

Gender Differences in the Association Between Perceived Discrimination and Adolescent Smoking

Sarah E. Wiehe, MD, MPH, Matthew C. Aalsma, PhD, Gilbert C. Liu, MD, MS, and J. Dennis Fortenberry, MD, MS

Several studies have found perceived racial/ethnic discrimination to be associated with adolescent and young adult smoking.¹⁻⁷ Smoking as a response to the stress of discrimination is a possible reason for this association, but mediating factors are not well understood.¹

A mediating factor that merits attention is the intersection of gender with smoking and the context of discrimination. Gender is relevant, as boys are more likely to smoke cigarettes than girls, and gender differences in smoking prevalence are more pronounced among Blacks.⁸ In addition, adolescents may make different choices about where to spend time based on gender,⁹ and these “gendered” contexts may relate to smoking behavior. For example, the Moving to Opportunity study showed that gender plays a significant role in both smoking behavior and where adolescents spend time. Girls in the Moving to Opportunity intervention groups, whose families used a study voucher to relocate to a neighborhood of their own choice or to a low-poverty neighborhood, were less likely to smoke than girls in the control group (whose families were not offered the means to move from public housing). However, boys in the intervention groups were more likely to smoke than boys in the control group.¹⁰

A follow-up study found that girls and boys spent time in different locales.¹¹ Girls in intervention groups were more likely to spend time closer to home. Boys in intervention groups were more likely to return to their public housing community and congregate at street corners, parks, vacant lots, and other places without adult supervision. These gender differences in context may influence adolescents’ situational exposure to discrimination. In other words, the experience of discrimination may be caused by gender-specific use of place, which may then differentially relate to smoking behaviors.

The primary purpose of this study was to examine the influence of gender on smoking’s association with discrimination and with context of discrimination among adolescents. We

Objectives. We examined associations between perceived racial/ethnic discrimination, gender, and cigarette smoking among adolescents.

Methods. We examined data on Black and Latino adolescents aged 12 to 19 years who participated in the Moving to Opportunity study (N=2561). Perceived discrimination was assessed using survey items asking about unfair treatment because of race/ethnicity in the prior 6 months. We used logistic regression to investigate associations between discrimination and smoking, stratified by gender and controlling for covariates.

Results. One fourth of adolescents reported that discrimination had occurred in at least 1 location. Discrimination was associated with increased odds of smoking among boys (odds ratio [OR]=1.9; 95% confidence interval [CI]=1.2, 3.0) and decreased odds among girls (OR=0.6; 95% CI=0.3, 1.1). Discrimination at school or work contributed to associations for girls (OR=0.3; 95% CI=0.1, 0.9), and discrimination at shops (OR=2.0; 95% CI=1.1, 3.8) and by police (OR=2.0; 95% CI=1.2, 3.4) contributed to associations for boys.

Conclusions. Associations between discrimination and smoking differ by gender. Girls’ decreased smoking in higher-discrimination settings may be a result of protective factors associated with where they spend time. Boys’ increased smoking in higher-discrimination settings may reflect increased stress from gender-specific targeting by police and businesses. (*Am J Public Health*. 2010;100:510-516. doi:10.2105/AJPH.2009.169771)

hypothesized that this association would be stronger among boys and that gender differences would be mediated by the context of discrimination. Analyses were adjusted for mediating factors that may contribute to smoking among individuals who perceive higher levels of discrimination, such as stress, depression, and anxiety.^{3,4,6,12} Whether these factors differentially influence girls and boys in terms of the association between discrimination and smoking risk is unknown.

METHODS

We analyzed 5-year follow-up data from the Moving to Opportunity for Fair Housing study by the US Department of Housing and Urban Development.¹⁰ Briefly, families in public housing in Baltimore, Maryland; Boston, Massachusetts; Chicago, Illinois; Los Angeles, California; and New York City, New York, were randomized to 1 of 3 study arms: (1) remain in public housing,

(2) move to any neighborhood outside of public housing, or (3) move to a low-poverty neighborhood (in which less than 10% of residents have household incomes below the federal poverty level). Interim data were collected in 2002, approximately 5 years after randomization. Up to 2 children per household were interviewed, and additional environmental measures were recorded by the interviewer. Data were linked to several administrative data sets, including US Census data.

