

Baltimore's Reach For Better Schools

The Maryland General Assembly is considering legislation to restructure the Baltimore City public school system. The legislation would give 110,000 children a better chance of getting the education they have a right to expect. Some representatives of other jurisdictions in the state, especially Montgomery and Prince George's counties, have been critical of the dollar amount that would be needed to accompany the legislation, but it is highly unlikely that those counties would be willing to make the dramatic changes that are in store for the Baltimore system.

These changes, incorporated in a court order and in the bill, have been designed in direct response to data that consistently demonstrate the failure of the Baltimore schools. The city ranks last in the state in student performance, and 50 of its 170 schools have been identified as eligible for reconstitution by the state under provisions of Maryland's school reform and accountability program. Only two schools in the rest of the state have been so identified.

Much of the media attention has focused on the additional dollars that would flow to Baltimore schools over a five-year period—about \$256 million. What is lost or buried in some news accounts is a recognition of the substantial changes that must take place before dollars flow.

Under the proposal, Baltimore Mayor Kurt Schmoke would cede almost all of his power over the school system to a new board of commissioners who would, for the first time, run the schools as an independent agency. This agency would not be dependent on the city for personnel or purchasing.

Four of the nine new commissioners would be required to have experience in running large organizations, such as hospitals, corporations or colleges—experience sorely needed to handle a budget of nearly \$700 million. This would be the first board in the country to require that its members have some relevant qualifications. Other board members would be educators, parents, community leaders and a nonvoting student.

Under the existing system, the mayor appoints all school board members. Under the new legislation, the board would be jointly appointed by the mayor and governor from a list submitted by the state board of education.

The system would be run by a newly appointed chief executive officer whose tenure would be directly related to his or her ability to improve student learning. The new CEO also would be required to

appoint a chief academic officer and a chief financial officer as a part of the leadership team. Progress in terms of student achievement would be monitored through a series of independent evaluations and reports.

Almost no additional dollars would go to Baltimore until these changes, as well as others, were made. This is a carefully thought-through plan. Those of us who have been involved in this proposal believe it is the best hope for Baltimore City's children. To ignore their plight not only would be unconscionable, it would increase costs for Maryland taxpayers for higher welfare costs, remedial education and law enforcement.

—Christopher T. Cross
is president of the Maryland
State Board of Education.

Radical school reformers are starting from scratch

Some cities tackle problems by rebuilding entire staffs

BY GIL KLEIN

MEDIA GENERAL NEWS SERVICE

WASHINGTON

When San Francisco School Superintendent Waldemar Rojas decides that a school is failing to educate its students, he removes every employee — the principal, all the teachers, even the custodians — and rebuilds the staff from scratch.

While the city's teachers union has balked at a policy that throws out good teachers with bad, Rojas

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said the purpose is not to punish the staff, who are reassigned to other schools, but to rethink the school's entire culture and organization.

"The decision to reconstitute a school is not an easy one," he said. "It is a dramatic and radical tactic for bringing positive development to a low-performing school."

Last week Education Secretary Richard Riley embraced such drastic measures to reform failing schools, saying in his annual State of Education speech that this should be the nation's "first order of business."

"We need to stop making excuses and get on with the business of fixing our schools," he said. "If a school is bad and can't be changed, reconstitute it or close it down. If a principal is slow to get the message, find strength in a new leader. If teachers

are burned out, counsel them to improve or leave the profession. If laws need to be changed, get on with it."

The federal government can offer some money, he said, but for the most part the federal role will be to provide models of education systems that work in minority communities.

The models "all have one common denominator," Riley said. "They all set high standards."

While San Francisco was the leader in reconstituting schools, the movement is gaining momentum nationwide. This month, Philadelphia School Superintendent David Hornbeck announced that two high schools would be overhauled, transferring 75 percent of their professional staff.

In those schools teachers and administrators are being replaced after attempts at reform "failed because of the inability of the school staff to work as a team to turn the school around," Hornbeck said.

Schools have been reconstituted in Atlanta, Houston, Memphis, New York and Albany, N.Y. In Chicago last fall, 109 out of the system's 557 schools were placed on academic probation, the first step that could lead to reconstituting, or even closing them.

"We're not sympathetic to excuses, and we refuse to accept the status quo," said Chicago Public Schools Chief Executive Officer Paul Vallas. "We want academic results,

and this is the length we're prepared to go to get them."

In Chicago the academic standard for probation is not particularly rigorous. Schools have to have more than 85 percent of their students working below grade level to get this special scrutiny.

San Francisco was able to be a leader in this movement only because a federal judge forced it to under a court order aimed at desegregation, officials concede.

As part of a consent decree, the city school system promised in 1984 to recreate the schools in a black section of town.

The new faculty and staff had to agree to an education philosophy that says all children can and will learn, and if they don't, the teachers must take responsibility.

To comply with the court order, the state contributed additional money that helped reduce class size and provide new technology.

A study in 1992 found that reconstituting the schools was successful in improving academic achievement, and the court ordered the program expanded to the poorest performing schools citywide. Since 1993, eight more schools have been overhauled.

But the change has come at a price. Teacher union officials complain about the growing number of "visibly wounded" teachers forced out of their schools to be dispersed throughout the city's system.

STUDY FINDS WHAT WORKS FOR DISADVANTAGED STUDENTS

An new Education Department study shows low-income students succeed when schools help them in early grades and fully implement programs and whole-campus reforms.

The report sounds a more optimistic note than a long-awaited longitudinal survey on Chapter 1, which found that the \$7 billion program overall did not help low-income students close the achievement gap with their better-off peers (ED, April 2).

"We know that some programs, well implemented, can make dramatic differences in students' academic achievement," the researchers concluded. At the same time, however, they acknowledged how daunting the task is.

After studying 10 effective strategies in 25 sites, the researchers conclude, "We still have not provided adequate human and fiscal resources, appropriately targeted, to make large-scale program improvements a reliably consistent reality."

Both reports are to be sent today to Congress, which will likely use them as ammunition in the annual funding battle. Confirm Conventional Wisdom To examine the 10 strategies, the researchers followed groups of first-, third- and ninth-grade students over three years beginning in 1990, visited schools and looked at individual student scores.

Most of the report's findings echo the latest research into serving disadvantaged children. The students "began the study far below the national average, yet made academic gains toward or exceeding national means. In some schools the gains were dramatic," the researchers say.

They report doesn't identify individual schools but says one each of the Comer School Development Program schools and the Success for All schools made particularly impressive gains.

"There is good reason to believe that most children of poverty, when well educated, can achieve at similar levels,"

the report said.

Success In The Making

The key isn't in the strategy but how it is implemented, the researchers say.

No one strategy is right for the variety of disadvantaged schools. "The specific program chosen only matters if the program is reasonably rigorously implemented," the study said.

Half-hearted, inconsistent implementation led to only minor gains, while schools that were scrupulous about initial and long-term implementation did best.

