evident in many societies around the world, but little is known about its impact on the poor or its role as an explanatory variable in the link between socioeconomic status and health. The current study tested the extent to which perceived discrimination explains socioeconomic gradients in physical health. Participants were 252 adolescents (51% male, 49% female; mean age = 17.51 years, *SD* = 1.03 years) who participated in Wave 3 of an ongoing longitudinal study focusing on the developmental consequences of rural poverty. Physical health was operationalized as allostatic load, a measure of cumulative wear and tear on the body caused by overactivation of physiological systems that respond to stress. Mediation analyses suggested that 13% of the effect of poverty on allostatic load is explained by perceived discrimination. The findings suggest that social-class discrimination is one important mechanism behind the influence of poverty on physical health.

Keywords

poverty, health, psychological stress, prejudice, adolescent development

Received 7/15/11; Revision accepted 1/17/12

Research has consistently demonstrated an inverse association between income and mortality and morbidity (Adler & Rehkopf, 2008; Matthews & Gallo, 2011). Furthermore, childhood poverty is linked to a range of subsequent physical-health outcomes, including cardiovascular and neuroendocrine markers of physiological stress (Cohen, Janicki-Deverts, Chen, & Matthews, 2010; Evans, Miller, Chen, & Seeman, in press; Shonkoff, Boyce, & McEwen, 2009). Despite widespread negative feelings toward the poor (Fiske, 2010; Lott, 2002) and long-standing social-class divisions around the world (Rank, 2004; Sennett & Cobb, 1993), surprisingly little research in the social and behavioral sciences has considered the influence of social-class discrimination on health. This study addressed this gap by examining perceived discrimination as an explanatory variable in the link between poverty and physical health.

One important health outcome in research on the impact of poverty and stress is *allostatic load*. It is defined as the wear and tear on the body resulting from chronic overactivation of physiological systems that maintain the body's equilibrium in the face of physical or social demands (Ganzel, Morris, & Wethington, 2010; McEwen, 1998; McEwen & Gianaros, 2010). Allostatic load combines indicators of health across multiple physiological domains (e.g., cardiovascular, endocrine, and metabolic) and therefore serves as an indicator of physiological dysregulation prior to the onset of specific clinically relevant disease. Given that many disease states do not become manifest until later in life, allostatic load is a particularly important measure of health among children and adolescents. Poverty and cumulative risk are associated with increases in allostatic load, and this association suggests that chronic environmental stress gets under the skin to create measurable changes in physiological processes that portend eventual morbidity and early mortality (Evans & Kim, 2010; Seeman, Epel, Gruenewald, Karlamangla, & McEwen, 2010). However, little is known about the specific mechanisms linking poverty to health over the life course, and research considering the role of discrimination in this relationship is lacking.

Perceived Discrimination as a Mechanism for the Effects of Poverty

Although a relatively large and growing literature has examined the influence of racial discrimination on health (Fuller-Rowell, Doan, & Eccles, 2012; Mays, Cochran, & Barnes,

Corresponding Author:
Thomas E. Fuller-Rowell, Population Health Sciences Department, University of Wisconsin, 610 Walnut St., WARF Office Building #707, Madison, WI 53726-2397
E-mail: tom.fullerrowell@gmail.com

2007; Williams & Mohammed, 2008), very little work has focused on the impact of social-class discrimination. In fact, only one study has examined whether perceived discrimination might explain the effects of poverty on the poor: Kessler, Mickelson, and Williams (1999) found that perceived discrimination partially mediated the association between poverty and mental health among adults. Despite pervasive negative treatment of groups with low socioeconomic status (SES) in many societies, and despite substantial research documenting a gradient in health across socioeconomic groups, to our knowledge no studies have considered perceived discrimination as an explanation for SES-related disparities in physical health. The investigation reported here tested the hypothesis that perceived discrimination accounts for part of the link between poverty and physical health.

Method

Participants

Participants were 252 adolescents (51% male, 49% female; mean age = 17.51 years, *SD* = 1.03 years) who participated in Wave 3 of an ongoing longitudinal study of rural poverty (Evans & Kim, 2007). At initial recruitment (mean age = 9.17 years, *SD* = 1.13 years), approximately half of the sample lived at or below the federal poverty line. The other half had family incomes 2 to 4 times the poverty line, the income level of the majority of American families. In accord with the demographics of the region, 92% of the sample were White.