At baseline, two thirds of participants were Black, and approximately one third were Latino. Baseline average household income was \$9300, and approximately 60% of households received additional public assistance. The response rate of the interim evaluation was 80%. We analyzed self-reported data from Black and Latino youth aged 12 to 19 years at the time of interim data collection (N=2630). Youth with missing data for current smoking (n=31) and perceived

discrimination (n=38) were excluded, leaving a final sample of 2561.

Measures of Perceived Discrimination

The adolescent survey included a question on perceived racial/ethnic discrimination: “Can you think of 1 or more occasions in the past 6 months when you felt you were treated unfairly because of your race or ethnicity in the following places?” The adolescent could answer yes or no for the following places: school or work; neighborhood playground or recreation program; store where you were shopping or restaurant where you wanted to eat; and in dealings with the police. Perceived discrimination was coded as none versus discrimination in at least 1 setting. (Sensitivity analyses using other cutoff points did not yield different findings.) We then investigated each location associated with perceived discrimination for differential associations with smoking by gender. Finally, the number of settings of perceived discrimination was considered for evidence of a dose-response relationship.

Covariates

We controlled for several covariates thought to confound the association between discrimination and smoking.^{6,13–16} Demographic variables included gender, race/ethnicity (Latino or Black), and age (categorized as 12–13, 14–15, 16–17, and 18–19 years). Other variables known to be associated with smoking and included in adjusted analyses were school status (in school, graduated, dropped out), peer drug use (1 or more friends who use marijuana or other drugs as reported by the adolescent), maternal smoking status, maternal education (at least high school degree or GED), maternal employment (currently employed at least 35 hours per week), household poverty (household income with respect to the federal poverty level: less than 50%, 50%–99%, 100%–149%, more than 149%), and neighborhood poverty (percent of households below the federal poverty level in the census tract of current residence based on 2000 US Census data, categorized as 0%–9.9%, 10%–14.9%, 15%–19.9%, 20%–29.9%, 30%–39.9%, 40%–49.9%, 50%–59.9%, 60% or more).¹⁰ We also controlled for the study site from which the participants were enrolled and for the study arm into which participants were randomized.

Effect modification variables. The primary focus was to examine differences in the association between perceived discrimination and smoking among girls and boys. Thus, gender was our primary effect modifying variable. We did, however, also evaluate whether race/ethnicity, age, pregnancy, and school status modified the association in post hoc analyses.

Mediating variables. We examined 3 groups of variables as mediators. The first group included 2 measures of mental health: anxiety and depression. The second included 5 measures of support: maternal support, paternal support, presence of an adult confidant, presence of an adult who would help in a time of trouble, and religious attendance. The third group of mediating variables included 2 measures of the respondent’s view of his or her own future: likelihood of finding a stable, well-paid job as an adult, and likelihood of completing college.

Outcome and Analysis

The outcome measure was self-reported current smoking, defined as smoking 1 or more cigarettes in the prior month. Descriptive statistics were calculated to compare socio-demographic characteristics among the entire sample and among the sample stratified by whether discrimination was reported. We calculated prevalence of perceived discrimination by setting of discrimination for boys and girls.

We performed multivariable logistic regression to investigate associations between perceived discrimination and current smoking, controlling for multiple covariates. We assessed for mediation by performing adjusted logistic regression analyses with and without variables for mental health, support, and view of the future. All analyses were stratified by gender.

In post hoc analyses, we assessed whether the association between discrimination and smoking was modified by other variables available in the Moving to Opportunity interim data. These additional analyses specifically explored reasons for findings that were contrary to our a priori hypotheses.

Finally, we assessed whether the differential association between the Moving to Opportunity intervention groups and smoking by gender was mediated by perceived discrimination. Using an intention-to-treat analysis, we assessed whether including perceived discrimination in any location as a mediating variable in the

model decreased the Moving to Opportunity intervention effect on smoking by at least 10%, while stratifying by gender.

Given that up to 2 siblings could be interviewed per household, we adjusted for clustering within families. In regression models, we calculated 95% confidence intervals (CIs) on the basis of robust variance estimates. In descriptive and regression analyses, we accounted for study weights resulting from subsampling during data collection and differences in response rate to that data collection.¹⁷ All analyses were performed using Stata/SE version 9.2 (StataCorp, College Station, TX).

