

# Socioeconomic Disadvantage, Parenting Responsibility, and Women's Smoking in the United States

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Smoking has been identified as one of the major preventable causes of morbidity and premature mortality.<sup>1</sup> The increasing proportion of women in the smoking population has heightened the importance of understanding smoking behavior within this group. Smoking among women of reproductive age has been of special interest, because such smoking influences not only the health of the women themselves but also that of their children. In part as a result of knowledge about the harmful effects of maternal smoking on the fetus and young child and also as a result of intensive prevention and cessation interventions for pregnant women, smoking prevalence among this population is lower than that in the general population.<sup>2</sup> However, substantial differences remain in smoking prevalence by educational attainment and by race/ethnicity. Among pregnant women, the prevalence of smoking is 2.8% for those with a college degree, compared with 27.0% for those who did not graduate from high school.<sup>3</sup> Several smoking-cessation intervention studies have found lower rates of smoking-cessation and higher rates of relapse among less-educated and lower-income women.<sup>4–6</sup> Despite overall lower rates of smoking among pregnant women and mothers of young children, the material and social environments of mothers may also affect their smoking behavior.

Parenting can provide a great sense of accomplishment but may also be stressful—caring for children, especially children of preschool age, requires considerable time and energy.<sup>7,8</sup> Although daily chores related to child rearing may not be burdensome, their cumulative effect can, over a period of time, be experienced as a chronic strain, especially when they are combined with low levels of resources and other stressors such as poverty. Several epidemiological studies report that mental health is worse among mothers of young children than among mothers without

**Objectives.** We carried out analyses of smoking in relation to poverty and child care responsibility among women aged 18–54 years residing in the United States.

**Methods.** With data from the Behavioral Risk Factor Surveillance System, we assessed the interaction effects of poverty and living with young children on maternal smoking behavior among 61 700 women aged 18–54 years in 4 different racial/ethnic groups.

**Results.** For non-White racial/ethnic groups, the prevalence of smoking among women with small children in the household was lower than that among women without small children. However, White women were more likely to smoke if they were poor and living with small children (odds ratio = 1.14, 95% confidence interval = 1.03, 1.26).

**Conclusions.** These results suggest that child care responsibility confers an increased risk of smoking among low-income White women. (*Am J Public Health.* 2004;94:2170–2176)

young children.<sup>7,9–13</sup> Naerde et al.<sup>7,14</sup> found that problems with child care arrangements combined with stressful work are associated with poor mental health among mothers of young children.

Parenting stresses associated with rearing young children might, however, be modified by the resources available to parents. Mothers with higher family incomes have been shown to exhibit better parenting behavior.<sup>15</sup> A longitudinal study of mothers of children aged 0–5 years found that child care responsibilities, such as making day-care arrangements and combining work and child care, were associated with maternal mental distress.<sup>7</sup> The same study also showed that social support with child care arrangements appeared to be associated with maternal mental well-being.<sup>7</sup> Mothers who received social support from public health nurses or from experienced volunteer mothers showed better family dynamics, parenting skills, and maternal self-esteem.<sup>16–18</sup> Mothers with greater support were significantly more positive in their attitudes and behavior, and social support moderated the adverse effects of stress on mothers' life satisfaction and behavior.<sup>19,20</sup> The prevalence of depressive episodes was higher among mothers without social support than among those with support.<sup>21</sup>

Smoking has been reported to be a means of reducing stress, especially among women.<sup>22–24</sup> Some qualitative studies of smoking among low-income women suggested that smoking is a way of coping with daily hassles and stress.<sup>25–29</sup> Graham reported that child care responsibilities, which are disproportionately borne by women, were associated with cigarette smoking in a study of White working-class women in the United Kingdom. Mothers living in conditions of material hardship often identified the time spent smoking cigarettes as the only time they had for themselves and cigarette smoking as the only activity they did for themselves. According to Graham, smoking might help these mothers cope with the stress and monotony of daily life.<sup>25,26</sup> Greaves suggests that, when mothers feel overwhelmed by too many demands, they may turn to a cigarette as a way of temporarily distancing themselves from their children, a strategy that helps them to manage their anger and avoid acting upon it (e.g., in the form of physical abuse).<sup>27</sup> Stewart et al.<sup>28,29</sup> also reported that disadvantaged women in Canada considered their smoking to be linked with their daily lives in poverty, isolation, and care giving and used smoking as a mechanism for coping with stress and associated negative emotions.

