

# Maternal Upward Socioeconomic Mobility and Black–White Disparities in Infant Birthweight

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In the United States, racial inequality in birth outcomes remains entrenched.<sup>1,2</sup> In 2002, 13.4% of babies born to Black women, but only 6.9% of babies born to White women, were of low birthweight.<sup>3,4</sup> Proximate determinants, such as cigarette smoking, inadequate prenatal care, and maternal age, fail to explain this disparity.<sup>5–10</sup> Moreover, Black-White differences in infant health are evident regardless of socioeconomic position (SEP). Compared with their White peers, the children of college-educated Black women face a significantly greater risk of being low birthweight.<sup>11–14</sup>

Several explanations have been suggested for disparities in birth outcomes among middle-class women. Middle-class Black women may have access to fewer financial resources than middle-class White women because of differentials in economic returns to education, racial discrimination, restricted opportunities for wealth accumulation, and residential segregation.<sup>12,15</sup> Life-course theories posit life-long health disadvantage as the legacy of childhood poverty. This may explain excess rates of poor pregnancy outcome among middle-class Black mothers compared with White, since Black individuals are more likely to have been poor as children.<sup>13,16,17</sup>

Indeed, numerous research efforts find associations between maternal birthweight and infant health.<sup>18–28</sup> However, few of these study samples include Black respondents. Moreover, by locating the source of current maternal health disadvantage in childhood experience or by adhering to a strictly additive model of the impact lifetime SEP has on adult health, lifecourse approaches often ignore the possibility that physical well-being may be negatively affected by tensions arising from the dynamic interplay between one's social class of origin and one's achieved social class.

Both the *process* and *outcome* of upward socioeconomic mobility may be qualitatively

**Objectives.** We estimate the extent to which upward socioeconomic mobility limits the probability that Black and White women who spent their childhoods in or near poverty will give birth to a low-birthweight baby.

**Methods.** Data from the National Longitudinal Survey of Youth 1979 and the 1970 US Census were used to complete a series of logistic regression models. We restricted multivariate analyses to female survey respondents who, at 14 years of age, were living in households in which the income-to-needs ratio did not exceed 200% of poverty.

**Results.** For White women, the probability of giving birth to a low-birthweight baby decreases by 48% for every 1 unit increase in the natural logarithm of adult family income, once the effects of all other covariates are taken into account. For Black women, the relation between adult family income and the probability of low birthweight is also negative; however, this association fails to reach statistical significance.

**Conclusions.** Upward socioeconomic mobility contributes to improved birth outcomes among infants born to White women who were poor as children, but the same does not hold true for their Black counterparts. (*Am J Public Health.* 2006; 96:2032–2039. doi:10.2105/AJPH.2005.076547)

different experiences for Black women than for White women—experiences that are characterized by high levels of psychosocial stress. Black women must negotiate ways to achieve educational and occupational objectives in the face of structural, institutional, and individual racial discrimination. In a race-conscious society, upward mobility also may confer fewer health benefits to Black women than to White women, because middle-class Black women suffer token stress (i.e. the need to demonstrate more competence than peers), report role overload (i.e. too many time demands and work responsibilities), and experience psychosocial stress by having to maintain multiple, and often conflicting, identities.<sup>29–34</sup>

To distinguish between the long-term effects of childhood deprivation and the effects of socioeconomic mobility itself on low birthweight among Black middle-class mothers relative to White mothers, it is essential to compare only mothers who were poor in childhood. We tested the following 3 hypotheses: (1) among White women who were poor in childhood, the probability of giving birth to a low-birthweight baby will be lower

for *nonpoor* mothers (i.e., upwardly mobile women) compared with otherwise similar *poor* mothers (i.e., chronically poor women); (2) among Black women who were poor in childhood, the probability of giving birth to a low-birthweight baby will *not* be lower for upwardly mobile women compared with otherwise similar chronically poor women; (3) differences in the association between upward maternal socioeconomic mobility and low birthweight between Blacks and Whites will not be explained by proximate maternal behavioral risk factors, such as smoking, alcohol use, prenatal care, and weight gain during pregnancy.