Measures

Poverty. Each participant's family income and household size were assessed at each wave of data collection (ages 9, 13, and 17 years). Family history relating to income and household size was also assessed for each 6-month period of the participant's life. Proportion of life in poverty from birth through age 17 years was calculated using the U.S. federally defined poverty level for the participant's household size. Current level of poverty was defined as the income-to-needs ratio (the ratio of family income to the federally defined poverty level for the participant's household size) at age 17 years. These two indicators of poverty were standardized and averaged such that higher scores indicate higher levels of poverty ($\alpha = .77$). Proportion of life in poverty and current level of poverty were combined because both were expected to influence exposure to social-class discrimination.[1]

Perceived discrimination. Responses to three items were used to assess discrimination at Wave 3: "People treat me differently because of my background"; "I feel I am excluded from certain activities because of my background"; and "People do not respect me because of who I am" ($\alpha = .73$). These items drew on existing measures of discrimination (Contrada et al., 2001; Kessler et al., 1999; Williams, Yu, Jackson, & Anderson, 1997) to capture perceptions of differential treatment, exclusion, and lack of respect, respectively. Participants rated the items on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Because the reason for negative treatment is often not clear to the victim (Sue, 2010), the scale was designed to assess general discriminatory treatment based on participants' background and did not require that participants attribute this treatment to their social class. This measurement strategy captured substantial variability in discrimination and was in line with our goal of empirically testing the link between poverty and perceived discrimination (rather than asking participants to report only discrimination attributed directly to their socioeconomic background).

Allostatic load. Allostatic load was calculated by summing the number of physiological parameters (0–6) for which the participant scored in the top quartile of risk. Although the use of a quartile cutoff is arbitrary, additive measures of allostatic load effectively predict morbidity and mortality end points and appear to capture physiological dysregulation across a wide range of samples (Juster, McEwen, & Lupien, 2010; Karlamangla, Singer, McEwen, Rowe, & Seeman, 2002; Seeman et al., 2010). The following six parameters were assessed in Wave 3 of the study: resting diastolic and systolic blood pressure; overnight levels of epinephrine, norepinephrine, and cortisol; and body mass index (BMI). Resting blood pressure was measured with six automated readings (Dinamap Model Pro 100, Critikon, Tampa, FL) taken every 2 min while participants sat quietly. Participants provided overnight urine samples (all urine between 8:00 p.m. and 8:00 a.m.). Epinephrine and norepinephrine were assayed from the urine samples by high-performance liquid chromatography with electrochemical detection (Riggin & Kissinger, 1977), and cortisol was measured with a radioimmunoassay (Contreras, Hane, & Tyrrell, 1986). Creatinine was also assayed to control for differences in body size and incomplete urine voidings. BMI was calculated from anthropometric measurements (kilograms per meter squared).

Results

Analytic strategy and preliminary analyses

Path analyses were conducted using the maximum likelihood estimator with robust standard errors (MLR) in Mplus (Version 6.0; Muthén & Muthén, 2010). Our findings are based on full-information maximum likelihood (FIML) models, which included the full sample of 252 individuals participating in Wave 3.

Table 1 shows descriptive statistics for the six physiological measures individually, and Table 2 shows descriptive statistics for the key variables and their correlations. Correlations among poverty, discrimination, and allostatic load were all significant and in the expected directions. Gender was not significantly correlated with any of the study variables.

Table 1. Descriptive Statistics for the Physiological Measures (Components of Allostatic Load)

Variable	*M*	*SD*
Systolic blood pressure (mm Hg)	115.07	13.09
Diastolic blood pressure (mm Hg)	64.94	9.41
Cortisol (μg/mg creatinine)	0.066	0.066
Epinephrine (ng/mg creatinine)	4.09	3.89
Norepinephrine (ng/mg creatinine)	19.22	9.51
Body mass index (kg/m^2)	25.38	6.08

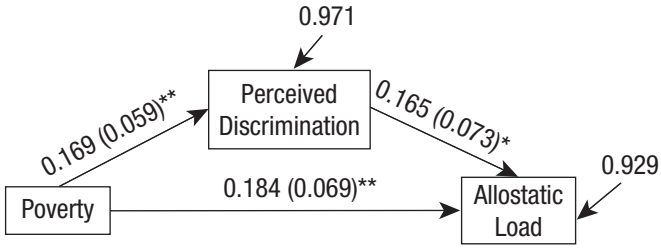

Fig. 1. Mediation model showing the effect of poverty on allostatic load, as mediated by perceived discrimination. Parameter estimates are standardized coefficients, and standard errors are given in parentheses. (Also shown are standardized residual variances for the two outcome variables.) Significant paths are indicated by asterisks (*p < .05, **p < .01).