In some cases, poor management also thwarted students' progress. For instance, younger students had plenty of access to reading and math curricula, but little science or writing experience. This was due in part to the strong focus on reading and math and on inadequate planning time for teachers.

Schools need a realistic perception of their strengths and weaknesses and should consider a wide variety of options—which they often don't—before embarking on reforms, the report says.

Support from the district, school administration and faculty is crucial: Schools that could hand-pick teachers and administrators committed to the reform program did better at sustaining it.

The researchers say teachers who don't support the program should be allowed to transfer to other schools, keep their seniority, and not suffer any negative consequences.

When these types of implementation issues weren't addressed, they "permanently crippled otherwise promising programs," the report says.

The researchers say programs for first-graders raised their reading comprehension scores on the Comprehensive Test of Basic Skills to near the national average by the end of third grade, but results for older students were not nearly as good.

Schools often drew unifying strength

and focus from associations with external, reform-focused organizations and whole school reform resulted in better scores.

Not surprisingly, schools that showed a combination of factors—strong implementation, focus on early grades, faculty involvement, and a connection to a national reform movement—showed "unusually large gains."

By the same token, there were lots of factors beyond schools' control that affected the success of the programs, including regional recessions, riots and drug infestation in surrounding neighborhoods.

Hobbled By Budget Cuts

Federal Chapter 1 funds were the primary engine for reform, the study said, a finding that "could hardly be overstated."

Chapter 1 was typically the largest flexible source of funding they had. Since revamped and renamed Title I in 1994, the program has become even more flexible (ED Special Supplement, Nov. 29, 1994).

While federal compensatory education funding remained stable during the period, local funding fluctuated. When the local money dried up, "the effect was always to permanently hobble or kill the reform effort."

For fiscal 1998, President Clinton wants to increase Title I funding by 4.8 percent, from about \$7.2 billion this year to \$7.54 billion (ED, Feb. 7). House appropriators are expected next month to start writing a fiscal 1998 spending bill for education programs.

"Special Strategies Studies for Educating Disadvantaged Children: Findings and Policy Implications of a Longitudinal Study" will be available from Education Department, Planning and Evaluation Service, 600 Independence Ave. SW, Room 4162, Washington, D.C. 20202-8240, (202)401-3389. —Laureen Lazarovici■

Congressmen hear from students, university personnel on financial aid

By NANCY ARMOUR

Associated Press Writer

SOUTH BEND, Ind. (AP) - U.S. Rep. Tim Roemer can sympathize with students who say their loans make it impossible for them to go into public service or other low-paying professions.

The Indiana Democrat finally paid off his loans last year - 15 years after he finished school. His wife, Sally, is still paying hers off.

"It is a heck of a burden. You start to factor that with your mortgage payments, your car payments and your savings for your own children," he said. "It certainly weighs on you. At times, it constrains your choices."

Roemer and Fred Upton, R-Mich., held a field hearing Thursday to get input from students, parents and higher education officials on how well the current financial aid system works, and how it could be improved. The two, members of the Education Committee, will use the testimony to reauthorize the Higher Education Act of 1965.

Of the 12 speakers - two students, a parent, a lending corporation official and eight higher education officials - no one suggested overhauling the current financial aid system, which consists of a variety of loans, grants, scholarships and work-study programs.

But they agreed that changes are needed to make sure a college education is available to everyone. In the past 15 years, college tuition has three times faster than real family income, Upton said.

Of those attending a two- or four-year college, 50 percent are receiving financial aid, he said.

"For many students, aid is the only difference between receiving a degree or training and having to say, 'No thanks,'" Upton said. "It is important to identify what we can do together to make the job easier, not harder."

An almost universal suggestion was to increase funding for Pell grants, which can be worth up to \$2,700 a year and do not have to be repaid. Most Pell grant families make less than \$20,000 a year.

President Clinton has proposed additional funding for the Pell grants, increasing the money available to \$3,000 a year. He also called for a \$10,000 tax deduction for the first two years of college or job training. The credit would be limited to \$10,000 per family, or a \$1,500 tax credit per student.

Where administrators disagree is on how Pell grants should be distributed. Some larger, four-year universities want increases to be based on a student's tuition, while community colleges say that is unfair and it should be distributed evenly.

Higher education officials also agreed that government should not regulate tuition costs. While costs may have gotten out of hand at some schools, most act responsibly. Besides, there is no way to compare universities because they all serve different roles, said Lester Lamon, acting chancellor at Indiana University-South Bend.

Despite its faults, the financial system has provided millions of needy students with an education they might not otherwise have had. Crescent Mohammad is one of those students.

-more-

NASFAA WANTS DETAILED FIX FOR HEA REAUTHORIZATION

Student aid administrators want Congress to dive into the nitty-gritty of the Higher Education Act (HEA) to streamline regulations and simplify the process for students.

Where most postsecondary groups want a mere fine-tuning of HEA, the National Association of Student Financial Aid Administrators (NASFAA) is suggesting four new sections for the law that would.

- Require lenders to sell loans at the request of a borrower trying to consolidate her debts with a single lender.

- Direct the Education Department to develop regulations supporting the development and expansion of distance learning programs.

- Make student loan and grant rules more flexible to account for accelerated postsecondary education programs.

- Codify loan repayment incentives, such as a 0.25 percent interest rate deduction for borrowers making direct deposit payments. Lenders and guarantors now offer similar incentives but not for all borrowers.

Several NASFAA task forces have developed the reauthorization proposals over the past year, and the group's board of directors plans to vote on the plan at a meeting April 13-15.

Digging Deeper

NASFAA's proposals take a more detailed approach to reforming the HEA.

The American Council on Education (ACE), the higher education community's umbrella organization, submitted less-specific recommendations aimed mainly at fine-tuning current provisions (ED, March 21).

Although 20 groups signed on to ACE's proposal, NASFAA withheld its

support because it disagreed with some points.

For example, ACE recommend increasing loan limits for graduate, professional and certain medical students, but wants to retain the system of limits set by grade level for undergraduates.

NASFAA has suggested setting a single, higher loan limit for all undergraduates, rather than setting lower limits for first- and second-year students, as HEA now does.

Zaglaniczny said that would streamline the process and be more fair, since students pay the same tuition.

The group's board also will vote on proposals suggesting that ED tap into an Internal Revenue Service database to get more accurate income information to determine aid eligibility (ED, March 17).

—Rebecca S. Weiner■

Education Daily

April 4, 1997

10 PROMISING MODELS

Researchers examining successful strategies in disadvantaged schools for the Education Department looked at efforts ranging from tutors to whole-school reform.

- James Comer's School Development Program, focusing on collaborative school governance, integrated social services and parent participation (ED, Jan. 29, 1993).

- Success for All, requiring intensive school restructuring and an emphasis on improving reading through small group and tutoring sessions, preschool, full-day kindergarten and addressing learning difficulties within the regular classroom

(ED, June 14, 1996).

