By Arnold Chandler, August 2025

Mobility Milestones

Key Life Course Milestones Shaping Racial Mobility Gaps

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ABOUT THE STRIVING AND THRIVING REPORT SERIES

1

Striving and Thriving

Racial Mobility Gaps and Patterns

The first report in the series examines current intergenerational mobility patterns and racial disparities in the United States across three dimensions: income, education, and health. Additionally, it investigates potential conflicts between “striving” (upward mobility in education and income) and “thriving” (improvements in mental and physical health) across generation.

2

Mobility Milestones

Key Life Course Milestones Shaping Racial Mobility Gaps

This publication is the second report in the series and presents findings from an extensive review of the research literature identifying 27 key life course milestones that help or hinder upward intergenerational mobility in education, income and health. These milestones help to explain racial/ethnic gaps in intergenerational mobilities.

3

Changing Life Trajectories

Effective Interventions for Addressing Mobility Gaps for Youth of Color

The third report in the series describes interventions that are effective in improving key mobility milestones for youth of color. It summarizes the characteristics of 65 rigorously evaluated programs affecting education, juvenile justice, employment, and health outcomes.

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EXECUTIVE SUMMARY

Upward intergenerational mobility has long been the dream of families the world over. It refers to the extent to which children achieve better life outcomes than their parents—a goal for every generation. This report presents a comprehensive assessment of research examining key life course milestones that predict whether individuals are on track to upward intergenerational mobility in education, income, and health. It also illuminates how these milestones contribute to racial disparities in mobility outcomes.

Building on the findings of the Forward Change report, *Striving & Thriving: Racial Mobility Gaps and Patterns* released in 2024, this report further develops the concept of "striving and thriving" across three significant areas. In this framework, "striving" refers to upward mobility in education and income, while "thriving" represents improvements in physical and mental health across generations.[1]

The *Striving & Thriving: Racial Mobility Gaps and Patterns* report identified significant racial disparities in intergenerational mobility. Black and American Indian populations are shown to experience lower rates of upward mobility and higher rates of downward mobility across all three dimensions compared to their White counterparts. Latino populations generally fell between Blacks/American Indians and Whites.

The findings of this second report in the Striving & Thriving series describe ostensible pathways to upward or downward intergenerational mobility and factors influencing related racial gaps. The report details an analytical framework and research methodology used to identify 27 mobility milestones from birth to young adulthood.

The findings from this report are expected to be useful to policymakers, service providers, and philanthropy as they design and develop "cradle-to-career" and mobility strategies intended to achieve broad-based equity goals.

1 Chander, Arnold L. (2024) Striving & Thriving: Racial Mobility Gaps and Patterns. Forward Change. Available at www.forwardchange.org/strivingandthriving

Mobility Milestones

The 27 mobility milestones that predict long-term trajectories in education, income, and health are outlined in **Table A**. Milestones found to exhibit predictive or plausibly causal relationships with long-term education, income, or health outcomes—using a multivariate analysis—were included in this report.

Notably, several milestones influence multiple trajectories. These milestones can be classified as **positive or negative milestones**, each with significant implications for an individual's future trajectory.

- **Positive milestones—**such as high school graduation or college completion—are generally associated with favorable long-term outcomes, including higher earnings and improved health.
- **Negative milestones—**such as dropping out of high school or incarceration—tend to correlate with adverse long-term consequences, including economic instability and poorer health.

The following analysis of each milestone weighs how important it might be in explaining racial gaps in education, income, and health mobilities. Two key findings reported for each milestone include:

- **Evidence of Long-Term Prediction:** This includes findings from longitudinal panel studies, revealing whether a given milestone predicts or causally influences long-term outcomes.
- **Racial/Ethnic Disparities:** Data on the prevalence of each milestone that highlights disparities across racial and ethnic groups.

Table A. List of Mobility Milestones

Mobility Milestone	Approximate Age Span	Income Mobility	Educational Mobility	Health Mobility
1. Low Birthweight	0	✓	✓	✓
2. Elevated Blood Lead Levels	0-5		✓	✓
3. Early Childhood Development	0-5	✓		✓
4. Child Physical and Mental Health	0-17	✓		
5. Attends Quality Preschool	3-5		✓	
6. Kindergarten Ready: Socioemotional Development at Kindergarten entry	5		✓	
7. Externalizing Behavior	6-14		✓	
8. Middle Childhood Math & Reading Test Achievement	8-10		✓	
9. School Absences	10-14		✓	
10. Middle School Math & Reading Test Scores	11-13		✓	
11. Grade Retention (held back in grade)	11-14		✓	
12. Conscientiousness / High-Striving	11-26		✓	✓
13. School Suspensions	12-17		✓	
14. Juvenile Delinquency, Arrest or Incarceration	12-17		✓	✓
15. Middle and High School Grades	12-17		✓	
16. High School Academic Test Scores	14-18	✓		
17. Teenage Parenthood	14-19	✓	✓	
18. Locus of Control & Self-Esteem	17-21	✓		
19. Attend a Selective or High Mobility College	18-24	✓		
20. Young Adult Incarceration / Felony Conviction	18-26	✓		✓
21. Housing Insecurity	18-26			✓
22. Timing of College Enrollment and Completion	18-35	✓		
23. Adult Physical and Mental Health	20-40	✓		
24. Postsecondary Completion	22-29	✓		✓
25. Stable Employment	22-40	✓		
26. Employment in High Demand Industry/Sector	25-30	✓		
27. Earnings Growth/Decline or Intragenerational Income Mobility	25-55	✓		✓

Comparing and Prioritizing Mobility Milestones

To determine the relative importance of each of these milestones for predicting racial mobility gaps today and into the future, three considerations are critical. First, is the milestone a highly prevalent one affecting a large population or a relatively small one. Second, does the milestone show substantial disparities in prevalence rates across racial groups? Lastly, is the prevalence of the milestone increasing or decreasing over time and by how much?

These considerations are used to summarize each milestone below. Milestones are grouped based upon whether they exhibit a low prevalence (under 10%), medium prevalence (11-49%), or high prevalence (50% or higher). Those with higher prevalence rates are expected to play a larger role in explaining racial mobility gaps.

Educational Mobility Milestones

Sixteen educational mobility milestones were identified and are reviewed in depth. These milestones were found to be long-term predictors or plausible causes for rates of high school dropout, high school graduation, college enrollment, and college completion. The prevalence rates, racial disparities, and trends for these milestones are summarized in Table A. For ease of interpretation and comparison, all milestones listed in Table A are reported as negative milestones.

Table A. Summary of Educational Mobility Milestones

Milestone	***Prevalence Range** (for Blacks, American Indians or Latinos)*	***Year(s) Measured***	***Racial Gap** between Whites and the group with the highest prevalence*	***% Change in Annual Rates:** for the racial group with highest prevalence*
Low Prevalence Milestones				
1. Juvenile incarceration	2.4%	late 1990s	N/A	**-80%** (1997-2019)
Medium Prevalence Milestones				
2. Elevated blood lead (ages 0-5)	2-12%	2003-06	10pp*	**-96%** (1991-2016)
3. Low birthweight	7.9-14.8%	2022	7.7pp	**+3%** (1980-2016)
4. Lifetime juvenile arrest	18-25%	late 1990s	8pp	**-72%** (1995-2019)
5. Grade retention (K-8)	24-29%	2000-09	11pp	**-55%** (1994-2010)
6. Teenage parenthood	17%-34%	2015-19	17pp	**-81%** (1991-2022)
7. Chronic school absences (K-12)	33-46%	2022-23	24pp	**+77%** (2015/16-2022/23)
High Prevalence Milestones				
8. Low high school GPA (below 3.0)	57-65%	2013	32pp	N/A
9. Not attending pre-K	62-66%	2018	9pp	**+17%** (2010 to 2018)
10. Ever suspended (K-12)	29-67%	1980s-2000s	28pp	**+24%** (2009/10-2017/8)
11. Not proficient: 4th grade reading scores	79-83%	2022	25pp	**-6%** (2002-2022)
12. Not proficient: 8th grade reading scores	79-84%	2022	22pp	**-3%** (2000-2022)
13. Not proficient: 4th grade math scores	78-85%	2022	33pp	**-11%** (2000-2022)
14. Not proficient: 8th grade math scores	86-91%	2022	26pp	**-4%** (2000-2022)
Unclear Prevalence Milestones				
15. Externalizing behavior (age 5)	N/A	N/A	N/A	N/A
16. Externalizing behavior (age 6 to 10)	N/A	N/A	N/A	N/A

*pp = percentage point

Lower Prevalence Milestones

The least prevalent educational mobility milestone is a negative milestone: juvenile incarceration. The existing evidence suggests juvenile incarceration is a strong negative predictor of high school graduation. Notably, juvenile incarceration has seen dramatic declines over the past few decades, falling -80% from 1997 to 2019. In recent years, the low prevalence of juvenile incarceration renders it unlikely to play a significant role in explaining educational mobility gaps.

Medium Prevalence Milestones

Low birthweight, elevated blood lead levels, K-8 grade retention, K-12 chronic school absences, lifetime juvenile arrests, and teenage parenthood fall into the medium prevalence range for reviewed milestones (11-49%) and are negatively predictive of graduating high school and enrolling in college. Although the evidence for teenage parenthood is more equivocal, some evidence suggests that the harmful effects of teenage parenthood on total years of schooling apply only to White females or those females residing in more affluent U.S. counties. Each of these milestones show large racial disparities, with the largest absolute gaps for rates of chronic absence (24pp) and rates of teenage parenthood (17pp). Looking at trends, elevated blood lead levels (-96% for 1991-2016), juvenile arrest rates (-72% for 1995-2019), grade retention rates (-55% for 1994-2010) and annual rates of teenage parenthood (-81% for 1991-2022) have declined sharply in recent years. Unfortunately, the prevalence and racial disparity in low birthweight has stubbornly persisted with little change (+3%) for several decades (1980-2016). Lastly, sparked by the COVID pandemic in 2020, rates of chronic school absence have risen dramatically, increasing +77% since 2015-16.

High Prevalence Milestones

Milestones showing relatively large prevalence levels (65% or more) and substantial disparities include not attending preschool, below proficiency in reading and math test scores in late elementary through high school, low high school G.P.A.s, and high rates of suspensions. These milestones are shown to be strong predictors of high school graduation, 4-year college enrollment, and college graduation. Not proficient in 4th and 8th grade math (26pp-33pp) and 4th and 8th grade reading (22pp-25pp), low high school GPAs (32pp), and suspensions (28pp) demonstrate some of the largest racial disparities of all education mobility milestones. In terms of trends, prevalence rates for most of these milestones have improved in recent years. Suspension rates have declined moderately (-24% from 2009-10 to 2017-18) while lack of 4th and 8th grade reading proficiency (-3% to -6% from 2000 to 2022) and 4th and 8th grade math proficiency (-4 to -11% from 2000 to 2022) have declined only modestly. Never attending pre-k appears to have worsened (+17% for 2010-2018) while trends for low high school G.P.A. by race could not be determined from the existing literature.

Unclear Prevalence Milestones

Externalizing behavior at kindergarten entry or in middle childhood are shown to predict high school graduation. However, their current prevalence levels could not be determined from the existing literature.

Income Mobility Milestones

Fifteen income mobility milestones were identified and are described in detail below. These milestones were found to be long-term predictors and plausible causes of adult employment, adult earnings, adult wages, adult household income, and intergenerational income mobility. Their prevalence rates, racial disparities, and trends are summarized in Table B. Again, milestone prevalence rates are reported as negative milestones.

Table B. Summary of Income Mobility Milestones

Milestone	***Prevalence Range** (for Blacks, American Indians or Latinos)*	***Year(s) Measured***	***Racial Gap** between Whites and the group with highest prevalence*	***% Change in Annual Rates:** for the racial group with highest prevalence*
Low Prevalence Milestones				
1. Fair or poor child health	2.7-3.4%	1998-2009	N/A	N/A
2. Completing college after age 30	9% (Black)[2]	2009	1pp	N/A
Medium Prevalence Milestones				
3. Low birthweight	7.9-14.8%	2022	7.7pp	**+3%** (1980-2016)
4. Adult disability (young adult)	7-16%	2016	7pp	N/A
5. Incarceration (young adult)	12-16%	2016	10pp	**-56%** (1991-2016)
6. Teenage parenthood	17%-34%	2015-2019	17pp*	**-81%** (1991-2022)
High Prevalence Milestones				
7. Lacking stable full-time employment	53%-59%	2022	6pp	**-13%** (2010-2022)
8. Below proficient: 12th grade reading scores	75-83%	2019	30pp	**-1%** (2005-2019)
9. No bachelor's degree (ages 25-34)	73-86%	2023	32pp	**-2%** (2009-2023)
10. Not attending a selective (or high mobility) college	89-90%	2013	15pp	**-6.2%** (1982-2013)
11. Below proficient: 12th grade math scores	89-92%	2019	24pp	**-2%** (2005-2019)
Unclear Prevalence Milestones				
12. Negative early childhood development	N/A	N/A	N/A	N/A
13. External locus of control and low self-esteem	N/A	N/A	N/A	N/A
14. Employment in a low-demand industry or sector	N/A	N/A	N/A	N/A
15. Earnings growth	N/A	N/A	N/A	N/A

*pp = percentage point

2 Bárány, Z. L., Buchinsky, M., & Corblet, P. (2023). *Late bloomers: The aggregate implications of getting education later in life* (No. w31874). National Bureau of Economic Research; Table C.1, pg. 37

Lower Prevalence Milestones

Low-prevalence income mobility milestones—including experiencing fair or poor health in childhood and completing a college degree after age 30—exhibit relatively small racial gaps. Empirical evidence indicates that both are associated with lower earnings in adulthood. Existing literature, however, does not provide sufficient data to assess trends over time for these milestones.

Medium Prevalence Milestones

Medium prevalence milestones (11-50%) include low birthweight, teenage parenthood, young adult incarceration, adult disability, adult depression and long-term unemployment. These milestones are shown to predict both reduced employment and reduced earnings. However, the evidence for teenage parenthood with respect to adult earnings is conflicting. While some studies find reductions in earnings for Baby Boomer and Gen X females, studies for subsequent generations find that the negative effects of teenage parenthood on adult income are limited to females from high income counties and White females.

All medium prevalence milestones show significant racial disparities. The largest such racial gaps are for teenage pregnancy (17pp), young adult incarceration (10pp), and low birthweight (7.7pp). Trends show annual rates of teenage parenthood (-81% for 1991-2022) and adult incarceration (-56% for 1991-2016) have decreased substantially in recent years while rates of low birthweight (+3% for 1980-2016) and long-term unemployment (+0.8% for 2010-2022) have unfortunately remained relatively stable. Although race-specific data is lacking, it is notable that work-limiting disability for the U.S. population increased by +17% from 2000 to 2018.

High Prevalence Milestones

High prevalence milestones have prevalence rates of 53% or higher and all show substantial racial gaps. These milestones are shown to predict earnings, and both intra- and inter-generational income mobility. Obtaining a bachelor's degree, especially from a selective or "high mobility" college, is associated with significantly higher incomes and a greater likelihood of experiencing upward income mobility, particularly from poverty. Lacking stable employment, on the other hand, predicts substantial reductions in long-term earnings and lower rates of upward income mobility. There is conflicting evidence regarding the role that cognitive tests scores, such as 12th grade reading and math, play in intergenerational mobility gaps. While some evidence suggests that test scores can statistically explain most of racial mobility gaps, other evidence suggests the relationship is primarily correlational and not causal. Racial gaps in these outcomes are substantial with the largest gaps for bachelor's degree completion (32pp), and below proficiency in 12th grade reading (30pp) and 12th grade math (24pp). A persistent gap in college graduation rates has lingered despite the fact that between 2005 and 2023 college graduation rates rose by +61% for Blacks, +41% for American Indians, and +145% for Latinos. Additionally, between 2005 and 2019, proficiency rates in 12th grade math have improved for Blacks (+33%), American Indians (+50%) and Latinos (+38%), but racial gaps have remained unchanged. Racial gaps in 12th grade reading proficiency have changed very little over this time period even as proficiency rates for Blacks and Latinos have grown modestly.

Unclear milestones

Positive early childhood development, locus of control and self-esteem, and employment in a high demand industry or sector all predict higher earnings. However, the historical and contemporary prevalence of these milestones could not be determined, making it difficult to assess their significance for income mobility gaps. Earnings growth is a direct determinant of income mobility, however, average rates of earnings growth could not be determined for racial groups either currently or historically.

Health Mobility Milestones

A total of 9 health mobility milestones were identified that predict mental health, chronic health conditions, body mass index, cardiometabolic disease, self-rated health, arthritis, and mortality. Their prevalence rates, racial disparities, and trends are summarized in Table C, all reported as negative milestones.

Table C. Summary of Health Mobility Milestones

Milestone	***Prevalence Range** (for Blacks, American Indians or Latinos)*	***Year(s) Measured***	***Racial Gap** between Whites and the racial group with highest prevalence*	*% **Change in Annual Rates (time period):** for the racial group with highest prevalence*
Medium Prevalence Milestone				
1. Elevated blood lead levels (ages 0-5)	2-12%	2003-06	10pp	**-96%** (1991-2016)
2. Low birthweight	7.9-14.8%	2022	7.7pp	**+3%** (1980-2016)
3. Incarceration (young adult)	12-16%	2016	10pp	**-56%** (1991-2016)
4. Housing insecurity	15.1-15.4%	2024	7.4pp	N/A
5. Juvenile delinquency	25%-27%	1990s	7pp	N/A
6. Downward intragenerational income mobility from the 50th percentile	38-41%	1993-2008	3pp	N/A
High Prevalence Milestones				
7. No bachelor's degree (ages 25-34)	73-86%	2023	32pp	**-2%** (2009-2023)
Unclear Prevalence Milestones				
8. Lack of positive early childhood development	N/A	N/A	N/A	N/A
9. High conscientiousness and high striving	N/A	N/A	N/A	N/A

*pp = percentage point

Medium Prevalence Milestones

Medium prevalence milestones, including elevated blood lead levels, low birthweight, young adult incarceration (before age 24), housing insecurity, juvenile delinquency and downward intragenerational income mobility from the 50th percentile of the income distributions were associated with a decline in self-rated health and an increase in a variety of health conditions including higher depression, BMI, hypertension, and cardiovascular disease. Elevated blood lead levels and incarceration were also associated with increased risk of mortality. Looking at racial gaps, adult incarceration (10pp) and elevated blood lead levels (10pp) showed the largest

absolute racial gaps with all medium-prevalence milestone showing racial disparities of at least 7 percentage points. In terms of trends, rates of adult incarceration (-56% for 1991-2016) and elevated blood lead levels (-96% for 1991-2016) have been falling precipitously for decades. The prevalence and racial disparity in low birthweight, however, has stubbornly persisted with little change (+3% 1980-2016) over four decades. Long-term trend data could not be identified for housing insecurity, juvenile delinquency and downward intragenerational income mobility from the 50th percentile.

High Prevalence Milestones

Prevalence rates for not earning a bachelor's degree (ages 25-34) was the only milestone to fall into the high-prevalence range with large racial gaps (32pp) and relatively little change (-2%) in the past decade (2009-2023). This is a complicated marker, however, because college completion has been shown to be associated with adverse health outcomes for young adults of color. For example, obtaining a bachelor's degree or upward educational mobility has been shown to predict increased allostatic load, metabolic syndrome and mortality for Blacks and Latinos, especially those from disadvantaged backgrounds, but not for Whites.

Unclear Prevalence Milestones

The lack of positive early childhood development, marked particularly by exposure to poverty, is associated with increased hypertension and arthritis in adulthood. High conscientiousness and high striving predict increased low-grade inflammation for youth from low-SES backgrounds and increased type 2 diabetes for Blacks from high disadvantage backgrounds. The current and historical prevalence rates for these milestones could not be determined making it difficult to assess their significance for health mobility gaps.

CONCLUSION

Parents want the best for their children—medical care, schooling, good jobs, and financial security. The upward intergenerational mobility that families work to achieve, however, remains a dream that is elusive.

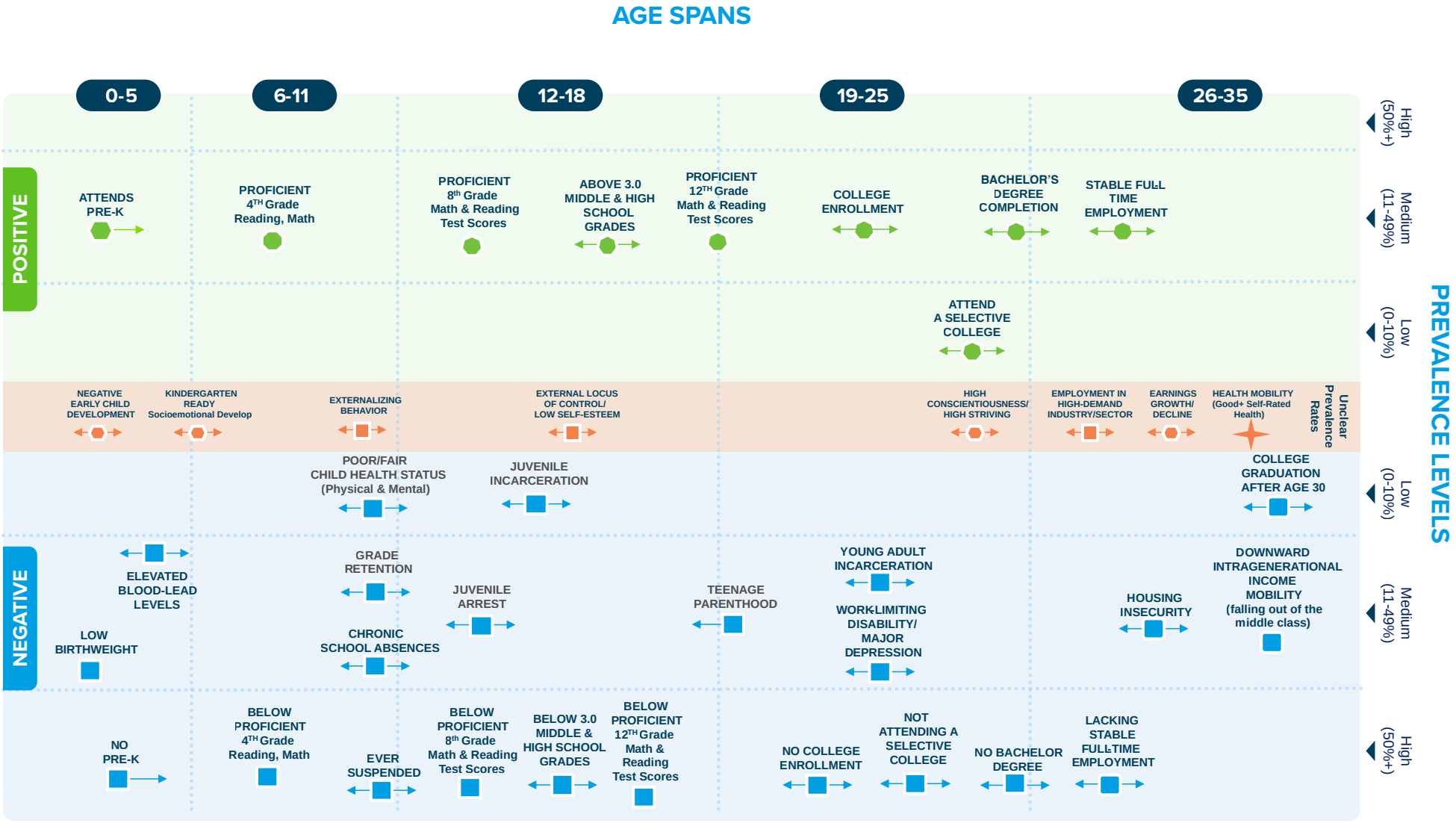
As the first report in the *Striving and Thriving* series showed, Blacks, American Indians, and Latinos are much less likely to enjoy upward intergenerational mobility and much more likely to be trapped within or fall into lower income brackets, lower levels of educational attainment, and poorer health across generations than their White peers.

This state of affairs calls for a clear and detailed analysis of the factors contributing to—and predictors of—intergenerational mobility, which was the impetus for this study.

This report, the second in the series, provided a comprehensive qualitative synthesis of research on the key life course milestones that predict whether individuals are on track to upward intergenerational mobility in education, income, and health, with a focus on how these milestones contribute to racial disparities in mobility outcomes.

Its findings reveal that, despite decades-long efforts, there remain several important life course impediments to reducing racial disparities in intergenerational mobility that should be the targets of sustained intervention. In this report, the focus has been on mobility milestones in three areas: Education, Income, and Health. This study has reviewed the impacts of 27 different but related mobility milestones that influence mobility gaps, representing a linked set of factors worthy of targeted intervention.

Figure A. All Mobility Milestones



INTRODUCTION

Upward intergenerational mobility has long been the goal of families across our nation and globe. The phrase refers to the extent to which children achieve better life outcomes than their parents. Relying on a comprehensive qualitative synthesis of research examining key life course milestones, this report identifies those that most strongly predict whether individuals are on track to upward intergenerational mobility in education, income, and health. It also explores how these milestones contribute to racial disparities in mobility outcomes.

Building on the findings of the *Forward Change* report, *Striving & Thriving: Racial Mobility Gaps and Patterns*, released in 2024, this report deepens out understanding of the drivers of "striving and thriving." In this framework, "striving" refers to upward mobility in education and income, while "thriving" represents improvements in physical and mental health across generations.[3]

The *Striving & Thriving: Racial Mobility Gaps and Patterns* report identified significant racial disparities in intergenerational mobility, with Black and American Indian populations experiencing lower rates of upward mobility and higher rates of downward mobility across all three dimensions compared to their White counterparts. Latino populations generally fell in the middle. Key findings from that report are summarized at the top of the next page.

This report seeks to chronicle many of the key factors that shape these mobility outcomes.

3 Chander, Arnold L. (2024) Striving & Thriving: Racial Mobility Gaps and Patterns. Forward Change. Available at www.forwardchange.org/strivingandthriving

Key Findings on Racial Disparities in Mobility

Income Mobility

Intergenerational Poverty: American Indians (18%), Blacks (16%), and Latinos (12%) were more likely to remain trapped in intergenerational poverty than Whites (8%).

Middle-Class Attainment: Whites were far more likely (51%) to reach the middle class (median household income) than Blacks (16%), American Indians (22%), and Latinos (34%).

Falling Out of the Middle Class: The risk of downward mobility from the middle class (middle quintile) was significantly higher for Blacks (56%), American Indians (53%), and Latinos (41%) compared to Whites (32%).

Educational Mobility

Upward Educational Mobility: Defined as being a first-generation four-year college graduate, American Indians (8%), Blacks (14%), and Latinos (16%) were less likely to experience upward educational mobility than Whites (22%).

Downward Educational Mobility: The likelihood of moving downward in educational attainment, defined as not graduating a four-year college even though at least one parent did so, was highest for American Indians (71%), followed by Blacks (58%), Latinos (55%), and Whites (37%).

Health Mobility

Lower Upward and Higher Downward Health Mobility: Blacks and Latinos exhibited lower rates of upward health mobility and higher rates of downward health mobility than Whites when health mobility is measured using self-rated health.

Data Gaps: Insufficient data exists to determine comparable health mobility patterns for American Indians.

SOURCE: Chander, Arnold L. (2024) Striving & Thriving: Racial Mobility Gaps and Patterns. Forward Change.

These findings highlight that, for many communities of color, the promise of intergenerational mobility—a core element of the American Dream—remains largely unfulfilled.

This troubling picture calls for a detailed analysis of the factors contributing to—and predictors of—intergenerational mobility, which is what this study aims to explore. The following sections of the report provide an overview of the analytical framework and research methodology, with detailed summaries for the 27 mobility milestones that may help explain these mobility gaps.

A LIFE COURSE SYSTEMS FRAMEWORK FOR STUDYING MOBILITY FACTORS

A central element of the life course paradigm in sociology, psychology, and health is its emphasis on adopting a "long view," considering how past experiences shape future pathways and attainments. This perspective arises from the intersection of life course sociology and lifespan psychology, providing foundational concepts for understanding the factors influencing intergenerational mobilities.[4] Life course sociology highlights the external forces and social structures that shape developmental tasks and opportunities that are stratified along dimensions of race, class, and gender. Lifespan psychology focuses on the internal aspects of lives, including "genetic, biological, physiological, and psychological" variation across individuals and over time. Both approaches consider multiple life domains (e.g., education, health, and work) and levels of analysis (e.g., individual, family, school, neighborhood, and society). Using this framework, three organizing concepts guided the research presented in this report regarding predictors of racial gaps in education, income, and health mobility. Items falling into any of these three groupings are collectively referred to as "**mobility factors**":

Ecological-Institutional Environments (EIEs):

The social, cultural, and institutional contexts in which lives unfold.

Dimensions of Human Development (DHDs):

The genetic, biological, physiological, and psychological factors within individuals that are shaped by social environments (EIEs) and evolve over time.

Life Course Outcomes (LCOs):

Behavioral outcomes occurring within institutional contexts that are shaped by social environments (EIEs) and influenced by human development dimensions (DHDs).

Ecological-Institutional Environments (EIEs)

As noted above, ecological-institutional environments (EIEs) refer to the social, cultural, and institutional contexts within which individual lives unfold. These environments are characterized by three key elements:

1) **Institutionalized Pathways:** Structured trajectories individuals follow in domains such as education, employment, and the criminal legal system, among others.

2) **Linked Lives:** The significant interpersonal relationships that move with an individual through time and space (e.g. family, friends, mentors, etc.).

3) **Overlapping Social-Ecological Settings:** Nested social environments ranging from micro- to macro-level influences.