Non-White race (0 = White; 1 = non-White) was associated with higher levels of poverty (p = .014), but was unrelated to perceived discrimination or allostatic load. Given the small number of non-White participants in the study, no effects of race on perceived discrimination or allostatic load were expected. However, because of previous research demonstrating that race, gender, and age have effects on perceived discrimination and allostatic load (Geronimus, Hicken, Keene, & Bound, 2006; Kessler et al., 1999), these variables were included as controls in the models described next.[2]

Model results

An initial model was estimated to assess the main effect of poverty on allostatic load. Results of this model suggested that, as hypothesized, poverty was positively associated with allostatic load (b = 0.259, SE = 0.083, p = .002). A full path model was then estimated to test our mediation hypothesis (Holmbeck, 1997).[3] Results of this model are shown in Figure 1. As hypothesized, greater poverty predicted higher levels of perceived discrimination (b = 0.144, SE = 0.052, p = .005), and greater perceived discrimination was associated with higher levels of allostatic load (b = 0.237, SE = 0.105, p = .025). Although the effects of poverty on allostatic load remained significant after perceived discrimination was added to the model, the strength of this effect decreased by 13% (b = 0.225, SE = 0.084, p = .007). The significance of the indirect effect of poverty on allostatic load through perceived discrimination was tested using the delta method to compute the standard error (Muthén & Muthén, 2010). The indirect effect was found to be significant (β = 0.028, SE = 0.014, p = .049). Thus, the hypothesized links in the mediation model were significant, and a significant portion of the association between poverty and allostatic load was accounted for by perceived discrimination.

Additional analyses were conducted to address the possibility that obesity drove the effects of poverty on perceived discrimination. Findings from these analyses confirmed that poverty was a significant predictor of BMI (b = 1.73, SE = 0.44, p < .001). However, the effect of BMI on perceived discrimination was not significant, and after controlling for the effects of BMI on perceived discrimination, the effects of

Table 2. Descriptive Statistics and Correlations Among the Key Variables

		Correlations						
Variable	*M*	1	2	3	4	5	6	7
1. Gender	0.484 (0.500)	—						
2. Age (years)	17.515 (1.028)	.001	—					
3. Race	0.079 (0.271)	.097	.077	—				
4. Proportion of life in poverty	.319 (.411)	–.006	.225**	.183**	—			
5. Income-to-needs ratio	2.807 (1.716)	–.104	–.135*	–.073	–.628***	—		
6. Poverty	–0.014 (0.908)	.061	.182**	.155*	.910***	–.904***	—	
7. Discrimination	1.962 (0.776)	.011	.101	.075	.146*	–.216**	.190**	—
8. Allostatic load (0–6)	1.227 (1.115)	–.109	.060	–.036	.155*	–.205**	.206**	.186*

Note: The values within parentheses are standard deviations. Gender was dummy-coded as 0 for male and 1 for female. Race was dummy-coded as 0 for White and 1 for non-White. Poverty is a combined measure based on the means of proportion of life in poverty (reverse-scored) and income-to-needs ratio (with both variables z-scored; higher scores indicate higher levels of poverty). Allostatic load was derived from the total number of biomarkers for which participants fell into the upper quartile of risk.
*p < .05. **p < .01. ***p < .001.

poverty on allostatic load remained ($b = 0.120$, $SE = 0.055$, $p = .030$). This finding suggests that the stigma associated with obesity did not drive the effects of poverty on perceived discrimination, as measured in this study. This lack of an effect is not surprising because our measure of perceived discrimination was not designed to capture discrimination based on body weight. We also found that after we partialed out the effects of BMI on allostatic load ($b = 0.348$, $SE = 0.063$, $p < .001$), the effects of perceived discrimination remained significant ($b = 0.228$, $SE = 0.093$, $p = .014$). In light of research on gender differences in the effects of poverty and discrimination on health (e.g., Lahelma, Martikainen, Laaksonen, & Aittomäki, 2004), we also tested for a moderating influence of gender. Gender was not found to moderate the influence of poverty or discrimination on allostatic load.