## METHODS

### Data

The National Longitudinal Survey of Youth 1979 (NLSY79)<sup>35</sup> contains information from 12 686 young men and women who were 14–22 years of age in 1979. The NLSY79 oversamples Black, Hispanic, and economically disadvantaged non-Black/non-Hispanic individuals. It is the only longitudinal US data set to include multigenerational measures of SEP

and other more proximate predictors of low birthweight such as maternal tobacco use, alcohol consumption, and prenatal care. Participants were interviewed on a yearly basis from 1979 through 1994 and biennially from 1996 through 2002. Response rates for individual survey years range from 96.9% and 97.6% for White and Black women, respectively, in 1983 to 82.3% and 84.8% in 2002.

We restricted our analyses to non-Hispanic Black and White women who were 14–22 years of age in 1979, had at least 1 child by 2002, and lived at age 14 in a household in which the income-to-needs ratio (a family's income as a proportion of the federal poverty income level for a family of that size) did not exceed 200% of the national poverty threshold.<sup>36</sup> We included in our analyses 574 and 1270 births to White and Black NLSY79 respondents, respectively.

## Measures

We combined information from 3 generations of family members. The first generation consisted of the adult male and/or female in the household of NLSY79 respondents when they were 14 years old. Information concerning first-generation individuals was acquired retrospectively from NLSY79 respondents who were 15 to 22 years old at the time of initial interview. The second generation was comprised of NLSY79 respondents who gave birth to at least 1 child before 2002. The third generation includes the children of NLSY79 respondents for whom birthweight was reliably obtained through maternal report.

The dependent variable, low birthweight, is coded as 1 if children in the third generation weighed less than 2500g at birth. Data regarding birthweight was first collected in 1983 when women in the second generation were asked to provide detailed retrospective birth histories. Extensive fertility questionnaires were conducted annually from 1983 to 1985 and biennially from 1986 to 2002. Thus, all information concerning maternal and infant health characteristics was obtained through maternal recall. Although the accuracy of *one's own* birthweight acquired through self-report is highly questionable,<sup>37,38</sup> a mother's recall of her *infant's* birthweight has been shown to be reliable.<sup>39–42</sup> Racial differences in the proportion of children in the

third generation who had missing birthweight data are virtually nonexistent (8.5% of Whites vs 8.7% of Blacks).

## Explanatory Variables

*Second-generation maternal SEP during adulthood.* Maternal SEP for women in the second generation was captured by a continuous measure of family income recorded the year in which they became pregnant. This variable includes income from a number of sources such as wages, unemployment benefits, child support, Aid to Families with Dependent Children, and food stamps. Family income for all survey years was adjusted for inflation using the Consumer Price Index for All Urban Consumers, Experimental Series, and reported in 2002 dollars.

*Second-generation maternal SEP during childhood.* The NLSY79 contains information concerning the occupation and educational attainment of first-generation individuals but does not provide measures of income. We combined information from Public Use Microdata Samples (PUMS) of the 1970 Census<sup>43</sup> and the NLSY79 to construct a measure of childhood SEP. First, we stratified Census data by marital and employment status, which yielded 8 distinct groups. Second, we separately calculated median earnings within each 3-digit occupational category by race and gender. Third, we used Census data to complete 2 types of ordinary least squares regression analyses, which were stratified by race. In the first set of models, we regressed the natural logarithm of the income-to-needs ratio ( $\ln(\text{income-to-needs ratio})$ ) on race- and gender-specific median earnings for each occupation category. We used the coefficients from these analyses to impute the income-to-needs ratios of the households in which NLSY79 respondents resided at age 14. For the 13.5% of observations in which occupational codes for first-generation respondents were missing, we relied on educational attainment to predict income-to-needs ratios. Women in the second generation whose childhood family income exceeded 200% of the national poverty threshold were excluded from the study sample.

*Sociodemographic control variables.* Family size refers to the number of people living in the household at the time of a third-generation

birth. Marital status was captured by 2 dummy variables. The first indicates whether NLSY79 respondents were either married or never married during the year in which they gave birth. The second indicates whether NLSY79 respondents were separated, divorced, or widowed as opposed to never married. Parity was coded as 0 if women in the second generation were experiencing their first birth and 1 if they were experiencing a higher-order birth. Maternal age is quantified by a dichotomous variable indicating if women in the second generation were either  $\leq 19$  or  $\geq 20$  years of age when their child was born (see sensitivity analyses for alternative variable specifications).

*Household composition.* Three variables reflect whether or not the spouse or partner of NLSY79 respondents, their mother (the grandmother of the infant in the third generation), or their father (the grandfather of the infant in the third generation) resided in the same household during the year in which the NLSY79 respondent gave birth.