4 Bernardi, L., Huinink, J., & Settersten Jr, R. A. (2019). The life course cube: A tool for studying lives. Advances in life course research, 41, 100258; Heckhausen, J., & Buchmann, M. (2019). A multi-disciplinary model of life-course canalization and agency. Advances in Life Course Research, 41, 100246; Alwin, D. F. (2012). Integrating varieties of life course concepts. Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 67(2), 206-220.

Institutionalized Pathways

Ecological-Institutional Environments (EIEs) are external forces that structure primary life trajectories, particularly within education, employment, and criminal legal systems. According to the life course perspective, individuals navigate institutionalized pathways marked by sequences of socially defined events, roles, and statuses (e.g. compulsory education, grade levels in K-12 education, postsecondary education, employment). These transitions across roles and statuses also take place across various domains including education, family, employment, housing, etc. Transitions affect relationships, access to resources, and social participation. Institutional gatekeepers influence individuals' access to certain status positions, such as educational programs and employment opportunities.[5] Within this dynamic "action field," opportunities and constraints are shaped by historical contexts, social institutions, and structural forces. Successfully navigating these pathways is crucial for educational and income mobility.[6]

Linked Lives

The concept of "linked lives" emphasizes the interconnectedness of individuals within social relationships. Decisions and outcomes are shaped by family, peers, mentors, and professional contacts.[7] Early childhood is shaped heavily by familial connections, including parents, siblings, and extended-family. Later, as children enter school and transition through adolescence, these relationships are supplemented by teachers, other school adults, and school and neighborhood peer networks. In adulthood, these networks further expand and differentiate to encompass mentors and professional contacts.[8] These relationships regulate behavior through informal social control, setting expectations and enforcing sanctions.[9] They also serve as conduits to employment and other opportunities. Empirical evidence highlights the role of social networks in shaping intergenerational educational mobility, income mobility, and long-term health outcomes.[10]

Overlapping Social-Ecological Environments

Institutionalized pathways and social networks form and operate within broader social-ecological contexts, typically classified into three hierarchical levels:[11]

- **Micro-environments:** immediate relationships such as families, peers, teachers, etc.
- **Meso-environments:** larger organizational contexts such as schools, neighborhoods, and human service systems.
- **Macro-environments:** the "diffuse abstract machinery of society" that includes economic systems, welfare policies, cultural norms, technology, and social media.[12]

5 Bernardi, L., Huinink, J., & Settersten Jr, R. A. (2019). The life course cube: A tool for studying lives. Advances in life course research, 41, 100258
6 Heckhausen, J., & Buchmann, M. (2019). A multi-disciplinary model of life-course canalization and agency. Advances in Life Course Research, 41, 100246
7 Elder, G. H., Jr. (1974). Children of the Great Depression: Social change in life experience. University of Chicago Press; Alwin, D. F., Felmlee, D. H., & Kreager, D. A. (2018). Together through time–Social networks and the life course. Social networks and the life course: Integrating the development of human lives and social relational networks, 3-26.
8 Elder, G. H., Shanahan, M. J., & Jennings, J. A. (2015). Human development in time and place. Handbook of child psychology and developmental science, 4, 6-54.
9 Settersten, R. A. (2018). Nine ways that social relationships matter for the life course. Social networks and the life course: Integrating the development of human lives and social relational networks, 27-40.
10 Fletcher, J., & Han, J. K. (2021). High schools and intergenerational mobility. Research in Social Stratification and Mobility, 76, 100621; Chetty, R., Jackson, M. O., Kuchler, T., Stroebel, J., Hendren, N., Fluegge, R. B., ... & Wernerfelt, N. (2022). Social capital I: measurement and associations with economic mobility. Nature, 608(7921), 108-121; Keim-Klärner, S., Adebahr, P., Brandt, S., Gamper, M., Klärner, A., Knabe, A., ... & von der Lippe, H. (2023). Social inequality, social networks, and health: a scoping review of research on health inequalities from a social network perspective. International Journal for Equity in Health, 22(1), 74.
11 Bronfenbrenner, U. (2005). Making human beings human: Bioecological perspectives on human development. Thousand Oaks, CA: Sage Publications.
12 Crosnoe, R., & Benner, A. D. (2016). Educational pathways. Handbook of the Life Course: Volume II, 179-200.

Micro- and meso-environments serve as primary developmental contexts shaping education, income, and health outcomes. Research identifies several features of ecological-institutional environments that contribute to racial mobility gaps.[13] They include:

- racial segregation
- neighborhood disadvantage
- social capital
- industrial economic change
- school funding disparities
- teacher characteristics
- and punitive systems ranging from school discipline to mass incarceration.

A detailed exploration of these environmental factors is unfortunately beyond the scope of this report.

Dimensions of Human Development (DHDs)

Human development is a continuous, dynamic process of change and transformation, characterized by an ongoing potential for growth and adaptation over time. Dimensions of Human Development (DHDs) encompass genetic, biological, physiological, and psychological factors that evolve dynamically to shape life outcomes starting from the earliest years. Examples of developmental dimensions known to impact long-term education, income, and health outcomes include cognitive functions, socioemotional development, personality traits, beliefs/expectations, stress response systems, and mental health.[14]

The process of human development involves a bidirectional interplay between individuals and their environments over time, mutually influencing one another. In this process the brain is sculpted by experiences in the environment and in turn acts to shape subsequent environmental experiences.[15]

Early childhood represents a critical period for brain development, laying the foundation for future cognitive, social, emotional, and health outcomes. Research demonstrates, for example, that early childhood poverty, neglect, or abuse exert harmful long-term effects on an array of outcomes including education, income, and health.[16] Studies of the long-term consequences of early childhood interventions, like the Carolina Abecedarian

13 Cholli, N. and Durlauf, S. (2022) Intergenerational Mobility. NBER Working Paper No. 29760. National Bureau of Economic Research. Ananat, E. O. (2011). The wrong side (s) of the tracks: The causal effects of racial segregation on urban poverty and inequality. American Economic Journal: Applied Economics, 3(2), 34-66; Chetty, R., Hendren, N., Kline, P., & Saez, E. (2014). Where is the land of opportunity? The geography of intergenerational mobility in the United States. The quarterly journal of economics, 129(4), 1553-1623; Chyn, E., Haggag, K., & Stuart, B. A. (2022). The effects of racial segregation on intergenerational mobility: Evidence from historical railroad placement (No. w30563). National Bureau of Economic Research; Quillian, L. (2014). Does segregation create winners and losers? Residential segregation and inequality in educational attainment. Social Problems, 61(3), 402-426; Chetty, R., Hendren, N., Jones, M. R., & Porter, S. R. (2020). Race and economic opportunity in the United States: An intergenerational perspective. The Quarterly Journal of Economics, 135(2), 711-783; Fletcher, J., & Jajtner, K. M. (2021). Intergenerational health mobility: Magnitudes and importance of schools and place. Health economics, 30(7), 1648-1667; Manduca, R., & Sampson, R. J. (2021). Childhood exposure to polluted neighborhood environments and intergenerational income mobility, teenage birth, and incarceration in the USA. Population and Environment, 42(4), 501-523; Chetty, R., Friedman, J. N., & Rockoff, J. E. (2014). Measuring the impacts of teachers II: Teacher value-added and student outcomes in adulthood. American economic review, 104(9), 2633-2679; Seltzer, N. (2024). Cohort-Specific Experiences of Industrial Decline and Intergenerational Income Mobility. Social Forces, 102(4), 1223-1248

14 Black, S. E., & Devereux, P. J. (2011). Recent developments in intergenerational mobility. Handbook of labor economics, 4, 1487-1541; Kröger, L. K., Palacios-Abad, A., & Radl, J. (2024). Non-cognitive skills and intergenerational inequality: Reviewing the power of personality. In Research Handbook on Intergenerational Inequality (pp. 400-414). Edward Elgar Publishing; Schneiderman, N., Ironson, G., & Siegel, S. D. (2005). Stress and health: psychological, behavioral, and biological determinants. Annu. Rev. Clin. Psychol., 1(1), 607-628.

15 Sameroff, A. (2009). The transactional model. American Psychological Association; Elder, G. H., Shanahan, M. J., & Jennings, J. A. (2015). Human development in time and place. Handbook of child psychology and developmental science, 4, 6-54;

16 Tooley, U. A., Bassett, D. S., & Mackey, A. P. (2021). Environmental influences on the pace of brain development. Nature Reviews Neuroscience, 22(6), 372-384; Knudsen, E., Heckman, J., Cameron, J., & Shonkoff, J. (2006). Economic, neurobiological, and behavioral perspectives on building America's future workforce. PNAS, 103, 10155–10162. Duncan, G. J., Ziol-Guest, K. M., & Kalil, A. (2010). Early-childhood poverty and adult attainment, behavior, and health. Child development, 81(1), 306–325. https://doi.org/10.1111/j.1467-8624.2009.01396.x; Ziol-Guest, K. M., Duncan, G. J., Kalil, A., & Boyce, W. T. (2012). Early childhood poverty, immune-mediated disease processes, and adult productivity. Proceedings of the National Academy of Sciences, 109(Supplement_2), 17289–17293. doi:10.1073/pnas.1203167109

Project and the High-Scope Perry Preschool Project, find impacts on key life outcomes like education and income decades after intervention.[17]

Moreover, early exposure to environmental toxins has lasting detrimental effects on developmental dimensions, contributing to poorer education, income, and health outcomes over the life course.[18]

Life Course Outcomes (LCOs)

Life Course Outcomes (LCOs), refer to behavioral outcomes occurring within institutional contexts, aligning with what Bernardi et al. (2019) term "socio-structural achievements." These outcomes are shaped by social environments and influenced by human development dimensions.[19] LCOs include "positive credentials" (e.g., educational degrees, employment) and "negative credentials" (e.g. school misbehavior, juvenile delinquency, adult crime, etc.) that are defined by laws organizational rules, and institutional expectations. The attainment of positive and negative credentials undergird positive and negative trajectories that build cumulatively on early advantages or disadvantages.

For example, positive credentials—such as secondary school grades, high school graduation, and college completion—are normative steppingstones that facilitate access to more advanced educational and career opportunities.[20] Conversely, negative credentials, such as juvenile incarceration, adult felony conviction, or prolonged unemployment, create barriers to normative pathways and reinforce cycles of disadvantage.[21]

Mobility Milestones: Dimensions of Human Development and Life Course Outcomes

This report focuses on mobility factors within the last two conceptual groupings: Dimensions of Human Development and Life Course Outcomes, collectively referred to as "**mobility milestones**." LCOs function as steppingstones within institutionalized pathways marked by the accumulation of shorter-term life course achievements. DHDs evolve throughout the life course in interaction with social environments, influencing individual outcome trajectories. Social environments primarily express their influence on long-term life outcomes through their intervening impact on patterns of human development and trajectories of life outcomes. Thus, this report prioritizes the study of DHDs and LCOs for understanding intergenerational mobility over the sprawling literature on ecological-institutional environments.

17 Cascio, E. (2021) *Early Childhood Education in the United States: What, When, Where, Who, How, and Why*. (NBER Working Paper 28722), doi: 0.3386/w28722

18 O'Brien, R. L., Neman, T., Rudolph, K., Casey, J., & Venkataramani, A. (2018). Prenatal exposure to air pollution and intergenerational economic mobility: Evidence from US county birth cohorts. Social Science & Medicine, 217, 92-96; Manduca, R., & Sampson, R. J. (2021). Childhood exposure to polluted neighborhood environments and intergenerational income mobility, teenage birth, and incarceration in the USA. Population and Environment, 42(4), 501-523; Winter, A. S., & Sampson, R. J. (2017). From lead exposure in early childhood to adolescent health: A Chicago birth cohort. *American journal of public health*, 107(9), 1496-1501

19 Bernardi, L., Huinink, J., & Settersten Jr, R. A. (2019). The life course cube: A tool for studying lives. *Advances in life course research*, 41, 100258. DiPrete, T. A., & Eirich, G. M. (2006). Cumulative advantage as a mechanism for inequality: A review of theoretical and empirical developments. Annu. Rev. Sociol., 32(1), 271-297.

20 Galla BM, Shulman EP, Plummer BD, et al. Why High School Grades Are Better Predictors of On-Time College Graduation Than Are Admissions Test Scores: The Roles of Self-Regulation and Cognitive Ability. American Educational Research Journal. 2019;56(6):2077-2115; Campbell, C. (2015). The socioeconomic consequences of dropping out of high school: Evidence from an analysis of siblings. Social science research, 51, 108-118; Deming, D. J. (2022). Four facts about human capital. Journal of Economic Perspectives, 36(3), 75-102.

21 For juvenile incarceration see Aizer, A., & Doyle, J. J. (2015). Juvenile Incarceration, Human Capital, and Future Crime: Evidence from Randomly Assigned Judges *. The Quarterly Journal of Economics, 130(2), 759–803. doi:10.1093/qje/qjv003; Mueller-Smith, M., & Schnepel, K. T. (2020). Diversion in the Criminal Justice System. The Review of Economic Studies. doi:10.1093/restud/rdaa030; Krueger, A. B., Cramer, J., & Cho, D. (2014). Are the long-term unemployed on the margins of the labor market?. Brookings papers on economic activity, 2014(1), 229-299;

LITERATURE REVIEW METHODOLOGY

To identify predictive milestones for education, income, and health mobility, the following methodology was undertaken:

1. **Framing Studies:** Seminal income mobility framing studies, particularly the Social Genome Model, guided the construction of a "starter list" of key explanatory factors for racial mobility gaps (see Appendix A).

2. **Systematic Literature Review:** Scans of the research literature on intergenerational and intragenerational income mobility, educational mobility, and health mobility were conducted between January 10, 2020, and May 2025 using the following topical and keyword searches:

   - **Income mobility:** intergenerational or intragenerational income mobility, earnings mobility, wage mobility, employment, and stable employment.
   - **Educational mobility or attainment beyond high school:** intergenerational educational mobility, educational attainment, college completion, and college graduation.
   - **Health mobility or good/excellent self-rated health in young adulthood:** intergenerational health mobility, and adult health.

3. **Study Criteria:** Studies used for identifying mobility milestones were restricted to prospective longitudinal panel designs with an emphasis on population cohorts born in the 1980s or later. A milestone was included in this report if it was found to exhibit a predictive relationship with long-term education, income, or health outcomes in a multivariate analysis framework.

4. **Study Limitations:** As with any review study, there is a possibility that important potential mobility milestones were omitted either because they were overlooked in research scans or because they are not adequately reflected in extant longitudinal research. In addition, for individual studies, data cleaning and modeling decisions can influence whether a predictive relationship is identified and how large it is**. Where possible, multiple studies were sought to establish evidence for a predictive relationship in order to mitigate this potential bias.

**See Huntington-Klein, N., Arenas, A., Beam, E., Bertoni, M., Bloem, J. R., Burli, P., ... & Stopnitzky, Y. (2021). The influence of hidden researcher decisions in applied microeconomics. Economic Inquiry, 59(3), 944-960; and Huntington-Klein, N., Portner, C. C., & McCarthy, I. (2025). The sources of researcher variation in economics (No. w33729). National Bureau of Economic Research.

Table of Data Sources Referenced

Several prospective panel studies are cited throughout this report. The table below provides easy reference to the various acronyms used

Acronym	*Name of Study*	*Cohort Characteristics*
PSID	Panel Study of Income Dynamics	An initial cohort of 5,000 families first interviewed in 1968. A Child Development supplement augmented the study following children born between 1985 and 2018.
NSLY79	National Longitudinal Survey of Youth 1979	The National Longitudinal Survey of Youth 1979 (NLSY79) began in 1979 with a sample of American youth born between 1957 and 1964. These respondents were ages 14 to 22 when first interviewed.
NLSY97	National Longitudinal Survey of Youth 1997	The National Longitudinal Survey of Youth 1997 (NLSY97) cohort includes individuals born between 1980 and 1984. When the first interviews began in 1997, these participants were aged 12 to 17.
Add Health	The National Longitudinal Study of Adolescent to Adult Health Study	The National Longitudinal Study of Adolescent to Adult Health (Add Health) study primarily focuses on individuals born between 1976 and 1982. These individuals were first interviewed as adolescents in grades 7-12 (ages 12-19) during the 1994-1995 school year. The study has followed these participants through five waves of data collection, with the most recent occurring between 2016 and 2018.
MIDUS	Midlife in the United States Study	The Midlife in the United States (MIDUS) study, first conducted in 1995-96, focused on individuals aged 25 to 74. This means the original study participants were generally born between approximately 1922 and 1970. A follow-up study, MIDUS 2, was conducted in 2004, and a refresher study in 2011-2014.
HRS	Health and Retirement Study	The Health and Retirement Study (HRS) has different cohorts with varying birth years. The original HRS cohort includes individuals born between 1931 and 1941. Subsequent cohorts, like the Children of the Depression (CODA), were born between 1924 and 1930, and the War Babies were born between 1942 and 1947. The HRS also has Early Baby Boomers (EBB) born 1948-1953, Mid Baby Boomers (MBB) born 1954-1959, and Late Baby Boomers (LBB) born 1960-1965.
NLSYCYA	Children of the NLSY79	The children of the NLSY79 cohort were born between 1970 and 2014. These children are the biological offspring of the women included in the original NLSY79 cohort, which began in 1979. The NLSY79 Child and Young Adult cohort, also known as the NLSCYA, was initiated in 1986 and follows these children's lives.
CLS	Chicago Longitudinal Study	The Chicago Longitudinal Study (CLS) primarily focused on participants born between 1979 and 1980 in the city of Chicago. These children, mostly African American, were studied to understand the effects of an early childhood intervention program, the Child-Parent Center (CPC) program, and their overall life course development.

Acronym	*Name of Study*	*Cohort Characteristics*
HSLS:09	High School Longitudinal Study of 2009	The High School Longitudinal Study of 2009 (HSLS:09) focuses on students who were in 9th grade in the fall of 2009. This study follows the students throughout their high school and postsecondary years, aiming to understand their educational and career trajectories.
NELS-88	National Education Longitudinal Study	The National Education Longitudinal Studies (NELS) program includes several longitudinal studies, each with its own birth cohort. For example, the NLS-72 focused on the high school class of 1972, while the NELS-88 focused on a sample of 8th graders in 1988.
PHDCN	Project on Human Development in Chicago Neighborhoods	The Project on Human Development in Chicago Neighborhoods (PHDCN) followed seven birth cohorts from birth (0) to 18 years old. These cohorts were tracked at intervals of 0, 3, 6, 9, 12, 15, and 18 years. The project aimed to understand how families, schools, and neighborhoods influenced child and adolescent development. The study included children born roughly between late 1994 and early 1996 (the cohort at age 0), and then reinterviewed them every three years until age 18 (ages 3, 6, 9, 12, 15, and 18).
BHS	Bogalusa Heart Study	The Bogalusa Heart Study began in 1973 and followed a cohort of children born between 1959 and 1969 into adulthood. Additionally, a substudy examined infants born between 1974 and 1975.
CPS	Current Population Survey	The Current Population Survey (CPS) is a monthly cross-sectional survey conducted by the U.S. Census Bureau for the Bureau of Labor Statistics. It provides data on employment, unemployment, and other labor force characteristics, as well as demographic information about the population. The CPS is the primary source of official labor force statistics, including the national unemployment rate.
ACS	American Community Survey	The American Community Survey (ACS) is a nationwide cross-sectional survey conducted annually by the U.S. Census Bureau to collect data on social, economic, and housing characteristics of the population.
LEHD	Longitudinal Employer-Household Dynamics	The LEHD is a longitudinal data set of linked employer-employee data starting in the 1990s that covers over 95% of the employment in the United States.
NHNES	National Health and Nutrition Examination Survey	The National Health and Nutrition Examination Survey (NHANES) is a cross-sectional survey conducted by the National Center for Health Statistics (NCHS) within the Centers for Disease Control and Prevention (CDC) to assess the health and nutritional status of adults and children in the United States. It combines interviews and physical examinations with laboratory tests. The survey has been conducted annually since 1999.

Acronym	*Name of Study*	*Cohort Characteristics*
GSS	General Social Survey	The General Social Survey (GSS) is a sociological survey conducted by NORC at the University of Chicago since 1972. It's a nationally representative cross-sectional survey with retrospective longitudinal elements of adults in the United States that collects data on contemporary American society to monitor and explain trends in opinions, attitudes, and behaviors.
ECLS-K	Early Childhood Longitudinal Study	The Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) followed children born in 2001 through kindergarten age. The study collected data at several time points, including when the children were about 9 months, 2 years, 4 years old (preschool), and in kindergarten. Baseline data for the ECLS-B was collected between October 2001 and December 2002.
ELS:2002	Educational Longitudinal Study of 2002	The Educational Longitudinal Study of 2002 (ELS:2002) was a large longitudinal study designed to track students as they progressed through high school and into postsecondary education or the workforce. It followed a nationally representative cohort of students in 10th grade in 2002, and continued to collect data at 2-year intervals. The study aimed to gather information about student learning, dropout rates, and the impact of high school on postsecondary access and success.

LIST OF MOBILITY MILESTONES

The 27 mobility milestones that predict long-term trajectories in education, income, and health are listed in Table 1. Notably, several milestones influence multiple trajectories. These milestones can be classified into two categories: **positive and negative milestones**, each with significant implications for an individual's future trajectory.

Positive milestones—such as high school graduation or college completion—are generally associated with favorable long-term outcomes, including higher earnings and improved health.

Negative milestones—such as dropping out of high school or incarceration—tend to correlate with adverse long-term consequences, including economic instability and poorer health outcomes.

The following sections provide an in-depth analysis of each milestone, to help illuminate how important it might be in explaining racial gaps in education, income, and health mobilities. Two key findings for each milestone are included:

Evidence of Long-Term Prediction: This includes findings from longitudinal panel studies, demonstrating whether a given milestone predicts or causally influences long-term outcomes.

Racial Disparities: Data on the prevalence of each milestone will be presented, highlighting disparities across racial groups.

Table 1. Mobility Milestones

Mobility Milestone	Approximate Age Span	Income Mobility	Educational Mobility	Health Mobility
1. Low Birthweight	0	✓	✓	✓
2. Elevated Blood Lead Levels	0-5		✓	✓
3. Early Childhood Development	0-5	✓		✓
4. Child Physical and Mental Health	0-17	✓		
5. Attends Quality Preschool	3-5		✓	
6. Kindergarten Ready: Socioemotional Development at Kindergarten entry	5		✓	
7. Externalizing Behavior	6-14		✓	
8. Middle Childhood Math & Reading Test Achievement	8-10		✓	
9. School Absences	10-14		✓	
10. Middle School Math & Reading Test Scores	11-13		✓	
11. Grade Retention (held back in grade)	11-14		✓	
12. Conscientiousness / High-Striving	11-26		✓	✓
13. School Suspensions	12-17		✓	
14. Juvenile Delinquency, Arrest or Incarceration	12-17		✓	✓
15. Middle and High School Grades	12-17		✓	
16. High School Academic Test Scores	14-18	✓		
17. Teenage Parenthood	14-19	✓	✓	
18. Locus of Control & Self-Esteem	17-21	✓		
19. Attend a Selective or High Mobility College	18-24	✓		
20. Young Adult Incarceration / Felony Conviction	18-26	✓		✓
21. Housing Insecurity	18-26			✓
22. Timing of College Enrollment and Completion	18-35	✓		
23. Adult Physical and Mental Health	20-40	✓		
24. Postsecondary Completion	22-29	✓		✓
25. Stable Employment	22-40	✓		
26. Employment in High Demand Industry/Sector	25-30	✓		
27. Earnings Growth/Decline or Intragenerational Income Mobility	25-55	✓		✓

EDUCATIONAL MOBILITY MILESTONES

Sixteen educational mobility milestones were identified and are reviewed in depth in the following section of the report. These milestones, listed in Table 2, were found to be long-term predictors and, in some cases, plausible causal factors, influencing high school dropout, high school graduation, college enrollment, and college completion rates.

If we sought to assign a relative importance to each milestone for potentially shaping educational mobility today and into the future, three considerations would be critical:

1. How prevalent is the milestone in the overall population? Milestones with low prevalence levels are much less likely than high prevalence milestones to significantly influence mobility outcomes or racial gaps.

2. Does the milestone show substantial disparities in prevalence across racial groups?

3. Is the prevalence for the milestone increasing or decreasing over time and by how much?

Table 2 summarizes data on these three considerations for each of the 16 educational mobility milestones, including their prevalence, racial gaps, and trends. Milestones have been grouped based upon whether they exhibit a low prevalence (under 10%), medium prevalence (11-49%), high prevalence (50% or higher), or unclear prevalence based on the most recent data that could be identified.

Table 2. Summary of Educational Mobility Milestones, Prevalence Levels, Racial Gaps and Trends

Milestone	***Prevalence Range** (for Blacks, American Indians or Latinos)*	***Year(s) Measured***	***Racial Gap** between Whites and the group with the highest prevalence*	***% Change in Annual Rates:** for the racial group with highest prevalence*
Low Prevalence Milestones				
1. Juvenile incarceration	2.4%	late 1990s	N/A	**-80%** (1997-2019)
Medium Prevalence Milestones				
2. Elevated blood lead (ages 0-5)	2-12%	2003-06	10pp	**-96%** (1991-2016)
3. Low birthweight	7.9-14.8%	2022	7.7pp	**+3%** (1980-2016)
4. Lifetime juvenile arrest	18-25%	late 1990s	8pp	**-72%** (1995-2019)
5. Grade retention (K-8)	24-29%	2000-09	11pp	**-55%** (1994-2010)
6. Teenage parenthood	17%-34%	2015-2019	17pp*	**-81%** (1991-2022) [Annual Rates]
7. Chronic school absences (K-12)	33-46%	2022-23	24pp	**+77%** (2015/16-2022/23)
High Prevalence Milestones				
8. Low high school GPA (below 3.0)	57-65%	2013	32pp	N/A
9. Not attending pre-K	62-66%	2018	9pp	**+17%** (2010 to 2018)
10. Ever suspended (K-12)	29-67%	1980s-2000s	28pp	**+24%** (2009/10-2017/8)
11. Not proficient: 4th grade reading scores	79-83%	2022	25pp	**-6%** (2002-2022)
12. Not proficient: 8th grade reading scores	79-84%	2022	22pp	**-3%** (2000-2022)
13. Not proficient: 4th grade math scores	78-85%	2022	33pp	**-11%** (2000-2022)
14. Not proficient: 8th grade math scores	86-91%	2022	26pp	**-4%** (2000-2022)
Unclear Prevalence Milestones				
15. Externalizing behavior (age 5)	N/A	N/A	N/A	N/A
16. Externalizing behavior (age 6 to 10)	N/A	N/A	N/A	N/A

*pp=percentage points

Lower Prevalence Milestones

The least prevalent educational mobility milestone is a negative milestone: juvenile incarceration. The existing evidence suggests juvenile incarceration is a strong negative predictor of high school graduation. Notably, juvenile incarceration has seen dramatic declines over the past few decades, falling -80% from 1997 to 2019. In recent years, the low prevalence of juvenile incarceration renders it unlikely to play a significant role in explaining educational mobility gaps.

Medium Prevalence Milestones

Low birthweight, elevated blood lead levels, K-8 grade retention, K-12 chronic school absences, lifetime juvenile arrests, and teenage parenthood fall into the medium prevalence range for reviewed milestones (11-49%) and are negatively predictive of graduating high school and enrolling in college. Although the evidence for teenage parenthood is more equivocal, some evidence suggests that the harmful effects of teenage parenthood on total years of schooling apply only to White females or those females residing in more affluent U.S. counties.

Each of these milestones show large racial disparities, with the largest absolute gap for rates of chronic absence (24pp) and rates of teenage parenthood (17pp). Looking at trends, elevated blood lead levels (-96% for 1991-2016), juvenile arrest rates (-72% for 1995-2019), grade retention rates (-55% for 1994-2010) and annual rates of teenage parenthood (-81% for 1991-2022) have declined sharply in recent years. Unfortunately, the prevalence and racial disparity in low birthweight has stubbornly persisted with little change (+3%) for several decades (1980-2016). Lastly, sparked by the COVID pandemic in 2020, rates of chronic school absence have risen dramatically, increasing +77% since 2015-16.

High Prevalence Milestones

Milestones showing relatively large prevalence levels (65% or more) and substantial disparities include not attending preschool, below proficiency in reading and math test scores in late elementary through high school, low high school G.P.A.s, and high rates of suspensions. These milestones are shown to be strong predictors of high school graduation, 4-year college enrollment, and college graduation. Not proficient in math (26pp-33pp) and reading (22pp-25pp), low high school GPAs (32pp), and suspensions (28pp) demonstrate some of the largest racial disparities of all education mobility milestones. In terms of trends, prevalence rates for most of these milestones have improved in recent years. Suspension rates have declined moderately (-24% from 2009-10 to 2017-18) while lack of reading proficiency (-3% to -6% from 2000 to 2022) and math proficiency (-4 to -11% from 2000 to 2022) have declined only modestly. Never attending pre-k appears to have worsened (+17% for 2010-2018) while trends for low high school G.P.A. by race could not be determined from the existing literature.

Unclear Prevalence Milestones

Externalizing behavior at kindergarten entry or in middle childhood are shown to predict high school graduation. However, their current prevalence levels could not be determined from the existing literature.