RESULTS

The study population (Table 1) reflected the Moving to Opportunity study’s high-risk population recruited from public housing in large urban areas. Two thirds of the adolescent participants were Black, and the remainder were Latino, with an even gender and age distribution. Demographic characteristics did not vary by perceived discrimination. Current smokers among the study population were more often female, older adolescents, and Black. Eighty-four percent of participants were enrolled in school or had graduated. Participants who had dropped out of school were more likely to report discrimination and cigarette smoking. Twelve percent of adolescents reported having smoked at least 1 cigarette in the prior month. Participants who reported discrimination and smoking were more likely to have friends who used drugs. Family characteristics did not vary by perceived discrimination. Mothers of participants who reported smoking were more likely to use tobacco, have less than a high school education, and work fewer than 35 hours per week.

Approximately one quarter of participants reported discrimination in at least 1 setting in the prior 6 months (Figure 1). Boys and girls reported similar rates of perceived discrimination in school or work and in their neighborhoods. Girls reported higher rates of discrimination in shops, and boys reported higher rates in dealings with the police.

Boys who reported discrimination in any setting had twice the odds of smoking of boys who did not report discrimination (Figure 2). Girls who reported discrimination in any setting

TABLE 1—Characteristics of Black and Latino Adolescent Participants, by Report of Discrimination and Smoking Status: Moving to Opportunity for Fair Housing Study, 2002

| | Total (N = 2559), % | Does Not Report Discrimination (n = 1885), % | Does Report Discrimination (n = 674), % | Not Current Smoker (n = 2230), % | Current Smoker (n = 331), % |
|--|------------------------|--|---|--|-----------------------------------|
| Male gender | 50 | 49 | 53 | 51 | 42 |
| Age, y | | | | | |
| 12–13 | 31 | 32 | 27 | 34 | 7 |
| 14–15 | 25 | 25 | 26 | 27 | 12 |
| 16–17 | 24 | 23 | 26 | 23 | 33 |
| 18–19 | 20 | 20 | 22 | 16 | 47 |
| Black race/ethnicity | 68 | 68 | 67 | 67 | 72 |
| School status | | | | | |
| In school | 73 | 74 | 70 | 78 | 34 |
| Graduated | 11 | 11 | 11 | 11 | 13 |
| Dropout | 16 | 15 | 20 | 11 | 53 |
| Current smoker | 12 | 11 | 16 | 0 | 100 |
| Peers use drugs ^a | 28 | 25 | 38 | 24 | 53 |
| Family characteristics | | | | | |
| Mother currently smokes | 38 | 38 | 40 | 36 | 51 |
| Mother has ≥ high school graduation/GED | 54 | 53 | 57 | 56 | 42 |
| Mother works ≥ 35 h/wk | 39 | 38 | 42 | 40 | 31 |
| Household income, % FPL | | | | | |
| <50 | 37 | 37 | 36 | 37 | 38 |
| 50–99 | 35 | 35 | 33 | 34 | 36 |
| 100–149 | 16 | 15 | 17 | 16 | 12 |
| ≥150 | 13 | 12 | 14 | 13 | 13 |
| Moving to Opportunity intervention groups | | | | | |
| Remain in public housing | 30 | 30 | 31 | 31 | 26 |
| Move to any neighborhood | 30 | 29 | 34 | 33 | 35 |
| Move to a low-poverty neighborhood | 40 | 42 | 35 | 40 | 40 |

Note. GED = general equivalency diploma; FPL = federal poverty level.

^a1 or more friends use marijuana or other drugs as reported by the adolescent.

had lower odds of smoking than did girls reporting no discrimination, although this association was not statistically significant. When we analyzed the number of settings in which perceived discrimination occurred as a continuous variable stratified by gender, the odds of smoking increased in boys (odds ratio [OR]=1.36; 95% CI=1.08, 1.70) and decreased in girls (OR=0.61; 95% CI=0.42, 0.89).

Although the odds of smoking among girls in each context of perceived discrimination was consistently lower than that among boys, differences between girls and boys within each context were not statistically significant (Figure

2). Moreover, the relative magnitude of the association between discrimination and smoking seemed to be similar in each context when stratified by gender. Among boys, the odds of smoking were positively associated with discrimination in the context of shops and interactions with police and not significantly associated with discrimination in the context of school or work. Among girls, the odds of smoking were negatively associated with discrimination in the context of school or work and not significantly associated with discrimination in other settings. Measures of anxiety, depression, social support, and view of the

future did not mediate the association between perceived discrimination and odds of smoking among girls or boys (Figure 3).