*Maternal health characteristics.* Smoking and alcohol use were both measured dichotomously, which indicated whether women in the second generation smoked cigarettes or consumed alcohol during pregnancy. Delayed prenatal care is quantified by a measure coded as 0 if women in the second generation obtained prenatal care during the first trimester and 1 if they did not. Inadequate gestational weight gain was determined by a dichotomous variable constructed according to standards established by the National Academy of Sciences which vary by prepregnancy body mass index.<sup>44</sup> The original NLSY79 measures on which this variable is based do not account for pregnancy duration.

## Analytic Strategy

A series of logistic regression models were estimated separately for Blacks and Whites and were restricted to women in the second generation whose childhood SEP fell below 200% of poverty. Odds ratios and 95% confidence intervals were calculated by exponentiating regression coefficients obtained from logit models which took the following form:

$$(1) \ln[\Pr(y=1|x)/1-\Pr(y=1|x)] = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_n x_n + \epsilon$$

where  $\text{Pr}(y)$  represents the probability of giving birth to a low-birthweight baby,  $x_1$  refers to maternal SEP during adulthood, and  $x_2 - x_n$  indicate selected covariates. Robust standard errors were calculated using the Huber/White estimator of variance.

Because the distribution of the adult family income variable was positively skewed, we transformed this measure by taking the natural logarithm ( $\ln$ ) of its value. For 34 observations, adult family income was coded as 0. This variable included government transfers such as Aid to Families with Dependent Children and food stamps. Members of extremely poor households, especially pregnant women or women with young children, are likely to qualify for these federal aid programs. An accurate indicator of their total family income would be the value of the government transfers received during a given year in addition to income from other sources. Therefore, we would not expect any NLSY79 respondent to report a family income of zero. In order to correct for the possibility that these assessments of adult SEP were a result of misreporting, we used the value of food stamp allotments in 2002 to recalculate family income during adulthood for second-generation women who lived in households that would have qualified for food stamps. Because we used the logarithmic form of family income, within-race income differences are comparable even if the cost of living is higher for Blacks than Whites; a 10% increase in income implies a 10% increase in purchasing power for both Black and White NLSY79 respondents.

We accounted for the possibility that multiple children in the third generation could be born to a single parent in the second generation and multiple individuals in the second generation could be members of the same original family by adjusting calculated standard errors for clustering at the level of the original NLSY79 respondent. Each birth was assigned a probability weight that is inversely proportional to the number of children born to each woman in the second generation. Regression models were estimated using these independently calculated probability weights. Thus, the findings reported here are representative of the populations sampled in the NLSY79 rather than a national cohort. This

weighting strategy allowed us to maximize the sample size of the population of interest—Black women who were poor as children.

### Sensitivity Analyses

We conducted sensitivity analyses to determine whether results from multivariate models were robust to variations in variable definition or model specification. These included measuring maternal age continuously or as a series of dummy variables (<18 y, 18–19 y, 20–24 y, 25–29 y, 30–34 y, and  $\geq 35$  y);

measuring childhood poverty as 185% of the federal poverty level; including an interaction term (adult family income  $\times$  coresidential grandmother); and including a continuous measure of  $\ln(\text{childhood family income})$ . All approaches yielded similar results.

## RESULTS

### Descriptive Findings

Descriptive statistics for the study sample are presented in Tables 1 and 2. Median

**TABLE 1—Individual and Family Characteristics of Births to Chronically Poor and Upwardly Mobile Black and White Women: National Longitudinal Survey of Youth, 1979–2002**