- Paideia, emphasizing challenging material, coaching and "Socratic seminars" for all students aimed at developing higher-order intellectual skills. Schools had a hard time implementing all three approaches simultaneously. The program improved students' critical thinking and communication skills, but not in reading.

- Coalition of Essential Schools (CES), a general restructuring strategy. But none of the schools studied could sustain whole school implementation of CES, although the report doesn't explain why (ED, Nov. 20, 1995).

- Schoolwide programs that virtually eliminate pullout programs, reduce class size and increase staff development.

- Extended year programs, adding school days, more of staff development and teacher planning time (ED, Jan. 17).

- Reading Recovery, one-on-one tutoring in reading and writing for first-graders.

- Tutoring by peers and aides.

- Computer-assisted learning, focusing on drills tailored for individual student skill levels; and • After-school and summer programs. —Laureen Lazarovici■

Threat in Tainted Strawberries Has Eased,

By LAWRENCE K. ALTMAN

Further investigation of the outbreak of hepatitis A infection from frozen strawberries among schoolchildren has eased concern about the extent of the health threat posed by strawberries shipped from the same lots for use in restaurants and homes, Federal health officials said last night.

But there is still the mystery of how the strawberries became contaminated with the hepatitis A virus. Strawberries from lots implicated in Michigan — where 163 children and teachers developed the liver infection after eating the tainted fruit since early March — were also sent to five other states as part of the Federal school lunch program: Arizona, California, Georgia, Iowa and Tennessee.

The strawberries used in the program account for about half of a shipment of one million pounds imported from Mexico and processed in California a year ago. The rest were shipped to a number of distributors for commercial sale, raising concern that the outbreak might have affected people other than those in the lunch program.

A substantial but unquantified portion of the commercial-use strawberries were included in such products as jams, jellies, preserves and fruit juices that were heated, said Dr. Michael Friedman, the Deputy Commissioner of the Food and Drug Administration.

If standard techniques were used, the heating would have destroyed any hepatitis A virus present, Dr. Friedman added in an interview. He said his agency would check the records of the companies that used the strawberries to determine whether the standard heating temperatures were reached.

In Michigan, 10 new cases of hepatitis A linked to the tainted strawberries were reported yesterday, bringing the total number to 163 in the state, said Dr. Claire V. Broome, the Deputy Director of the Centers for Disease Control and Prevention, in Atlanta. So far Michigan is the only state to report hepatitis A cases linked to the strawberries, Dr. Broome said.

The tainted strawberries were processed by the Andrew & Williamson Sales Company of San Diego, a unit of Epitope of Beaverton, Ore. Yesterday, Dr. Friedman said, health officials found that containers of Andrew & Williamson strawberries were still available to consumers in Michigan.

Commercial heating of fruit would kill any presence of the hepatitis A virus.

The food agency said its inspectors had found six-and-a-half-pound plastic tubs labeled as "AW Frozen Sliced Strawberries" at distributors, restaurants and retailers in the Detroit area. The lot numbers are 4141961, 6541963, 6541984, 7741962, 7741963, 31507612, 3150862, 3150863, 31508612, 7750862, 7750863, 7750864 and 7750865.

Health officials in Michigan and the five other states are urging that individuals notify local health departments if they believe that they have eaten strawberries from the suspect lots within the last 14 days. Health officials have recommended that such individuals be offered gamma globulin shots. The shots were given yesterday to 2,000 schoolchildren in California and Georgia.

The disease-control agency is also asking all states to make an extra

effort to check previously reported cases of hepatitis A for a possible link to the tainted strawberries and to search for unreported cases.

"Who knows, there could be no more," Dr. Broome said. "Or it could be that we uncover something."

An average of 25,000 cases of hepatitis A are reported to the disease-control agency each year. But because many such cases are unreported or unrecognized, epidemiologists estimate that the actual number is 135,000.

Although gamma globulin is in short supply, apparently enough is available to cover the needs of the outbreak, Dr. Broome said. The amount of gamma globulin injected is determined by a patient's weight. Thus doses do not strictly correlate with numbers of patients receiving injections.

Officials Say

The disease control agency says that it is aware of a supply of at least 40,000 adult doses (which would cover many more children) and that about 13,000 of those doses were committed for use in the hepatitis outbreak, Dr. Broome said. But the agency is exploring contingencies in case more gamma globulin is needed, she added.

Only one other outbreak of hepatitis A has been traced to frozen strawberries, and it might shed some light on the current outbreak, in part because the contaminated frozen strawberries originated from one processing plant in California.

The earlier outbreak involved 28 cases in two states, at an elementary school in Georgia and an institution for the developmentally disabled in Montana. Tainted strawberries were included in a shortcake in Georgia and in desserts in Montana.

The lot number on empty containers from Georgia and Montana showed that the strawberries had been picked, processed, packed and frozen on the same day and shift at a single plant two years before the two outbreaks. The plant was not the same that is involved in the school lunch outbreak, Dr. Broome said.

Scientists with the disease control agency who investigated the outbreaks wrote in The Journal of Infectious Diseases in 1992 that "contamination probably did not occur from an infected worker within the processing plant but most likely from an infected picker."

Urban Schools



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MEDIA ADVISORY

April 22, 1997

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URBAN SUPERINTENDENTS FORM NATIONAL COALITION TO TACKLE CRISES IN MATH AND SCIENCE EDUCATION

Superintendents of the nation's largest urban school districts will announce the formation of a national coalition to develop and share solutions to common problems they face in improving mathematics and science education. Revitalizing urban schooling is a key to the success of national education reform programs because urban school systems enroll roughly half of all U.S. public school students.

Each of the superintendents heads a district that has received a grant from the National Science Foundation (NSF), either as part of NSF's Urban Systemic Initiatives (USI) program or NSF's Comprehensive Partnership for Science and Mathematics Achievement (CPSMA) program. Baltimore, Cleveland, Detroit, New York, New Orleans, St. Louis, and San Diego are among the cities represented by the coalition.

Eligibility for the USI program is limited to the cities with the largest number of school-age children (ages 5 to 17) living in poverty, as determined by the 1990 census. USI is designed to spur officials and the public to undertake a sustained reform of their educational systems by first mounting a comprehensive overhaul of math and science programs. CPSMA has similar goals for smaller school districts.

The IBM Corp. and Texas Instruments, Inc. will help to link coalition members in a national telecommunications network.

Who: Luther S. Williams, head of NSF's education and human resources directorate
Richard J. Schaar, senior vice president of personal productivity products, Texas Instruments, Inc.

What: Press briefing on the coalition's goals and strategies

When: Thursday, April 24, 1997 at 1 p.m.

Where: Washington Marriot Hotel/Salon C
1221 22nd St NW (Foggy Bottom Metro)
Washington, D.C.