To investigate reasons for increased likelihood of smoking among boys in the intervention groups (compared with boys in the control group) but decreased likelihood of smoking among girls in the intervention groups (compared with girls in the control group),¹⁰ we assessed a potential role for mediation of gender and smoking by perceived discrimination. However, no evidence of mediation was identified in an intent-to-treat analysis of intervention effects (data not shown).

In a stratified analysis by intervention group adjusted for covariates, the association between perceived discrimination and smoking among boys was greatest in the control group (OR=5.03; 95% CI=2.03, 12.45), whereas the associations for both intervention groups were not statistically significant. There were no significant differences by intervention group in the association between discrimination and smoking among girls.

Additional post hoc analyses were conducted to explore the apparent protective association between perceived discrimination and current smoking among girls. Analyses stratified by age (12–15 years versus 16–19 years) showed that the negative association between perceived discrimination and smoking was driven by the group aged 16 to 19 years (OR=0.33; 95% CI=0.16, 0.67). There was no significant association in the group aged 12 to 15 years. Among girls aged 16 to 19 years, the association of perceived discrimination and smoking was especially strong among school dropouts (OR=0.09; 95% CI=0.03, 0.32) as opposed to those in high school or who had graduated (OR=0.58; 95% CI=0.21, 1.64).

Because of associations between school dropout and pregnancy among girls,¹⁸ we also explored the role of pregnancy status. Girls who had been pregnant were significantly less likely to report smoking in the context of perceived discrimination (OR=0.30; 95% CI=0.10, 0.92), whereas girls who had never been pregnant had no significant association. When analyses were stratified by both pregnancy and school status, girls who were in school or had graduated and had never been pregnant had no association between discrimination and smoking, whereas those who had been pregnant and had dropped

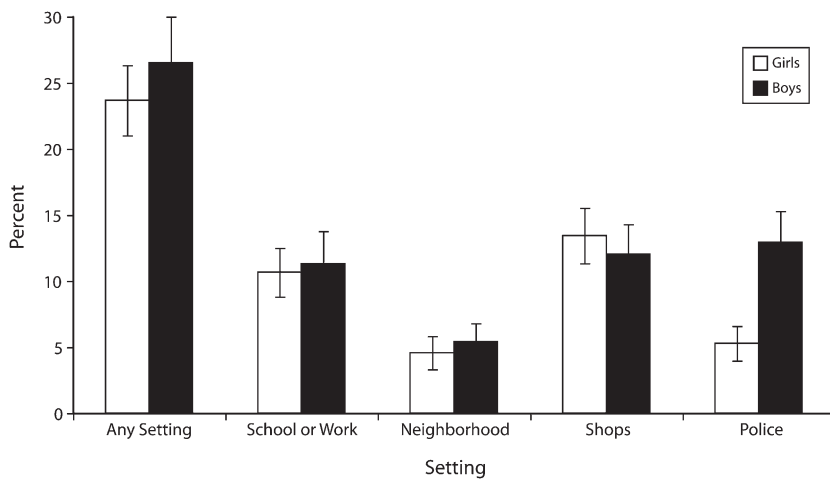


FIGURE 1—Prevalence of perceived discrimination among Black and Latino adolescents, by setting and gender: Moving to Opportunity for Fair Housing study, 2002.

out of school had a dramatically protective association (OR=0.01; 95% CI=0.00, 0.22). There were insufficient numbers to run a stratified analysis of pregnant girls who had not dropped out.

Notably, the association of perceived discrimination and smoking among boys was also driven by the group aged 16 to 19 years (OR=2.57; 95% CI=1.48, 4.45), whereas there was no significant association among the group aged 12 to 15 years. School status was also a significant effect modifier among boys. Odds of smoking were 3.63 times higher among older boys in school or who had graduated and who

reported any discrimination in the prior 6 months (95% CI=1.57, 8.35), compared with similar-aged boys in school or graduated who had not reported discrimination. The odds of smoking were 1.65 times higher among older boys who had dropped out of school and who reported any discrimination (95% CI=0.75, 3.59) compared with those who had not reported discrimination.

DISCUSSION

Our analyses suggest that associations between perceived discrimination and smoking

among adolescents are influenced by gender, the context of discrimination, age, and pregnancy. Our findings indicate that simplistic explanations for the linkage of discrimination and smoking (e.g., smoking is a coping response to discrimination-induced stress) are insufficient.