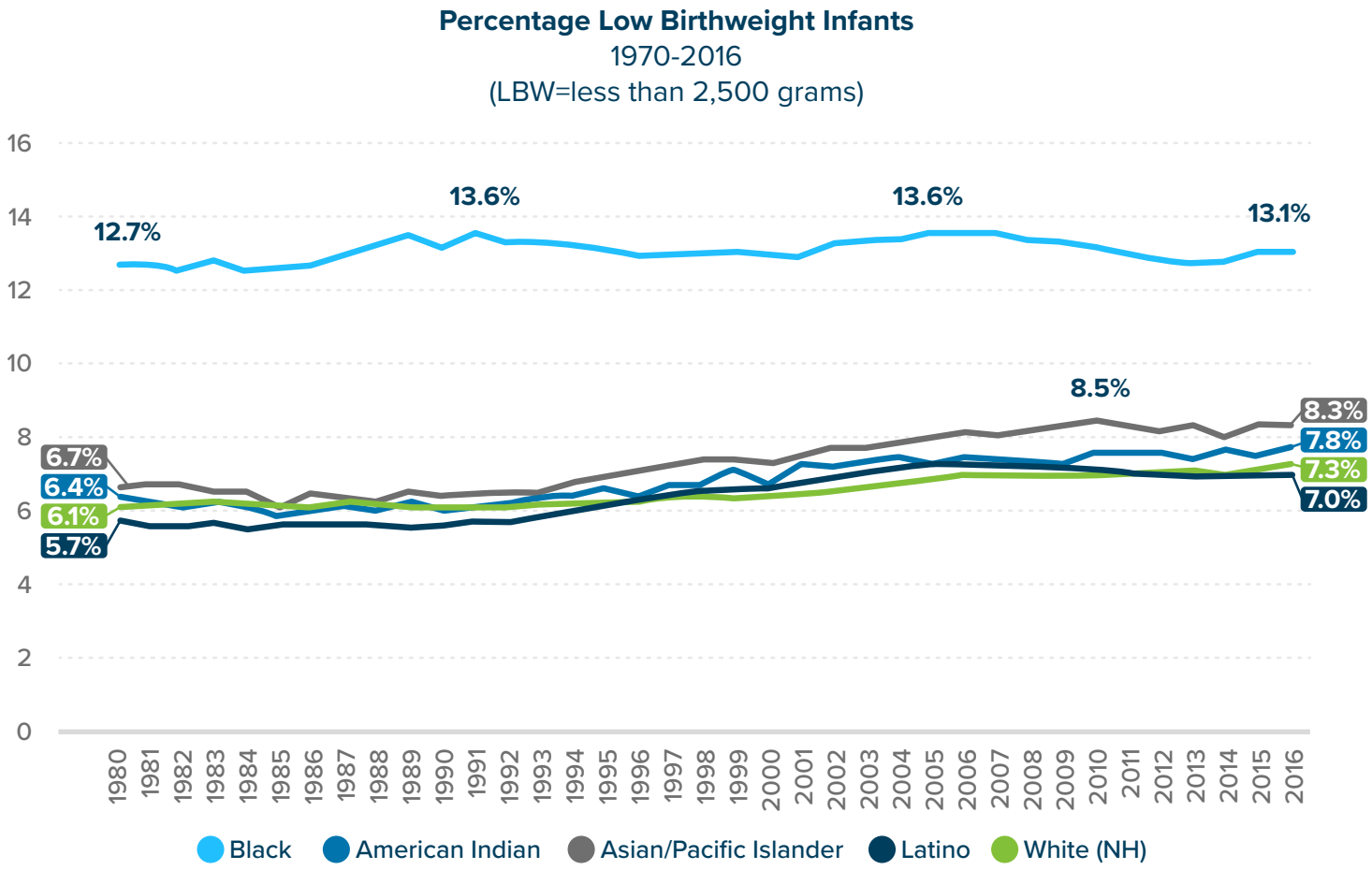
Low Birthweight

Low birthweight has been shown to have a small causal effect on total years of schooling attained, but a much larger effect on the risk of dropping out of high school.

Studies from multiple countries have found that birthweight affects long-term educational outcomes, although studies from the United States are relatively rare.[22] One U.S. study (Royer, 2009), examined birth record data for 3,400 pairs of female twins born in California between 1989 and 2002. They found that a one-kilogram increase in birth weight was associated with close to 1/6th of a school year increase in completed years of schooling.[23] Similarly, Johnson and Schoeni (2011) who studied a nationally representative sample (PSID) of individuals born 1951 to 1976, found a 32% increase in the risk of dropping out of high school for low birthweight children compared to normal birthweight children.[24]

Racial Gaps: Data from 2022 reveals a considerable disparity in the risk of low birthweight between Black (14.8%), American Indian (8.8%), Asian (9.4%), Pacific Islander (8.5%), Latino (7.9%), and White (7.1%) infants.[25] Figure 1 depicts the longstanding racial gaps in low birthweight risk. It shows that Black infants have had roughly twice the likelihood of low birthweight as White infants over the past 4 decades. In fact, rates of low birthweight have either worsened or stayed the same since the 1980s, depending on the racial group considered.

Figure 1. Percentage Low Birthweight Infants, 1980-2016



SOURCE: NCHS, National Vital Statistics System, public-use Birth File. Martin JA, Hamilton BE, Osterman MJK, Driscoll AK, Drake P. *Births: Final data for 2016*. National Vital Statistics Reports; vol 67 no 1. Hyattsville, MD: National Center for Health Statistics. 2018. Available from: https://www.cdc.gov/nchs/data/nvsr/nvsr67/nvsr67_01.pdf. See Appendix I, National Vital Statistics System (NVSS).

22 Prinz, D., Chernew, M., Cutler, D., & Frakt, A. (2018). *Health and economic activity over the lifecycle: Literature review. (NBER Working Paper 24865)*, doi: 10.3386/w24865

23 Royer, H. (2009). Separated at girth: US twin estimates of the effects of birth weight. *American Economic Journal: Applied Economics*, 1(1), 49-85.

24 Johnson, R. C., & Schoeni, R. F. (2011). The influence of early-life events on human capital, health status, and labor market outcomes over the life course. *The BE journal of economic analysis & policy,* 11(3).

25 Osterman, M. J., Hamilton, B. E., Martin, J. A., Driscoll, A. K., & Valenzuela, C. P. (2024). *Births: Final Data for 2022*. National Vital Statistics Reports: From the Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System, 73(2), 1-56.

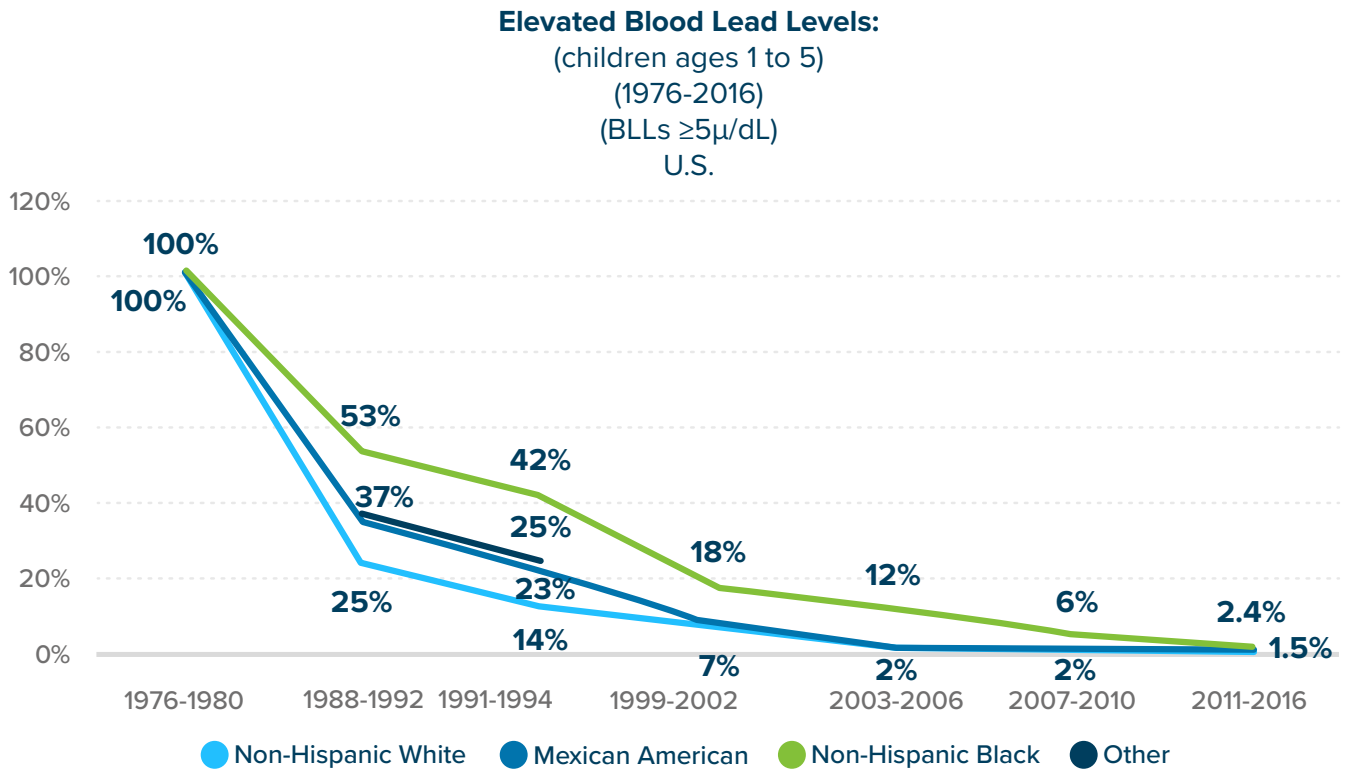
Elevated Blood Lead Levels (early childhood)

Elevated levels of lead in the blood of young children is associated with reduced high school graduation and college completion.

Lead in the blood of children is associated with a host of negative developmental, health, and behavioral outcomes.[26] In a quasi-experimental analysis of data from Cleveland, Ohio, Coulton et al (2023) found that blood lead levels at or above 5 µg/dL measured in children ages 5 or younger in 2012, led to significant negative effects on educational outcomes. Specifically, elevated lead levels reduced high school graduation rates by 18% and college attendance between the ages of 18 and 23 by 18%.[27]

Racial Gaps: Rates of elevated blood lead levels in children have notably declined over the past 40 years (see Figure 2). In 2011-16, the percentage of children under the age of 5 with elevated blood levels was 2.4% for Blacks, 1.5% for non-Hispanic Whites, and .3% for Mexican Americans, suggesting that blood lead levels may be less important for long-term outcomes for children born today than in the past. However, relatively large shares of children born in the 1990s or earlier had elevated blood lead levels with sharp racial disparities. For example, almost all of the more than 15 million children born in the late 1970s had elevated blood lead levels. One recent study estimated that almost half of the U.S. population alive today was exposed to adverse lead levels in early childhood.[28] Thus, while lead exposure has fallen substantially for those born after 2000, a large share of young adults today was exposed to harmful lead levels in childhood.

Figure 2. Elevated Blood Lead Levels among Children ages 5 and under, 1976-2016



SOURCE: Egan, K. B., Cornwell, C. R., Courtney, J. G., & Ettinger, A. S. (2021). Blood lead levels in US children ages 1–11 years, 1976–2016. *Environmental health perspectives*, 129(3), 037003.

26 Muller, C., Sampson, R. J., & Winter, A. S. (2018). Environmental inequality: the social causes and consequences of lead exposure. *Annual Review of Sociology,* 44(1), 263-282.
27 Coulton, C., Richter, F. G. C., Cho, Y., Park, J., Jeon, J., & Fischer, R. L. (2023). Making the case for lead safe housing: Downstream effects of lead exposure on outcomes for children and youth. *Health & Place,* 84, 103118
28 McFarland, M. J., Hauer, M. E., & Reuben, A. (2022). Half of US population exposed to adverse lead levels in early childhood. *Proceedings of the National Academy of Sciences*, 119(11), e2118631119.

Attends High-Quality Preschool

Attending high-quality preschool has been shown to cause significant increases in rates of high school graduation, college enrollment, and college completion. However, there are large racial/ethnic disparities in access to high-quality preschools.

Several long-term studies have pointed to the beneficial effects of preschool programs on educational attainment, including the Carolina Abecedarian program, the High-Scope Perry Preschool Project, and Chicago's Child-Parent Centers.[29] More recent studies of pre-K programs in Boston and Tulsa show similar findings.

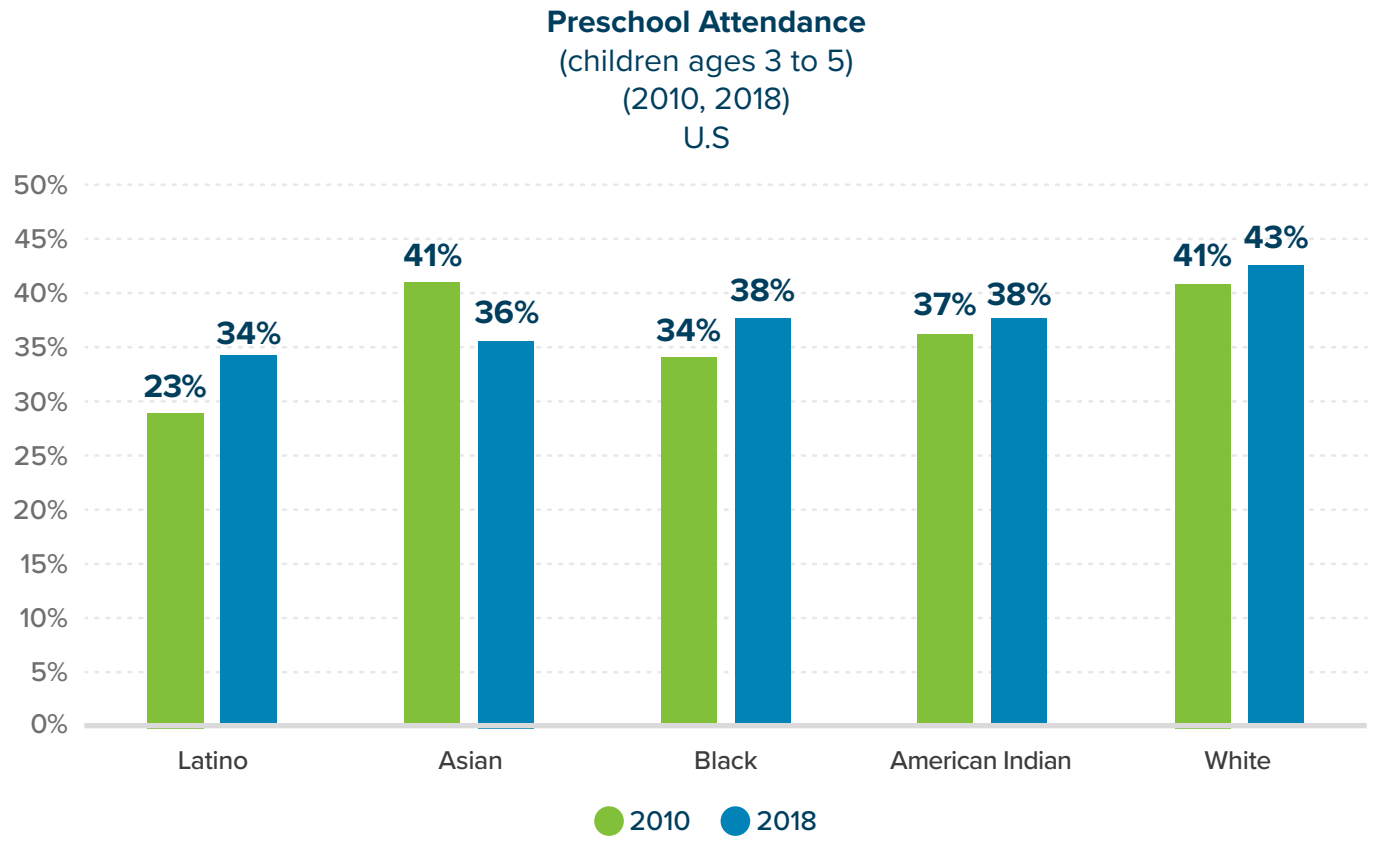
Gray Lobe et al. (2021) studied Boston's universal preschool programs to assess their effects on long-term educational outcomes. They used data for 4,000 four-year-old lottery applicants to the city's public preschools between 1997 and 2003 and then matched that data with postsecondary records from the National Student Clearinghouse. They found that preschool attendance increased on-time high school graduation rates by 6 percentage points (69.6% vs 63.6%), on-time college enrollment by 8 percentage points (54.2% vs 45.9%), and ever attending a four-year college by 5.9 percentage points (56.5% vs. 50.6%). Effects did not vary by race and were generally larger for boys. Although both boys and girls showed an increase in on-time college enrollment, only boys saw improvements in juvenile incarceration, high school graduation, SAT-taking, and college graduation.[30]

Gormley et al (2023) applied a quasi-experimental analysis to data for a cohort of approximately 4,000 Tulsa kindergarten students in 2006 to assess the relationship between pre-K enrollment and subsequent college enrollment. They found that participants in Tulsa's universal pre-K program or the Tulsa Community Action Project (CAP) Head Start program had 12-percentage point and 7.5 percentage point higher likelihoods of enrolling in college. Furthermore, enrollment in Tulsa's Pre-K program significantly predicted 4-year college enrollment for Black and Latino students.[31]

Racial Gaps: Nationally, in 2018, Black (38%), American Indian (38%), and Latino (34%) children ages 3 to 5 were less likely to attend preschool than White children (43%).[32] See Figure 3. These figures represent modest increases compared to 2010 for all groups except Asian, who saw a decline during this period.

29 Cascio, E. (2021) Early Childhood Education in the United States: What, When, Where, Who, How, and Why. *(NBER Working Paper 28722)*, doi: 0.3386/w28722
30 Gray-Lobe, G. Pathak, P. A., and Walters C. R. (2021) "The Long-Term Effects of Universal Preschool in Boston," *NBER Working Paper* No. 28756
31 Gormley Jr, W. T., Amadon, S., Magnuson, K., Claessens, A., & Hummel-Price, D. (2023). Universal Pre-K and College Enrollment: Is there a Link? *AERA Open,* 9, 23328584221147893.
32 Hussar, B., Zhang, J., Hein, S., Wang, K., Roberts, A., Cui, J., ... & Dilig, R. (2020). *The Condition of Education 2020.* NCES 2020-144. National Center for Education Statistics.

Figure 3. Preschool Attendance for children ages 3-5, 2010 and 2018



SOURCE: Aud, S., Hussar, W., Johnson, F., Kena, G., Roth, E., Manning, E., ... & Zhang, J. (2012). *The Condition of Education 2012*. NCES 2012-045. National Center for Education Statistics; Hussar, B., Zhang, J., Hein, S., Wang, K., Roberts, A., Cui, J., ... & Dilig, R. (2020). *The Condition of Education 2020*. NCES 2020-144. National Center for Education Statistics.

Furthermore, the quality of preschool education in the United States exhibits significant variation across racial and ethnic groups. Valentino (2018) explored disparities in pre-K classroom quality by examining 647 randomly selected classrooms across 11 states with substantial investments in public pre-K programs between 2001 and 2004. Her findings revealed a Black-White gap of .66 standard deviations and a Latino-White gap of .37 standard deviations in classroom quality, as measured by the Classroom Assessment Scoring System (CLASS).[33] Local studies have corroborated these findings of racial disparities in access to high-quality preschool education. For instance, an analysis of Boston's universal pre-K program from 2012 to 2017 identified pronounced racial disparities in access to high-quality preschools. Black and Latino students were 17 and 15 percentage points less likely, respectively, to attend one of Boston's higher-quality preschools, a discrepancy partly attributed to geographical proximity to these institutions.[34] Similarly, research on New York City's universal pre-K program highlighted substantial racial and ethnic disparities in access to higher-quality public preschool programs.[35]

33 Valentino, R. (2018). Will public pre-K really close achievement gaps? Gaps in prekindergarten quality between students and across states. American *Educational Research Journal*, 55(1), 79-116.
34 McCormick, M., Pralica, M., Hsueh, J., Weiland, C., Weissman, A. K., Shapiro, A., ... & Sachs, J. (2023). Going the Distance: Disparities in Pre-K Enrollment in Higher-Quality Schools by Geographic Proximity, Race/Ethnicity, Family Income, and Home Language. *AERA Open*, 9
35 Latham, S., Corcoran, S. P., Sattin-Bajaj, C., & Jennings, J. L. (2021). Racial disparities in pre-k quality: Evidence from New York City's universal pre-k program. *Educational Researcher,* 50(9), 607-617.

Kindergarten Ready: Socioemotional Development at Kindergarten Entry

Problems with attention and externalizing behavior at kindergarten entry are associated with reductions in high school graduation and years of schooling completed.

Rabiner et al. (2016), using a sample of 386 kindergarteners recruited in 1991 as part of the Fast-Track longitudinal study, found that kindergarteners with one standard deviation higher levels of attention difficulties were 40% less likely to graduate from high school.[36] Owens (2016), using a nationally representative sample (NLSYCYA) of individuals born 1979 to 2012, found that gender gaps in the levels and effects of behavior problems at ages 4 and 5 help explain gender gaps in years of schooling completed by ages 26 to 29. Specifically, she found that controlling for other early childhood factors, externalizing problems accounted for 60 percent of the .75-year gender gap in educational attainment between boys and girls when they reached adulthood.[37]

Racial Gaps: Current data on the overall prevalence of attention and externalizing problems among kindergarteners is not regularly available on a national basis. Most research studies are reliant on data from the Early Childhood Longitudinal Study, Kindergarten (ECLS-K). For example, Morgan et al (2016) used ECLS-K data for kindergarteners in 1998-99 and found that the combined prevalence of attention and externalizing behavior problems among kindergarteners is 3.8%.[38] Racial disparities in kindergarten externalizing behavior have been found by Reardon and Portilla (2016) using nationally representative data for 2010. They found that the Black-White disparity in teacher-reported externalizing behavior among kindergarteners was .28 standard deviations. There was no similar gap for Latinos compared to Whites.[39]

Middle Childhood Math & Reading Test Scores

Persistent math and reading problems during middle childhood are associated with significant reductions in the likelihood of high school graduation and college enrollment.

Math and reading competencies assessed in middle childhood have been linked to high school graduation and college enrollment. Duncan and Magnuson (2011) found in a national sample of kindergarteners from 1998-99 (ECLS-K) with statistical controls for several child and family variables, that persistent math achievement problems between ages 6 and 10 were associated with a 13-percentage point drop in the probability of high school graduation.[40] Moreover, a study by Magnuson et al. (2016) using a quasi-experimental analysis with a nationally representative cohort of children born 1978 to 1992 (NLSYCYA) found that consistently poor reading achievement between the ages of 5 and 12 reduced the odds of high school graduation by 21%.[41]

Racial Gaps: There are notable racial disparities in math and reading proficiency during middle childhood. In the early 2000s, the Black-White gap in these proficiencies in the 5th grade was .43 and .56 standard deviations for math and reading respectively, while the corresponding Hispanic-White gap was .21 and .23 standard

36 Rabiner, D. L., Godwin, J., & Dodge, K. A. (2016). Predicting Academic Achievement and Attainment: The Contribution of Early Academic Skills, Attention Difficulties, and Social Competence. *School Psychology Review*, 45(2), 250–267. doi:10.17105/spr45-2.250-267

37 Owens, J. (2016). Early Childhood Behavior Problems and the Gender Gap in Educational Attainment in the United States. *Sociology of Education*, 89(3), 236–258.

38 Morgan, P. L., Li, H., Cook, M., Farkas, G., Hillemeier, M. M., & Lin, Y. C. (2016). Which kindergarten children are at greatest risk for attention-deficit/hyperactivity and conduct disorder symptomatology as adolescents?. *School Psychology Quarterly*, 31(1), 58; Table 1, page 41

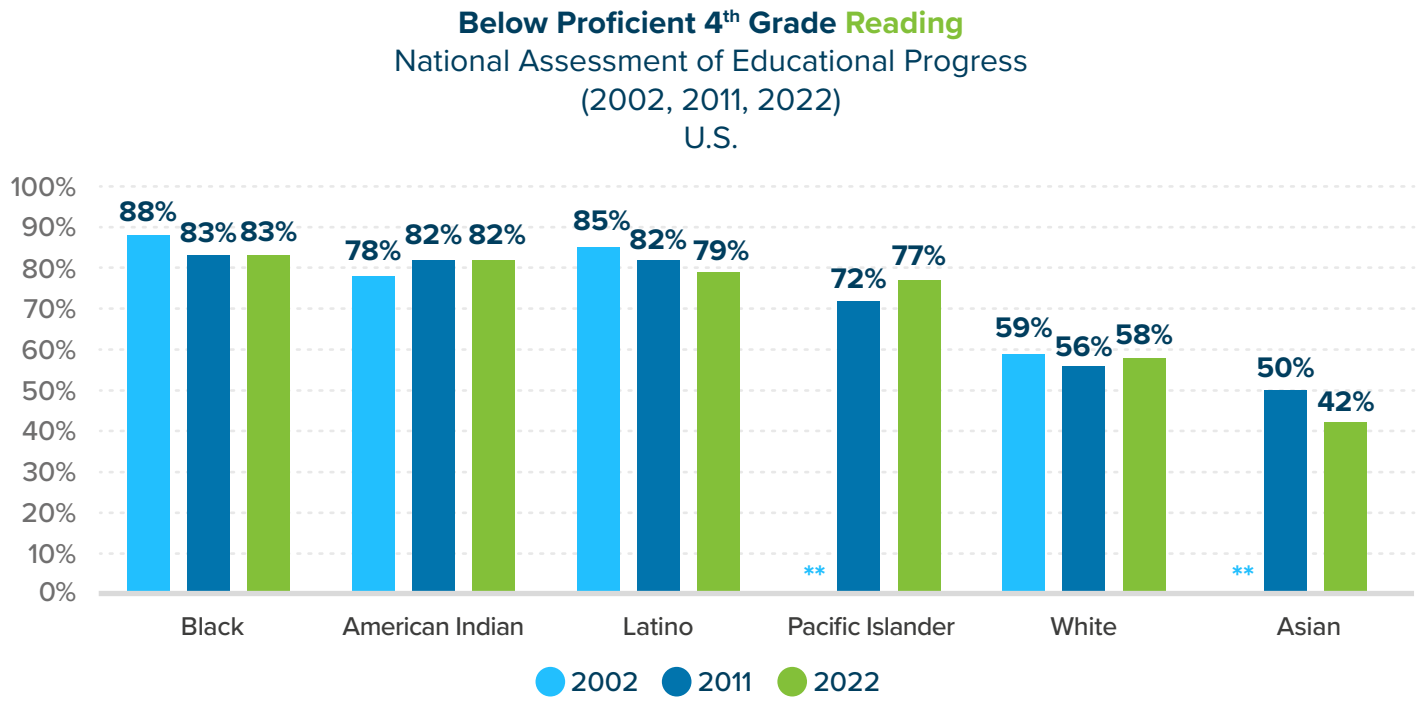
39 Reardon SF, Portilla XA. Recent Trends in Income, Racial, and Ethnic School Readiness Gaps at Kindergarten Entry. *AERA Open*. July 2016.

40 Duncan and Magnuson (2011) "Online Appendix to Chapter 3: The Nature and Impact of Early Achievement Skills, Attention Skills and Behavior Problems," (2011) in Duncan, G. J., & Murnane, R. J. (Eds.) *Whither Opportunity?: Rising Inequality, Schools, and Children's Life Chances*. Russell Sage Foundation.

41 Magnuson, K., Duncan, G., Lee, K. T., & Metzger, M. (2016). Early School Adjustment and Educational Attainment. *American educational research journal*, 53(4), 1198–1228. https://doi.org/10.3102/0002831216634658

deviations.[42] To further simplify for intuitive comparison, Figures 4 and 5 show disparities in the percentages of 4th graders that were not proficient in math and reading on the National Assessment of Educational Progress (NAEP) over the past two decades. Blacks (83% and 85%) had the highest rates of non-proficiency in reading and math respectively followed by American Indians (82% and 78%), Latinos (79% and 78%), Whites (58% and 52%), and Asians (42% and 37%). However, Bond and Lang (2013) and Bond and Lang (2018) have found that much of the apparent Black-White test score gap in elementary school reflects test score scaling decisions by researchers or socioeconomic differences between Black and White students.[43]

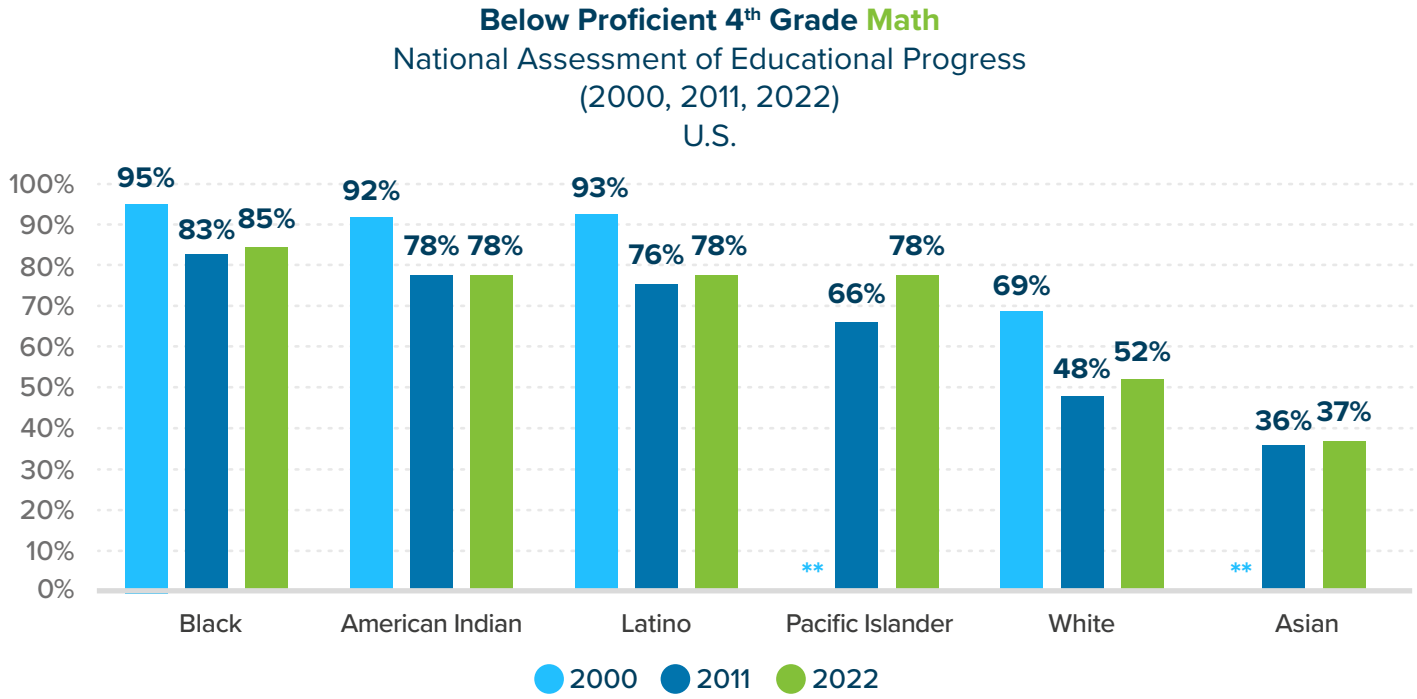
Figure 4. Below Proficient in 4th Grade Reading by Race, NAEP



**2011 data was not separately available for Pacific Islanders and Asians
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), various years, 2002–2022 Reading Assessments.