Discussion

Before this study, researchers had not explored discrimination as an explanation for socioeconomic gradients in physical health. This topic is of particular importance given the growing body of research demonstrating clear disparities in health across socioeconomic groups (Adler & Rehkopf, 2008; Matthews & Gallo, 2011). This study begins to address this gap by showing that perceived discrimination accounts for a significant portion of the association between poverty and allostatic load (see Fig. 1). Therefore, the findings suggest that discrimination may be one important mechanism behind SES-related health inequalities.

In addition to the overall mediation results, each of the individual links in our model is noteworthy. First, our findings are consistent with existing research on SES-related gradients in child health (Cohen et al., 2010; Evans et al., in press; Shonkoff et al., 2009). Persons growing up in poorer families have more physiological dysregulation, as indicated by higher levels of allostatic load. We have also extended this research by showing these SES-related gradients during adolescence—specifically, at age 17. Second, with respect to the link between poverty and perceived discrimination, our findings are consistent with our methodological perspective that broadly worded measures of discrimination can capture important aspects of social-class discrimination. Furthermore, although poverty is linked to obesity, which has its own stigma, we found that there is also a stigma associated with poverty or social class after the effects of obesity are statistically controlled. Last, the results demonstrate a significant association between perceived discrimination and allostatic load. This finding is consistent with the idea that discrimination can be a chronic social-environment stressor that over time has a detrimental impact on physiological systems (Fuller-Rowell et al., 2012; Mays et al., 2007; Williams & Mohammed, 2008).

Although the analyses presented here show an important link between perceived discrimination and physical health, testing the specific mechanisms underlying this effect was not within the scope of this investigation. Furthermore, although the role of obesity was explored, other third-variable explanations for the observed associations cannot be ruled out. Therefore, the pathways through which discrimination, in the context of poverty, leads to physical-health outcomes, as well as individual differences in these associations, are important topics for future research. We believe that it will be important for researchers examining these questions to try to account for individuals' unique emotional and coping responses, as well as for the impact of these responses on mental health and health behavior. Furthermore, another promising direction for research will involve capturing physiological reactivity to social rejection or unfair treatment. Measures of such reactions will enable exploration of specific biological pathways linking discrimination to longer-term health outcomes and may suggest important ways in which early adversity combines with differential social experiences to create SES-related disparities in health.

The issue of why poverty is linked to unfair treatment or perceived discrimination is another important area for future research. We believe that research on how children and adolescents develop an understanding of social class and occupational diversity will help to shed light on the roots of social-class discrimination. For example, the degree to which youth are exposed to messages suggesting that social class is socially determined rather than individually controlled may be one important factor influencing attitudes toward more and less privileged groups.

Some additional limitations of the current study should be noted. First, although this study has several methodological strengths, such as the use of prospective data with objective measures of poverty and physical health, because perceived discrimination and health were measured concurrently, and no experimental manipulation was used, causal attributions are not possible. Also, because the study was conducted on a moderately sized sample of rural adolescents, the findings may not generalize beyond this ecological context or age group. In addition to corroborating the findings longitudinally and across contexts, future research should explicitly examine the potentially unique dynamics of social-class discrimination in specific settings. For example, when there are relatively few low-SES adolescents within a particular school environment, it is conceivable that these individuals stand out more from their peers and that this could make social-class discrimination more severe. If this is the case, then in urban school contexts, where often a majority of students are from low-SES backgrounds, the effects of poverty on physical health may be less influenced by social-class discrimination and instead may be influenced by other detrimental factors associated with concentrated poverty.

It is inevitable that many forms of unfair treatment based on social class or other characteristics will not be recognized or labeled by the victim as discrimination. Furthermore, even when discrimination is recognized or suspected, the reason for the unfair treatment is often unknown. As a result of these attributional complexities, self-report measures of discrimination are likely to capture only a small portion of the actual unfair treatment that occurs, and thus estimates of the link

between perceived discrimination and health are likely to be low. Although the methodology used in this study represents one important measurement strategy, it would be useful for researchers to develop additional ways to address methodological challenges inherent in measuring discrimination. For example, considering variability in health at the group level (across social settings that are known to differ on key variables relating to discrimination) may be one promising approach. Another useful perspective may be to consider the health sequelae of specific attributions relating to negative social experiences. For example, does it matter for health whether an individual perceives discrimination based on gender, age, ethnicity, or social class? And what happens when an individual perceives discrimination against him- or herself to be based on two of more of these characteristics?