Our findings among adolescent boys are congruent with other studies that have shown associations between smoking and discrimination in adolescents and young adults^{1,4,5} and in adults.¹⁹ The lack of an association between discrimination and smoking among younger adolescent girls, and the potentially negative associations among older girls, have not previously been reported in the literature. Gender differences in this relationship between perceived discrimination and smoking may represent opportunities to unravel a complicated tangle of behaviors and to tailor interventions.

There was no statistically significant interaction between the context of perceived discrimination and smoking by gender. However, the likelihood of smoking among boys was not associated with discrimination in school, work, or neighborhood settings, whereas the likelihood of smoking among girls was associated with discrimination in these settings, raising the possibility of a differential sensitivity to the context of discrimination by gender. In addition, discrimination in settings such as shops may differ in terms of intensity, frequency, and form when compared with discrimination in settings such as neighborhood, school, or workplace. Likewise, interactions with the police may instill powerful impressions and distress. Few data exist on how discrimination is perceived various settings. For example, persons may be more sensitive to discrimination in some settings than in others.²⁰

The differential gender effect may also be caused by unmeasured factors. For example, girls may be subject to different social norms relating to smoking, more influenced by their mother's smoking behavior, or exposed to different types of cigarette marketing than boys. Alternatively, if boys are more open and honest about discrimination than girls, the "true" association may only be detected in boys. This potential internalizing behavior on the part of girls (i.e., girls who do not realize or report experienced discrimination) may contribute to increased stress and subsequent smoking.^{21,22} Girls may also be more likely than

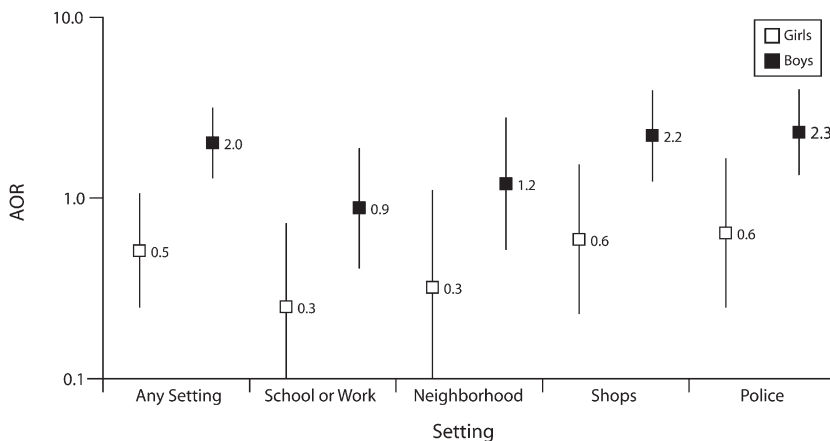


FIGURE 2—Adjusted odds ratio (AOR) of current smoking among Black and Latino adolescents, by setting of perceived discrimination and gender: Moving to Opportunity for Fair Housing study, 2002.

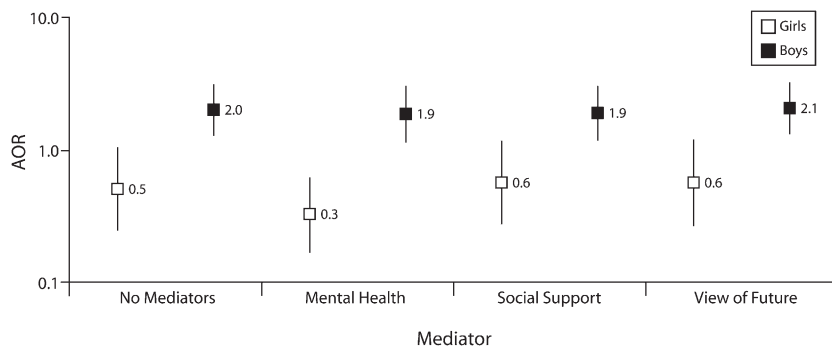


FIGURE 3—Adjusted odds ratio (AOR) of current smoking among Black and Latino adolescents reporting discrimination in the prior 6 months, by mediators included in the model: Moving to Opportunity for Fair Housing study, 2002.

boys to discuss stressors with peers and use social networks in adaptive ways to mitigate the negative outcomes associated with experience of discriminations.²³

This surprising finding of an apparent reduction in smoking associated with perceived discrimination among older girls prompted additional post hoc analyses. The fact that the decreased odds of smoking associated with discrimination is driven by a subgroup of pregnant adolescents may be because (1) they are more likely to experience or perceive discrimination than are nonpregnant teens because of their race and pregnancy status, and (2) they are also less likely to either smoke or to report smoking, given the known adverse fetal effects of smoking. A study of pregnant adolescents showed that 39% reported feeling stigmatized by their pregnancy, and feeling stigmatized was related to contextual factors such as school dropout.²⁴