|                                   | Chronically Poor <sup>a</sup> |                 | Upwardly Mobile <sup>b</sup> |                 |
|-----------------------------------|-------------------------------|-----------------|------------------------------|-----------------|
|                                   | White (n = 335)               | Black (n = 991) | White (n = 239)              | Black (n = 279) |
| Median family income, \$          | 19 247                        | 19 712          | 50 399                       | 43 952          |
| Mean family size <sup>c</sup>     | 3.32                          | 4.65            | 2.94                         | 3.08            |
| Mean no. of births <sup>d</sup>   | 2.26                          | 2.66            | 1.89                         | 2.06            |
| Parity, %                         |                               |                 |                              |                 |
| First birth                       | 56.19                         | 50.45           | 63.60                        | 58.11           |
| Second or third birth             | 40.28                         | 42.14           | 34.74                        | 39.98           |
| Higher order birth                | 3.53                          | 7.41            | 1.66                         | 1.91            |
| Marital status, %                 |                               |                 |                              |                 |
| Never married                     | 36.48                         | 73.93           | 3.82                         | 29.77           |
| Presently married                 | 46.88                         | 14.57           | 93.27                        | 65.29           |
| Other                             | 16.65                         | 11.50           | 2.90                         | 4.94            |
| Mother's age, y, %                |                               |                 |                              |                 |
| $\leq 19$                         | 30.85                         | 35.37           | 10.31                        | 9.09            |
| $> 19$                            | 69.15                         | 64.63           | 89.69                        | 90.91           |
| Spouse or partner in household, % |                               |                 |                              |                 |
| Yes                               | 62.19                         | 22.45           | 95.12                        | 70.25           |
| No                                | 37.81                         | 77.55           | 4.88                         | 29.75           |
| Partner in household, %           |                               |                 |                              |                 |
| Yes                               | 14.15                         | 6.84            | 1.58                         | 4.96            |
| No                                | 85.85                         | 93.16           | 98.42                        | 95.04           |
| Grandmother in household, %       |                               |                 |                              |                 |
| Yes                               | 23.30                         | 46.66           | 6.33                         | 18.14           |
| No                                | 76.70                         | 53.34           | 93.67                        | 81.86           |
| Grandfather in household, %       |                               |                 |                              |                 |
| Yes                               | 11.23                         | 16.06           | 2.24                         | 5.78            |
| No                                | 88.77                         | 83.94           | 97.76                        | 94.22           |

Source. National Longitudinal Survey of Youth 1979,<sup>35</sup> National Longitudinal Survey of Youth 1979 Children's Supplement,<sup>45</sup> and 1970 Public Use Microdata Samples.<sup>43</sup>

<sup>a</sup>Chronically poor was defined as living in a household during both childhood and adulthood where the income-to-needs ratio  $\leq 200\%$  of poverty.

<sup>b</sup>Upwardly mobile is defined as living in a household during childhood, but not adulthood, where the income-to-needs ratio  $\leq 200\%$  of poverty.

<sup>c</sup>Individuals living in the household of third generation infants at the time of their birth who were related by blood, marriage, or adoption.

<sup>d</sup>Mean number of children included in the NLSY79 Children's Supplement born to each second generation woman.

**TABLE 2—Health Characteristics (%) of Births to Chronically Poor and Upwardly Mobile Black and White Women: National Longitudinal Survey of Youth, 1979–2002**

|                                     | Chronically Poor <sup>a</sup> |                 | Upwardly Mobile <sup>b</sup> |                 |
|-------------------------------------|-------------------------------|-----------------|------------------------------|-----------------|
|                                     | White (n = 335)               | Black (n = 991) | White (n = 239)              | Black (n = 279) |
| Smoke cigarettes                    |                               |                 |                              |                 |
| Yes                                 | 47.05                         | 30.09           | 29.44                        | 16.65           |
| No                                  | 52.95                         | 69.91           | 70.56                        | 83.35           |
| Smoke heavily (≥1 pack/day)         |                               |                 |                              |                 |
| Yes                                 | 17.25                         | 6.54            | 10.88                        | 2.52            |
| No                                  | 82.75                         | 93.46           | 89.12                        | 97.48           |
| Drink alcohol                       |                               |                 |                              |                 |
| Yes                                 | 34.85                         | 25.47           | 41.24                        | 22.59           |
| No                                  | 65.15                         | 74.53           | 58.76                        | 77.41           |
| Frequent drinking (≥1 time/week)    |                               |                 |                              |                 |
| Yes                                 | 11.73                         | 11.51           | 11.34                        | 9.84            |
| No                                  | 88.27                         | 88.49           | 88.66                        | 90.16           |
| Prenatal care                       |                               |                 |                              |                 |
| During 1st trimester                | 73.83                         | 74.44           | 89.05                        | 85.43           |
| After 1st trimester                 | 26.17                         | 25.56           | 10.95                        | 14.57           |
| Inadequate weight gain <sup>c</sup> |                               |                 |                              |                 |
| Yes                                 | 26.76                         | 40.22           | 25.68                        | 23.76           |
| No                                  | 73.24                         | 59.78           | 74.32                        | 76.24           |
| Birthweight                         |                               |                 |                              |                 |
| <2500g                              | 11.82                         | 14.62           | 4.62                         | 9.99            |
| ≥2500g                              | 88.18                         | 85.38           | 95.38                        | 90.01           |

Source. National Longitudinal Survey of Youth 1979,<sup>35</sup> National Longitudinal Survey of Youth 1979 Children's Supplement,<sup>45</sup> and 1970 Public Use Microdata Samples.<sup>43</sup>

<sup>a</sup>Chronically poor was defined as living in a household during both childhood and adulthood where the income-to-needs ratio ≤200% of poverty.