Overall, the findings of this study show that social-class discrimination may be one mechanism underlying social gradients in health. Given the lack of research on this topic, the findings suggest that social-class discrimination is an important area for future research, and that underlying societal ideologies relating to wealth and social class can be an important locus of intervention.

Acknowledgments

We are indebted to the many families who have participated in this research program. We thank Jana Cooperman, Kim English, Missy Globerman, Matt Kleinman, Rebecca Kurland, Melissa Medoway, Tina Merilees, Chanelle Richards, Adam Rohksar, and Amy Schreier for their assistance with data collection.

Declaration of Conflicting Interests

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

Funding

Support was provided by the W. T. Grant Foundation, the John D. and Catherine T. MacArthur Foundation Research Network on Socioeconomic Status and Health, and the Robert Wood Johnson Foundation Health & Society Scholars program.

Notes

1. When these two measures were considered separately, the patterns of mediation findings were equivalent.
2. Residualized versions of the outcome variables were created for the analyses reported.
3. With a variance-covariance matrix including only three variables, our estimated mediation model was "just-identified"; that is, it had zero degrees of freedom, had a chi-square value of zero, and showed perfect fit.

References

Adler, N. E., & Rehkopf, D. H. (2008). U.S. disparities in health: Descriptions, causes, and mechanisms. *Annual Review of Public Health*, *29*, 235–252. doi:10.1146/annurev.publhealth.29.020907.090852

Cohen, S., Janicki-Deverts, D., Chen, E., & Matthews, K. A. (2010). Childhood socioeconomic status and adult health. *Annals of the New York Academy of Sciences*, *1186*, 37–55. doi:10.1111/j.1749-6632.2009.05334.x

Contrada, R. J., Ashmore, R. D., Gary, M. L., Coups, E., Egeth, J. D., Sewell, A., . . . Chasse, V. (2001). Measures of ethnicity-related stress: Psychometric properties, ethnic group differences, and associations with well-being. *Journal of Applied Social Psychology*, *31*, 1775–1820.

Contreras, L. N., Hane, S., & Tyrrell, J. B. (1986). Urinary cortisol in the assessment of pituitary-adrenal function: Utility of 24-hour and spot determinations. *Journal of Clinical Endocrinology & Metabolism*, *62*, 965–969.

Evans, G. W., & Kim, P. (2007). Childhood poverty and health: Cumulative risk exposure and stress dysregulation. *Psychological Science*, *18*, 953–957. doi:10.1111/j.1467-9280.2007.02008.x

Evans, G. W., & Kim, P. (2010). Multiple risk exposure as a potential explanatory mechanism for the socioeconomic status-health gradient. *Annals of the New York Academy of Sciences*, *1186*, 174–189. doi:10.1111/j.1749-6632.2009.05336.x

Evans, G. W., Miller, G., Chen, E., & Seeman, T. (in press). How poverty gets under the skin: A life course perspective. In V. Maholmes & R. King (Eds.), *The Oxford handbook of poverty and child development*. New York, NY: Oxford University Press.

Fiske, S. T. (2010). Envy up, scorn down: How comparison divides us. *The American Psychologist*, *65*, 698–706. doi:10.1037/0003-066X.65.8.698

Fuller-Rowell, T. E., Doan, S. N., & Eccles, J. S. (2012). Differential effects of perceived discrimination on the diurnal cortisol rhythm of African Americans and Whites. *Psychoneuroendocrinology*, *37*, 107–118. doi:10.1016/j.psyneuen.2011.05.011

Ganzel, B. L., Morris, P. A., & Wethington, E. (2010). Allostasis and the human brain: Integrating models of stress from the social and life sciences. *Psychological Review*, *117*, 134–174. doi:10.1037/a0017773

Geronimus, A. T., Hicken, M., Keene, D., & Bound, J. (2006). "Weathering" and age patterns of allostatic load scores among Blacks and Whites in the United States. *American Journal of Public Health*, *96*, 826–833. doi:10.2105/AJPH.2004.060749

Holmbeck, G. N. (1997). Toward terminological, conceptual, and statistical clarity in the study of mediators and moderators: Examples from the child-clinical and pediatric psychology literatures. *Journal of Consulting and Clinical Psychology*, *65*, 599–610.