There were other unanticipated findings in this study. First, the association between perceived discrimination and smoking did not appear to be mediated by mental health, social support, or view of the future. This is contrary to other reports in which similar measures were shown to mediate this association.^{4,19,25} Only 1 of these studies, however, was among adolescents, and it focused on Black girls. The lack of a mediating role of the available mental health indicators in this study may be attributable to the population (less variability with respect to included variables) or the way in which the indicators were measured. Personality

dispositions and other domains, which were not available in these data, may also mediate the relationship.²⁶

Second, discrimination did not significantly mediate the Moving to Opportunity intervention effects. Despite a positive association among boys between discrimination and smoking and Moving to Opportunity intervention group and smoking, and a negative association among girls between discrimination and smoking and Moving to Opportunity intervention group and smoking, these 2 sets of associations for boys and girls appear to be independent. In a qualitative analysis of the Moving to Opportunity participants, Clampet et al. described differences in contexts of girls and boys in the intervention and control groups.¹¹ Boys in the experimental groups reported worse peer interactions and increased cultural conflict compared with boys in the control group, whereas girls in the experimental group described a more protective setting compared with the control group. Perhaps these differences in peer and social contexts also influenced the ways in which discrimination was experienced. This may explain differential relationships with self-reported smoking among girls and boys.

Finally, the strongest association between discrimination and smoking was among boys in the Moving to Opportunity control group. Given that there were no significant differences in prevalence of discrimination (overall or by setting) by intervention group, situational factors (other than location) or severity of

discrimination may differ in some way. Intra-racial racism has been postulated to have a greater impact than extraracial racism because discrimination from someone given greater respect is more hurtful.²⁷ Another explanation may be a reporting difference by intervention group—i.e., those who actively cope with prejudice are more likely to report events.²⁰

Although there is no consensus on how best to measure discrimination,²⁸ there are several factors to note regarding the measure used in this study. First, the measure specified discrimination based on race/ethnicity and did not include discrimination as a result of gender, class, sexual orientation, or other factors. Gender discrimination may have contributed to some of our findings. Second, given that the data were collected during face-to-face interviews, honesty in reporting may vary according to the race or gender of the interviewer.²⁰ Third, as the measure only assesses discrimination in the prior 6 months, it does not distinguish chronic from acute discrimination or the duration or extent of exposure to discrimination. Discrimination has been found to relate more strongly to physical and mental health among adolescents than among adults.²⁹

In addition, our measure does not assess the “distinct and cumulative impact of multiple dimensions of perceived discrimination,” so it may underestimate the prevalence of discrimination and the strength of its association with smoking.²⁸ The measure also does not differentiate between institutional discrimination and racism. Both institutional and individual discrimination contribute to adverse health outcomes.³⁰ We cannot determine whether our measure of discrimination correlates with the prevalence of institutional or structural racism.³¹ Still, perceived discrimination is an important measure, regardless of its subjectivity, particularly given its association with adverse health outcomes.

Limitations and Strengths

There are several limitations to our study. As described above, the discrimination measure is self-reported and thus is not a validated measure of an unfair event occurring as a result of one’s race or ethnicity. In addition, the measure is an indication of interpersonal, rather than organizational or institutional, discrimination³² and thus provides a fairly blunt measure of the

degree or chronicity of discrimination. It is also impossible to determine, in this cross-sectional analysis, whether discrimination led to increased likelihood of smoking or whether people were more likely to be discriminated against if they were smoking (either because of the public's response or because of a change in an individual's sensitivity). In our study, the individual reported both the discrimination and the smoking behavior, thus the analysis is subject to same-source bias.¹⁹ Likewise, a "better adapted" individual who is less likely to smoke may also underestimate discriminatory events.³¹ Finally, the measure of tobacco use in this study indicated smoking at least 1 cigarette in the prior 30 days and does not necessarily reflect more frequent or long-term use.

The strengths of this analysis are that it utilizes data from a study in which youth were recruited from fairly homogeneous living situations (public housing) and randomly assigned to move to a variety of neighborhoods in terms of aggregate household income. Thus, the contextual exposures may be quite variable, whereas the individual factors are relatively similar, allowing us to narrow down effects of context or perceived context among this poor urban population of adolescents. In addition, we had access to rich covariate data, which allowed a more fully specified model of the relationship between discrimination and smoking.