<sup>b</sup>Upwardly mobile was defined as living in a household during childhood, but not adulthood, where the income-to-needs ratio ≤200% of poverty.

<sup>c</sup>Inadequate weight gain defined according to standards based on prepregnancy body mass index originally developed by the Institute of Medicine.<sup>44</sup>

family income for chronically poor White and Black mothers are remarkably similar at \$19 247 and \$19 712, respectively. However, the median family income of upwardly mobile Black mothers (\$43 952) is lower than that of their White counterparts (\$50 399).

The proportion of births to chronically poor teenaged women in the second generation is 31% for Whites and 35% for Blacks. The proportion of births to upwardly mobile teenaged women in the second generation is also similar across race (10% for Whites and 9% for Blacks).

With respect to marital status, almost all (93%) infants born to upwardly mobile White women but only 15% of infants born to chronically poor Black women are marital

births. Upwardly mobile Black women most closely resemble chronically poor White women, at 65% and 47%, respectively.

Fourteen percent of births to chronically poor White women occurred within households in which respondents in the second generation cohabited. This was true among less than 2% of births to upwardly mobile White women. Of births to chronically poor and upwardly mobile Black women, 7% and 5%, respectively, took place within cohabiting relationships.

Almost half (47%) of Black children in the third generation whose mothers were chronically poor, but less than one quarter (23%) of similar White children in the same generation, were born into households within which

their grandmother resided. Among upwardly mobile mothers, 18% of births to Black mothers occurred within multigenerational households (i.e., with grandmothers and mothers); this was true for only 6% of births to White mothers.

Almost half (47%) of the chronically poor White respondents in the second generation reported smoking during pregnancy; moreover, 17% admitted to smoking 1 or more packs per day (Table 2). Of chronically poor Black women in the second generation, 30% smoked during pregnancy, virtually the same percentage as upwardly mobile White mothers. By contrast, 17% of upwardly mobile Black mothers smoked while they were pregnant and only 3% reported smoking heavily.

Among the third generation, 35% of White children and 25% of Black children were born to chronically poor mothers who consumed alcohol while they were pregnant. This was true of 41% of births to upwardly mobile White women and 23% of births to their Black counterparts.

Among births to Black and White chronically poor individuals in the second generation, 26% were to women who received inadequate prenatal services. Conversely, among births to upwardly mobile White and Black women, 11% and 15%, respectively, occurred to mothers with substandard prenatal care.

Fifteen percent of Black children and 12% of White children in the third generation who were born to chronically poor mothers, weighed less than 2500g at birth. Among children in the third generation who were born to upwardly mobile women, 10% of Blacks and 5% of Whites were low birthweight.

### Multivariate Findings

For Whites, increases in adult family income are associated with significant decreases in low birthweight (Table 3). This relation holds true within all 4 regression models. Odds ratios vary from 0.46 in Model 2 to 0.52 in Model 4. Thus, the effect of maternal SEP on low birthweight appears to be quite consistent and does not depend on the inclusion of other covariates. The only other independent variable that is significantly associated with the risk of low birthweight for