Our study explored the combined effects of parenting responsibilities and limited material circumstances on smoking among women. Previous research on parenting and smoking has been limited to qualitative studies from the United Kingdom and Canada and to studies with small sample sizes. Because of cumulative evidence and widespread knowledge of the harmful effects on children of maternal smoking during pregnancy and childhood, overall smoking prevalence is low during pregnancy,<sup>3</sup> and raising young children also is a protective factor against tobacco use among women. However, on the basis of qualitative studies on smoking among low-income women, we hypothesized that the effect of parenting on smoking differs according to the socioeconomic status (SES) of the mother. We assume that high-SES women have more resources for coping with stress related to parenting, an advantage that enables them to avoid smoking, whereas low-SES women lack such resources. Parenting under disadvantaged circumstances is a factor that may contribute to continued tobacco use among women, despite their knowledge of its harmful effects. Therefore, by testing the interaction effect of poverty and parenting on smoking, we investigated whether parenting actually increases the risk of tobacco use among low-SES women.

Thanks to a large sample size (the Behavior Risk Factor Surveillance System [BRFSS] population), we were able to test whether previous study findings about low-income White women and smoking also apply to women of other racial/ethnic backgrounds. We performed separate analyses by racial/ethnic group, because smoking prevalence historically has varied by racial/ethnic group, and smoking behavior is considered to be influenced by cultural norms.<sup>30</sup>

## METHODS

### Sources of Data

The study was based on the 2000 BRFSS of the Centers for Disease Control and Prevention,<sup>31</sup> which consists of a representative sample of households by state in the United States. Each state selects an independent probability sample of its civilian, noninstitutionalized adult population 18 years of age or

older, using random-digit-dialing telephone survey techniques.

All 50 states, as well as the District of Columbia and Puerto Rico, participated in the BRFSS in 2000. The total sample size was 184 450. After we restricted the sample to women of reproductive age (18–54 years), the sample size was reduced to 73 457 (a 31.4% decrease by restricting to those aged 18–54 years, and an additional 42.0% decrease by excluding males). The final sample size of women who provided complete information on smoking status and other socioeconomic characteristics was 61 700. Although the income variable had many missing observations (11.3%), most other variables had only a few missing observations (<1.0).

### Outcome Measures of Tobacco Use

Self-reported smoking status was used as the measure of tobacco use. We defined smokers as those who reported current smoking. Self-report of smoking status was determined in response to the questions “Have you smoked at least 100 cigarettes in your entire life?” and “Do you smoke cigarettes every day, some days, or not at all?” “Current smokers” were defined as those who had smoked at least 100 cigarettes during their lifetime and who currently smoked cigarettes every day or some days. “Former smokers” were women who had smoked 100 cigarettes during their lifetime but who currently did not smoke cigarettes regularly, and “never smokers” were women who had not smoked at least 100 cigarettes and who did not smoke. Former and never smokers were combined into a nonsmoker category for these analyses.

### Sociodemographic Data

The BRFSS 2000 questionnaire also asked about individual characteristics. Parenting of young children was dichotomized as living with children who were younger than 5 years versus not living with young children. SES was measured by household income. To increase comparability across households of different sizes, we adjusted household income for household size by using a standard equalization procedure (i.e., dividing the household income by the square root of the number of people in that household).<sup>32,33</sup> Household income was recalculated on the basis of midpoints of income categories, ad-

justed for family size. Income was then dichotomized as poor (<\$15 000) and nonpoor (≥\$15 000). We set the \$15 000 cut point at 150% of the 2000 US Census Bureau poverty threshold,<sup>34</sup> which is less than \$10 000 after adjustment for family size.