Conclusions

Although there are many studies supporting the relationship between smoking and discrimination among adults, this study adds to an emerging literature focusing on adolescents. Understanding why and how discrimination occurs among adolescents is important because of its association with risk behaviors such as smoking, its significant mental and physical health consequences, and its contribution to inequalities in health outcomes. In survey assessments, more youth report discrimination than adults (even for lifetime measures), suggesting that youth may experience more discrimination overall because of a cohort effect, increased sensitivity and reporting of these events, or less denial of discriminatory acts.^{33,34} In light of this fact and the associated adverse health outcomes in both adolescence and adulthood, it is critically important to study discrimination among adolescents.

The fact that a positive association between smoking and discrimination occurred only among adolescent boys deserves further study. If factors such as school status and pregnancy contribute to the relationship between smoking and discrimination among adolescent females, additional questions arise. How might these young women react to the added stress associated with perceived discrimination, particularly if other protective factors such as social support are not available? Overall, this study confirms the complex nature of the association between discrimination and smoking and emphasizes the need for analyses that consider multiple factors, especially those related to context. ■

About the Authors

Sarah E. Wiehe and Gilbert C. Liu are with Children's Health Services Research, Department of Pediatrics, Indiana University School of Medicine, Indianapolis. Matthew C. Aalsma and J. Dennis Fortenberry are with Adolescent Medicine, Department of Pediatrics, Indiana University School of Medicine, Indianapolis.

Correspondence should be sent to Loyce Stultz, Children's Health Services Research, Indiana University School of Medicine, 410 West 10th St, HS1020, Indianapolis, IN 46202 (e-mail: lstultz@iupui.edu). Reprints can be ordered at <http://www.ajph.org> by clicking the "Reprints/Eprints" link.

This article was accepted July 24, 2009.

Contributors

S.E. Wiehe originated the study, conducted the data analysis, and wrote the initial draft of the article. M.C. Aalsma, G.C. Liu, and J.D. Fortenberry contributed substantially by refining study objectives, interpreting results, and editing and critically revising the article.

Acknowledgments

We would like to thank Abt Associates, especially Debi McInnis, and the US Department of Housing and Urban Development, especially Todd Richardson and Mark Shroder, for use of and assistance with the Moving to Opportunity data.

Human Participation Protection

All study procedures were approved by the Indiana University institutional review board.

References

- Bennett GG, Wolin KY, Robinson EL, Fowler S, Edwards CL. Perceived racial/ethnic harassment and tobacco use among African American young adults. *Am J Public Health*. 2005;95(2):238–240.
- Brook JS, Morojele NK, Brook DW, Zhang C, Whiteman M. Personal, interpersonal, and cultural predictors of stages of cigarette smoking among adolescents

in Johannesburg, South Africa. *Tob Control*. 2006; 15(suppl 1):i48–i53.