**TABLE 3—Odds Ratios (ORs) and 95% Confidence Intervals (CIs) From Logistic Regression Analyses Predicting the Probability of Low Birthweight for Whites (N = 574 Births): National Longitudinal Survey of Youth, 1979–2002**

|                                | Model 1<br>OR (95% CI) | Model 2<br>OR (95% CI) | Model 3<br>OR (95% CI) | Model 4<br>OR (95% CI) |
|--------------------------------|------------------------|------------------------|------------------------|------------------------|
| Ln(family income)              | 0.48*** (0.30, 0.75)   | 0.46*** (0.29, 0.74)   | 0.51*** (0.32, 0.80)   | 0.52*** (0.33, 0.82)   |
| Family size                    | 1.15 (0.90, 1.47)      | 1.14 (0.81, 1.61)      | 1.15 (0.83, 1.59)      | 1.15 (0.82, 1.60)      |
| Female child                   | 1.55 (0.78, 3.08)      | 1.56 (0.79, 3.11)      | 1.67 (0.84, 3.31)      | 1.67 (0.84, 3.34)      |
| Parity > 1                     | 1.43 (0.64, 3.18)      | 1.47 (0.58, 3.74)      | 1.26 (0.50, 3.21)      | 1.20 (0.45, 3.16)      |
| Married vs. never married      | 0.98 (0.34, 2.81)      | 0.99 (0.27, 3.56)      | 0.97 (0.26, 3.59)      | 0.98 (0.30, 3.70)      |
| Other vs. never married        | 0.48 (0.14, 1.67)      | 0.49 (0.14, 1.71)      | 0.35* (0.10, 1.21)     | 0.36 (0.10, 1.25)      |
| Age < 18 y                     | 0.98 (0.35, 2.76)      | 0.95 (0.34, 2.66)      | 0.88 (0.32, 2.42)      | 0.87 (0.31, 2.42)      |
| Spouse or partner in household |                        | 0.86 (0.21, 3.42)      | 0.84 (0.20, 3.53)      | 0.87 (0.21, 3.65)      |
| Grandmother in household       |                        | 1.20 (0.28, 5.14)      | 1.03 (0.22, 4.89)      | 1.04 (0.22, 5.06)      |
| Grandfather in household       |                        | 0.82 (0.18, 3.81)      | 0.82 (0.17, 4.04)      | 0.81 (0.16, 4.18)      |
| Smoked cigarettes              |                        |                        | 2.76** (1.28, 5.98)    | 2.71** (1.25, 5.87)    |
| Consumed alcohol               |                        |                        | 0.62 (0.29, 1.31)      | 0.60 (0.28, 1.30)      |
| Delayed prenatal care          |                        |                        | 1.41 (0.60, 3.30)      | 1.38 (0.58, 3.30)      |
| Inadequate weight gain         |                        |                        |                        | 1.38 (0.62, 3.05)      |

Source. National Longitudinal Survey of Youth 1979,<sup>35</sup> National Longitudinal Survey of Youth 1979 Children's Supplement,<sup>45</sup> and 1970 Public Use Microdata Samples.<sup>43</sup>

Note. Nonindependence of observations was accounted for by adjusting for clustering within individual women. Robust standard errors were used to calculate 95% CIs.

\* $P < .1$ ; \*\* $P < .05$ ; \*\*\* $P < .01$ .

## DISCUSSION

All 3 study hypotheses are supported by the findings. For White women who spent their childhoods in poverty, increases in adult family income were associated with nearly a 50% decrease in the probability of having a low-birthweight baby, which suggests that upward socioeconomic mobility contributes to improved birth outcomes for White women who were poor in early life. However, for their Black counterparts, the relation between adult SEP and low birthweight, although also negative, was substantially weaker and failed to reach statistical significance. Gains in lifetime SEP did not translate into beneficial birth outcomes for upwardly mobile Black women.

Maternal health behaviors failed to account for racial disparities in the relation between upward social mobility and low birthweight. Of the 4 maternal health measures, cigarette smoking and inadequate weight gain were the only ones to predict low birthweight among children in the third generation born to White and Black women, respectively. However, none of the maternal health variables explained a significant proportion of the association between family income and low birthweight. Given the analyses that were performed, it remains unclear why inadequate weight gain would be an indicator of low birthweight among Blacks but not among Whites.

Our findings suggest the important role that grandmothers play in Black families by illustrating that their presence is associated with healthier pregnancies. Among births to Black women who were poor in childhood, having a coresidential grandmother reduced the risk of low birthweight by 56%; this was not true for their White counterparts.

The role that extended kin networks play in the provision of childcare, the pooling of limited monetary resources, and the maintenance of family ties for Black families, especially those residing in poor communities, is well documented.<sup>46–54</sup> What remains ambiguous, however, is the extent to which upwardly mobile Black women are able to maintain relationships with their families of origin while ascending the socioeconomic hierarchy. Among Blacks, 47% of births to chronically

Whites is cigarette smoking. The full model reveals that infants born to smokers are 2.7 times more likely to be low birthweight than infants born to nonsmokers.