Age was examined as a continuous variable and was centered on the mean (36 years old). Race/ethnicity was grouped into 4 categories: non-Hispanic White, non-Hispanic Black, Hispanic, and “other.” Marital status was grouped into 4 categories: married, divorced/widowed/separated, never married, and member of an unmarried couple. Educational attainment was grouped into 4 categories: did not graduate from high school, high school graduate, some college or trade school, and college graduate. The number of children aged 5–17 years was calculated and truncated at 4 children because few households had 5 or more children.

### Statistical Analysis

Multilevel logistic regression procedures based on a logit-link function<sup>35,36</sup> were used to model the 2-level structure of 61 700 individual women (at level 1) nested within 50 US states (at level 2). Models were fitted with the MlwiN software<sup>37</sup> and second-order Penalized Quasilikelihood estimation procedures.<sup>38</sup> At the individual level, we analyzed data with and without extrabinomial variation to determine whether the binomial distributional assumption was supported.<sup>36,39,40</sup> Because the results showed that extrabinomial variation was not significantly different from 1, the level 1 variation was constrained to 1 (pure binomial variation) in all of the models reported.

To estimate the effect on smoking of the parenting of young children, we included individual predictors in the fixed part of the model while allowing for variation between states. We assessed the relationship between smoking and all of the individual predictors across all 50 US states. Models were built by sequentially adding covariates. First, the relation between raising young children and smoking was examined with control for age, number of children aged 5–17 years, educational attainment, marital status, and race/ethnicity. Next, interaction terms between poverty status (poor or nonpoor) and each

individual characteristic were added to the main effect model to determine whether the association of parenting and other characteristics differed by poverty status. When an individual characteristic was added, the likelihood ratio test for overall model fit and the Wald test for individual indicator variables were performed. Finally, we stratified the sample by racial/ethnic group and tested an interaction effect between parenting young children and poverty status within each stratum.

To account for design-based variation in probability of selection into the sample by

age, gender, and race, we weighted the data in all analyses with sampling weights provided by BRFSS 2000.

**RESULTS**

Table 1 presents the characteristics of the study population. The sample was predominantly White (77.4%), the mean age was 36 years, and 35.4% of the sample had income levels that fell within the poor category (i.e., less than \$15 000). Blacks and Hispanics were much more likely than Whites to be

poor (43% of Blacks and 55% of Hispanics vs 19% of Whites). Of the 61 700 respondents in the sample, 24.9% were current smokers. Respondents living with young children (aged 0–4 years) were less likely to be current smokers than were women not living with young children (25.7% for no child vs 22.7% for 1 or more children). Rates of smoking were lower for Blacks, Hispanics, and “other” racial/ethnic groups than for Whites. Smoking rates also were lower among respondents with higher educational attainment and income.

**TABLE 1—Distribution of Sample by Individual Characteristics and Percentage of Current Smoking<sup>a</sup>: Behavioral Risk Factor Surveillance System (BRFSS) 2000**

	No. (Unweighted)	Weighted Percentage <sup>b</sup>	Weighted Percentage <sup>b</sup> of current smoking
Age, y			
18–24	7148	11.6	28.8
25–34	17 036	27.6	23.9
35–44	20 395	33.1	26.6
45–54	17 121	27.8	21.7
No. of children aged 0–4 years			
None	46 879	73.6	25.7
≥ 1	14 821	26.4	22.7
1	10 553	17.5	23.5
2	3 683	5.4	20.6
≥ 3	585	1.0	20.7
Race/ethnicity			
White, non-Hispanic	47 719	70.8	27.3
Black, non-Hispanic	5 998	11.2	20.9
Hispanic	4 768	13.2	17.7
Other	3 215	4.8	19.4
Marital status			
Married	34 490	59.2	19.9
Divorced/separated/widowed	13 188	16.2	36.4
Never been married	12 026	20.5	28.0
Member of unmarried couple	1 996	4.1	37.0
Educational attainment			
College graduate	19 861	30.3	12.6
Some college	19 313	31.0	25.4
High school graduate	18 210	29.4	33.4
Less than high school graduate	4 316	9.3	36.6
Income, \$			
< 15 000	15 666	26.9	32.8
≥ 15 000	46 034	73.1	22.0
Total	61 700	100.0	24.9

<sup>a</sup>Sample was restricted to women aged 18–54 years.