42 Duncan and Magnuson (2011) "Online Appendix to Chapter 3: The Nature and Impact of Early Achievement Skills, Attention Skills and Behavior Problems," (2011) in Duncan, G. J., & Murnane, R. J. (Eds.) *Whither Opportunity?: Rising Inequality, Schools, and Children's Life Chances.* Russell Sage Foundation.
43 Bond, T. N., & Lang, K. (2013). The evolution of the Black-White test score gap in Grades K–3: The fragility of results. *Review of Economics and Statistics*, 95(5), 1468-1479; Bond, T. N., & Lang, K. (2018). The black–white education scaled test-score gap in grades k-7. *Journal of Human Resources*, 53(4), 891-917.

Figure 5. Below Proficient in 4th Grade Math by Race, NAEP



**2011 data was not separately available for Pacific Islanders and Asians
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), various years, 2000–2022 Mathematics Assessments.

Externalizing Behavior

Externalizing behavior during adolescence, especially persistent antisocial behavior, is a strong negative predictor of high school graduation.

Childhood externalizing behaviors such as arguing, getting angry, or fighting, have been shown to predict high school graduation rates in national studies. Duncan and Magnuson (2011) analyzed national data from a cohort of kindergarteners from 1998-99 (ECLS-K) and found that a one standard deviation increase in these behaviors between ages 10 and 14 was associated with a 5 to 10 percentage point decrease in high school graduation.[44] Notably, persistent antisocial behavior between ages 6 and 10 corresponded to a 16-percentage point drop in high school completion, with more pronounced effects for boys.

Racial Gaps: National studies have found that racial disparities in externalizing behavior are evident starting in the early grades and continue to grow into middle childhood. One study found that the gap in externalizing behavior between Black and White 5th graders in 2003-2004 was .37 standard deviations. There was no corresponding Latino-White disparity.[45]

44 Duncan and Magnuson (2011) "Online Appendix to Chapter 3: The Nature and Impact of Early Achievement Skills, Attention Skills and Behavior Problems," (2011) in Duncan, G. J., & Murnane, R. J. (Eds.) Whither Opportunity?: Rising Inequality, Schools, and Children's Life Chances. Russell Sage Foundation.
45 Ibid

School Absences

School absences are strongly negatively associated with high school graduation, with some research showing a modest causal relationship.

Evidence from nationally representative data (Add Health) shows that the number of unexcused school day absences in adolescence predicts lower educational attainment.[46] A high rate of school absenteeism is a reliable predictor of high school graduation and college enrollment. Local studies from Chicago and California further bear out these findings. Smerillo et al. (2018), utilizing data from cohort of Chicago kindergarteners (CLS) starting in 1985, discovered that missing 14 or more school days in grades 4 through 6 led to an 18-percentage point decline in on-time high school graduation.[47] Liu and Gershenson (2021) provide evidence of a modest causal impact of absences in middle and high school on high school graduation and college enrollment.[48] They analyzed class-level administrative attendance data for 70,000 students in a large California urban school district from 2002-2013 and determined that ten total absences in 9th grade decreased the chances of on-time high school graduation and college enrollment by 2%. Further research has found that not all school absences are equally harmful. Skipping school and other unexcused absences are the most predictive type of absences for high school graduation and postsecondary enrollment. Liu et al (2025) used detailed administrative data for two cohorts of 9th graders in 2015 and 2016 drawn from a large urban school district in California to study the relationship between educational attainment and school absences, suspensions and measures of self-reported socioemotional learning constructs that included self-efficacy, self-management, growth mindset, and social awareness.[49] They found that school absences were far stronger predictors of high school graduation and college enrollment than the survey-reported SEL constructs. Among absences, the strongest predictor for on-time high school graduation or enrolling in college immediately after graduating high school was "part-day absences," or skipping classes. Full-day absences were the second strongest predictor, though much less so (about half as strong) for immediate college attendance. It should be noted that the relationship between school absences and high school dropout identified in all studies in this section used data that predates the sharp increase in chronic absence brought on by the 2020 pandemic.

Racial Gaps: Prior to the start of the COVID pandemic in 2020, the most recent nationwide data on school absence rates were from the Civil Rights Data Collection at the U.S. Department of Education. Data for the 2015-16 school year reveals that 26% of American Indian, 21% of Black, and 17% of Latino students missed 15 or more school days in that year compared to 14.5% of White and 8.6% of Asian students.[50] More recent data in Figure 6 shows that the 2020 COVID pandemic led to startling increases in rates of chronic absence. Data from the 2022-23 school year shows that chronic absences affected nearly half of American Indian and Pacific Islander students and roughly a third of Black and Latino students. This compared to about 1 in 5 White students.[51]

46 Cardwell, S. M., & Tillyer, M. S. (2024). Demographic variation in truancy in adolescence and its effects on educational attainment and income in early adulthood. *Journal of Criminology*

47 Smerillo, N. E., Reynolds, A. J., Temple, J. A., & Ou, S. R. (2018). Chronic absence, eighth-grade achievement, and high school attainment in the Chicago Longitudinal Study. *Journal of school psychology*, 67, 163–178. https://doi.org/10.1016/j.jsp.2017.11.001

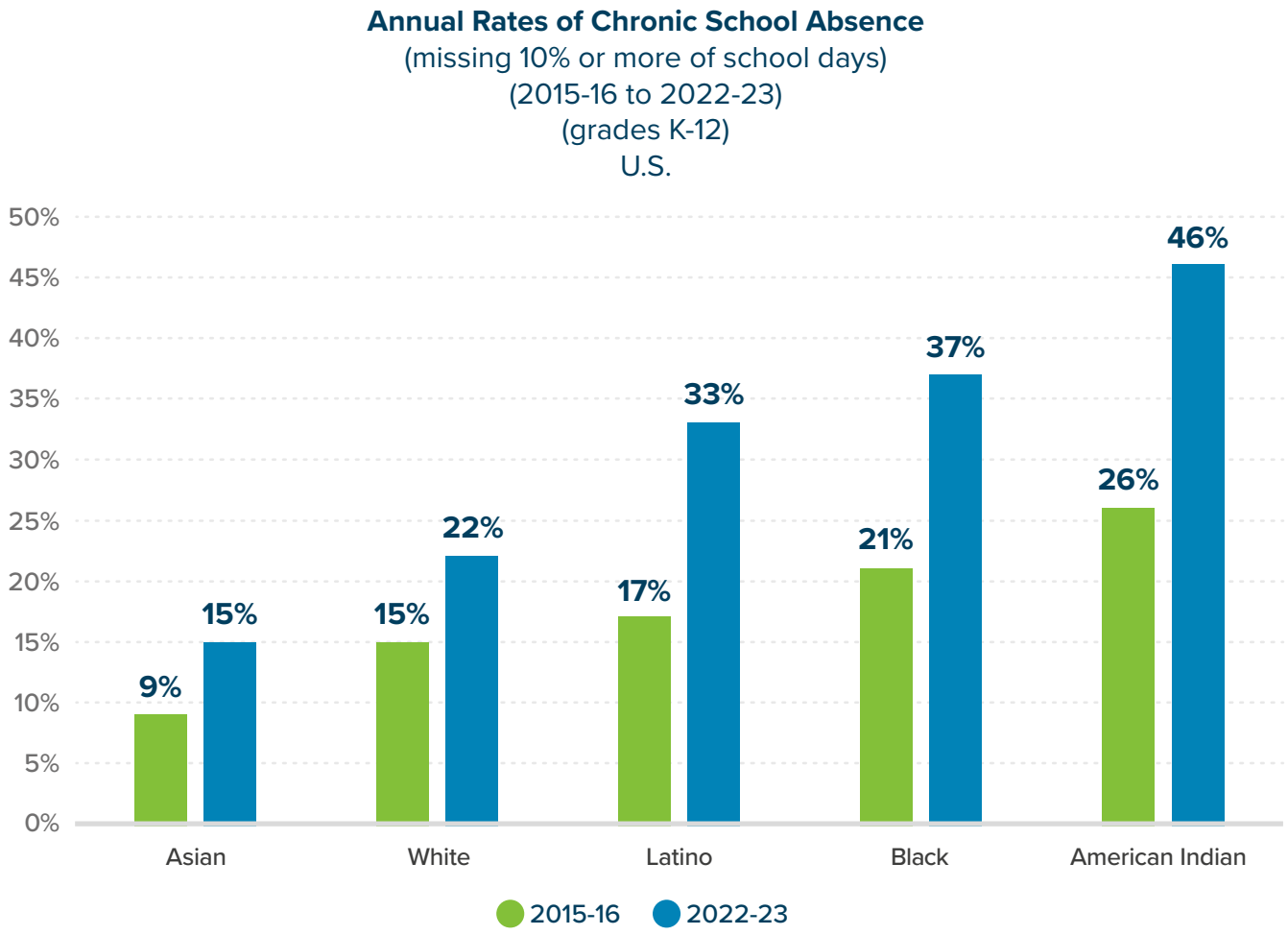
48 Liu, J., Lee, M., & Gershenson, S. (2021). The Short- and Long-Run Impacts of Secondary School Absences. *Journal of Public Economics* 199, 10441. Doi:10.26300/xg6s-z169.

49 Liu, J., Kuhfeld, M., & Lee, M. (2025). Noncognitive Factors and Student Long-Run Success: Comparing the Predictive Validity of Observable Academic Behaviors and Social-Emotional Skills. *Educational Policy*, 39(1), 131-169.

50 U.S. Department of Education. *Chronic Absenteeism in the Nation's Schools*. Civil Rights Data Collection (2015-2016); https://www2.ed.gov/datastory/chronicabsenteeism.html#intro

51 US Department of Education. Retrieved on December 21, 2024 from https://www.ed.gov/chronic-absenteeism#:~:text=The%20U.S.%20rate%20of%20chronic,schools%20and%20communities%20increase%20attendance.

Figure 6. Annual Chronic Absence Rates by Race, 2015-16 to 2022-23



SOURCE: US Department of Education. Retrieved on December 21, 2024 from https://www.ed.gov/chronic-absenteeism#:~:text=The%20U.S.%20rate%20of%20chronic,schools%20and%20communities%20increase%20attendance; U.S. Department of Education, Office for Civil Rights, Civil Rights Data Collection, 2015-16, available at https://ocrdata.ed.gov.

Grade Retention

Growing evidence indicates that grade retention is strongly associated with reduced high school graduation, especially for youth retained in the 6th grade or higher.

Many school districts retain or hold back low-achieving students in grades to provide another chance for them to acquire needed academic skills. However, growing evidence suggests that grade retention is a potential cause of reduced high school graduation, especially for young adolescent students.[52]

Jacob et al. (2009) used a quasi-experimental design with administrative data from Chicago public schools (years 1997-1999), where performance on standardized tests were used to determine eligibility for being retained in a grade. They found that 8th-grade retention led to a 14% reduction in high school graduation, while 6th-grade retention showed no impact.[53] In a similar study, Mariano et al. (2018) analyzed 2004-2016 data from

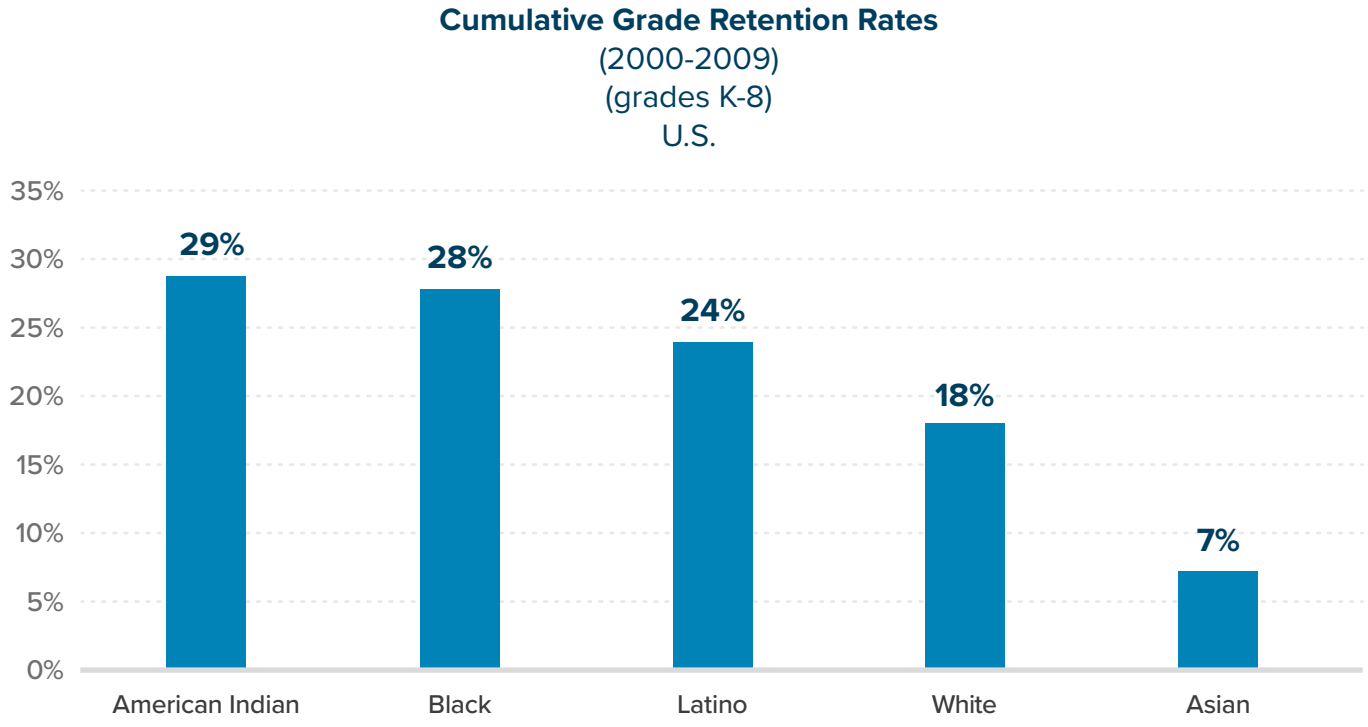
52 Valbuena, J., Mediavilla, M., Choi, Á., & Gil, M. (2021). Effects of grade retention policies: A literature review of empirical studies applying causal inference. *Journal of Economic Surveys*, 35(2), 408-451.
53 Jacob, B. A., & Lefgren, L. (2009). The Effect of Grade Retention on High School Completion. *American Economic Journal: Applied Economics*, 1(3), 33–58. http://www.jstor.org/stable/25760170

New York City public schools and found that grade retention in elementary school had no negative effects. However, 7th and 8th-grade retention were associated with a 30% increase in dropout rates.[54]

Lastly, a recent study by Giano et al (2022) employed a national cohort of 9th graders in 2009 (HSLS:09) to explore which grades between kindergarten and 8th grade most prominently correlated with dropout rates and how these patterns varied by both gender and race.[55] The study yielded three important findings: First, students repeating 6th or 7th grades faced the highest odds of dropping out of high school, with a seven-fold increase for 6th graders (OR = 7.08) and four-and-a-half times increase for 7th graders (OR = 4.54). Second, distinct gender patterns emerged in both the risk of retention and the relationship between retention and dropout. Boys repeated grades at a rate of 22%, compared to 16% for girls. For girls in elementary school, retention in the first (OR = 2.40) or fourth grades (OR = 4.04) increased dropout risk, while 3rd-grade retention doubled the risk for boys (OR = 2.18). In middle school, girls who repeated the seventh grade faced a risk of dropping out that was seven times greater (OR = 7.12) than for those not retained. In comparison, boys who repeated the same grade had a threefold increase in dropout likelihood (OR = 3.35). Third, distinct racial/ethnic patterns emerged in the relationship between retention and dropouts. Retention in the 7th grade was the only significant period linked to dropout rates for Hispanic students (OR = 5.66) while Black youth were more likely to drop out if retained during both the 6th (OR = 10.62) or 7th grades (OR = 5.46). In contrast, White youth faced a greater risk of dropping out if retained in any grade, but with much larger risks in the 6th (OR = 10.70) and 7th grades (OR = 5.40).

Racial Gaps: Using nationally representative data, Giano et al (2022) provide estimates of racial gaps in grade retention for children in kindergarten through the 8th grade. They found that more than a quarter of American Indian, Black, and Latino students were retained in a grade prior to the 8th grade compared to 18% and 7.2% of White and Asian students (see Figure 7).[56]

Figure 7. Cumulative Rates of Grade Retention between Kindergarten and 8th Grade, 2000-2009

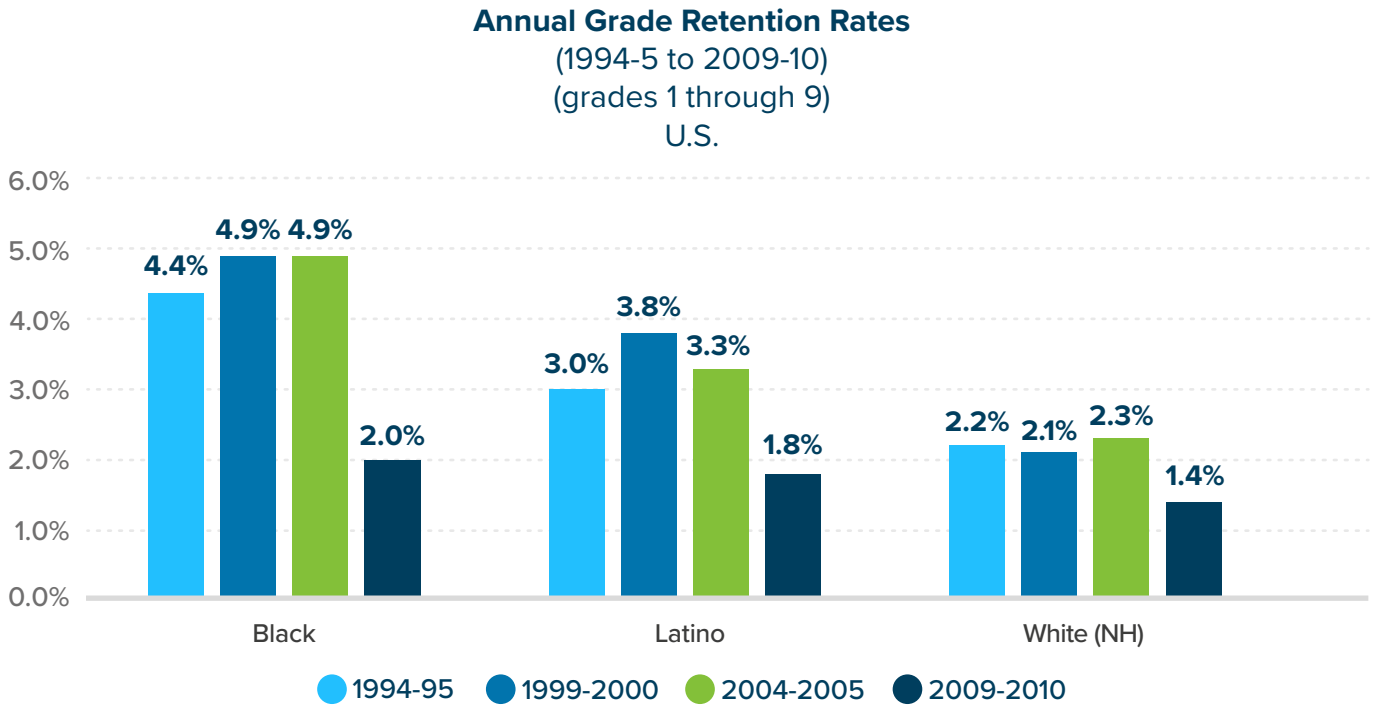


SOURCE: NCES High School Longitudinal Study of 2009 (HSLS:09) as reported in Giano, Z., Williams, A. L., & Becnel, J. N. (2022). Grade retention and school dropout: comparing specific grade levels across childhood and early adolescence. *The Journal of Early Adolescence*, 42(1), 33-57.

54 Mariano, L. T., Martorell, P. and Berglund, T. (2018). *The Effects of Grade Retention on High School Outcomes: Evidence from New York City Schools* (RAND Corporation Working Paper WR-1259-DEIES). https://www.rand.org/pubs/working_papers/WR1259.html
55 Data came from the NCES High School Longitudinal Study of 2009 (HSLS:09); Giano, Z., Williams, A. L., & Becnel, J. N. (2022). Grade retention and school dropout: comparing specific grade levels across childhood and early adolescence. *The Journal of Early Adolescence*, 42(1), 33-57.
56 Ibid

Figure 8 shows that annual retention rates for grades 1 through 9 declined substantially after 2005. Rates for Black children declined by 55% between 1994-95 and 2009-10, while rates for Latino and White children declined by 40% and 36% respectively during this period.

Figure 8. Annual Grade Retention Rates, Grades 1 through 9: 1994 to 2009-10



SOURCE: Warren, J. R., Hoffman, E., & Andrew, M. (2014). Patterns and trends in grade retention rates in the United States, 1995–2010. *Educational Researcher,* 43(9), 433-443, Table 3

School Suspensions

Studies show that suspensions plausibly cause reductions in high school graduation, college enrollment, and college graduation.

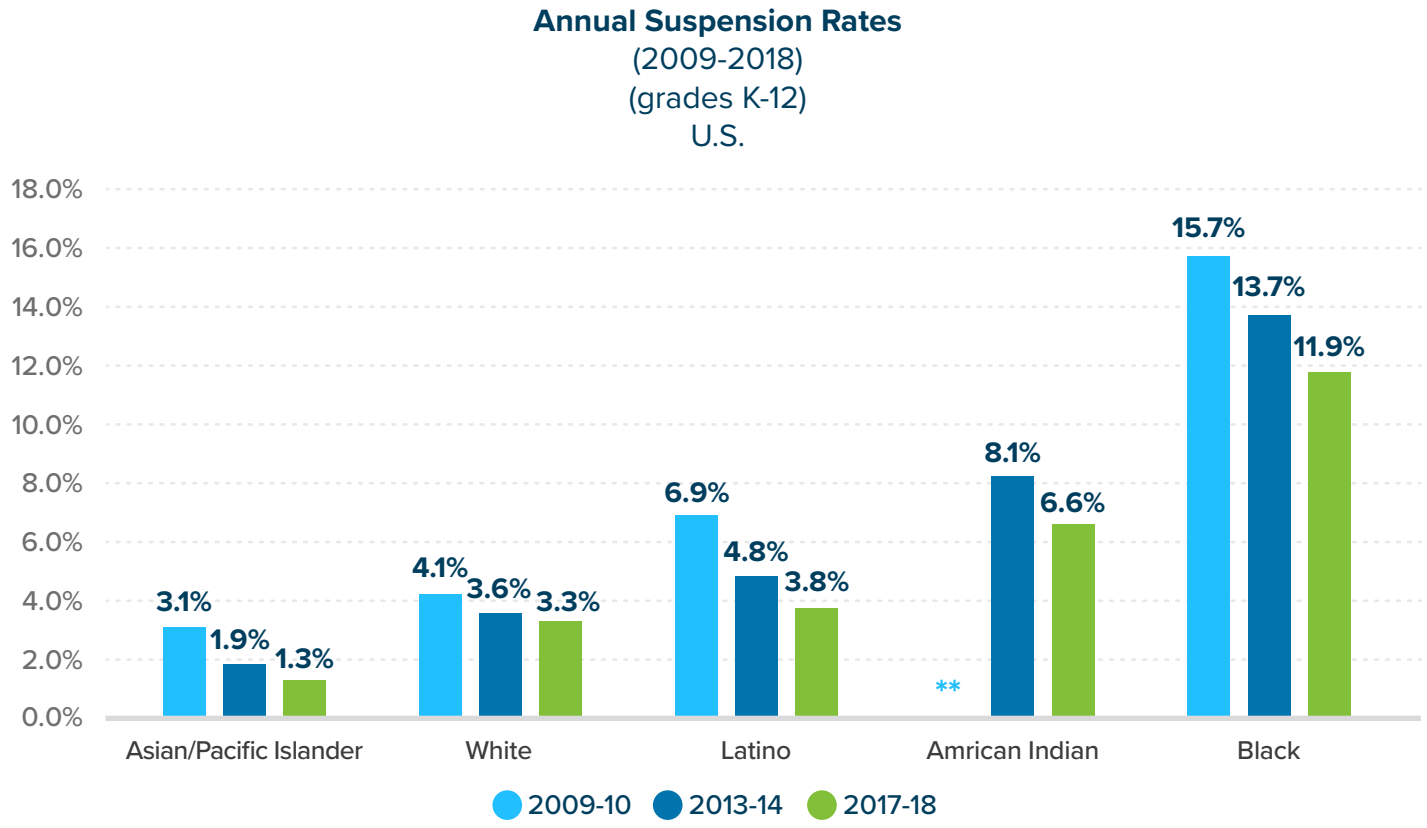
The negative relationship between school suspensions and long-term educational outcomes, especially high school graduation, has been well-documented in the research literature.[57] More recent studies have provided evidence for a causal interpretation of this relationship. Using nationally representative data, two quasi-experimental studies have shown suspensions to affect both high school graduation and college completion. The first study, by Rumberger and Losen (2016), tapped into data from the Education Longitudinal Study of 2002, tracking a nationally representative cohort of high school sophomores from 2002 to 2012. The authors found, after controlling for various family factors, that receiving one or more school suspensions led to a 12-percentage point drop in high school graduation rates (80% vs. 68%).[58] In separate analyses, they also found a 13-percentage point drop for suspended students in California (79% vs. 66%) and a 7-percentage point decline for similar students in Florida (51% vs. 44%). In a subsequent study, Rosenbaum (2020) employed data from the National Longitudinal Study of Adolescent and Adult Health (Add Health) which tracks a sample of middle and

57 Noltemeyer, A. L., Ward, R. M., & Mcloughlin, C. (2015). Relationship between school suspension and student outcomes: A meta-analysis. *School Psychology Review*, 44(2), 224-240.
58 Rumberger, R. and Losen, D. (2016) *The High Cost of Harsh Discipline and its Disparate Impact*, The Center for Civil Rights Remedies. https://www.civilrightsproject.ucla.edu/resources/projects/center-for-civil-rights-remedies/school-to-prison-folder/federal-reports/the-high-cost-of-harsh-discipline-and-its-disparate-impact

high school students beginning in 1995. After controlling for 60 potentially confounding factors, they found that suspension resulted in students being 6% less likely to graduate high school and 24% less likely to earn a 4-year college degree.[59] Among Black youth, suspended youth were 94% less likely to have earned a 4-year college degree than non-suspended youth. In addition, two similar quasi-experimental studies using student data from New York City found that suspensions caused significant reductions in high school graduation rates.[60]

Racial Gaps: National data show large racial disparities in suspension rates. In 2017-2018, annual national suspensions rates were significantly higher for Blacks (11.9%) and American Indians (6.9%) compared to Latinos (3.8%) and Whites (3.3%). McCombs et al (2022) published annual out-of-school suspension rates for the nation covering 1973 to 2018. Select portions of this data displayed in Figure 9 show that annual K-12 suspension rates have declined by -24% for Blacks, -45% for Latinos, and -20% for Whites between the 2009-10 school years and 2017-18. Rates for Native Americans declined by -19% between the 2013-14 and 2017-18 school years. Despite this trend, Black students were roughly 3.5 times as likely to be suspended as White students from 2009 to 2018 while rates for Native American students were about twice as high from 2013-2018. Rates for Latinos were roughly 15- 40% higher than White students from 2009 to 2018.[61]

Figure 9. Annual Suspension Rates by Race (2009-2018)



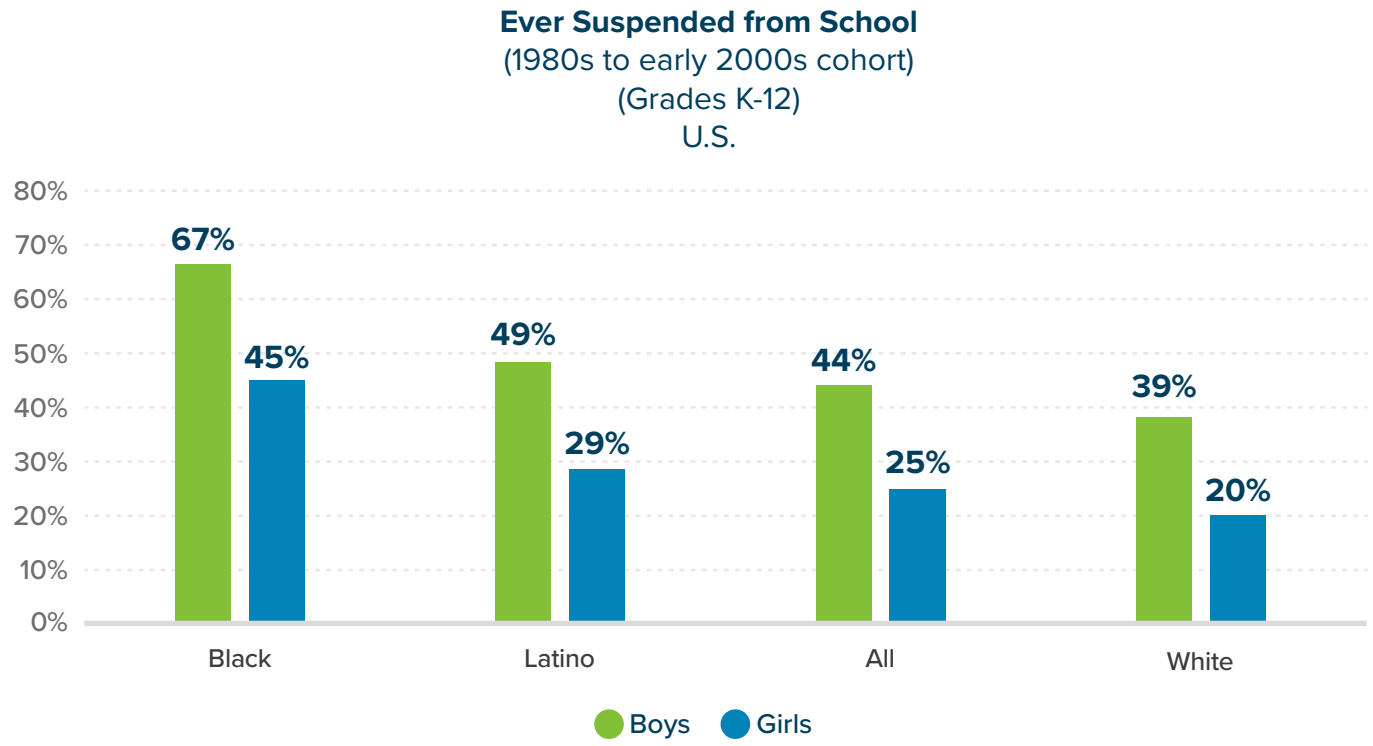
**Data are unavailable for American Indians in 2009-10
SOURCE: McCombs, J., Scott, C., & Losen, D. J. (2022). *Pushed Out: Trends and Disparities in Out-of-School Suspension*. Learning Policy Institute

Annual rates of suspension do not tell us how many students ever receive a suspension throughout primary and secondary schooling. Studies that have examined the cumulative risk of ever having been suspended among

59 Rosenbaum J. E. (2020). Educational and criminal justice outcomes 12 years after school suspension. *Youth & society*, 52(4), 515–547. https://doi.org/10.1177/0044118X17752208
60 Chu, E. M., & Ready, D. D. (2018). Exclusion and urban public high schools: Short-and long-term consequences of school suspensions. *American Journal of Education*, 124(4), 479-509; LiCalsi, C., Osher, D., & Bailey, P. (2021). *An empirical examination of the effects of suspension and suspension severity on behavioral and academic outcomes*. American Institutes for Research, 8.
61 McCombs, J., Scott, C., & Losen, D. J. (2022). *Pushed Out: Trends and Disparities in Out-of-School Suspension*. Learning Policy Institute.