Increases in adult family income do not have a significant effect on the probability of Black infants being low birthweight (Table 4). The odds ratios for family income range from 0.75 in Model 1 to 0.85 in Model 4; however, none of the coefficients reaches statistical significance. Postestimation analyses reveal that the family income coefficients for White and Black individuals were significantly different ( $P = .05$ ).

Other predictors that influence the probability that Black children in the third generation will be low birthweight are parents' marital status, presence of a coresidential grandmother, and inadequate weight gain. Having a spouse or partner in the household is marginally significant ( $P < .10$ ). Infants born to married Black individuals in the second generation are 65% less likely than infants born to never-married Black individuals in the same generation to weigh

less than 2500g (Model 4, Table 4). Net of all other covariates, including family income, a coresidential grandmother reduces the likelihood of low birthweight by 53%. These results suggest that for Blacks the presence of certain key family members has an independent effect on birthweight above and beyond the provision of financial resources.

Tobacco and alcohol use during pregnancy yielded point estimates that suggest increased risk, but are marginally significant at best. Delaying prenatal care appears to have no effect. However, compared with children in the third generation whose mothers gained sufficient weight, children in the same generation whose mothers failed to do so were 3.7 times as likely to be low birthweight. Although the association of maternal weight gain and infant birthweight is confounded by the rate at which fetal intrauterine growth occurs, the inclusion of this variable does not qualitatively change the relation between any other predictors and low birthweight.

**TABLE 4—Odds Ratios (ORs) and 95% Confidence Intervals (CIs) From Logistic Regression Analyses Predicting the Probability of Low Birthweight for Blacks (N = 1270 Births): National Longitudinal Survey of Youth, 1979–2002**

|                                | Model 1<br>OR (95% CI) | Model 2<br>OR (95% CI) | Model 3<br>OR (95% CI) | Model 4<br>OR (95% CI) |
|--------------------------------|------------------------|------------------------|------------------------|------------------------|
| Ln(family income)              | 0.75 (0.51, 1.09)      | 0.78 (0.53, 1.13)      | 0.78 (0.54, 1.13)      | 0.85 (0.59, 1.23)      |
| Family size                    | 1.02 (0.93, 1.12)      | 1.08 (0.97, 1.20)      | 1.07 (0.96, 1.19)      | 1.08 (0.96, 1.21)      |
| Female child                   | 0.95 (0.67, 1.35)      | 0.95 (0.67, 1.35)      | 0.96 (0.67, 1.36)      | 0.91 (0.64, 1.30)      |
| Parity > 1                     | 1.04 (0.66, 1.62)      | 0.89 (0.55, 1.44)      | 0.87 (0.54, 1.39)      | 0.87 (0.54, 1.42)      |
| Married vs. never married      | 0.45** (0.24, 0.83)    | 0.31*** (0.16, 0.60)   | 0.36*** (0.18, 0.70)   | 0.35*** (0.18, 0.69)   |
| Other vs. never married        | 1.25 (0.65, 2.39)      | 1.06 (0.55, 2.03)      | 1.11 (0.58, 2.10)      | 1.27 (0.68, 2.38)      |
| Age < 18 y                     | 0.86 (0.52, 1.41)      | 0.86 (0.52, 1.41)      | 0.90 (0.55, 1.46)      | 0.72 (0.43, 1.19)      |
| Spouse or partner in household |                        | 0.41* (0.17, 1.01)     | 0.41* (0.17, 1.01)     | 0.45* (0.17, 1.15)     |
| Grandmother in household       |                        | 0.45*** (0.25, 0.79)   | 0.49** (0.28, 0.87)    | 0.47** (0.26, 0.85)    |
| Grandfather in household       |                        | 1.18 (0.63, 2.23)      | 1.19 (0.63, 2.26)      | 0.97 (0.43, 1.89)      |
| Smoked cigarettes              |                        |                        | 1.42* (0.94, 2.13)     | 1.25 (0.81, 1.94)      |
| Consumed alcohol               |                        |                        | 1.36 (0.87, 2.12)      | 1.34 (0.83, 2.16)      |
| Delayed prenatal care          |                        |                        | 0.89 (0.57, 1.38)      | 0.86 (0.54, 1.36)      |
| Inadequate weight gain         |                        |                        |                        | 3.70† (2.42, 5.67)     |

Source. National Longitudinal Survey of Youth 1979,<sup>35</sup> National Longitudinal Survey of Youth 1979 Children's Supplement,<sup>45</sup> and 1970 Public Use Microdata Samples.<sup>43</sup>

Note. Nonindependence of observations was accounted for by adjusting for clustering within individual women. Robust standard errors were used to calculate 95% CIs.