<sup>b</sup>We used weighted percentages to account for differential response rates and design-based variation in probability of selection into the sample by age, gender, and race, with sampling weights provided by the BRFSS 2000.

**Non-Hispanic White Women**

Table 2 shows the results of our adjusted model by poverty status as well as by racial/ethnic group. Among nonpoor White women, living with young children was inversely related to current smoking, whereas among poor White women, living with young children was positively associated with current smoking. In the nonpoor group, the odds of smoking among women living with 1 or more children of preschool age (0–4 years) was 0.9 times that of women not living with young children (95% confidence interval [CI]=0.8, 0.9). By contrast, the odds of smoking among poor White women who lived with children aged 0–4 years was 1.1 times that among women who did not live with young children (95% CI=1.0, 1.3).

**Non-Hispanic Black and Hispanic Women**

Among Black and Hispanic women, living with young children uniformly decreased the odds of smoking, regardless of income level. For Black women with children, the odds of smoking were 0.7 (95% CI=0.6, 0.9) for nonpoor women and 0.9 (95% CI=0.7, 1.1) for poor women. For Hispanic women with children, the odds of smoking were 0.7 (95% CI=0.5, 0.9) for nonpoor women and 0.9 (95% CI=0.7, 1.1) for poor women. For non-White women, therefore, living with young children decreased the risk of smoking.

**DISCUSSION**

Our study found a lower prevalence of smoking, for non-White racial/ethnic groups, among women with small children in the household than among women without small

**TABLE 2—Effect of Living With Young Children<sup>a</sup> on Smoking Prevalence Among Woman Aged 18–54 Years: Behavioral Risk Factor Surveillance System (BRFSS) 2000**

	Nonpoor ( $\geq$ \$15 000) <sup>b</sup>		Poor ( $<$ \$15 000) <sup>b</sup>	
	Weighted Percentage <sup>c</sup> of current smoking	OR <sup>d</sup> (95% CI)	Weighted Percentage <sup>c</sup> of current smoking	OR <sup>d</sup> (95% CI)
Total	22.0	0.85 (0.80, 0.90)	32.8	1.07 (0.99, 1.16)
White, non-Hispanic	23.4	0.86 (0.80, 0.92)	44.1	1.14 (1.03, 1.26)
Black, non-Hispanic	16.1	0.73 (0.56, 0.95)	27.4	0.89 (0.73, 1.09)
Hispanic	18.5	0.70 (0.53, 0.91)	17.0	0.86 (0.69, 1.08)
Other	15.4	0.87 (0.64, 1.17)	29.6	1.20 (0.88, 1.64)

Note. OR = odds ratio; CI = confidence interval.

<sup>a</sup>Women with 1 or more children aged 0–4 years living in the household, compared with women of the same income and race/ethnicity group with no children aged 0–4 years living in the household. Sample was restricted to women aged 18–54 years.

<sup>b</sup>Household income was equalized to increase comparability across households of different size by division of midpoints of household income by the square root of the number of people in that household.

<sup>c</sup>We used weighted percentages to account for differential response rates and design-based variation in probability of selection into the sample by age, gender, and race/ethnicity, with sampling weights provided by the BRFSS 2000.

<sup>d</sup>The odds ratios were from a weighted logistic regression model for smoking that included individual-level age, number of children aged 5–17 years, marital status, educational attainment, and race/ethnicity. A random intercept was specified at the state level in each model.

children in the household. However, this inverse association between small children in the household and smoking was not apparent in low-income, non-Hispanic White women, who were more likely to smoke if they were living with small children.

However, we found no interaction effect of poverty status and parenting on smoking among non-White women. For Black and Hispanic women, raising young children had a protective effect on smoking, regardless of poverty status.