K-12 students paint an even more sobering picture. Analyzing data from the National Longitudinal Survey of Youth (NLSY97), which includes 9,000 adolescents attending secondary school from the mid-1980s through the early 2000s, Shollenberger (2015) found that suspension was both quite prevalent and noticeably racially disparate (see Figure 10).[62] Two-thirds of Black boys (67%) and half of Latino boys (49%) were ever suspended compared to 39% for White boys. Black (45%) and Latina girls (29%) were also more likely to ever have been suspended than White girls (20%).

Figure 10. Ever Suspended from School, Kindergarten to 12th Grade



SOURCE: Shollenberger, T. L. (2015). Racial disparities in school suspension and subsequent outcomes in Losen, D. J. (Ed.). (2014). *Closing the school discipline gap: Equitable remedies for excessive exclusion*. Teachers College Press.

Another study of a more recent national cohort of around 11,000 9th graders in 2009, also found large disparities in the risk of ever having been suspended in grades K through 8.[63] Table 3 shows suspension rates for Black students that are triple those for Whites.

Table 3. Ever Suspended from School, Kindergarten through 8th Grade [9th graders in 2009]

Race	K-8th Grade
Black	24%
Latino	10%
White	7%
Asian	3%

SOURCE: Jabbari, J., & Johnson, O. (2022). The Process of "Pushing Out": Accumulated Disadvantage across School Punishment and Math Achievement Trajectories. *Youth & Society,* 54(6), 911-934.

62 Shollenberger, T. L. (2015). Racial disparities in school suspension and subsequent outcomes in Losen, D. J. (Ed.). (2014). *Closing the school discipline gap: Equitable remedies for excessive exclusion.* Teachers College Press.
63 Jabbari, J., & Johnson, O. (2022). The Process of "Pushing Out": Accumulated Disadvantage across School Punishment and Math Achievement Trajectories. *Youth & Society*, 54(6), 911-934.

Juvenile Delinquency, Arrest, or Incarceration

The studies summarized below demonstrate that juvenile delinquency, arrest, and incarceration are all negatively associated with either high school graduation, college enrollment, or college completion.

Juvenile Delinquency

Self-reported delinquency, particularly before age 16, is associated with lower high school graduation and college completion. Ward et al (2020) use self-reported delinquency data for a national cohort of adolescent males first interviewed in 1997 (NLSY97) and a quasi-experimental analysis to estimate the relationship between delinquency and educational outcomes. They found that delinquency increased the rate of high school dropout by 31%.[64] They further determined that income-generating delinquency was a primary link between delinquency and school dropout, with earlier involvement in such activities showing a stronger relationship. Kim (2021) also studied the relationship between delinquency and education using a quasi-experimental design applied to data for a nationally representative cohort of students in grades 7 through 12 in 1994–1995 (Add Health). They found that juvenile delinquency increases the probability of dropping out of high school by 4.6 percentage points, and that the effect is limited to boys.[65] In another study by Kim (2020) using the same methodological approach and study sample, he found that self-reported nonviolent delinquency committed in middle or high school reduces the probability of bachelor's degree completion by 4 percentage points.[66]

Racial Gaps: Racial differences in self-reported offending are relatively small, particularly when important covariates are accounted for.[67] For example, in a study using a nationally representative sample of adolescents in the 1990s, Haynie & Payne (2006) found that 20% of White adolescents reported engaging in violent delinquency compared to 25% and 27% of Black and Latino adolescents respectively.[68]

Juvenile Arrest

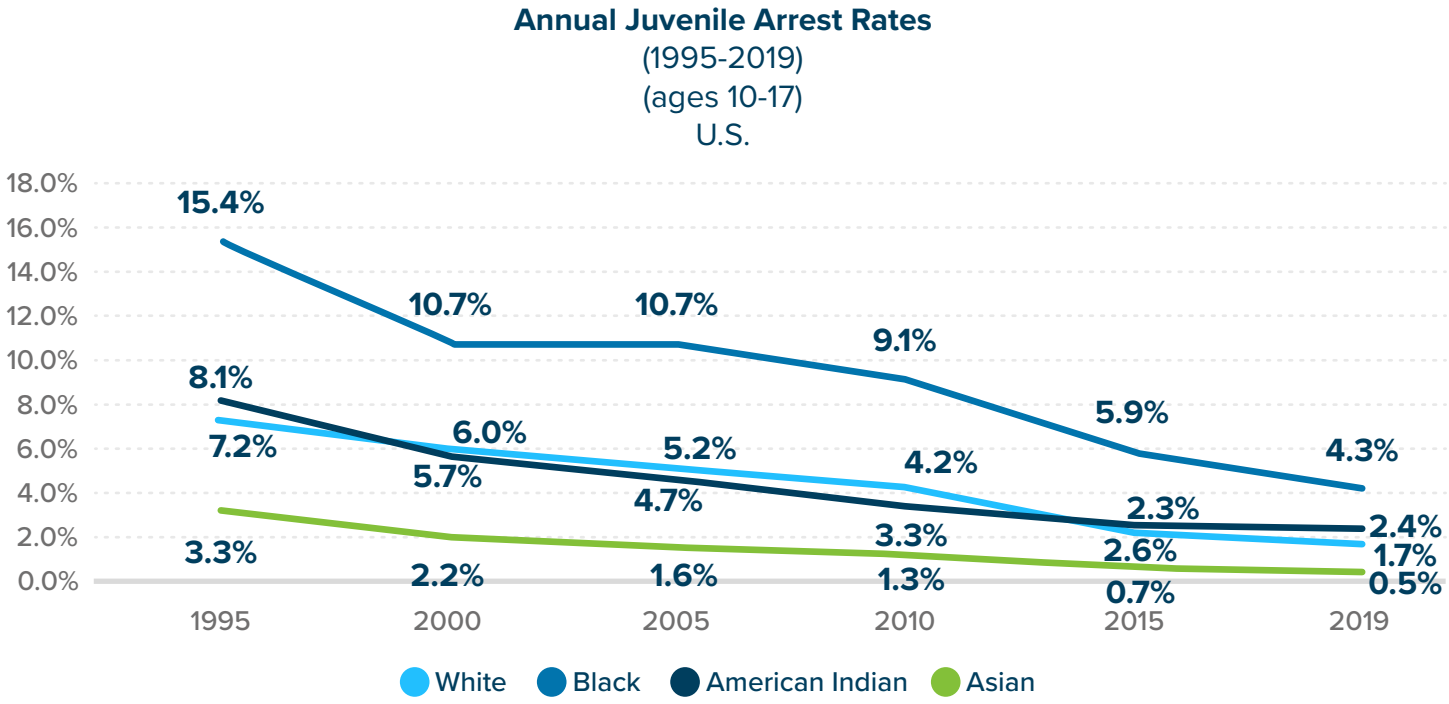
Juvenile arrest has been shown in multiple studies to increase high school dropout and reduce college enrollment. Kirk & Sampson (2013) applied a quasi-experimental analysis to longitudinal survey data matched with administrative records for Chicago adolescents in the 1990s (PHDCN).[69] They found that being arrested reduced high school graduation rates by 22 percentage points (from 51% to 27%) for arrested youth compared to a matched sample of non-arrested youth. Similarly, arrest reduced rates of enrollment in four-year colleges by 16 percentage points (from 34% to 18%) for arrested youth compared to those who avoided arrest. Ward et al. (2020) applied a quasi-experimental analysis to data for a national cohort of adolescent males first interviewed in 1997 (NLSY97). They found that arrest reduced high school graduation rates for affected teens by 58%.[70] Widdowson et al. (2016) studied the correlation between juvenile arrest and college enrollment in a national sample of adolescents born 1983-84 (NLSY97). Using a quasi-experimental analysis, they found that arrested youth had a 9 percentage-point lower probability of enrolling in college than non-arrested youth (41% vs. 50%). Further analysis showed that high school GPA and advanced coursework accounted for more than half of the relationship between arrest and college enrollment while high school dropout accounted for approximately a quarter.[71] Lastly, Sittner and Estes (2020) studied the effect of juvenile arrest on the long-term educational

64 Ward, S., Williams, J., & van Ours, J. C. (2020). Delinquency, Arrest and Early School Leaving*. *Oxford Bulletin of Economics and Statistics.* doi:10.1111/obes.12393
65 Kim, J. (2021). Gender Differences in the Educational Penalty of Delinquent Behavior: Evidence from an Analysis of Siblings. J *Quant Criminol* 37, 179–216.
66 Kim, J. (2020). The Role of Violent and Nonviolent Delinquent Behavior in Educational Attainment. *Youth & Society,* 52(3), 377–402. https://doi.org/10.1177/0044118X18781641
67 Sohoni, T. W., Ousey, G. C., Bower, E., & Mehdi, A. (2021). Understanding the gap in self-reported offending by race: A meta-analysis. *American Journal of Criminal Justice*, 46, 770-792.
68 Haynie, D. L., & Payne, D. C. (2006). Race, friendship networks, and violent delinquency. *Criminology,* 44(4), 775-805.
69 Kirk, D. S., & Sampson, R. J. (2013). Juvenile arrest and collateral educational damage in the transition to adulthood. *Sociology of education,* 86(1), 36-62.
70 Ward, S., Williams, J., & van Ours, J. C. (2020). *Delinquency, Arrest and Early School Leaving*. Oxford Bulletin of Economics and Statistics.* doi:10.1111/obes.12393
71 Widdowson, A. O., Siennick, S. E., & Hay, C. (2016). The implications of arrest for college enrollment: An analysis of long-term effects and mediating mechanisms. *Criminology*, 54(4), 621-652.

outcomes of American Indian youth. They applied a quasi-experimental analysis to data from the Healing Pathways project which includes a large longitudinal sample (n=735) of American Indian children residing on reservation lands that were first interviewed in 2002 at ages 10 to 12. These children were interviewed over multiple waves into young adulthood (mean age = 26.2 years). The authors found that arrest during adolescence increased high school dropout by 13 percentage points (from 21% to 34%) and reduced attainment of any postsecondary education by 19 percentage points (from 47% to 28%).[72]

Racial Gaps: There are significant disparities in lifetime juvenile arrest rates. Andersen (2015) analyzed data from the National Longitudinal Survey of Youth (NLSY97) covering youth who were teenagers during the late 1990s.[73] They found that Black youth (25%) were more likely to experience juvenile arrests than Whites (17%). Latinos (18%) were also somewhat more likely to experience arrest as a juvenile. Another study by Brame et al (2015) using the same data (NLSY97) found that the cumulative risk of juvenile arrest was much more elevated for males than for females with 30% of Black males, 26% of Latino males, and 21% of White males experiencing juvenile arrest compared to around 12.0% for females from all three racial groups. Juvenile arrest rates, however, have declined substantially over the past two decades. As Figure 11 shows, between 1995 and 2019, annual juvenile arrest rates fell -77% for Whites, -72% for Blacks, -71% for Latinos, and -85% for Asians.

Figure 11. Trend in Annual Juvenile Arrests, 1995-2019



SOURCE: Arrest estimates for 1980-2014 were developed by the Bureau of Justice Statistics and disseminated through "Arrest Data Analysis Tool." Online.[74]

Juvenile Incarceration

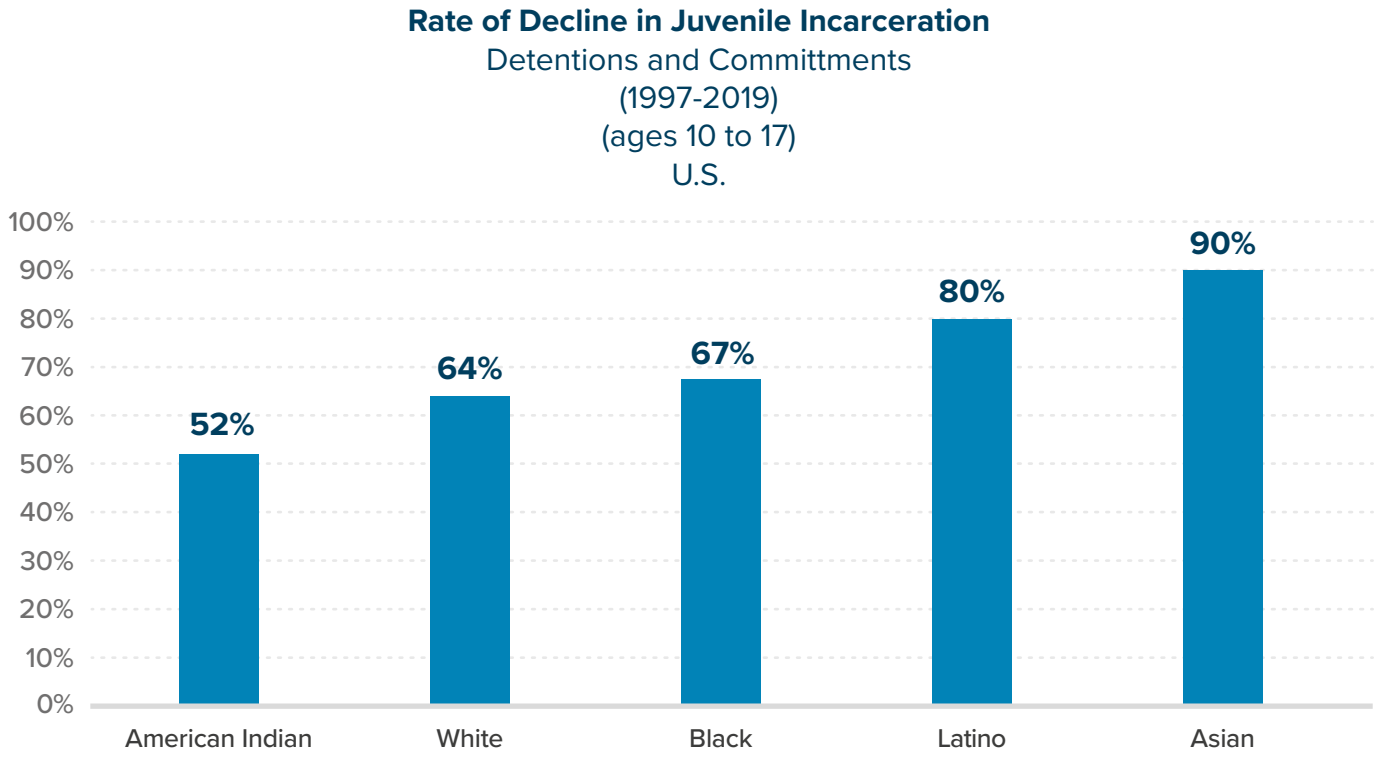
Mounting evidence suggests that juvenile incarceration causes large reductions in the probability of graduating from high school. In a study conducted by Hjalmarsson (2008), a nationally representative cohort of adolescents first interviewed in the 1990s (NLSY97) was utilized to examine the impact of juvenile incarceration on high school graduation rates. The author found that incarcerating juveniles decreased their probability of graduating high school by 25 percentage points. Interestingly, the study also found that the length of incarceration did not appear to influence the likelihood of graduation. This suggests that the lasting stigma

72 Sittner, K. J., & Estes, M. L. (2020). Adult outcomes of justice involved Indigenous youth. *Race and Justice*, 13(3), 279-302.
73 Andersen, T. S. (2015). Race, ethnicity, and structural variations in youth risk of arrest: Evidence from a national longitudinal sample. *Criminal justice and behavior,* 42(9), 900-916.
74 OJJDP Statistical Briefing Book. Online. Available: http://www.ojjdp.gov/ojstatbb/crime/JAR_Display.asp?ID=qa05261&selOffenses=1. July 08, 2022.

of incarceration may be a central contributor to the overall impact of incarceration on the risk of dropout.[75] Similarly, Aizer and Doyle (2015) examined over 35,000 juvenile incarceration records and corresponding adult outcomes in Illinois over a ten-year period for a sample of adolescents born in the late 1970s and early 1980s. They compared the outcomes of incarcerated youth with those who had committed similar offenses and had comparable risk profiles but were assigned to judges who opted against incarceration. The researchers found that incarceration resulted in a 30 percent decrease in high school graduation rates (from 43% to 30%).[76] Lastly, Baron et al (2023) employed quasi-experimental analysis to individual public-school records in Michigan linked to juvenile and adult criminal justice for a cohort of 6th graders from 2007-2013. Their analysis revealed that juvenile pretrial confinement resulted in a 31% drop in the probability of graduating from high school.[77]

Racial Gaps: Compared to other milestones, the overall prevalence of juvenile incarceration is relatively small today. As shown in Figure 12, between 1997 and 2019, juvenile incarceration rates fell -80% for Latinos, -67% for Blacks, -52% for American Indians, -90% for Asians and -64% for Whites.[78]

Figure 12. Rate of Decline in Juvenile Incarceration, 1997-2019

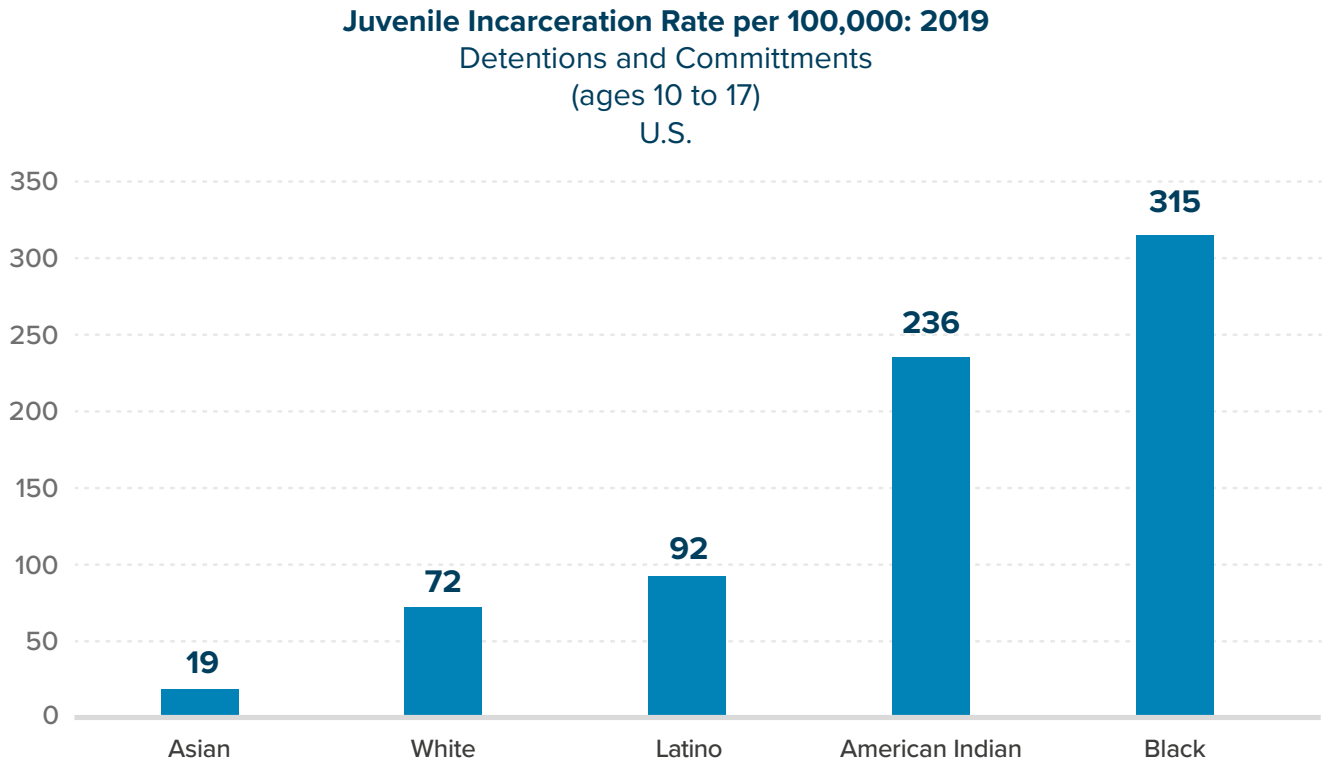


SOURCE: Puzzanchera, C., Hockenberry, S., & Sickmund, M. (2022). *Youth and the juvenile justice system: 2022 national report.*

In a national study of adolescents who completed high school in the late 1990s, Barnert et al (2021), found that just 2.4% reported ever having been incarcerated as a juvenile.[79] Despite this low prevalence, there are notable racial disparities. Data from 2019 (see Figure 13) shows that the incarceration rates (comprising both detention and commitment) for Black, American Indian, and Latino juveniles were 4.4, 3.3 and 1.3 times those of White youth respectively.[80]

75 Hjalmarsson, R. (2008). Criminal justice involvement and high school completion. Journal of Urban Economics, 63(2), 613-630.
76 Aizer, A., & Doyle, J. J. (2015). *Juvenile Incarceration, Human Capital, and Future Crime: Evidence from Randomly Assigned Judges *. The Quarterly Journal of Economics*, 130(2), 759–803. doi:10.1093/qje/qjv003
77 Baron, E. J., Jacob, B., & Ryan, J. (2023). Pretrial juvenile detention. *Journal of Public Economics*, 217, 104798.
78 Puzzanchera, C., Hockenberry, S., & Sickmund, M. (2022). *Youth and the juvenile justice system: 2022 national report.*
79 Barnert, E. S., Perry, R., Shetgiri, R., Steers, N., Dudovitz, R., Heard-Garris, N. J., ... & Chung, P. J. (2021). Adolescent protective and risk factors for incarceration through early adulthood. *Journal of Child and Family Studies*, 30, 1428-1440.
80 Puzzanchera, C., Hockenberry, S., & Sickmund, M. (2022). *Youth and the juvenile justice system: 2022 national report.*

Figure 13. Juvenile Incarceration Rate per 100,000: 2019



SOURCE: Puzzanchera, C., Hockenberry, S., & Sickmund, M. (2022). *Youth and the juvenile justice system: 2022 national report.*

Middle and High School Math and Reading Test Scores

Persistently low math and reading test scores in middle and high school are associated with significant reductions in high school graduation and postsecondary completion.

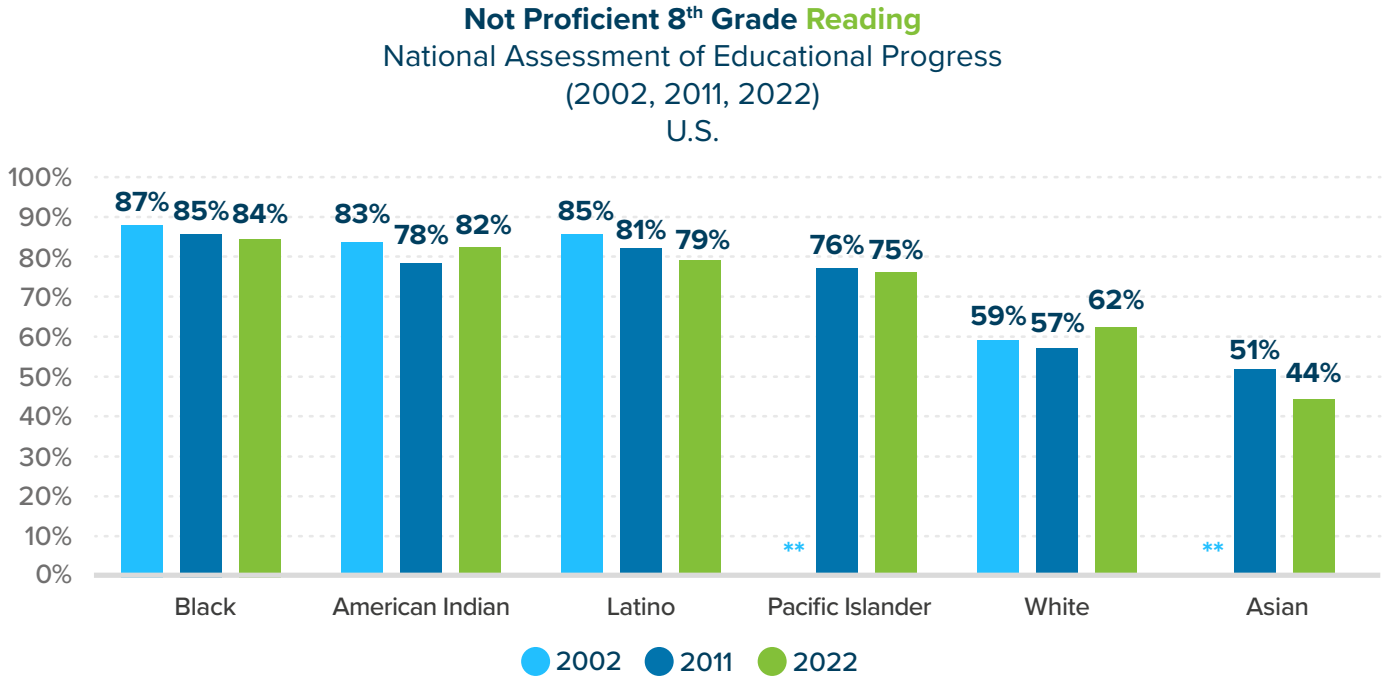
Farkas (2011), using data from the nationally representative NELS:88 cohort of 8th-grade students first surveyed in 1998, found that students with persistently low math test scores from grades 8 through 10 were 7 percentage points less likely to graduate from high school and 8 percentage points less likely to attain a postsecondary degree. Similarly, persistently low reading scores during these grades lowered high school graduation by 2 percentage points and postsecondary degree attainment by 6 percentage points.[81] However, it's controversial whether these middle school or earlier test scores are mere predictors of future educational attainment or if they hold causal influence. In their review of the value of test scores for school accountability, Hitt et al. (2018) observed a crucial inconsistency. Experimental and quasi-experimental studies of several educational programs showed that most producing no positive impacts on achievement (test scores) still often produced positive impacts on high school graduation and college attendance. Moveover, several programs that yielded substantial test score gains reported no effect on high school graduation.[82]

Racial Gaps: In recent years, significant racial disparities in math and reading proficiency from 8th to 12th grades have been observed in the U.S. Figures 14 and 15 illustrate these gaps using data from the National Assessment of Educational Progress (NAEP) for the years 2002, 2011 and 2022. Although a majority of 8th graders across all racial groups fail to meet NAEP proficiency standards in all three years (as shown in Figure 14), the proportions

81 Farkas, G. (2011) "Chapter 4: Middle and High School Skills, Behaviors, Attitudes and Curriculum Enrollment, and Their Consequences" in Duncan, G. J., & Murnane, R. J. (Eds.) *Whither Opportunity?: Rising Inequality, Schools, and Children's Life Chances*. Russell Sage Foundation.
82 Hitt, C., McShane, M. Q., & Wolf, P. J. (2018). *Do impacts on test scores even matter? Lessons from long-run outcomes in school choice research*. American Enterprise Institute. Retrieved from http://www.aei.org/publication/do-impacts-on-test-scores-evenmatterlessons-from-long-run-outcomes-in-school-choice-research.