For more information contact: Peter West, (703) 306
1070/pwest@nsf.gov

From

Barry Toiv

Thanks

Self-sufficiency at Ages 27 to 33 Years: Factors Present Between Birth and 18 Years That Predict Educational Attainment Among Children Born to Inner-city Families

Janet B. Hardy, MDCM^{*}; Sam Shapiro, BS[†]; E. David Mellits, ScD[§]; Elizabeth A. Skinner, MSW[‡]; Nan Marie Astone, PhD^{||}; Margaret Ensminger, PhD[‡]; Thomas LaVeist, PhD[‡]; Rosemary A. Baumgardner, BA[¶]; and Barbara H. Starfield, MD[‡]

ABSTRACT. *Objectives.* Some inner-city infants grow to be successful, self-sufficient adults. This study is designed to identify characteristics from early childhood that foster or impede favorable outcomes and are useful for formulation of public policy.

Methods. Population: 2694 children (G-2s), born 1960 through 1965, to 2307 inner-city women (G-1s) enrolled in the Johns Hopkins Collaborative Perinatal Study. Data: 1) prospective observations (birth through 8 years) of neurologic and cognitive development, health, behavior, and family and neighborhood socioeconomic characteristics and 2) completed interviews with 1758 G-2s (age 27 to 33) and 1552 G-1s, bridging the period from age 9 to present status. An intergenerational, life course model of development identified significant characteristics and events associated with G-2 outcome (education, physical and mental health, healthy lifestyle, and financial independence of public support, emphasizing educational attainment of a high school diploma or a graduate equivalency degree). Multiple logistic regression equations identified independent, predictive variables during infancy, preschool and early school years, and adolescence. The probability of a good outcome was estimated in the presence of combinations of the six variables most strongly associated with that outcome.

Results. Among G-2s, 79% had a successful outcome for education, 60% health, 70% lifestyle, and 76% for financial independence. Black G-2s had more favorable outcomes than white G-2s in education and lifestyle, whites for financial outcome; health did not differ by race. The six variables most predictive of adult education were: G-1 education at G-2 birth and G-2 attainment of honor roll, average or better reading skills at 8 years, avoidance of regular smoking, and pregnancy before age 18, and not repeating a grade in school.

Conclusions. Substantial proportions of inner-city children become successful adults. Attention to improving public education, particularly language and reading

skills, and the prevention of smoking and adolescent pregnancy are clearly indicated. *Pediatrics* 1997;99:80-87; inner-city children and adolescents, successful adult outcomes, health, lifestyle, financial independence, predictors of educational attainment.

ABBREVIATIONS. JHCPS, Johns Hopkins Collaborative Perinatal Study; GED, graduate equivalency degree.

The Pathways to Adulthood study is an intergenerational, multidisciplinary follow-up of children (G-2) born from 1960 through 1965 to inner-city mothers (G-1). The primary objective is the identification of factors that enable children (G-2) to break out of the disadvantageous circumstances in which they were raised to become successful, self-sustaining adults. In addition to describing the Pathways to Adulthood study, its population, database, and methods, this report focuses on four outcomes at 27 to 33 years among members of the second generation (G-2s). Function in four domains important in daily living are considered: educational attainment; physical and mental health status; a healthy lifestyle (ie, absence of potentially self-destructive and unlawful behavior); and financial independence of public assistance. These domains are valued across a wide range of social contexts as indicators of an individual's ability to reach his/her potential in adult life. Special attention is given here to educational attainment.

Several studies have influenced our thinking. Drilien¹ observed that premature infants who escaped profound neurologic damage, when born into upper and middle class families, had early school performance that was indistinguishable from that of their siblings. This contrasted with similar infants born into lower class families whose academic performance was significantly below that of their siblings. Werner and Smith²⁻⁴ conducted a 30-year follow-up of all the children born in 1955 on the island of Kauai. Their research advanced the concepts of vulnerability and resilience and of protective factors that allow some vulnerable children to be resilient and overcome biological and/or family/environmental risk factors to grow and develop normally. Follow-up studies of inner-city adolescent mothers and their children have demonstrated both the diversity in

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long-term outcome for the mothers^{5,6} and the high developmental and academic risks for their children.^{6,7} A series of reports from the British Perinatal and Child Development Studies has described outcomes at various points over the life span.⁸⁻¹⁰ The most recent at 33 years describes diverse outcomes in terms of education, employment, family formation, housing, health and attitudes and values.¹¹ Haverman and Wolfe¹² used data from the Panel Study of Income Dynamics to study the attainment of 1700 American children followed from 6 to 24 years old, examining the effect of many background variables (exclusive of health and cognitive development) on education, out-of-wedlock teenage birth, and idleness with respect to labor force participation.

We have taken a prospective, multidisciplinary approach with detailed observations from the mother's pregnancy along the child's life course to age 8 years, supplemented by information pertaining to adolescence and young adulthood collected retrospectively by interview from both the mother and child who is now an adult. Although the data include both positive and negative events, our primary interest is in those that are associated with successful rather than pathological outcomes. Accordingly, the study is designed to identify conditions in the lives of children, born in a poor, urban environment that lead to physical, mental and behavioral well-being and economic independence in young adult life. The data were gathered into five time periods from birth to young adulthood, (Time I = birth to 1 year; Time II = preschool; Time III = early school age; Time IV = 9 to 17 years; and, Time V = adulthood). In this report, emphasis is on the identification of factors present during the period from birth to age 18 that have the potential to affect educational outcome at 27 to 33 years.

METHODS

Source of Subjects

The basis for the study is the population and database in the Johns Hopkins Collaborative Perinatal Study (JHCPS) a component of the Collaborative Perinatal Project of the National Institute of Neurologic and Communicative Disease and Stroke.¹³⁻¹⁷ Women (G-1s) were selected at random, at the time of their first prenatal visit to the hospital's public obstetric clinic, between 1959 and 1965. The women enrolled in the study lived in east Baltimore, most within a 10-block radius of the hospital; this area continues to be among the poorest in Baltimore. Twenty-three percent of the women were white and 77% were black, (4 subjects [0.2%] of other ethnic backgrounds were included among the black population). Eighty-five percent of white and 70% of black G-1s were married and 25% were less than 20 years old when their G-2 children were born. Educational attainment among G-1s was generally low; only 12% of whites and 32% of blacks had completed high school. Public assistance support was reported by 4% and 9%, respectively. They tended to live in segregated enclaves but their children attended the same inner-city schools. At birth, 46% of G-2s lived in families at or below the poverty level and only 12% had an income greater than twice that level. (Based on United States Department of Agriculture standards for specific years, (1960 through 1992) which take account of family income, size, and inflation rate.¹⁸ Where specific income was missing, reported income groups were used with short intervals (\$2500) in the lower ranges (ie, below \$10 000), increasing as income increased to (\$50 000 and above).

A subsample ($n = 2694$) of JHCPS children (G-2s) was randomly selected for follow-up from those whose mothers had

started prenatal care after January 1, 1960 and who had received the 7- and/or 8-year JHCPS assessments; over 90% were assessed at both times. As some women (14.0%) had more than one child in the study, there were 2307 G-1s in the sample.