### Interaction Effects

For low-income White women, raising young children in the context of economic hardship amplified the risk of cigarette smoking. Our finding is consistent with qualitative findings reported by Graham et al.,<sup>26</sup> whose results were based on data from low-income White women in England. These women have multiple role demands<sup>28</sup> with fewer material and social resources than are available to more privileged women.<sup>26,29</sup>

Children influence women's smoking behavior. Parenting children has conflicting effects on smoking. On the one hand, the burdens of child care are often considered stressors associated with smoking or the relapse of smoking. On the other hand, because

of mothers' concerns about the effects of secondhand smoke, children are also a reason for women to quit smoking.<sup>41</sup>

Our study shows both positive and negative effects of children on mothers' smoking. According to Greaves, many women feel that smoking is useful for controlling emotion in a variety of situations. It helps women to quash negative feelings, dispel tension, or delay an emotional response.<sup>27</sup> In their in-depth interviews with disadvantaged women, Stewart et al. found that disadvantaged women who continued to smoke did so to cope with their immediate situation<sup>28</sup> and that coping was the women's principal explanation for their smoking behavior—they smoked to cope with the stress, chaos, and crises in their lives, including child care. These women also reported that smoking helped them cope with loneliness and isolation. Women in economically deprived circumstances suffered from loneliness and lack of social support. Cigarettes were used as a reward and for pleasure. Smoking provided a break from a monotonous, burdensome daily routine.<sup>28</sup>

Results of smoking-cessation interventions aimed at low-income women show that relapse rates are highest among low-income single White women.<sup>42</sup> Several smoking-cessation programs consisting of self-help

booklets, telephone contacts, and even systematic provision of motivational counseling improved neither prenatal cessation rates nor postpartum maintenance rates, and researchers have concluded that there is a need to develop innovative strategies to assist this group.<sup>43,44</sup> An intervention by community health centers that focused on improving low-income women's quality of life showed better smoking-cessation rates than those achieved with other intervention programs (38% vs 20%–25%).<sup>45</sup> The key goals were to integrate low-income women's social and economic circumstances into the program. When planning an intervention, one must acknowledge the association between the need of smoking as a source of relief of stress among low-income women and to recognize that lifestyle habits are influenced by personal choices, as well as by economic circumstances and social structures.<sup>46,47</sup>

### Racial/Ethnic Differences

Many researchers have pointed out the strong support networks among African American communities.<sup>48–52</sup> This extensive support system has been reported to be a Black cultural pattern.<sup>49</sup> Studies have found that racial/ethnic minorities are more likely to live in extended-family households.<sup>53–58</sup> Farley and Allen found, based on 1980 census data, that extended living arrangements were twice as common among African American households as among White households.<sup>58</sup> Black communities have used networks of intimate mutual aid and social interactions with neighbors and kin as a coping strategy against isolation from larger society.<sup>49,51,52</sup> Care of children, shopping, and counseling are among the services provided by extensive kin systems.<sup>49,50</sup> According to McAdoo's study on the extended family support network, mothers of young children, especially single mothers, benefited from the network. Mothers appeared to receive more help than they provided in this network, and the help most frequently exchanged in the network was child care.<sup>49</sup> There was evidence that mothers who received support were protected against the harmful effect of negative life circumstances.

The Hispanic population in the United States continues to increase, partly as a result

of immigration.<sup>59</sup> Many studies have suggested that income, education, and acculturation might interact in significant ways to affect the smoking behavior of Hispanic women. For example, Latina immigrants with initially lower smoking rates tend to increase their smoking rates as they become more educated and more acculturated.<sup>60</sup> Although there is a need to belong to, and assimilate into, the general mainstream of American culture, Hispanic/Latino women are also influenced by the norms of their countries of origin, where smoking tends to be relatively uncommon among women. Furthermore, immigrant Latino subgroups experience some very positive benefits from their social networks.<sup>61,62</sup> Zuniga found that, because of their linguistic, cultural, and economic isolation, immigrants were heavily dependent on the moral support and networks of their community.<sup>59</sup> Baezconde-Garbanati found relatively lower overall rates of adult smoking, psychopathology, and depression to be tied to traditional cultural values and the presence of a strong family network.<sup>62</sup> Contact with extended families from the country of origin, and even with nonfamilial kin systems, offers support and helps preserve the values of the culture among Hispanics/Latinos. These factors may play protective roles for mothers with young children and serve as a resource for coping with stress.