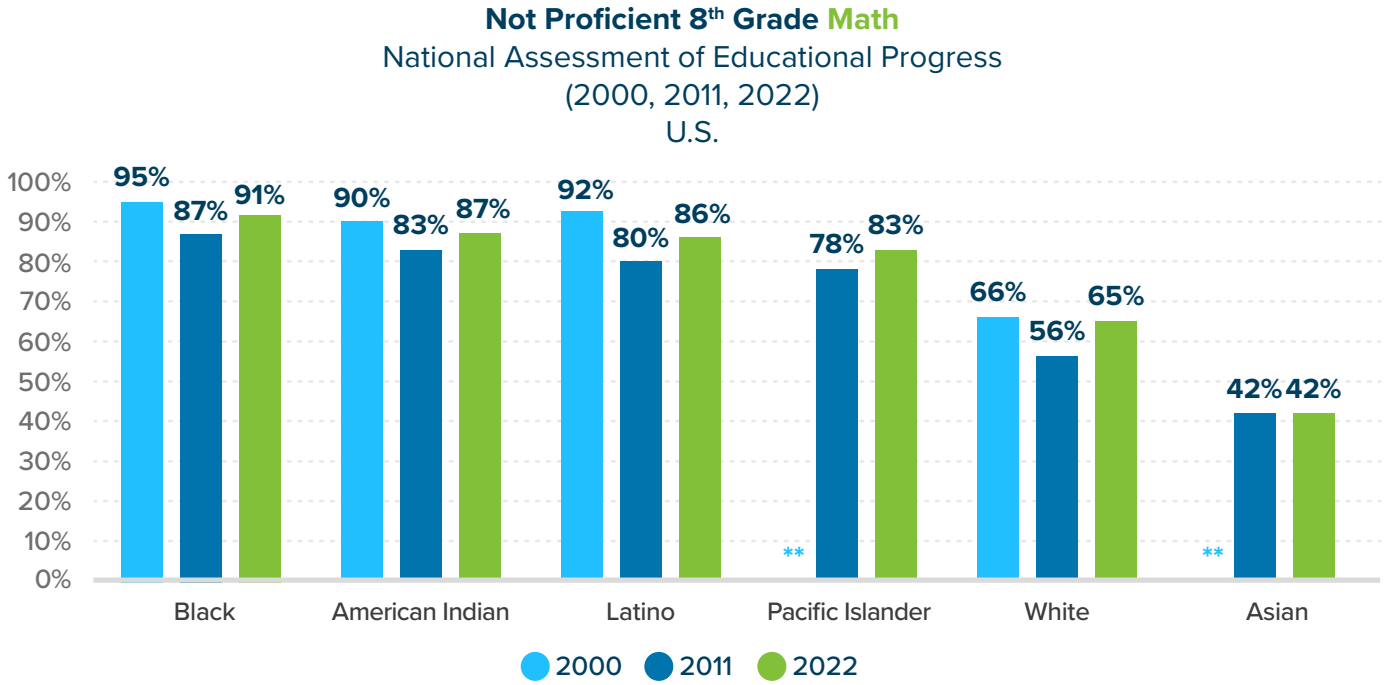
are notably higher in 2022 for Black students (84% in reading, 87% in math), Latino students (79% in reading, 81% in math), and American Indian students (78% in reading, 80% in math) compared to White students (56% in reading, 57% in math) and Asian/Pacific Islander students (48% in reading, 41% in math).

Figure 14. Not Proficient in 8th Grade Reading, 2002, 2011 and 2022



**2002 data was not separately avaialble for Pacific Islanders and Asians
SOURCE U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), various years, 2002–2022 Reading Assessments. Retrieved on February 25th, 2024 from https://www.nationsreportcard.gov/reading/nation/achievement/?grade=8

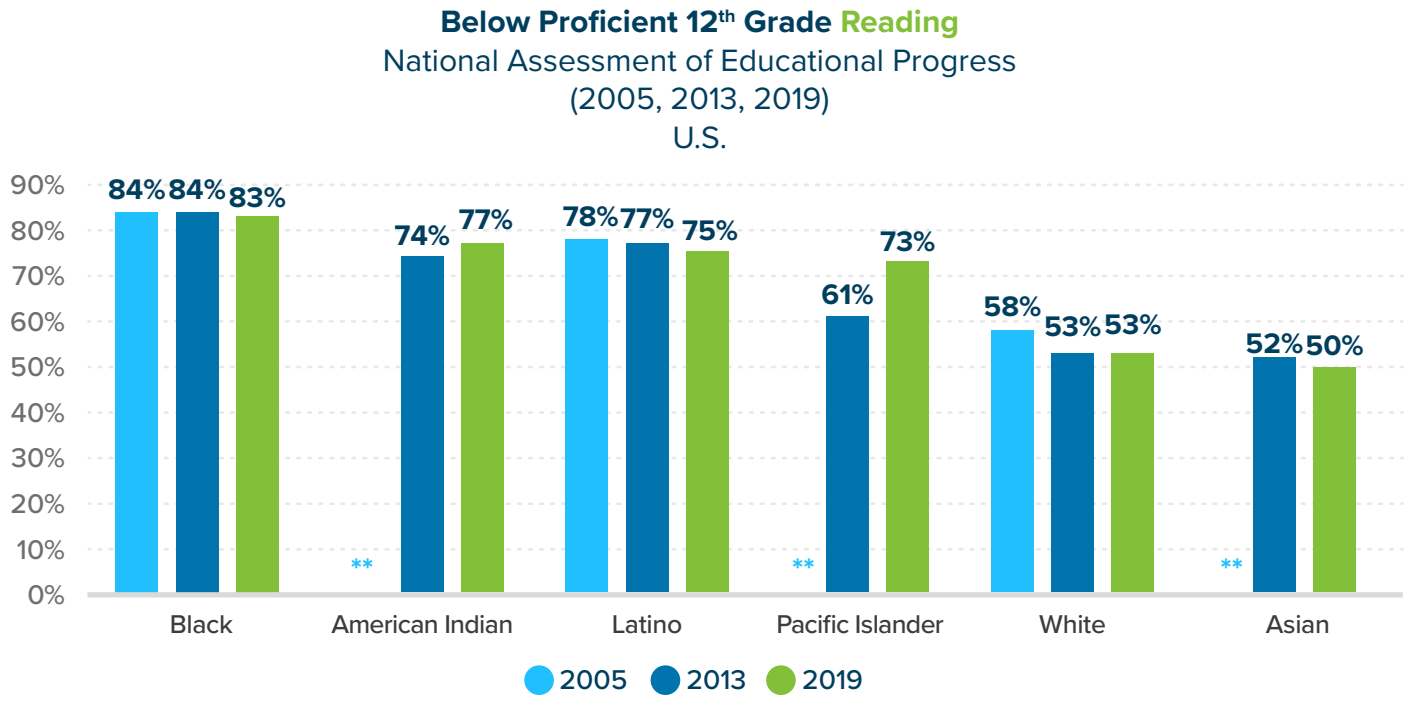
Figure 15. Not Proficient in 8th Grade Math, 2000, 2011, 2022



**2002 data was not separately available for Pacific Islanders and Asians
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), various years, 2002–2022 Reading Assessments. Retrieved on February 25th, 2024 from https://www.nationsreportcard.gov/mathematics/nation/achievement/?grade=8

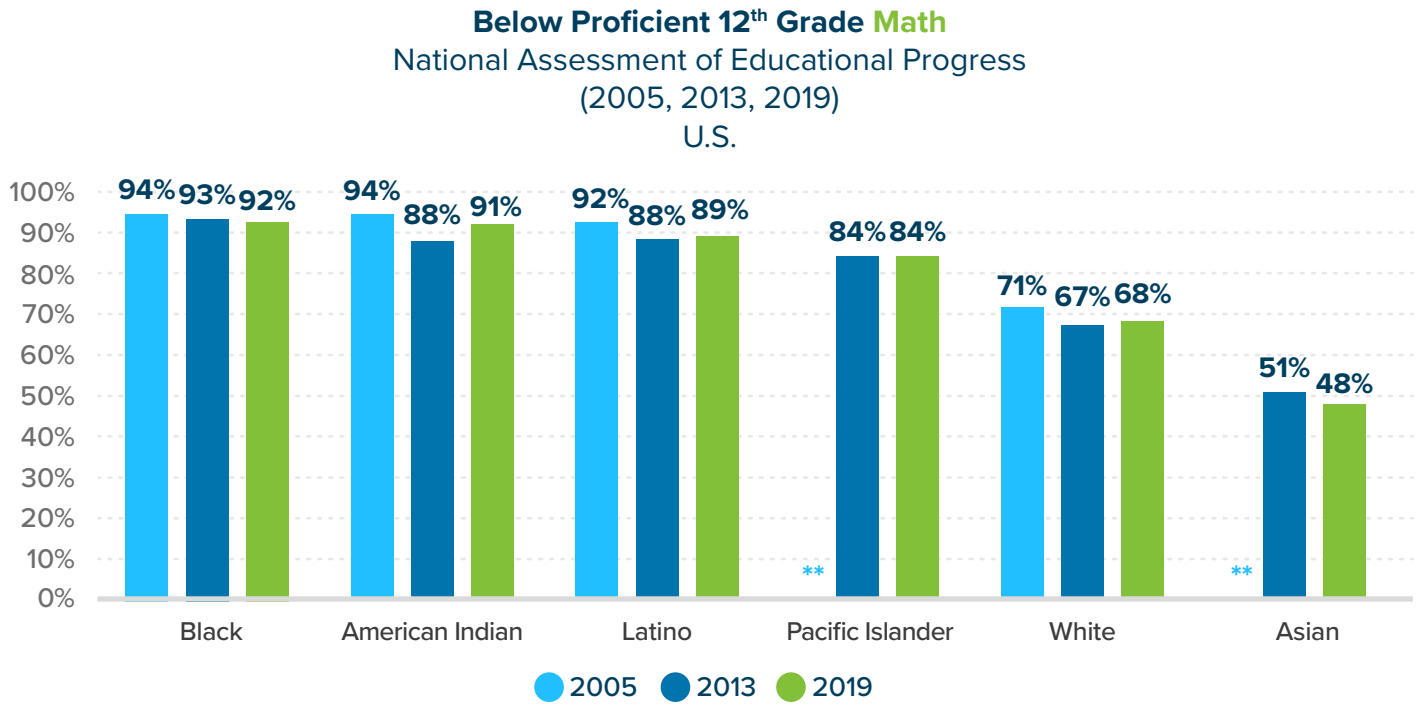
Unfortunately, these substantial gaps remain through 12th grade, as depicted in Figures 16 and 17.

Figure 16. Below Proficient in 12th Grade Reading, 2005, 2013, 2019



**2005 data was not separately available for Pacific Islanders and Asians. Data was also statistically unreliable for American Indian 12th graders in 2005.
SOURCE U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), various years, 2002–2022 Reading Assessments. Retrieved on February 25th, 2024 from https://www.nationsreportcard.gov/mathematics/nation/achievement?grade=12

Figure 17. Below Proficient in 12th Grade Math, 2005, 2013, 2019



**2005 data was not separately available for Pacific Islanders and Asians.
SOURCE U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), various years, 2002–2022 Reading Assessments. Retrieved on February 25th, 2024 from https://www.nationsreportcard.gov/reading/nation/achievement/?grade=12

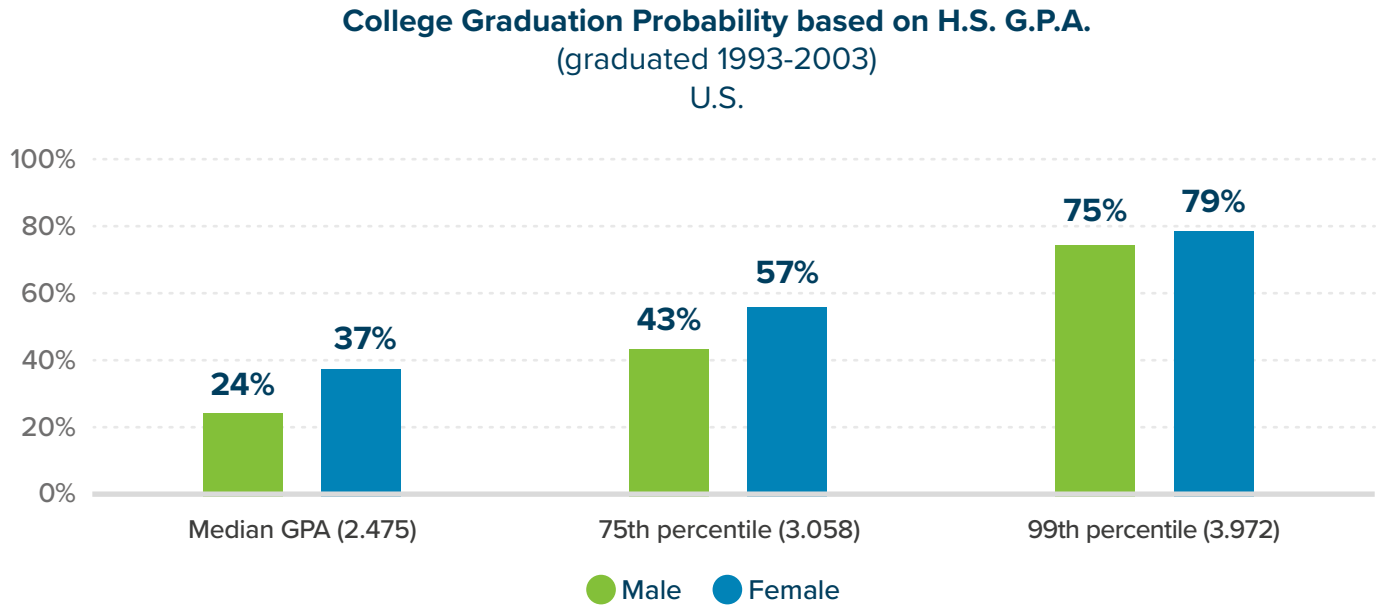
Middle and High School Grades

Several studies have found that grades in middle and high school are the strongest predictors of high school graduation and college completion.[83]

Zheng et al (2023) meta-analyzed the results of 47 studies published between 1985 and April 2022. Among the many factors that they examined, they found that grade point average (G.P.A.) in the 8th and 9th grades were the strongest predictors of on-time high school graduation.[84] Using a nationally representative cohort of adolescents first interviewed in the mid-1990s (Add Health), French et al, (2015) found that an additional point in cumulative high school G.P.A. (e.g. moving from 2.5 to 3.5) doubled the likelihood of bachelor's degree completion from 21 percent to 42 percent.[85] Figure 18 illustrates the variation in the probability of college completion at the median, 75th, and 99th percentiles of the G.P.A. distribution for all participants in the Add Health longitudinal study.

83 Bowers, A. J. (2019). *Report card grades and educational outcomes*; Kurlaender, M., & Cohen, K. (2019). *Predicting College Success: How Do Different High School Assessments Measure Up?* Policy Analysis for California Education, PACE; Geiser, S., & Santelices, M. V. (2007). Validity of high-school grades in predicting student success beyond the freshman year: High-school record vs. standardized tests as indicators of four-year college outcomes; and DiPrete, T.A. and Buchmann, C. (2014) *The Secret Behind College Completion, Girls, Boys, and The Power of Eighth Grade Grades*. Third Way Report. https://www.thirdway.org/report/the-secret-behind-college-completion-girls-boys-and-the-power-of-eighth-grade-grades#:~:text=To%20see%20into%20the%20future,to%20look%20at%20eighth%20grade.&text=DiPrete%20and%20Buchmann%20explain%20that,into%20high%20school%20and%20college
84 Zheng, Y., Gao, X., Shen, J., Johnson, M. R., & Y. Krenn, H. (2023). A Meta-Analysis of the Predictors of On-time High School Graduation in the United States. *NASSP Bulletin*
85 French, M. T., Homer, J. F., Popovici, I., & Robins, P. K. (2015). What you do in high school matters: High school GPA, educational attainment, and labor market earnings as a young adult. *Eastern Economic Journal*, 41, 370-386.

Figure 18. Probability of College Graduation based on High School G.P.A.



SOURCE: "Appendix A. Predicted Probabilities for Highest Level of Education" to French, M. T., Homer, J. F., Popovici, I., & Robins, P. K. (2015). What you do in high school matters: High school GPA, educational attainment, and labor market earnings as a young adult. *Eastern Economic Journal*, 41, 370-386.

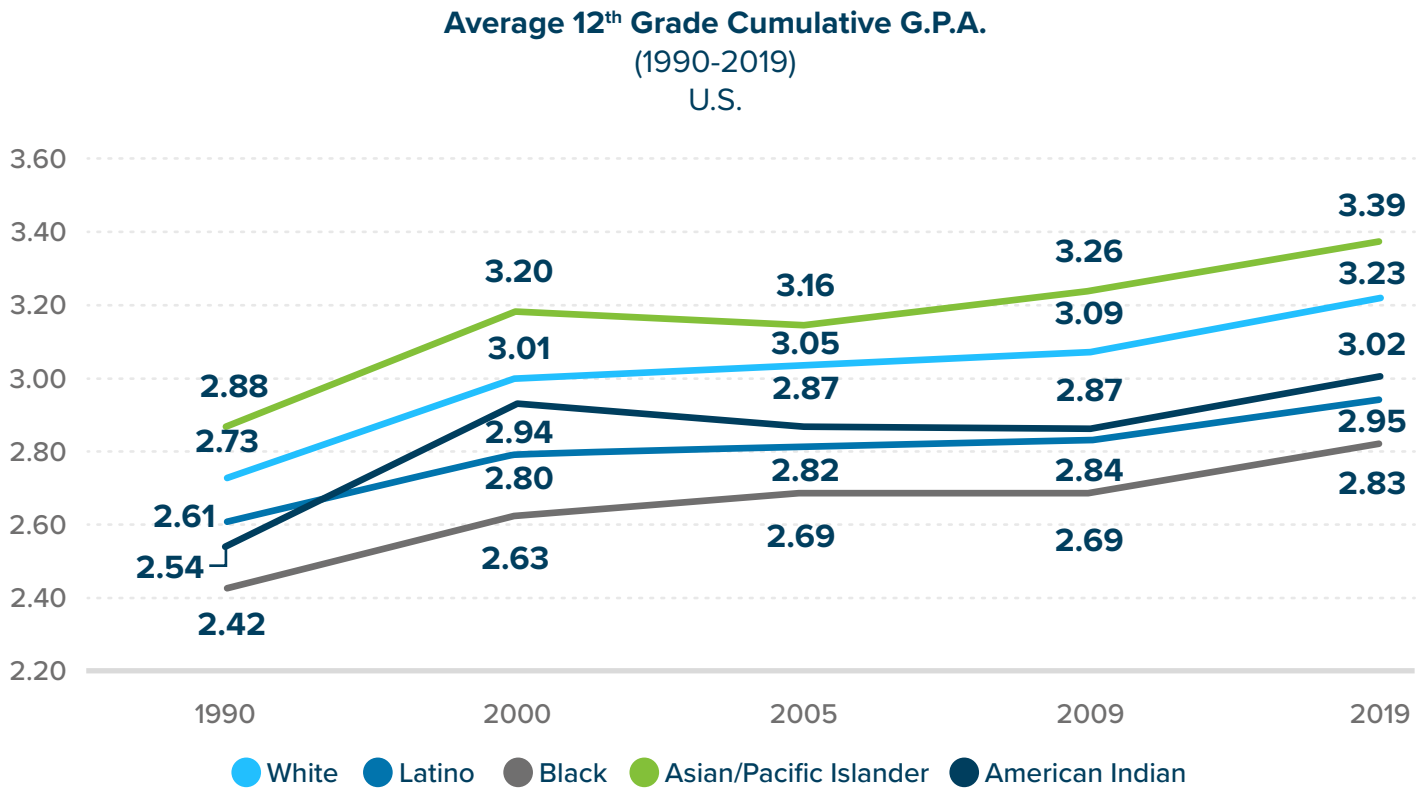
Hasl et al (2019) compared the degree to which high school G.P.A. predicts educational attainment (e.g. total years of schooling) for nationally representative cohorts of individuals born in the early 1960s (NLSY79) and the 1980s (NLSY97). They found that high school GPA, as a predictor of educational attainment, increased in magnitude by 79% (unstandardized coefficient =.708 vs. 1.264) between the two cohorts while IQ remained unchanged.[86]

For college graduation, studies consistently find that grades are more potent predictors than admission test scores. In their 2019 study, Galla et al. analyzed the high school GPAs of a nationwide sample of 47,303 college applicants during the 2009/2010 academic year. They discovered that once demographic characteristics were accounted for, high school GPA demonstrated greater predictive validity for college graduation (OR=1.28) than SAT/ACT scores (OR=1.12).[87] Similar findings emerged from a study by Allensworth and Clark (2020), who linked administrative data from Chicago Public Schools (CPS) with six-year college graduation data from the National Student Clearinghouse for all CPS students who graduated high school from 2006 to 2009 and who enrolled in a 4-year university immediately after graduation. Their results showed that high school GPA consistently predicted college graduation while standardized test scores did not.[88] Furthermore, DiPrete and Buchmann (2014) investigated a nationally representative sample of adolescents first interviewed in the late 1990s (NLSY97) and found that middle school grades proved to be more predictive of college completion than standardized test scores.[89]

Racial Gaps: National data reveals significant racial gaps in high school GPA. Figure 19 displays the trend line in high school G.P.A. by race. It shows that in 2019, the average GPA for 12th grade students was 2.83 for Blacks, 2.95 for Latinos, 3.02 for American Indians, 3.23 for Whites, and 3.39 for Asian.[90]

86 Hasl, A., Kretschmann, J., Richter, D., Voelkle, M., & Brunner, M. (2019). Investigating core assumptions of the "American Dream": Historical changes in how adolescents' socioeconomic status, IQ, and GPA are related to key life outcomes in adulthood. *Psychology and Aging*, 34(8), 1055.
87 Galla BM, Shulman EP, Plummer BD, et al. Why High School Grades Are Better Predictors of On-Time College Graduation Than Are Admissions Test Scores: The Roles of Self-Regulation and Cognitive Ability. A*merican Educational Research Journal.* 2019;56(6):2077-2115.
88 Allensworth EM, Clark K. (2020) High School GPAs and ACT Scores as Predictors of College Completion: Examining Assumptions About Consistency Across High Schools. *Educational Researcher*. 2020;49(3):198-211.
89 DiPrete, T.A. and Buchmann, C. (2014) The Secret Behind College Completion, Girls, Boys, and The Power of Eighth Grade Grades. Third Way Report. https://www.thirdway.org/report/the-secret-behind-college-completion-girls-boys-and-the-power-of-eighth-grade-grades#:~:text=To%20see%20into%20the%20future,to%20look%20at%20eighth%20grade.&text=DiPrete%20and%20Buchmann%20explain%20that,into%20high%20school%20and%20college.
90 U.S. Department of Education, Institute of Education Sciences, *National Center for Education Statistics, National Assessment of Educational Progress (NAEP) High School Transcript Study, various years*, *1990–2019*. Retrieved on 1.14.24 from https://www.nationsreportcard.gov/hstsreport/#coursetaking_1_0_el

Figure 19. Average 12th Grade Cumulative G.P.A. by Race, 1990-2019

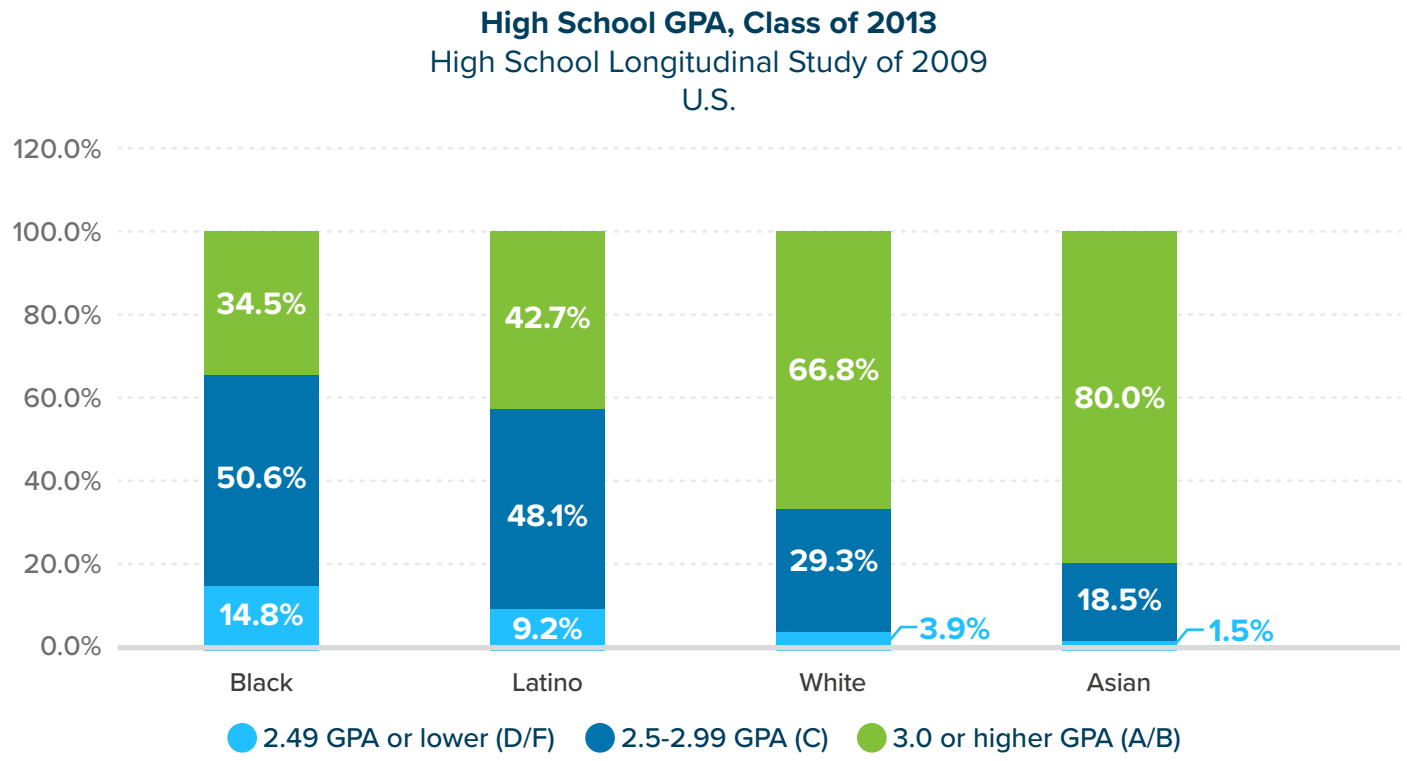


SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1990, 2000, 2005, 2009, and 2019 High School Transcript Study (HSTS).

Balfanz et al (2016) documented the high school GPA distribution by race using nationally representative data from the High School Longitudinal Study of 2009 which followed the high school graduating class of 2013 both prior to and after their graduation.[91] Figure 20 shows that about a third of Blacks (35%) had GPAs of 3.0 or better compared to two-thirds of Whites (67%), 43% of Latinos and 80% of Asians.

91 Balfanz, R., DePaoli, J. L., Ingram, E. S., Bridgeland, J. M., & Fox, J. H. (2016). *Closing the College Gap: A Roadmap to Postsecondary Readiness and Attainment*. Civic Enterprises.

Figure 20. High School GPA by Race, Class of 2013



SOURCE: Table 7 in Balfanz, R., DePaoli, J. L., Ingram, E. S., Bridgeland, J. M., & Fox, J. H. (2016). *Closing the College Gap: A Roadmap to Postsecondary Readiness and Attainment.* Civic Enterprises.

Teenage Parenthood

Evidence of an impact of teenage parenthood on high school graduation and college completion is mixed. Some studies find large, plausibly causal effects on both outcomes, while others report smaller effects or effects that are limited to White teens or those from more affluent counties.

Teenage parenthood has long been recognized as potentially detrimental to high school graduation or postsecondary attainment for young women. Given that Blacks, American Indians, and Latinos have teenage birth rates approximately double or triple those of Whites, curtailing teenage pregnancy has been viewed as a potential approach to closing racial educational gaps for young women of color.[92] However, the literature presents conflicting findings for the potential impact of teenage childbearing on educational outcomes.