\* $P < .1$ ; \*\* $P < .05$ ; \*\*\* $P < .01$ ; † $P < .001$ .

poor women but only 18% of births to upwardly mobile women occurred within households that included a coresidential grandmother. These results suggest that as Black women begin to achieve upward socioeconomic mobility, they may be less likely to rely on their mothers for support during their pregnancy or for assistance with child-rearing responsibilities after the baby is born. If upward mobility decreases the likelihood that young Black women can fully participate in extended kin networks and thereby obtain important forms of social support, our findings suggest that the health of their newborns may suffer despite beneficial changes in social class status.

Data constraints affected measurement choices for key SEP indicators. First, the variable used to quantify maternal SEP during childhood was imputed by combining 1970 PUMS and NLSY79 data. Although the census provides detailed socioeconomic information and is often viewed as the best secondary source of demographic data, it tends to underrepresent racial minorities and poor

individuals. However, we relied on PUMS data only to obtain measures such as median earnings and income-to-needs ratios. Variables that identified the occupations and educational attainment of respondents in the first generation were obtained from the NLSY79. Second, the indicator of adult family income that we used did not capture common dimensions of household wealth, such as home equity or the value of personal savings. Because wealth accrual occurs at disparate rates among Blacks and Whites within similar income categories,<sup>55,56</sup> the more modest effect of adult family income on low birthweight for Blacks may be attributable to differential measurement error.<sup>57</sup>

The publicly available version of the NLSY79 does not provide information regarding primary sampling units. Thus, we were unable to adjust for the complex sampling design of the survey. Nonetheless, design effects have been substantially decreasing over time, especially among non-Hispanic Black women.<sup>58</sup> Sample size restrictions may have constrained our ability to detect

statistically significant associations; however, this potential problem is of more concern with regard to results for Whites as opposed to Blacks. For every birth to a White woman included in the analyses, there are 2.2 births to Black women.

Although this study provides preliminary evidence that unlike White women, Black women are unable to translate upward socioeconomic mobility into beneficial birth outcomes, it does not explain why this is so. Racial disparities in the effect of upward mobility on birthweight may be attributable to macrolevel factors that diminish material resources, such as residential segregation or Black–White differences in wealth accumulation. However, affective and physiological responses to structural constraints may also negatively affect health status and play a role in limiting the advantageous health effects typically associated with increased SEP. Such psychosocial experiences include responses to discriminatory acts<sup>59–62</sup> as well as sustained high-effort coping with economic oppression and institutional racism.<sup>63,64</sup> In addition, upwardly mobile Black women are more likely than their chronically poor counterparts to postpone childbearing, and may do so in order to achieve their educational or occupational goals. Geronimus and others have found evidence that Black women experience early health deterioration, or “weathering,” and that this leads to an increased risk of having low-birthweight infants among Black mothers who postpone childbearing.<sup>65–71</sup> Because of insufficient data and limited sample sizes, we were unable to pursue these additional lines of inquiry. They remain viable explanations for the existence of Black–White differences in the association between upward socioeconomic mobility and infant well-being and should be examined in future research efforts. ■

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## Contributors

C.G. Colen conceptualized the paper, completed the statistical analyses, interpreted the findings, and wrote significant portions of the text. A.T. Geronimus contributed to the delineation of the research hypotheses and statistical analyses, helped to define the overarching goals of the study, and wrote portions of the text. J. Bound conceptualized statistical analyses, specifically those resulting in the imputation of family income for parents of National Longitudinal Survey of Youth respondents, and participated in the interpretation of findings. S.A. James assisted with model specification and participated in the interpretation of findings.

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## Human Participation Protection

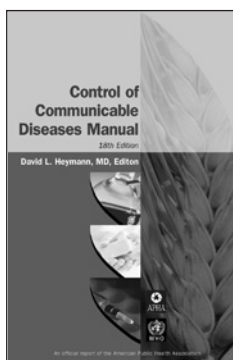
This study was exempt from protocol approval.

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