We hypothesize that although women in African American and Hispanic racial/ethnic minority groups generally have less easy access to material resources than do their White counterparts, they may have strong social support systems within their communities. These social support systems may help lower the stress of child rearing for mothers of young children, resulting in a lower prevalence of smoking among these women. The most disadvantaged women, such as single mothers, may also benefit the most from these strong family or community support networks.

### Limitations

This study has several limitations. First, the cross-sectional nature of the data limits our ability to make causal inferences. Thus, it is impossible to distinguish whether the evidence we observed is a result of the effect of parenting on smoking or whether it is simply a correlation between these variables.

Second, the smoking assessment was based on self-report and was not verified by objective measures. Strong emphases on the harmful effects of secondhand smoke on children's health may compromise the validity of self-report. In fact, 2 trials targeting pregnant women who received even stronger messages "not to smoke" found high percentages of deception (28% and 35%) during late pregnancy.<sup>63,64</sup> However, a meta-analysis of 26 validation studies concluded that self-reported smoking status is generally accurate.<sup>65</sup> The only exceptions are among pregnant women, adolescents, and participants of intense smoking-cessation programs.<sup>63,66,67</sup>

In addition, the estimates of smoking prevalence in the BRFSS may be lower than the true prevalence. Studies have reported that the BRFSS tends to underestimate smoking prevalence compared with the Current Population Survey (CPS), which conducts most interviews in person.<sup>68–70</sup> In 2000, about 95% of US households had telephones,<sup>71</sup> but telephone coverage is lower in many southern states.<sup>71,72</sup> Furthermore, some risk behaviors are more common among persons in households without telephones, whereas nonresponse rates are higher among smokers,<sup>73</sup> and underreporting of smoking occurs more often in telephone interviews.<sup>74</sup> The BRFSS, which uses telephone survey methods, is susceptible to these flaws. Nevertheless, studies comparing the BRFSS with the CPS and the National Health Interview Survey suggest that state estimates of smoking prevalence from the BRFSS were reasonably accurate for the purposes of ongoing state surveillance.<sup>69,75</sup>

Finally, we attempted to measure women's child care responsibilities, but what we actually measured was whether women lived with children aged 0–4 years. Although we assumed that living with children aged 0–4 years is equivalent to raising young children, the validity of this assumption may vary by how much time women spend with their children. In fact, there is a wide variation in burdens of child care responsibilities, even given the same number of children. Actual child care depends on whether a mother is working full-time, whether the child attends day care, whether the parent receives child care from professionals or relatives, and how many adults are responsible for the child. There may be systematic differences

between high- and low-SES groups or between racial/ethnic groups in the pattern of child care.

### CONCLUSIONS

Despite these limitations, our study adds to a growing body of evidence that smoking behavior is embedded in the socioeconomic circumstances of the lives of low-income women. The apparent differences between non-Hispanic White women and other racial/ethnic groups links between child care and smoking also suggest that the strong social support systems within the Black and Hispanic communities might help women in these groups to avoid smoking. These racial/ethnic differences and the potential role of social support warrant further investigation. ■

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### Contributors

H. Jun designed the study, analyzed the data, and wrote the article. S. V. Subramanian provided statistical guidance. S. Gortmaker suggested revisions to the analysis and contributed to the interpretation of the results. I. Kawachi contributed to the study design, data interpretation, and critical revisions.

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### Human Participant Protection

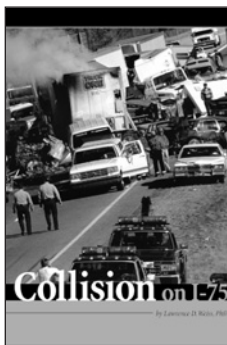
No protocol approval was needed for this study.

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