Sources of Information

Two primary data sources were used: 1) data collected in the JHCPS; and 2) in-person interviews with the G-1s and G-2s.

The JHCPS data determined the timing of, and provided information for Times I through III as follows: a) the course of pregnancy, labor and delivery (including birth weight, gestational age, intrauterine growth, and Apgar scores), and neurologic status of the newborn; b) pediatric, neurologic, and developmental observations every 4 months during the first year of life;^{13,14} language, hearing, and speech at 36 months; psychological (Stanford-Binet IQ and other tests) and behavioral observations at 48 months;¹⁵ psychological tests including the Wechsler Intelligence Scale for Children, behavioral observations, and the Wide Range Achievement Test at 84 months;¹⁶ neurologic and general pediatric at 90 months; and language (oral and written), hearing, and speech at 96 months;¹⁷ c) health events from medical records at each follow-up visit and at 6- to 12-month intervals between protocol assessments, and d) sociodemographic information on characteristics of parents and conditions in the home around the time of birth and when the children were 7 to 8 years old.

Seventy-six percent of JHCPS children had all nine of the scheduled examinations. The examinations were performed by professionals trained in the specific areas involved. Each protocol provided for numerous individual items and a structured summary rating the child's function as normal, suspect or definitely abnormal in key areas.

Interviews

Field work for the follow-up study (July 1992 through March 1994) provided for the location of subjects and the collection of data from the end of the JHCPS to the date of interview. G-1 and G-2 subjects were interviewed separately, after informed consent, by different interviewers. The interviews were, for the most part, conducted face-to-face (70%). When the respondent lived beyond the greater Baltimore area, in a particularly dangerous neighborhood, or refused a personal interview, the interview was conducted by telephone. A random 10% of all interviews were super-numerated with a brief telephone interview within 10 to 14 days.

The primary objectives of the G-1 interviews were to: 1) obtain the location and status of the G-2s; 2) determine family relationships, childhood and adolescent behavior, school achievements and problems; and 3) provide data about the G-1s present status. The G-2 interview had two components, a life history calendar¹⁹ and a conventional questionnaire. The life history calendar was designed to facilitate recall by identifying and timing the occurrence and duration of events with the potential for change, eg, schooling, marital history, living arrangements, fertility, part-time and full-time employment, and welfare utilization from the end of the JHCPS to the present. The remainder of the G-2 interview was designed to determine: (a) events during late childhood, adolescence, and early adulthood that may have influenced later outcome, eg, problems at home, in school and neighborhood, social and school activities, home and neighborhood conditions, health, employment, sexual activity and abuse, substance abuse, delinquent and criminal activity, and family formation; and (b) outcome measures in adulthood. Information was also obtained on the children (G-3s) of the G-2s.

Results of follow-up are shown in Table 1. Among G-1s ($n = 2307$), 67% completed a full interview. The response rate among those known to be living was 75%. Among G-2s ($n = 2694$), 65% completed a full interview for a response rate of 67% among those known to be living. Although the response rates for G-1s and for G-2s do not differ by race, male G-2s were more difficult to find, as a result, the response rate for females is slightly higher than that for males. Abbreviated data were collected from relatives where possible about deceased subjects and those unavailable for interview. This report concerns the 1758 G-2s who provided a complete interview.

Potential Bias

Several sources of potential bias are discussed in this section.

TABLE 1. Final Status of Field Effort

	Mothers (G-1)		Children (G-2)	
	n	%	n	%
Original sample	2307	100.0	2694	100.0
Refused	151	6.5	136	5.0
Not located	283	12.3	490	18.2
Deceased (no information)	69	3.0	16	0.6
Deceased (partial information)	177	7.7	54	2.0
Absent G-2 interview*	N/A	N/A	72	2.7
Other incomplete	75	3.3	168	6.2
Complete full interviews	1552	67.3	1758	65.3
Response rate†		75.3		67.0

* If the G-2 was living outside the survey area and a telephone interview could not be completed, the G-1 was asked questions concerning the G-2's current status.

† G-1 response rate was $1552 \div (2307 - 246 \text{ deaths}) \times 100$. G-2 response rate was $1758 \div (2694 - 70 \text{ deaths}) \times 100$.

1. Interviewer bias was minimized by use of: a) interviewers "blinded" to the JHCPS data; and b) separate interviewers for each family member surveyed.
2. Bias due to sample attrition ie, whether G-2s who could not be interviewed at 27 to 33 years may have differed significantly from those who were interviewed, was considered by comparing the distributions of several JHCPS variables. Few differences were noted. G-2s not interviewed were born to mothers who were somewhat younger, had less educational attainment, and were more likely to be at or below the poverty level (47.9% vs 43.1%) at the time of the G-2 birth than the mothers of the G-2s interviewed. The proportion of G-2s who were low birth weight did not differ between groups. At 7 to 8 years, differences in Wechsler Intelligence Scale for Children verbal IQ scores were not statistically significant, but those interviewed had somewhat greater skill in reading (46.3% vs 36.9%) and fewer were neurologically suspect or abnormal (17.5% vs 23.4%) than those not interviewed. Because of the relatively high proportions who were interviewed, the characteristics of the total sample (interviewed and not interviewed combined) were similar to those from whom interviews were obtained.
3. The following steps were taken to minimize recall bias: a) in the main, the data collected pertained to discrete events that could be easily recalled; b) a random 10% of all interviews were supernumerated by separate staff within 10 to 14 days of the original interview and few discrepancies were noted; c) the use of both life history calendar and standard interview questions with immediate resolution of discrepancies facilitated accuracy in longitudinal data collection; and d) interviewers received intensive training and supervision.
4. Approximately 30% of interviews were completed by telephone, sometimes during two sessions. Freedman et al,¹⁸ who used a life history calendar and standard interview questions, found that similar information can be collected by telephone as by in-person interviews (A. Thornton, personal communication with J.B.H.).
5. In the logistic regression analyses (Tables 5 through 8) the possible effect of nonindependence introduced by the inclusion of additional births to the same women during the 5½ years of enrollment in the JHCPS was adjusted for using the generalized estimation equation technique.²⁰
6. Data are examined for all ages combined, however, no significant associations were identified between specific year of age, between 27 and 33, at interview and any of the four outcome measures.

Outcome Measures: Dependent Variables

A successful adulthood was defined as self-sufficiency in four domains of function. These domains include education, general health, healthy lifestyle, and family independence of public financial support. The measures used to assess each of the four domains are described below.