Juster, R.-P., McEwen, B. S., & Lupien, S. J. (2010). Allostatic load biomarkers of chronic stress and impact on health and cognition. *Neuroscience & Biobehavioral Reviews*, *35*, 2–16. doi:10.1016/j.neubiorev.2009.10.002

Karlamangla, A. S., Singer, B. H., McEwen, B. S., Rowe, J. W., & Seeman, T. (2002). Allostatic load as a predictor of functional decline: MacArthur studies of successful aging. *Journal of Clinical Epidemiology*, *55*, 696–710.

Kessler, R. C., Mickelson, K. D., & Williams, D. R. (1999). The prevalence, distribution, and mental health correlates of perceived discrimination in the United States. *Journal of Health and Social Behavior*, *40*, 208–230.

Lahelma, E., Martikainen, P., Laaksonen, M., & Aittomäki, A. (2004). Pathways between socioeconomic determinants of health. *Journal of Epidemiology & Community Health*, *58*, 327–332. doi:10.1136/jech.2003.011148

Lott, B. (2002). Cognitive and behavioral distancing from the poor. *American Psychologist*, *57*, 100–110.

Matthews, K. A., & Gallo, L. C. (2011). Psychological perspectives on pathways linking socioeconomic status and physical health. *Annual Review of Psychology*, *62*, 501–530. doi:10.1146/annurev.psych.031809.130711

Mays, V. M., Cochran, S. D., & Barnes, N. W. (2007). Race, race-based discrimination, and health outcomes among African Americans. *Annual Review of Psychology*, *58*, 201–225. doi:10.1146/annurev.psych.57.102904.190212

McEwen, B. S. (1998). Protective and damaging effects of stress mediators. *New England Journal of Medicine*, *338*, 171–179. doi:10.1056/NEJM199801153380307

McEwen, B. S., & Gianaros, P. J. (2010). Central role of the brain in stress and adaptation: Links to socioeconomic status, health, and disease. *Annals of the New York Academy of Sciences*, *1186*, 190–222. doi:10.1111/j.1749-6632.2009.05331.x

Muthén, L. K., & Muthén, B. O. (2010). *Mplus user's guide* (6th ed.). Los Angeles, CA: Author.

Rank, M. R. (2004). *One nation, underprivileged: Why American poverty affects us all*. New York, NY: Oxford University Press.

Riggin, R. M., & Kissinger, P. T. (1977). Determination of catecholamines in urine by reverse-phase liquid chromatography with electrochemical detection. *Analytical Chemistry*, *49*, 2109–2111.

Seeman, T., Epel, E., Gruenewald, T., Karlamangla, A. S., & McEwen, B. S. (2010). Socio-economic differentials in peripheral biology: Cumulative allostatic load. *Annals of the New York Academy of Sciences*, *1186*, 223–239. doi:10.1111/j.1749-6632.2009.05341.x

Sennett, R., & Cobb, J. (1993). *The hidden injuries of class*. New York, NY: W. W. Norton & Co.

Shonkoff, J. P., Boyce, W. T., & McEwen, B. S. (2009). Neuroscience, molecular biology, and the childhood roots of health disparities: Building a new framework for health promotion and disease prevention. *Journal of the American Medical Association*, *301*, 2252–2259. doi:10.1001/jama.2009.754

Sue, D. W. (2010). *Microaggressions in everyday life: Race, gender, and sexual orientation*. Hoboken, NJ: John Wiley & Sons.

Williams, D. R., & Mohammed, S. A. (2008). Discrimination and racial disparities in health: Evidence and needed research. *Journal of Behavioral Medicine*, *32*, 20–47. doi:10.1007/s10865-008-9185-0

Williams, D. R., Yu, Y., Jackson, J. S., & Anderson, N. B. (1997). Racial differences in physical and mental health: Socio-economic status, stress and discrimination. *Journal of Health Psychology*, *2*, 335–351. doi:10.1177/135910539700200305