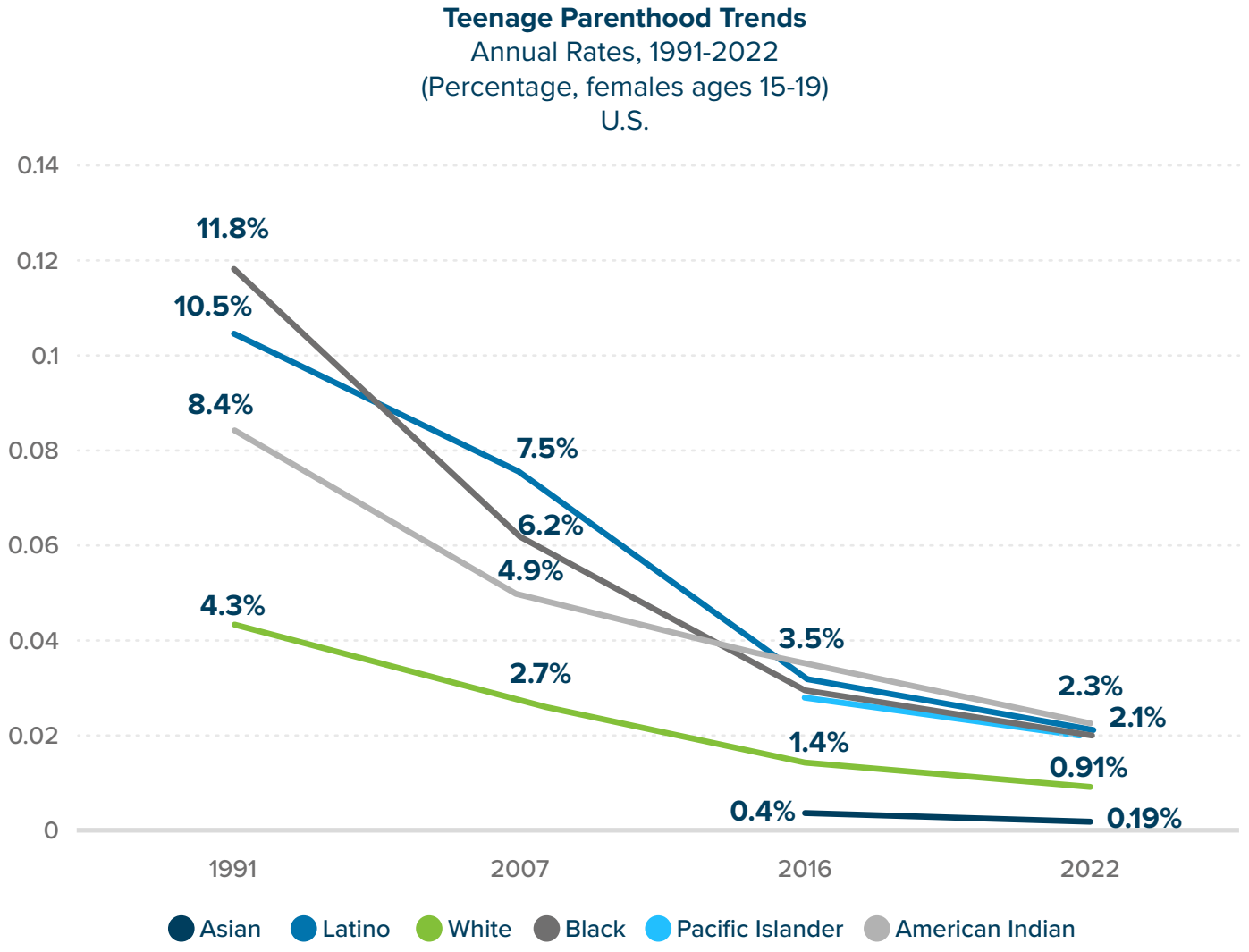
Three studies using data from a nationally representative cohort of adolescent females first interviewed in the mid-1990s (Add Health) and quasi-experimental analysis find contrasting results. Kane et al. (2013) found that giving birth before age 20 reduced completed schooling by 0.7 years for teenage mothers.[93] In contrast Heiland et al. (2019) found much smaller impacts of teenage childbearing on educational attainment, at just 0.25 years.[94] Meanwhile, Gorry (2019) found that the negative educational consequences of teenage parenthood vary based on race and socioeconomic context, with significant adverse effects primarily impacting individuals from high-income counties and Whites. The impact on females from low-income counties or Black and Latino teens was

92 CDC. "About Teen Pregnancy." https://www.cdc.gov/teenpregnancy/about/index.htm
93 Kane, J. B., Philip Morgan, S., Harris, K. M., & Guilkey, D. K. (2013). The educational consequences of teen childbearing. *Demography, 50*(6), 2129–2150. https://doi.org/10.1007/s13524-013-0238-9
94 Heiland, F., Korenman, S., & Smith, R. A. (2019). Estimating the educational consequences of teenage childbearing: Identification, heterogeneous effects and the value of biological relationship information. *Economics and human biology,* 33, 15–28. https://doi.org/10.1016

deemed minor and statistically insignificant.[95] Overall, these findings suggest the negative effect of teenage parenthood for education is either relatively small or less applicable to teenage females of color.

Racial Gaps: Data from 2015-19 show that the lifetime prevalence of a teenage birth for females ages 15 to 49 was around 1 in 3 for both Black females (34%) and Latina females (31%), and 1 in 7 for White females (17%).[96] However, rates of teenage childbearing among young females has been declining dramatically over the past two decades. See Figure 21. In 2022, annual rates of teenage childbearing were 0.19% for Asians, 0.91% for non-Hispanic Whites, 2.0% for Blacks, 2.3% for American Indians, 2.1% for Latinos, and 2.0% for Pacific Islanders.96 This contrasts with rates for teenage females in 1991 that were 11.8% for Blacks, 10.5% for Latinos, 8.4% for American Indians and 4.3% for Whites.

Figure 21. Trends in Annual Parenthood Rates, 1991-2022



SOURCE: Martin JA, Hamilton BE, Osterman MJK, et al. (2017) *Births: Final data for 2015*. National vital statistics report; vol 66, no 1. Hyattsville, MD: National Center for Health Statistics; Osterman, M. J., Hamilton, B. E., Martin, J. A., Driscoll, A. K., & Valenzuela, C. P. (2024). *Births: Final Data for 2022*. National Vital Statistics Reports: From the Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System, 73(2), 1-56.

95 Gorry, D. (2019). Heterogeneous Consequences of Teenage Childbearing. Demography, 56(6), 2147–2168. doi:10.1007/s13524-019-00830-1
96 Martinez, G. M., & Daniels, K. (2023). Fertility of men and women aged 15–49 in the United States: National Survey of Family Growth, 2015–2019.

INCOME MOBILITY MILESTONES

This section offers results of the literature review focused on identifying long-term predictors of intergenerational income mobility, intragenerational income mobility, adult earnings, wages, and income. A total of 15 predictors were identified. They are listed in Table 4, below, which summarizes the prevalence, racial gaps, and trends for each milestone.

Table 4. Summary of Income Mobility Milestones, Prevalence Levels, Racial Gaps and Trends

Milestone	***Prevalence Range** (for Blacks, American Indians or Latinos)*	***Year(s) Measured***	***Racial Gap** between Whites and the group with highest prevalence*	***% Change in Annual Rates:** for the racial group with highest prevalence*
Low Prevalence Milestones				
1. Fair or poor child health	2.7-3.4	1998-2009	N/A	N/A
2. Completing college after age 30	9% (Black)[97]	2009	1pp	N/A
Medium Prevalence Milestones				
3. Low birthweight	7.9-14.8%	2022	7.7pp	**+3%** (1980-2016)
4. Adult disability (young adult)	7-16%	2016	7pp	N/A
5. Incarceration (young adult)	12-16%	2016	10pp	**-56%** (1991-2016)
6. Teenage parenthood	17%-34%	2015-2019	17pp*	**-81%** (1991-2022) [Annual Rates]
High Prevalence Milestones				
7. Lacking stable full-time employment	53%-59%	2022	6pp	**-13%** (2010-2022)
8. Below proficient: 12th grade reading scores	75-83%	2019	30pp	**-1%** (2005-2019)
9. No bachelor's degree (ages 25-34)	73-86%	2023	32pp	**-2%** (2009-2023)
10. Not attending a selective (or high mobility) college	89-90%	2013	15pp	**-6.2%** (1982-2013)
11. Below proficient: 12th grade math scores	89-92%	2019	24pp	**-2%** (2005-2019)

97 Bárány, Z. L., Buchinsky, M., & Corblet, P. (2023). *Late bloomers: The aggregate implications of getting education later in life* (No. w31874). National Bureau of Economic Research; Table C.1, pg. 37

Milestone	***Prevalence Range** (for Blacks, American Indians or Latinos)*	***Year(s) Measured***	***Racial Gap** between Whites and the group with highest prevalence*	***% Change in Annual Rates:** for the racial group with highest prevalence*
Unclear Prevalence Milestones				
12. Negative early childhood development	N/A	N/A	N/A	N/A
13. External locus of control and low self-esteem	N/A	N/A	N/A	N/A
14. Employment in a low-demand industry or sector	N/A	N/A	N/A	N/A
15. Earnings growth	N/A	N/A	N/A	N/A

*pp=percentage points

Lower Prevalence Milestones

Low-prevalence income mobility milestones—including experiencing fair or poor health in childhood and completing a college degree after age 30—exhibit relatively small racial gaps. Empirical evidence indicates that both are associated with lower earnings in adulthood. Existing literature, however, does not provide sufficient data to assess trends over time for these milestones.

Medium Prevalence Milestones

Medium prevalence milestones (11-50%) include low birthweight, teenage parenthood, young adult incarceration, adult disability, adult depression and long-term unemployment. These milestones are shown to predict both reduced employment and reduced earnings. However, the evidence for teenage parenthood with respect to adult earnings is conflicting. While some studies find reductions in earnings for Baby Boomer and Gen X females, studies for subsequent generations find that the negative effects of teenage parenthood on adult income are limited to females from high income counties and White females.

All medium prevalence milestones show significant racial disparities. The largest such racial gaps are for teenage pregnancy (17pp), young adult incarceration (10pp), and low birthweight (7.7pp). Trends show large decreases in annual rates of teenage parenthood (-81% for 1991-2022) and adult incarceration (-56% for 1991-2016) while rates of low birthweight (+3% for 1980-2016) and long-term unemployment (+0.8% for 2010-2022) have unfortunately remained relatively stable. Although race-specific data is lacking, it is notable that work-limiting disability for the U.S. population increased by +17% from 2000 to 2018.

High Prevalence Milestones

High prevalence milestones have prevalence rates of 53% or higher and all show substantial racial gaps. These milestones are shown to predict earnings, and both intra- and inter-generational income mobility. Obtaining a bachelor's degree, especially from a selective or "high mobility" college, is associated with significantly higher incomes and a greater likelihood of experiencing upward income mobility, particularly from poverty. Lacking stable employment, on the other hand, predicts substantial reductions in long-term earnings and lower rates of upward income mobility. There is conflicting evidence regarding the role that cognitive tests scores, such as 12th grade reading and math, play in intergenerational mobility gaps. While some evidence suggests that

test scores can statistically explain most of racial mobility gaps, other evidence suggests the relationship is primarily correlational and not causal. Racial gaps in these outcomes are substantial with the largest gaps for bachelor's degree completion (32pp), and below proficiency in 12th grade reading (30pp) and 12th grade math (24pp). A persistent gap in college graduation rates has lingered despite the fact that between 2005 and 2023 college graduation rates rose by +61% for Blacks, +41% for American Indians, and +145% for Latinos. Additionally, between 2005 and 2019, proficiency rates in 12th grade math have improved for Blacks (+33%), American Indians (+50%) and Latinos (+38%), but racial gaps have remained unchanged. Racial gaps in 12th grade reading proficiency have changed very little over this time period even as proficiency rates for Blacks and Latinos have grown modestly.

Unclear milestones

Positive early childhood development, locus of control and self-esteem, and employment in a high demand industry or sector all predict higher earnings. However, the historical and contemporary prevalence of these milestones could not be determined, making it difficult to assess their significance for income mobility gaps. Earnings growth is a direct determinant of income mobility, however, average rates of earnings growth could not be determined for racial groups either currently or historically.

Low Birthweight

Low birthweight is associated with reductions in adult income.

Studies assessing the relationship between birthweight and adult income are rare in the empirical literature.[98] One such study by Behrman and Rosenzweig (2004) uses data from a sample of 1,418 female monozygotic twins from the Minnesota Twin Registry.[99] The twins were born between 1936 and 1955 and had a mean age of 45 when adult earnings were measured. The authors found that increasing a child's birthweight by 1lb was associated with more than a 7% increase in adult earnings. Furthermore, based on their data, they extrapolate that if low birthweight babies were born at the average US birthweight, their lifetime earnings might have increased by 10%. Johnson and Schoeni (2011) utilized a nationally representative cohort (PSID) of adults born 1951 to 1975 and a quasi-experimental design to estimate the relationship between low birthweight and adult earnings. Their findings indicate that low birthweight results in a 10.2% reduction in annual earnings at age 25, and a 15.6% reduction at age 35. Importantly, educational attainment explained only a small fraction of this relationship for this cohort.[100]

Racial Gaps: Data from 2022 (see Figure 1, pg 31), reveals a considerable disparity in the risk of low birthweight between Black (14.8%), American Indian (8.8%), Asian (9.4%), Pacific Islander (8.5%), Latino (7.9%) and White (7.1%) infants.[101] Figure 1 (pg. 29) depicts the longstanding racial gaps in low birthweight risk, showing that Black infants have had roughly twice the likelihood of low birthweight as White infants for the past 4 decades.

Early Child Development

The mechanisms that link early childhood experiences and development to later adult outcomes are unclear. Poverty in early childhood, however, has been repeatedly shown to predict if not cause outcomes well into adulthood.

98 Prinz, D., Chernew, M., Cutler, D., & Frakt, A. (2018). *Health and economic activity over the lifecycle: Literature review*. (NBER Working Paper 24865), doi: 10.3386/w24865

99 Behrman, J. R., & Rosenzweig, M. R. (2004). Returns to birthweight. *Review of Economics and statistics*, 86(2), 586-601.

100 Johnson, R. C., & Schoeni, R. F. (2011)

101 Osterman, M. J., Hamilton, B. E., Martin, J. A., Driscoll, A. K., & Valenzuela, C. P. (2024). *Births: Final Data for 2022*. National Vital Statistics Reports: From the Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System, 73(2), 1-56.

Human development in early childhood is extremely sensitive to environmental conditions, particularly caregiving and resources.[102] While the evidence is clear that early childhood experiences influence outcomes in adulthood, it is unclear which developmental mechanisms drive these results.[103] The theorized social mechanisms that may explain how early child deprivation lowers lifetime income fall into two broad conceptual categories: 1) "what money can buy," and 2) exposure to stress.[104] Higher incomes allow parents to invest resources in an array of cognitive and social supports, as well as better housing, food, health care, and childcare. Families with low incomes not only have less to invest in supportive environments and resources, but they also experience an array of family or neighborhood stressors in the form, among other things, of parental psychological distress, family conflict, harsh and inconsistent parenting, and neighborhood violence. These mechanisms are likely to be mutually reinforcing. The consequence of these exposures is to produce developmental differences that are believed to underlie gaps in long-term outcomes.

Looking at long-term outcomes, a family's income during early childhood has been shown to exhibit a strong association with a child's intergenerational mobility measured in adulthood. Chen and Song (2019) use data from the 1968 to 2017 waves of the Panel Study of Income Dynamics (PSID) to examine the association between fathers' adult income and their sons' adult income, measured when both fathers and sons were between 25 and 50 years old. They found that fathers' income measured when sons were between 3 and 6 years old has a stronger association with the sons' adult income than any other period of the sons' childhood.[105]

Other studies show that family poverty before age 5 is strongly correlated with depressed income in adulthood. Duncan et al (2010), studied data from a national cohort of adults (PSID) born between 1968 and 1975, to estimate the effects of early child poverty on adult income. After adjusting for an extensive set of controls, including family income in later years of childhood, they found that for young children raised in low-income families (family incomes below $25,000 per year in 2005 dollars) a $3,000 annual increase in income between ages zero and five was associated with 19% increase in annual earnings and a 135 more annual hours worked between ages 25 and 37.[106]

Ziol-Guest et al. (2012) examined a nationally representative cohort of adults from the Panel Study of Income Dynamics (PSID), focusing on individuals born between 1968 and 1975. Their analysis, which incorporated an extensive set of control variables, revealed significant long-term negative effects of economic deprivation

102 Nelson, C. A., & Gabard-Durnam, L. J. (2020). *Early adversity and critical periods: neurodevelopmental consequences of violating the expectable environment. Trends in neurosciences*, 43(3), 133-143; National Scientific Council on the Developing Child (2010). *Early Experiences Can Alter Gene Expression and Affect Long-Term Development: Working Paper No. 10*. Retrieved from www.developingchild.harvard.edu.
103 Pages, R., Bailey, D. H., & Duncan, G. J. (2023). The impacts of Abecedarian and Head Start on educational attainment: Reasoning about unobserved mechanisms from temporal patterns of indirect effects. *Early Childhood Research Quarterly*, 65, 261-274.
104 National Academies of Sciences, Engineering, and Medicine. 2019. *A Roadmap to Reducing Child Poverty.* Washington, DC: The National Academies Press.
105 Cheng, S., & Song, X. (2019). Linked Lives, Linked Trajectories: Intergenerational Association of Intragenerational Income Mobility. *American Sociological Review,* 84(6), 1037–1068. https://doi.org/10.1177/0003122419884497
106 Duncan, G. J., Ziol-Guest, K. M., & Kalil, A. (2010). Early-childhood poverty and adult attainment, behavior, and health. *Child development, 81*(1), 306–325.

during the first two years of life. Children who lived in families with annual incomes below $25,000 during early childhood earned an average of $21,600 annually in their 30s, compared to $53,400 for those from families earning more than $25,000. Additionally, children from low-income families had adult hourly wages that were only half those of their higher-income peers and worked approximately 20 percent fewer hours annually.[107]

Beyond family income, neighborhood poverty also has lasting adverse effects on children's economic outcomes. The Moving to Opportunity (MTO) experiment—a large-scale study involving 4,600 low-income families with children living in public housing across five cities (Baltimore, Boston, Chicago, Los Angeles, and New York)—tested the impact of residential mobility. Families were offered housing vouchers to move from high-poverty neighborhoods to areas with lower poverty rates, reduced segregation, and less violent crime. Among children who moved to lower-poverty neighborhoods (under 40% poverty) before the age of 13, adult earnings increased by 31%, or $3,477 more than the control group average of $11,270. The analysis found a linear dose-response relationship: the more years spent in a lower-poverty environment, the greater the improvement in income by age 26, with the strongest effects observed among the youngest children. In contrast, children who were older than 13 at the time of relocation experienced no long-term economic benefits.[108]

Racial Gaps: Exposure to poverty in early childhood varies substantially by race. In 2018, roughly a third (32%) of Black children and a quarter (24%) of Latino children younger than five lived in poverty, compared to 9% of non-Hispanic White children.[109] In addition, Black-White gaps in cognitive and socioemotional development are large and remained so between 1998 and 2010.[110]

Child Physical and Mental Health

Childhood physical and mental health predict income in adulthood.

Children from low-income families tend to experience poorer health outcomes early in life, which can adversely affect their long-term economic prospects. However, existing longitudinal studies in the United States do not permit researchers to follow individuals' health and economic trajectories continuously from birth through young adulthood.[111]

There are, however, two studies that explore the connection between retrospectively reported health in childhood and adult health outcomes. Smith (2009) used a quasi-experimental analysis with national data (PSID) to study the link between a retrospectively reported index of self-rated child health and adult family income measured for individuals when they reached ages 25 to 47 (born 1952 to 1974).[112] Based on sibling comparisons, Smith discovered that better child health (rated as excellent or very good) corresponded to a 24% increase in adult family income and a 25% rise in adult earnings. In a subsequent study, Smith and Smith (2010) employed a similar approach with the same data to estimate the relationship between retrospectively reported instances of childhood depression, drug or alcohol abuse, and other psychological problems, and adult family incomes measured for respondents when they reached ages 25 to 53 (born 1952 to 1980. They found that adults with childhood histories of behavioral health issues had their family income reduced by 20%, or $10,400 per year, relative to adults who did not have these experiences during childhood.[113]

107 Ziol-Guest, K. M., Duncan, G. J., Kalil, A., & Boyce, W. T. (2012). Early childhood poverty, immune-mediated disease processes, and adult productivity. *Proceedings of the National Academy of Sciences, 109(Supplement_2), 17289–17293*. doi:10.1073/pnas.1203167109
108 Chetty, R., Hendren, N., & Katz, L. F. (2016). The Effects of Exposure to Better Neighborhoods on Children: New Evidence from the Moving to Opportunity Experiment. *The American economic review, 106*(4), 855–902. https://doi.org/10.1257/aer.20150572
109 Paschall, K., Bartlett, J. D. (2019). "Child poverty declines even as disparities persist among the nation's youngest children." https://www.childtrends.org/publications/child-poverty-declines-even-as-disparities-persist-among-the-nations-youngest-children
110 Reardon SF, Portilla XA. Recent Trends in Income, Racial, and Ethnic School Readiness Gaps at Kindergarten Entry. *AERA Open*. July 2016.
111 Case, A., & Paxson, C. (2006). Children's health and social mobility. *The Future of Children*, 151-173.
112 Smith J. P. (2009). The Impact of Childhood Health on Adult Labor Market Outcomes. *The review of economics and statistics, 91*(3), 478–489.
113 Smith, J. P., & Smith, G. C. (2010). Long-term economic costs of psychological problems during childhood. *Social science & medicine,* 71(1), 110-115.

Racial Gaps: Data from 1998-2009 indicate significant racial disparities in children's health. Black children are about three times as likely (3.4%) as White children (1.1%) to be reported by a parent or knowledgeable household adult as being in fair or poor health. Similarly, Latino children, at a rate of 2.7%, are twice as likely as White children to be reported in the same condition. The rate for Asians was 0.8%.[114] National rates for American Indians could not be determined from existing research studies.

High School Academic Test Scores

Evidence regarding the effect of academic test scores on racial mobility gaps is mixed, with the most compelling evidence suggesting that test scores are not causally related to mobility gaps.

Several studies, primarily using the National Longitudinal Surveys (NLSY79 and NLSY97), have determined that scores on the Armed Forces Qualifying Test (AFQT) can statistically account for racial gaps in intergenerational mobility. Researchers using a nationally representative sample of adults born between 1957 and 1982 (NLSY79) found that AFQT scores can explain much, if not all, of the Black-White and Latino-White gaps in intergenerational income mobility.[115] However, other researchers have questioned whether the statistical relationship between AFQT scores and income mobility is causal. Chetty et al (2020) provide a persuasive argument against this assumption, considering it unlikely that cognitive test scores could explain the Black-White gaps in intergenerational mobility. They studied a cohort of 20 million children born between 1978 and 1983 and observed that Black females, despite significantly lower standardized test scores on the National Assessment of Educational Progress (NAEP), have upward mobility rates comparable to, if not better than, those of White females.[116] Additionally, while white females have higher cognitive test scores than White males, they have considerably lower rates of upward intergenerational mobility. Such patterns contradict the idea that cognitive skills, as gauged by standardized tests, are the primary drivers of racial (or gender) disparities in income mobility.

Racial Gaps: Despite important differences, the closest nationally available assessment to the AFQT is the 12th Grade National Assessment of Educational Progress.[117] Although a majority of 12th graders across all racial groups fail to meet NAEP proficiency standards (see Figure 16 and 17), the proportions are notably higher for Black students (83% in reading, 92% in math), Latino students (75% in reading, 89% in math), and American Indian students (77% in reading, 91% in math) compared to White students (53% in reading, 68% in math) and Asian/Pacific Islander students (51% in reading, 50% in math).

Teenage Parenthood

There is mixed evidence regarding the effect of teenage parenthood on adult employment and earnings.

114 Mehta, N. K., Lee, H., & Ylitalo, K. R. (2013). Child health in the United States: recent trends in racial/ethnic disparities. *Social science & medicine* (1982), 95, 6–15.

115 Mazumder (2008); Bhattacharya, D. and Mazumder, B. (2011), A nonparametric analysis of black–white differences in intergenerational income mobility in the United States. *Quantitative Economics,* 2: 335-379; Acs, G. (2011). *Downward Mobility from the Middle Class: Waking Up from the American Dream*. Economic Mobility Project, Pew Charitable Trusts. https://www.pewtrusts.org/en/research-and-analysis/reports/2011/09/06/downward-mobility-from-the-middle-class-waking-up-from-the-american-dream; Mazumder, B. (2014) Black–White Differences in Intergenerational Economic Mobility in the United States. *Economic Perspectives*, 38(1): https://ssrn.com/abstract=2434178; William J. Collins, W. J. & Wanamaker, M. H. (2017). *Up From Slavery: African American Intergenerational Economic Mobility since 1880* (NBER Working Paper 23395).

116 Vanneman, A., Hamilton, L., Baldwin Anderson, J., and Rahman, T. (2009). *Achievement Gaps: How Black and White Students in Public Schools Perform in Mathematics and Reading on the National Assessment of Educational Progress*, (NCES 2009-455). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC.; Vanneman, A., Hamilton, L., Baldwin Anderson, J., and Rahman, T. (2009). *Achievement Gaps: How Black and White Students in Public Schools Perform in Mathematics and Reading on the National Assessment of Educational Progress*, (NCES 2009-455). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC.

117 Bloxom, B., Pashley, P. J., Nicewander, W. A., & Yan, D. (1995). Linking to a large-scale assessment: An empirical evaluation. *Journal of Educational and Behavioral Statistics*, 20(1), 1-26.

Numerous studies have demonstrated the potential adverse influence of teenage parenthood on adult employment and earnings. Florian (2018) employed a quasi-experimental analysis using a sample of children born 1957-1965 drawn from the National Longitudinal Survey of Youth 1979 (NLSY79). Her analysis revealed that teenage motherhood significantly reduced employment for White, Latino, and Black females.[118] In another study using a quasi-experimental analysis and data from the Child and Young Adult Cohorts of the National Longitudinal Survey of Youth (born between 1970 and 2010), Diaz and Fiel (2016) found that teenage pregnancy led to a 23% reduction in average earnings between the ages of 25 and 35 for those more likely to become pregnant on average. This reduction leapt to 67% for teens least likely to become pregnant on average.[119] A recent study using a nationally representative cohort of adolescents born between 1976 and 1982 (Add Health) found that the negative impacts of teenage parenthood only applied to White teens and those from wealthier communities. Applying a quasi-experimental analysis, Gorry (2019) found that only individuals from high-income U.S. counties (those with median family incomes above the median income levels for the sample of pregnant teens) and White teens experienced a negative impact from teenage childbearing. For Black and Latino teenagers, the effects were both small and statistically insignificant.[120]

Racial Gaps: Data from 2015-19 show that the lifetime prevalence of a teenage birth for females ages 15 to 49 was around 1 in 3 for both Black females (34%) and Latina females (31%), and 1 in 7 for White females (17%).[121] However, rates of teenage childbearing among young females has been declining dramatically over the past two decades. See Figure 21 on page 59. In 2022, annual rates of teenage childbearing were 0.19% for Asians, 0.91% for non-Hispanic Whites, 2.0% for Blacks, 2.3% for American Indians, 2.1% for Latinos, and 2.0% for Pacific Islanders.96 This contrasts with rates for teenage females in 1991 that were 11.8% for Blacks, 10.5% for Latinos, 8.4% for American Indians and 4.3% for Whites.

Locus of Control & Self-Esteem

Both locus of control and self-esteem measured in adolescence have been found to be as predictive of earnings at age 30 as cognitive skills. Racial gaps in earnings persist, however, despite similarities in these "non-cognitive" characteristics.

So-called "non-cognitive" characteristics have been associated with a variety of educational, employment and earnings outcomes.[122] Two such adolescent non-cognitives—locus of control (Rotter scale) and self-esteem (Rosenberg scale)—have been shown by Heckman et al (2006) to be long-term predictors of wages in

118 Florian, S. M. (2018). Motherhood and employment among Whites, Hispanics, and Blacks: A life course approach. *Journal of Marriage and Family*, 80(1), 134-149.
119 Diaz, C. J., & Fiel, J. E. (2016). The effect (s) of teen pregnancy: Reconciling theory, methods, and findings. *Demography,* 53(1), 85-116.
120 Gorry, D. (2019). Heterogeneous Consequences of Teenage Childbearing. *Demography*, 56(6), 2147–2168.
121 Martinez, G. M., & Daniels, K. (2023). Fertility of men and women aged 15–49 in the United States: National Survey of Family Growth, 2015–2019.
122 Lundberg, S. (2019). 6. Noncognitive Skills as Human Capital: In C. Hulten & V. Ramey (Ed.), *Education, Skills, and Technical Change: Implications for Future US GDP Growth* (pp. 219-250). Chicago: University of Chicago Press. https://doi.org/10.7208/9780226567945-007

adulthood.[123] The Rotter Locus of Control Scale measures the extent to which respondents believe that they, rather than external forces, primarily exercise control over the events of their lives. The Rosenberg Self-Esteem Scale measures respondents' global sense of self-worth by measuring both positive and negative feelings toward the self. Both measures were taken when respondents were ages 14-23. Heckman et al (2006) applied a quasi-experimental analysis to a nationally representative cohort of individuals born 1957-1965 and found that locus of control and self-esteem have about the same effect on wages measured at age 30 as cognitive skills.[124] Furthermore, they found that the effect of these characteristics on wages were stronger for men with lower levels of education. For employment levels measured at age 30, Heckman et al (2006) found that locus of control and self-esteem measured in adolescence exert stronger effects than cognitive skills.

Expanding upon the work of Heckman et al, Hall and Farkas (2011) used data for a national sample of individuals born 1957 to 1965 (NLSY79) to estimate the relationship between cognitive skills (as measured by AFQT scores), attitudinal behavioral traits (locus of control, self-esteem, educational aspirations, and expectations), and wage trajectories, separately by race.[125] They discovered that Black men with the same cognitive skills and attitudinal/behavioral traits as White men initially earned roughly equal wages, but a wage gap developed and widened to around 27% in favor of White males by the time both groups reached their 40s. For Latino men, the wage gap in their 40s was roughly 10%. Like Black men, Black women also showed a substantial wage gap. The wage gap for White and Black women in their 40s with the same cognitive skills and attitudinal/behavioral traits was also approximately 27%. Conversely, Latino women in mid-career earned $3 more per hour than their White counterparts.