Success in the domain of education was defined in terms of a high school diploma (68.4%), or a graduate equivalency degree

(GED) (10.7%). The GED was included as it is often considered a substitute for a diploma.^{4,5}

Good physical and mental health was defined by satisfactory ratings in the criteria of good physical and mental health combined into one variable as described below. Good physical health required both: 1) self-assessment of current health as good or better, on a 5-point scale ranging from excellent to poor in which good is the midpoint; and, 2) no current physical chronic conditions of 3 or more months' duration. Good mental health required a combination of three or four variables: self-assessment of good or better on a scale similar to the one described above, combined with any two or all three of the following variables: a score less than 5 on the 28-item General Health Questionnaire (current symptoms of distress and demoralization²¹); absence of reported current mental health problems of 3 or more months' duration; and no professional mental health care, inpatient or ambulatory, (unrelated to drugs or alcohol) during the prior 12 months.

Healthy lifestyle included freedom, during the prior year, from the following types of self-destructive or antisocial behavior: 1) heavy alcohol consumption, defined as five or more drinks on an average day; 2) use of illicit drugs, ie, marijuana, cocaine and its derivatives, heroin, opiates, etc; and 3) criminal behavior, defined as reported arrests and/or being currently incarcerated.

Financial independence was defined in terms of absence during the past year of G-2 public financial support ie, Aid to Families With Dependent Children, Supplemental Security Income, General Assistance or Relief, food stamps, or Medicaid at the time of interview. Eligibility for Aid to Families With Dependent Children is unusual among males but is met by most poor women with dependent children thus affecting the distributions of good outcomes in this category, accounting for the lower proportion of good outcomes for women as compared with the men.

Independent Variables

Associations between the four outcomes and numerous health, developmental, and family environmental characteristics of both G-1s and G-2s, between G-2 birth and the 18th birthday, were examined as described below. Variables were selected on the basis of their known or suspected influence on development.

Analytic Approach

1. Using bivariate methods, possible associations between each independent variable and each outcome were examined separately within each time period, using χ^2 tests and t tests. Those with significant associations ($P < .05$) were retained for the multivariate analyses.
2. Separate, stepwise logistic regression equations were developed to identify associations of the independent variables with each of the four outcomes, separately, within each time period from G-2 birth through age 17 years. Race and gender were included in the first time period. The possible effect of interactions where the presence of one independent variable changed the effect of another was tested in numerous instances by introducing an interaction term into the equation. The few occasions where interactions were significant are shown in Tables 5 through 7. The distributions of those variables, having significant bivariate associations with G-2 educational attainment are listed by time period in Table 2.
3. The constellation of variables found to have independently significant multivariate relationships with an outcome within a given time period were combined in a single equation to determine a predictive solution for that outcome. (The education outcome is dealt with in detail in this paper).
4. The probability that a successful outcome would be achieved in the presence of possible combinations of the six independent variables with the strongest association with that outcome was estimated.

The frequency of missing data for most independent variables was negligible (less than 5%). However, in a few instances, larger proportions were unknown, eg, G-1 welfare status at G-2 birth (2.9%), G-1 employment when G-2 was 7 years (8.5%), G-1 welfare at G-2 birth and 7 years (11.7%), G-2 reading level at 8 years (3.8%). In these cases missing data for independent variables were imputed from other variables, within the same time period, by the use of multiple regression in which an equation relating the variable in question to all other nonestimated, independent variables

TABLE 2. Percent Distribution of Variables With Significant Bivariate Associations With G-2 Educational Attainment of High School Diploma or Graduate Equivalency Degree, by Time Period

Variable	Percent
Time I (0-1 Year)	
G-1 education*	
≤8th grade	29
Some high school	43
High school graduate	21
≥Some college	7
G-2 race*	
White	18
Black	82
G-2 gender†	
Male	46
Female	54
G-1 on welfare at G-2 birth‡	
Yes	9
G-1 prior live births‡	
None	30
1	18
2 or 3	26
≥4	26
G-1 age, years at G2 birth‡	
≤17	14
18-19	11
20-34	63
≥35	12
Time II (1-4 Years)	
G-2 Binet IQ score at 4 years*	
<85	27
85-109	61
≥110	12
Time III (5-8 Years)	
G-2 reading level, 8 years*	
≥Normal grade for age	46
1-2 grades below	46
>2 grades below	8
G-2 Wechsler Intelligence Scale for Children verbal IQ score, 7 years*	
<85	24
85-109	69
≥110	7
G-1 % time employed since G-2 birth*	
0	20
1-75	59
≥76	21
G-2 lives with, at 8 years†	
Both parents	60
Mother only	33
Father only	1
Other relatives	4
Others	2
G-1 additional education/training, G-2 birth to age 7†	
None	67
Some	33
G-1 poverty ratio when G-2 age 7‡	
≤1	32
>1-2	46
>2-3	17
>3	5
Time IV (9-18 Years)	
G-2 honor roll*	
Yes	52
G-2 extracurricular activities*	
Yes	68
G-2 have summer job*	
Yes	64
G-2 received other training/schooling‡	
Yes	55
G-2, age 16, main source of household income*	
Job	86
Welfare	10
Other	4
G-2 ever repeat grade in school*	
Yes	52

TABLE 2. Continued.

Variable	Percent
G-2 ever suspended/expelled‡	
Yes	53
G-2 age smoke regularly*	
≥18, Never	60
<18	40
G-2 age first left home >4 mo*	
≥17, Never	92
<17	8
G-2 age at first birth*	
≥15	3
16-17	8
≥18, No births	89
G-2 age at first arrest*	
≥18, Never	90
<18	10

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

in the equation was computed and then applied to estimate the missing value. Missing data indicator variables were constructed to test the significance of using an estimate. The procedure did not affect the predictive value of the variables imputed because of the small proportion of missing data.

RESULTS

An Overview

Table 3 shows the proportion of G-2s who were successful in each domain, by race and gender. These proportions ranged from a high of 79% for those who achieved a high school diploma or GED to 60% who were judged to have good physical and mental health. As seen in Table 4, almost all G-2s were successful in at least one outcome: 35% had four, 32% three, 20% two, and 10% only one successful outcome. The highest Pearson correlation coefficients were between the educational and behavioral outcomes ($r = .32$) and education and financial independence ($r = .26$). Other correlations were between $r = .11$ and $r = .18$. These relationships indicate some heterogeneity among G-2s in meeting the criteria for the multiple yardsticks for success.

Differences by gender in the total number of successful outcomes were not significant ($P = .22$), however there were significant differences within the four outcomes (Table 3). Female G-2s had generally higher educational attainment ($P < .01$) and fewer behavioral problems ($P < .001$) than male G-2s but were less likely to be healthy or financially independent. With respect to race, blacks had significantly higher education than whites ($P < .001$) and were somewhat better off behaviorally ($P < .05$) but whites were somewhat better off financially ($P < .05$). With respect to health there was no significant difference by race.

Educational Attainment

Educational attainment is generally viewed as a prerequisite for entry to employment and a satisfactory economic status; the attainment of a high school diploma or GED was selected as the outcome for the life course analysis in this paper.