- Gibbons FX, Gerrard M, Cleveland MJ, Wills TA, Brody G. Perceived discrimination and substance use in African American parents and their children: a panel study. *J Pers Soc Psychol*. 2004;86(4):517–529.
- Guthrie BJ, Young AM, Williams DR, Boyd CJ, Kintner EK. African American girls' smoking habits and day-to-day experiences with racial discrimination. *Nurs Res*. 2002;51(3):183–190.
- Landrine H, Klonoff EA, Corral I, Fernandez S, Roesch S. Conceptualizing and measuring ethnic discrimination in health research. *J Behav Med*. 2006;29(1):79–94.
- Paradies Y. A systematic review of empirical research on self-reported racism and health. *Int J Epidemiol*. 2006;35(4):888–901.
- Whitbeck LB, Hoyt DR, McMorris BJ, Chen X, Stubben JD. Perceived discrimination and early substance abuse among American Indian children. *J Health Soc Behav*. 2001;42(4):405–424.
- Centers for Disease Control and Prevention. Cigarette use among high school students—United States, 1991–2007. *MMWR Morb Mortal Wkly Rep*. 2008; 57(25):686–688.
- Green E, Singleton C. Risky bodies at leisure: young women negotiating space and place. *Sociology*. 2006; 40(5):853–871.
- Orr L, Feins JD, Jacob R, et al. *Moving to Opportunity for Fair Housing Demonstration Program: Interim Impacts Evaluation*. Washington, DC: Office of Policy Development and Research, US Dept of Housing and Urban Development; 2003. Available at: <http://www.hud.gov/progdsc/mto.cfm>. Accessed December 14, 2009.
- Clampet-Lundquist S, Edin K, Kling J, Duncan G. *Moving At-Risk Teenagers Out of High-Risk Neighborhoods: Why Girls Fare Better Than Boys*. Princeton, NJ: Industrial Relations Section, Princeton University; 2006. Working Paper 509.
- 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.
- Kobus K. Peers and adolescent smoking. *Addiction*. 2003;98(suppl 1):37–55.
- Blum RW, Beuhring T, Shew ML, Bearinger LH, Sieving RE, Resnick MD. The effects of race/ethnicity, income, and family structure on adolescent risk behaviors. *Am J Public Health*. 2000;90(12):1879–1884.
- Preventing Tobacco Use Among Young People: A Report of the Surgeon General. Washington, DC: US Dept of Health and Human Services; 1994.
- Lantz PM, Lynch JW, House JS, et al. Socioeconomic disparities in health change in a longitudinal study of US adults: the role of health-risk behaviors. *Soc Sci Med*. 2001;53(1):29–40.
- Kling J, Sanbonmatsu L. *Documentation for the Weights File Tier 2 Restricted Access Dataset*. Washington, DC: Dept of Housing and Urban Development; 2003.
- Cairns RB, Cairns BD, Neckerman HJ. Early school dropout: configurations and determinants. *Child Dev*. 1989;60(6):1437–1452.

19. Borrell LN, Jacobs DR Jr, Williams DR, Pletcher MJ, Houston TK, Kiefe CI. Self-reported racial discrimination and substance use in the Coronary Artery Risk Development in Adults Study. *Am J Epidemiol*. 2007; 166(9):1068–1079.
20. Contrada R, Ashmore R, Gary M, et al. Ethnicity-related sources of stress and their effects on well-being. *Curr Dir Psychol Sci*. 2000;9(4):136–139.
21. Krieger N. Racial and gender discrimination: risk factors for high blood pressure? *Soc Sci Med*. 1990; 30(2):1273–1281.
22. 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.
23. Patterson JM, McCubbin HI. Adolescent coping style and behaviors: conceptualization and measurement. *J Adolesc*. 1987;10(2):163–186.
24. Wiemann CM, Rickert VI, Berenson AB, Volk RJ. Are pregnant adolescents stigmatized by pregnancy? *J Adolesc Health*. 2005;36(4):352e1–352.e7.
25. Borrell LN, Kiefe CI, Williams DR, Diez-Roux AV, Gordon-Larsen P. Self-reported health, perceived racial discrimination, and skin color in African Americans in the CARDIA study. *Soc Sci Med*. 2006;63(6):1415–1427.
26. Watson D, Clark LA. Negative affectivity: the disposition to experience aversive emotional states. *Psychol Bull*. 1984;96(3):465–490.
27. Major B, Gramzow RH, McCoy SK, Levin S, Schmader T, Sidanius J. Perceiving personal discrimination: the role of group status and legitimizing ideology. *J Pers Soc Psychol*. 2002;82(3):269–282.
28. Williams DR, Neighbors HW, Jackson JS. Racial/ethnic discrimination and health: findings from community studies. *Am J Public Health*. 2003;93(2):200–208.
29. Williams DR, Yu Y, Jackson JS, Anderson NB. Racial differences in physical and mental health: socio-economic status, stress and discrimination. *J Health Psychol*. 1997; 2(3):335–351.
30. Gee GC, Spencer MS, Chen J, Takeuchi D. A nationwide study of discrimination and chronic health conditions among Asian Americans. *Am J Public Health*. 2007;97(7):1275–1282.
31. Meyer IH. Prejudice as stress: conceptual and measurement problems. *Am J Public Health*. 2003;93(2): 262–265.
32. Krieger N. Refiguring “race”: epidemiology, racialized biology, and biological expressions of race relations. *Int J Health Serv*. 2000;30(1):211–216.
33. Broman CL. The health consequences of racial discrimination: a study of African Americans. *Ethn Dis*. 1996;6(1–2):148–153.
34. Kessler RC, Mickelson KD, Williams DR. The prevalence, distribution, and mental health correlates of perceived discrimination in the United States. *J Health Soc Behav*. 1999;40(3):208–230.