Table 5 shows variables present during infancy, preschool, and early school years having a significant ($P < .05$) or nearly significant relationship with the attainment of a high school diploma (or GED) in the

TABLE 3. Individuals With Successful Outcomes at Age 27 to 33 Years, by Race and Gender

Outcome	Total All (n = 1758) %	White (n = 320) %	Black (n = 1438) %	Male (n = 807) %	Female (n = 951) %
Education (High school graduate or graduate equivalency degree)	79.1	62.2	82.8*	76.3	81.4†
Health (Good physical and mental)	60.3	55.6	61.3 NS	64.1	57.1†
Healthy lifestyle (Not self-destructive or antisocial)	69.9	64.4	71.1†	55.4	82.2*
Financially independent	76.2	81.5	75.0†	89.1	65.3*

NS indicates not significant.

* $P < .001$; † $P < .01$; ‡ $P < .05$.**TABLE 4.** Distribution of the Number of Successful Adult Outcomes by Race and Gender (n = 1758)*

Number of Successful Outcomes	Total		Race†				Gender‡			
	n	%	White		Black		Male		Female	
			n	%	n	%	n	%	n	%
Four	611	35.3	88	27.7	523	37.0	271	34.2	340	36.1
Three	552	31.8	103	32.4	449	31.7	253	31.9	299	31.8
Two	347	20.0	67	21.1	280	19.8	170	21.5	177	18.8
One	166	9.6	42	13.2	124	8.8	79	10.0	87	9.3
None	57	3.3	18	5.7	39	2.8	19	2.4	38	4.0
Total*	1733	100.0	318	18.4	1415	81.6	792	45.7	941	54.3

* Twenty-five G-2s had missing information.

† $P = .001$.‡ $P = .221$.**TABLE 5.** G-2 Educational Attainment: High School Diploma or Graduate Equivalency Degree (n = 1390) Versus Neither (368) Logistic Regression Analysis: Predictors From Time I, Infancy; Time II, Preschool; and Time III, Early School Age

Variable Entered			Odds Ratio	95% Confidence Intervals
Time I, Infancy				
Intercept			0.05	0.01-0.42
G-1 education at G-2 birth	0 = ≤8, 1 = 9-11	2 = High school graduate; 3 = ≥ Some college	2.19	1.84-2.61
G-2 race	0 = White	1 = Black	2.53	1.88-3.41
G-2 gender	0 = Male	1 = Female	1.51	1.19-1.93
G-1 on welfare at G-2 birth	0 = No	1 = Yes	0.70	0.46-1.05
G-1 number of prior live births at G-2 birth	Continuous		0.39	0.19-0.78
Log of G-1 age at G-2 birth, years	Continuous		2.72	1.34-5.52
Interaction: G-1 number of prior live births at G-2 birth and log of G-1 age at G-2 birth	Continuous		1.27	1.03-1.56
Time II, Preschool				
Intercept			0.26	0.13-0.54
Binet IQ	Continuous		1.03	1.02-1.04
Time III, Early School Age				
Intercept			0.15	0.04-0.49
Reading—8 years (grade/age)	0 = Normal	1 = 1-2 Below; 2 = >2 Below	0.45	0.36-0.57
Wechsler Intelligence Scale for Children Verbal IQ—7 years	Continuous	$\bar{x} = 92$, (SD 12)	1.03	1.02-1.05
G-1 % time employed—G-2 birth to age 7	0 = 0%	1 = 1-75%; 2 = 76-100%	1.41	1.12-1.77
G-2 lives with whom—8 years	0 = All Others	1 = Both Parents	1.54	1.17-2.04
G-1 additional education—G-2 birth to age 7	0 = No	1 = Yes	1.51	1.13-2.04
G-1 poverty ratio when G-2 age 7	0 = ≤1	1 = >1-3; 2 = >3	1.33	1.01-1.75

multivariate equation for each time period. G-1s' educational attainment had a marked influence on G-2s' graduation from high school or GED. Other favorable G-1 factors included older maternal age, fewer prior children and possible independence of public financial support. Gender and race (with blacks being in a more favorable position) also played a role. A somewhat unexpected result is that the associations between educational attainment and birth weight, gestational age and neurologic status at 1 and 7 years were not statistically significant.

Satisfactory cognitive and academic development in the early school years were highly predictive of

graduating from high school (or GED). The home environment was also associated with higher educational achievement. A G-2 was more likely to be successful, if the G-2 lived with both parents, if the G-1 had taken additional training or schooling, and if the family was not poor.

As the preadolescent and adolescent periods (Table 6), particularly the latter, are proximal to early adult life many characteristics in this period were associated with adult outcomes. Delaying having children and not smoking regularly (less than 18 years) were predictive of high school graduation (or GED). Remaining part of the family through age 16

TABLE 6. G-2 Educational Attainment: High School Diploma or Graduate Equivalency Degree (n = 1390) Versus Neither (n = 368) Logistic Regression Analysis: Predictors From Time IV, Ages 9 Through 17 Years

Variable Entered			Odds Ratio	95% Confidence Interval
Intercept			0.08	0.04-0.17
Honor roll, scholarships, etc	0 = No	1 = Yes	2.99	2.19-4.07
Ever repeat a grade	0 = No	1 = Yes	0.39	0.29-0.52
Age birth to first child	0 = <18	1 = ≥18, No Child	2.64	1.77-3.94
Age regular smoker	0 = <18	1 = ≥18, Never	1.85	1.39-2.47
Age 1st left home for ≥4 months	0 = <17	1 = ≥17, Never	2.01	1.24-3.25
Extracurricular activities	0 = No	1 = Yes	1.85	1.40-2.46
Did teen ever have a summer job?	0 = No	1 = Yes	1.79	1.35-2.36
Age 16, main source of household income	0 = Other	1 = Job	2.05	1.39-3.02
Age first arrested	0 = <18	1 = ≥18, Never	1.87	1.22-2.86
Does teen go library or read?	0 = No	1 = Yes	1.50	1.14-1.99
Other schooling or training	0 = No	1 = Yes	1.39	1.05-1.85
Ever suspended/expelled	0 = No	1 = Yes	0.71	0.52-0.97

and not having difficulty with police (less than 18 years) were also favorable conditions. Problem behavior while in school or being retained in a grade predicted dropping out of high school, whereas engaging in extracurricular activities, going to the library, working during the summer, and being in a family where employment was the main source of income were associated with high school graduation (or GED).

Table 7 shows the six variables from Tables 5 and 6, most strongly associated with educational outcome when the significant variables from each time period were combined. The equation for these six variables has been calculated to show the probability of success when all six are considered jointly (Table 8). The values are hypothetical in that they are derived from a model based on equations which statistically fit the results shown in Table 7.

$$P_{\text{diploma/GED}} = \exp(R) / [1 + \exp(R)]$$

R =

$$\begin{aligned} & - 0.2658 + (1.2582 \times \text{G-2 Honor Roll}) \\ & + (0.7026 \times \text{G-1 Education at G-2 birth}) \\ & - (0.7610 \times \text{G-2 Reading, 8 yr.}) \\ & + (0.9079 \times \text{G-2 Age Regular Smoker}) \\ & + (1.0908 \times \text{Age First Birth}) \\ & - (0.7986 \times \text{G-2 Repeat Grade}). \end{aligned}$$

Probabilities for categories that are based on fewer than 10 cases in almost all of the cross-classified data, ie: G-1 education, some college; G-2 8-year reading level more than 2 grades below normal; and G-2 age at birth of first child, under 18 years are omitted. Nevertheless, the Table does contain some probabilities that are based on less than 10 cases.

As expected, probabilities of success are highest when the characteristics are positive. However, the Table throws light on the degree to which probabilities change as one progresses from one combination of characteristics to another. For example, G-1s' educational level appears to have only a small influence on G-2s' success when there is no record of negative status or achievement for G-2; ie, G-2s' reading level at 8 years is normal, G-2 had never repeated a grade and had honors in school, and G-2 was not a regular smoker under the age of 18 years. In this case, the G-2s whose mothers had only a grade school education have a 95% probability of completing high school (or GED). This compares with a probability of 99% for G-2s with mothers who had completed high school.

As negative characteristics are added, the positive influence of G-1s' education on the probability of G-2s attaining a high school diploma (or GED) increases; for example, the negative influence of G-2 smoking appears to be offset by increasing levels of maternal education. In the category where G-2s had a normal 8-year reading level, never repeated a grade in school, did not achieve honors, and did not have a child while under 18, the probability varies among nonsmokers under 18, from 96% for G-2s with G-1s who were high school graduates to 85% for those with no high school education; the corresponding probabilities for smokers are reduced to 90% (G-1s, high school graduates) and 70% (G-1 no high school).

DISCUSSION

This study is unusual in the breadth of the early prospective data and the care taken to assure their

TABLE 7. G-2 Educational Attainment: High School Diploma or Graduate Equivalency Degree (n = 1390) Versus Neither (n = 368) Logistic Regression Analysis: Predictors From Times I-IV, Top Six Variables

Variable Entered			Time	Odds Ratio	95% Confidence Interval
Intercept				0.77	0.48-1.23
Honor roll, scholarships, etc	0 = No	1 = Yes	IV	3.52	2.60-4.76
G-1 education at G-2 birth	0 = ≤8; 1 = 9-11	2 = High school graduate; 3 = ≥Some College	I	2.02	1.69-2.42
Reading—8 years (grade/age)	0 = Normal	1 = 1-2 Below; 2 = >2 Below	III	0.47	0.37-0.59
Age regular smoker	0 = <18	1 = ≥18, Never	IV	2.48	1.88-3.26
Age birth of first child	0 = <18	1 = ≥18, No Child	IV	2.98	1.99-4.46
Ever repeat a grade	0 = No	1 = Yes	IV	0.45	0.34-0.60

TABLE 8. Probability of G-2 Attainment of High School Diploma or Graduate Equivalency Degree Based on the Six Variables, Between Birth and Age 18, With the Strongest Associations With Educational Outcome, in Table 7

G-2 Repeat Grade	G-2 Honors		Yes		No	
	G-2 Age Birth of 1st Child		≥18, No Child		≥18, No Child	
	G-2 Age Smoke Regularly		≥18, Never	<18	≥18, Never	<18
G-2 8 Years Reading	G-1 Education at G-2 Birth					
No	≥Grade for age	High school graduate	0.99	0.97	0.96	0.90
		Some high school	0.98	0.94	0.92	0.82
		<=8th Grade	0.95	0.89	0.85	0.70
No	1-2 Grades below	High school graduate	0.97	0.94	0.92	0.81*
		Some high school	0.95	0.88	0.84	0.68
		<=8th Grade	0.90	0.79	0.73	0.52
Yes	≥Grade for age	High school graduate	0.97*	0.94*	0.91*	0.81*
		Some high school	0.95*	0.88	0.84	0.67
		<=8th Grade	0.90*	0.78*	0.72*	0.51
Yes	1-2 Grades below	High school graduate	0.94	0.87*	0.83	0.66
		Some high school	0.89	0.77	0.71	0.49
		<=8th Grade	0.81	0.63	0.54	0.32

* Less than 10 cases.

validity and comparability over time. Possible biases and limitations pertaining to the interview data bridging the gap between 8 years and adulthood have been discussed in the "Methods" section. In addition, the findings presented above must be considered in the light of societal changes during the past 30 years that may have impacted disadvantaged families, living initially in east Baltimore. These changes are mirrored in other large cities. As restrictions imposed by segregation lessened, many study families migrated toward the periphery of the city and beyond. Only 64% of study families remained in Baltimore City, many in more affluent peripheral areas; 10% moved to other states or overseas.

Among adult G-2s, educational attainment was markedly higher than that of their mothers when G-2s were born. Even, excluding the 11% with a GED, 68% of G-2s graduated from high school as compared with 28% of G-1s at G-2s birth. The differential is further increased when the comparison with G-1s is restricted to female G-2s, 72% of whom graduated from high school (57% of G-1s reported high school graduation at the G-1 interview).

G-2s were, in general, better off financially than their birth families. Twenty percent of G-2 families were at or below the poverty level but 25% were above four times the poverty level as compared with G1 families at G2 birth, when 46% were at the poverty level or below and only 12% had reached twice that level. However, not all G-2s met the study's criteria for successful adulthood; 21% had not achieved either a high school diploma or GED; 18% were currently receiving welfare; an additional 6% had Medicaid or food stamps; and over 4% were incarcerated at the time of interview. Only 60% met the criteria for good mental and physical health and 70% the criteria for a lifestyle that was not potentially self-destructive and/or unlawful.

This study provides insight with respect to the likely protective or adverse effect of selected biological/health and family/environmental circumstances on the adult outcome of a cohort of inner-city children and youth. Living with both parents and continuing freedom from poverty, which are not un-

der the control of the young, predict good outcomes, as do normal cognitive and academic development (particularly reading and language skills). Behavior, internal and external to school, is also influential. Being on the honor role, participating in extracurricular activities, and having a summer job are highly favorable while use of drugs or alcohol, having a child, problems with the criminal justice system, and regular cigarette smoking, all before age 18, are associated with unfavorable outcomes.

The observation that birth weight, gestational age, and neurologic status at 1 year were not predictors of adult education is puzzling as these variables were strongly related to 4- and 7-year cognitive and academic performance, which in turn were related to adult education. The mediating effects of variables occurring during childhood appear to be of critical importance and remain to be investigated.

Despite the marked improvement in educational attainment in the G-2 generation, reading and language achievement levels among G-2s were well below national norms at 7 and 8 years. These findings indicate a clear need for early increased attention by those responsible for the health and education of young children. As language and reading are so strongly associated with educational outcome and later success, children must be given an optimal opportunity for acquiring these skills.

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