Racial Gaps: Whether locus of control or self-esteem play a role in racial mobility gaps depends crucially on how large the racial gaps are in these development predictors. Existing evidence, however, demonstrates that these gaps are neither substantial nor do they favor Whites over Blacks. Twenge and Crocker (2002) find in their meta-analysis of several studies that Blacks scored higher than Whites on self-esteem measures (d=0.19), while American Indians (d=-0.21) and Latinos (d=-0.09) scored lower.[126] Moreover, Kang et al (2015) find that whether using the a nationally representative cohort of adolescents in 2007 (ECLS-K) or a nationally representative cohort of 8th graders first interviewed in 1998 (NELS), locus of control, when measured during the 8th and 10th grades, shows negligible gaps between Whites and either Blacks or Latinos.[127]

Postsecondary Completion

Graduating college is strongly associated with lifetime earnings growth and upward intergenerational mobility, especially from poverty.

Studies focusing on upward mobility from poverty have highlighted attaining a college degree as a critical milestone. While, in the past, high school graduation was sufficient to obtain a well-paying job, in recent decades a bachelor's degree has become a virtual prerequisite to securing upward mobility and avoiding downward mobility.[128] Drawing from the Panel Study of Income Dynamics (PSID) data, Haskins (2007) observed notable disparities in the likelihood of escaping poverty depending on whether one attained a college degree.[129] He found that only 16% of poor children who went on to obtain a college degree remained in poverty as adults, compared to 45% of those without a college degree. He also found that the likelihood of moving from poverty

123 Heckman, J.J., Stixrud, J., and Urzua, S. (2006). The Effects of Cognitive and Noncognitive Abilities on Labor Market Outcomes and Social Behavior. *Journal of Labor Economics* 24(3), 411-482.
124 Cognitive skills are measured using scores on the Armed Forces Qualifying Test (AFQT).
125 Hall, M., & Farkas, G. (2011). *Adolescent Cognitive Skills, Attitudinal/Behavioral Traits and Career Wages. Social Forces*, 89(4), 1261–1285.
126 Twenge, J. M., & Crocker, J. (2002). Race and self-esteem: Meta-analyses comparing Whites, Blacks, Hispanics, Asians, and American Indians and comment on Gray-Little and Hafdahl (2000). *Psychological Bulletin,* 128(3), 371–408;
127 Kang, H. S., Chang, K. E., Chen, C., & Greenberger, E. (2015). Locus of control and peer relationships among Caucasian, Hispanic, Asian, and African American adolescents. *Journal of Youth and Adolescence,* 44, 184-194.
128 Autor, D. H. (2014). Skills, education, and the rise of earnings inequality among the "other 99 percent". *Science*, 344(6186), 843-851.
129 Haskins, R. (2007). *Education and Economic Mobility.* The Economic Mobility Project, Pew Charitable Trusts. https://www.brookings.edu/wp-content/uploads/2016/07/02_economic_mobility_sawhill_ch8.pdf

to the middle class was 9% for those without a college degree and 22% for those with a college degree. Lastly, 19% of those in poverty with a college degree reached the highest income quintile in adulthood compared to 5% for those without a college degree. Although not addressing intergenerational mobility directly, Brand (2023) applied a quasi-experimental analysis to data from a nationally representative cohort of adolescents born in the early 1960s (NLSY79) and a later cohort born in the early 1980s (NLSY97). She found that students with a low statistical likelihood (i.e. propensity) of completing college (i.e. Black, Latino, low-income, low expectations to graduate college, attending disadvantaged schools, etc.) saw a 47% improvement in wages if they graduated college compared to similar individuals that did not graduate college.[130] There were also significant decreases in the risk of poverty, unemployment, low-wage work, and job instability for these low likelihood college graduates. While on average those with bachelor's degrees earn more in the long-term than those with associate degrees or vocational certificates, field of study matters. Kim and Tamborini (2019), for example, studied nationally representative earnings data for men and women who graduated from high school between 1972 and 1995. They found that for a period of 20 years after graduating high school, men with an AA in engineering saw 18 percent higher cumulative earnings than men with a BA in liberal arts and humanities.[131]

Looking specifically at how college completion affects racial mobility gaps, Mazumder (2014) found that the Black-White gap in upward mobility from poverty virtually disappeared for individuals holding college degrees based on data drawn from a nationally representative cohort of adolescents born 1957-1965 (NLSY79).[132] He also found, however, that attaining a college degree did not eliminate the 14-percentage point higher rate of downward income mobility for Black college graduates compared to White ones.

Other studies have looked at the effect that graduating college has on racial gaps in long-term earnings. Zhou and Pan (2023) used data from a national cohort of adolescents first interviewed in the late 1990s (NLSY97) to study earnings gaps between Black and White young adults. Applying a quasi-experimental analysis, they found that the earnings gap between Black and White men in their 30s was reduced from around 8 percentage points among those with only a high school diploma to just 2 percentage points among college graduates.[133] Earnings gaps among Black and White women at either educational level were not statistically significant. Keo et al. (2019) used data from the American Community Survey (2008-2016) to assess earnings gaps between American Indians and Whites. They found that American Indian workers earn 15.1% less than their White counterparts, even after controlling for educational attainment.[134] Lastly, Wang and Sakamoto (2021) found, using data from the 2010 National Survey of College Graduates (a national survey of adults ages 25 to 64 in 2010), that despite earning college degrees, native-born Latino men faced a 10% wage gap compared to similar White men, while native born Latina women experienced no such gap.[135]

Racial Gaps: There are large disparities in rates of college enrollment across race and ethnicity. Figure 22 shows college enrollment rates for young adults aged 18 to 24 years old in 2018. Asians (59%) led the way in college enrollment followed by Whites (42%), Blacks (37%), Latinos (36%), and American Indians (24%).

130 Brand, J. E. (2023). *Overcoming the odds: The benefits of completing college for unlikely graduates.* Russell Sage Foundation; Online Appendix to Overcoming the Odds

131 Kim, C., & Tamborini, C. R. (2019). Are they still worth it? The long-run earnings benefits of an associate degree, vocational diploma or certificate, and some college. *RSF: The Russell Sage Foundation Journal of the Social Sciences,* 5(3), 64-85.

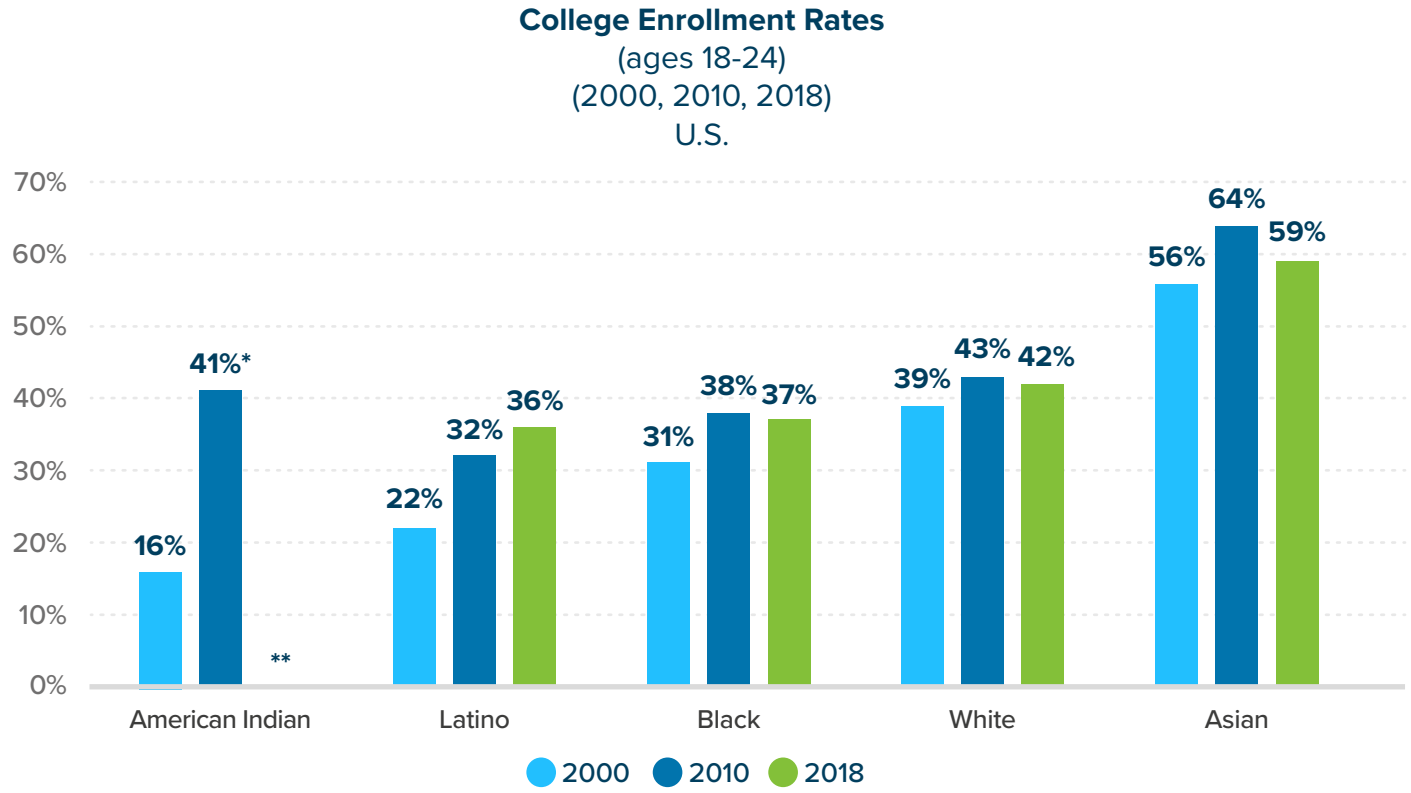
132 Mazumder, B. (2014) Black–White Differences in Intergenerational Economic Mobility in the United States. *Economic Perspectives*, 38(1): https://ssrn.com/abstract=2434178

133 Zhou, X., & Pan, G. (2023). Higher Education and the Black-White Earnings Gap. *American Sociological Review*, 88(1), 154-188. https://doi.org/10.1177/00031224221141887

134 Keo, C., Peterson, A., & West, K. (2019). Returns to Higher Education for American Indian and Alaska Native Students. *Journal of American Indian Education*, 58(1-2), 7-38

135 Wang, S. X., & Sakamoto, A. (2021). Can Higher Education Ameliorate Racial/Ethnic Disadvantage? An Analysis of the Wage Assimilation of College-Educated Hispanic Americans. *Sage Open*, 11(2). https://doi.org/10.1177/21582440211009197

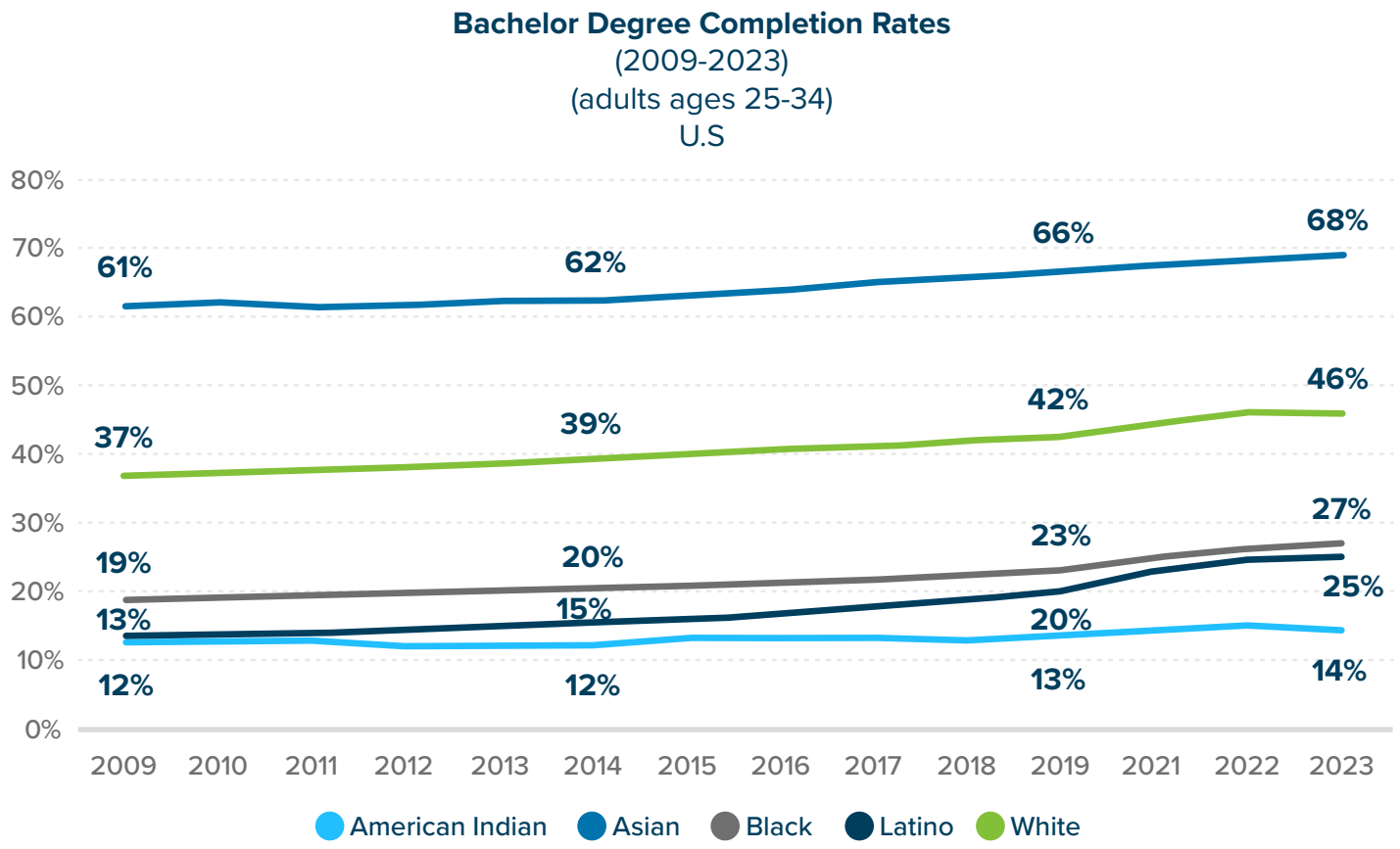
Figure 22. College Enrollment Rates, ages 18 to 24: 2000, 2010, 2018



**Statistically unreliable estimate
SOURCE: U.S. Department of Commerce, Census Bureau, Current Population Survey (CPS), October Supplement, 2000, 2010, and 2017. See Digest of Education Statistics 2018, table 302.60; Hussar, B., Zhang, J., Hein, S., Wang, K., Roberts, A., Cui, J., ... & Dilig, R. (2020). The Condition of Education 2020. NCES 2020-144. National Center for Education Statistics.

When it comes to graduating college, Figure 23 shows that roughly a quarter of Blacks (27%) and Latinos (25%) attained a bachelor's degree or higher in 2023, while nearly half of Whites (46%) and more than two-thirds of Asians (68%) did so. Just 1 in 6 American Indians (14%) graduated college, however. While bachelor degree completion rates increased for all groups between 2009 and 2023, rates for American Indians have remained stagnant since 2021 yielding just a 14% improvement since 2009. Marked increases in college completion have occurred for Latinos (87%) over the 14-year period, narrowing the gap with Whites from 23 percentage points to 21. While college completion rates for Blacks rose 42% from 2009 to 2023, the gap between them and Whites continued to grow over this period from 18 percentage points to 19.

Figure 23. Bachelor's Degree or Higher Completion Rates, 2009-2023



SOURCE: "We're tracking degree attainment by race and ethnicity," Lumina Foundation. Retrieved on January 2, 2025 from https://www.luminafoundation.org/stronger-nation/report/#/progress/racial_equity

Timing of College Enrollment and Completion

Not enrolling in college immediately following high school is associated with reduced annual earnings.

In addition to completing college, the timing of when young people enroll in college has been found to have a bearing on long-term earnings. Lin and Liu (2019) apply quasi-experimental analysis to nationally representative data from a cohort of adolescents who graduated high school between 1998 and 2003 (NLSY97), and found that those who did not enroll in college within months of graduating from high school earned $7,470 less annually than on-time college enrollees at 13 years post high school graduation.[136]

Racial Gaps: Blacks are much more likely to complete college degrees in their 30s than Whites. For example, almost two in five Blacks (37%) born in 1970 who graduated from college did so after age 30. This is compared to 18% for Whites.[137]

136 Lin, Y., & Liu, V. Y. T. (2019). Timing matters: How delaying college enrollment affects earnings trajectories.
137 Bárány et al (2024) "Late bloomers: Older adult college enrollment trends and benefits." Brookings Institution. Retrieved on February 28th, 2024 from https://www.brookings.edu/articles/late-bloomers-older-adult-college-enrollment-trends-and-benefits/

Attending a Selective or High Mobility College

Attending a highly selective or "high mobility" college is associated with higher intergenerational mobility.

Three characteristics of postsecondary institutions have important consequences for the income mobility prospects of the students who attend them: their selectivity, their combination of "access" along with success, and whether they are a for-profit institution.

College Selectivity

The selectivity of colleges that young people attend is strongly associated with their long-term earnings.[138] Researchers often define selectivity tiers using Barron's college selectivity index as detailed in Barron's Profiles of American Colleges. Students attending highly selective colleges tend to reap the benefits of extensive tuition subsidies, abundant college resources, and increased faculty attention.[139] In a study by Chetty et al. (2017), they linked IRS data with data from the Department of Education to yield a sample of over 30 million individuals born between 1980 and 1991.[140] Their analysis found that those attending schools in the top tier of Baron's selectivity rankings (approximately 65 schools, excluding Ivy League schools and a select group of elite institutions), reached the 80th income percentile on average after age 30 compared to those attending lower-tier four year colleges who on average reached the 70th percentile of the income distribution on average.

High Mobility Colleges: Combining "Access" and "Success"

While selective colleges can offer a mobility boost to students of color and low-income students, relatively few of these students attend such institutions.[141] Colleges that combine "access"—a substantial share of low-income students and students of color in their student bodies—with "success"—a significant income mobility boost for their graduates—are likely to have a much greater impact on overall mobility rates. Simpfenderfer (2024) finds that the institutions most likely to combine both access and success are mid-tier, regional colleges and universities.[142] A key common characteristic of these institutions that has the strongest associations with student upward mobility is the share of staff and faculty that are persons of color. Koch & Swinton (2023) also find that historically black colleges and universities (HBCUs) outperform other types of institutions at promoting upward income mobility for their graduates.[143]

138 Witteveen, D., & Attewell, P. (2020). Reconsidering the 'meritocratic power of a college degree'. *Research in social stratification and mobility*, 66, 100479; Thompson, J. (2019). Mobility in the middle: Bachelor's degree selectivity and the intergenerational association in status in the United States. *Research in Social Stratification and Mobility*, 60, 16-28; Zhou, X. (2019). Equalization or selection? Reassessing the "meritocratic power" of a college degree in intergenerational income mobility. *American Sociological Review, 84*(3), 459-485.

139 Hoxby, C. M. (2009). The changing selectivity of American colleges. *Journal of Economic perspectives*, 23(4), 95-118; Hoxby, C. M., & Avery, C. (2012). The missing" one-offs": The hidden supply of high-achieving, low income students (NBER Working Paper 18586).

140 Chetty, R., Friedman, J. N., Saez, E., Turner, N., & Yagan, D. (2017). *Mobility report cards: The role of colleges in intergenerational mobility* (No. w23618). national bureau of economic research

141 Chetty, R., Friedman, J. N., Saez, E., Turner, N., & Yagan, D. (2020). Income segregation and intergenerational mobility across colleges in the United States. *The Quarterly Journal of Economics*, 135(3), 1567-1633.

142 Simpfenderfer, A. (2024). The role of higher education in intergenerational mobility: An exploration using multilevel structural equation modeling. *Research in Higher Education,* 65(3), 379-416.

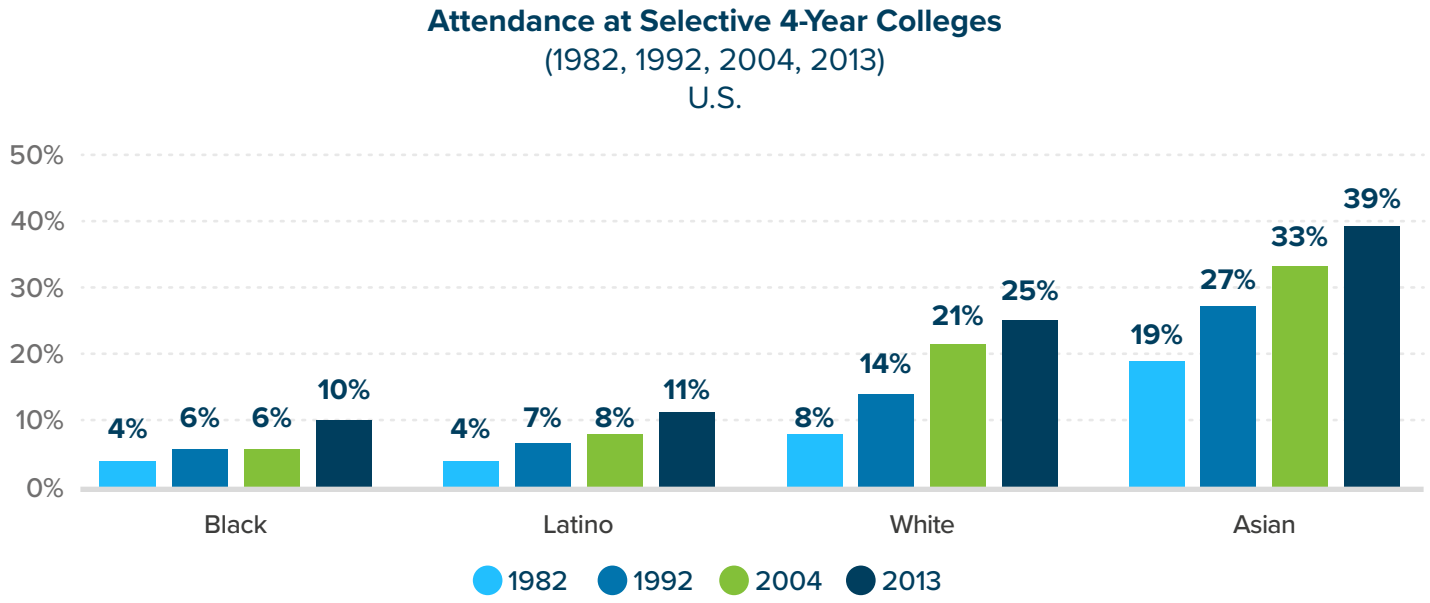
143 Koch, J. V., & Swinton, O. H. (2023, May). Colleges and Upward Economic Mobility: The Distinctive Contribution of HBCUs. In *AEA Papers and Proceedings* (Vol. 113, pp. 446-450): American Economic Association.

Attending For-Profit Colleges

Attending a for-profit college does not appear to yield the same economic gains of college degrees earned at public or nonprofit universities. Multiple studies reinforce this conclusion showing lower earnings as well as higher levels of loan receipt and default among for-profit college students.[144]

Racial Gaps: Blacks and Latinos are significantly less likely to attend selective colleges than are Whites and Asians. As per Oh et al (2024), Figure 24 shows that in 2013 only 10% and 11% of Blacks and Latinos attended selective colleges versus 25% of Whites and 39% of Asians.[145] Furthermore, over the past three decades the racial gap in enrollment in selective institutions has grown significantly.[146]

Figure 24. Attendance at Selective 4-Year Colleges by Race, 1982, 1992, 2004 and 2013



SOURCE: Oh, B., Tilbrook, N., & Shifrer, D. (2024). Shifting Tides: The Evolution of Racial Inequality in Higher Education from the 1980s through the 2010s. Socius, 10. Data sources include the High School and Beyond study, the National Education Longitudinal Study of 1988, the Education Longitudinal Study of 2002, and High School Longitudinal Study of 2009.

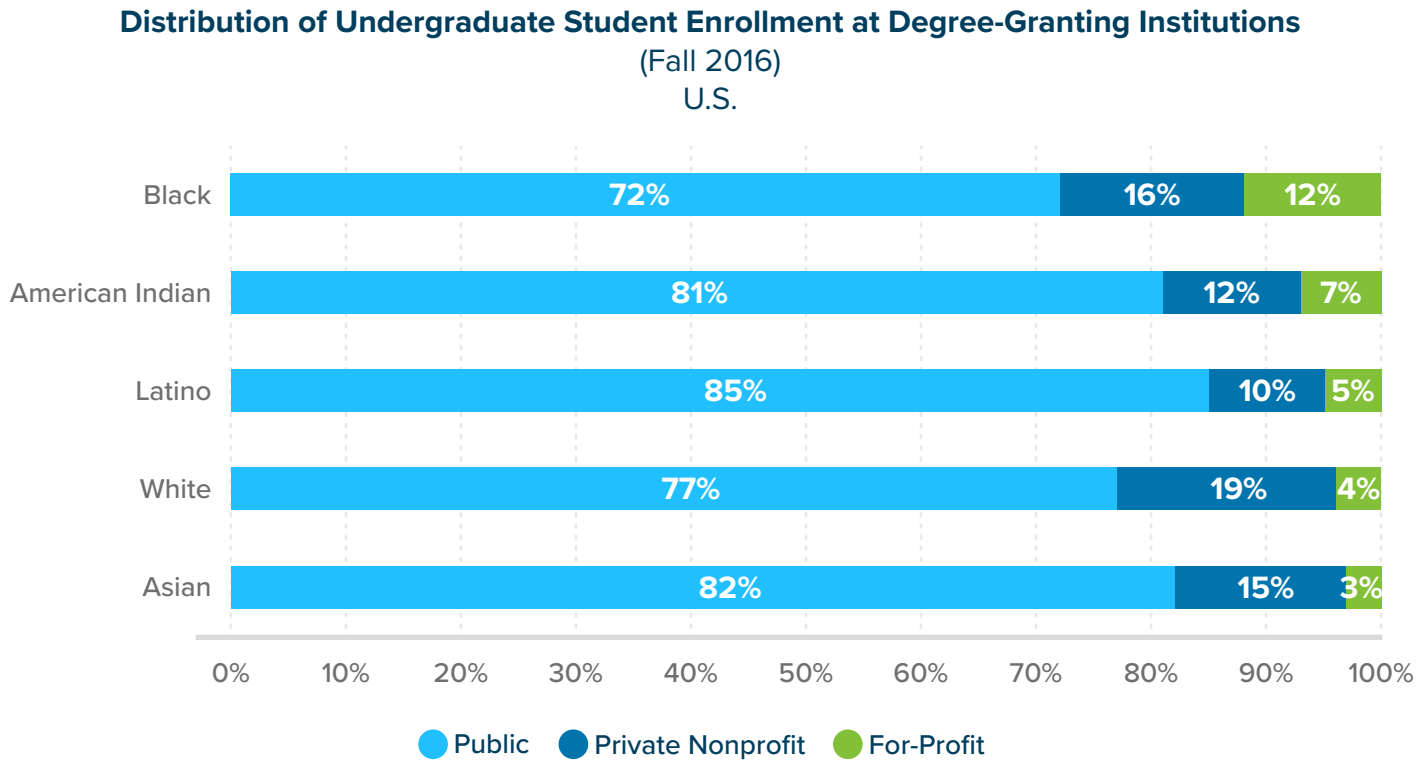
Compared to Whites, Blacks and American Indians are significantly more likely to attend for-profit college institutions. Figure 25 shows that Black college students (12%) were three times as likely as Whites (4%) to enroll in for-profit colleges while American Indians (7%) were nearly twice as likely.

144 Cellini, S. R. (2021). For-Profit Colleges in the United States: Insights from Two Decades of Research. In *The Routledge Handbook of the Economics of Education* (pp. 512-523). Routledge; Armona, L., Chakrabarti, R., & Lovenheim, M. F. (2022). Student debt and default: The role of for-profit colleges. *Journal of Financial Economics*, 144(1), 67-92; Liu, V. Y. T., & Belfield, C. (2020). The labor market returns to for-profit higher education: Evidence for transfer students. *Community College Review,* 48(2), 133-155

145 Oh, B., Tilbrook, N., & Shifrer, D. (2024). Shifting Tides: The Evolution of Racial Inequality in Higher Education from the 1980s through the 2010s. *Socius,* 10, 23780231231225578

146 Iibd.; Baker, R., Klasik, D., & Reardon, S. F. (2018). Race and Stratification in College Enrollment Over Time. *AERA Open*. https://doi.org/10.1177/2332858417751896

Figure 25. Distribution of Undergraduate Student Enrollment at Degree-Granting Institutions, Fall 2016



SOURCE: "Indicator 20: Undergraduate Enrollment", De Brey, C., Musu, L., McFarland, J., Wilkinson-Flicker, S., Diliberti, M., Zhang, A., ... & Wang, X. (2019). *Status and Trends in the Education of Racial and Ethnic Groups 2018*. NCES 2019-038. National Center for Education Statistics.

Young Adult Incarceration or Felony Conviction

Incarceration rates exploded between the early 1970s and early 2000s, particularly for black men without a high school diploma or GED. Those who went to jail or prison saw dramatic reductions in their lifetime employment levels and earnings.

Over the past half-century, the rate of prison incarceration rose by 430% a historically unprecedented increase.[147] Since going to prison or receiving a felony conviction can lead to a host of societal exclusions in areas like education, employment, and housing, it is a plausible contributor to mobility gaps for Blacks, American Indians, and Latinos. Studies using data from the National Longitudinal Surveys demonstrate large earnings penalties for those who have experienced criminal convictions or imprisonment. Craigie et al. (2020) utilized a quasi-experimental analysis applied to data from a nationally representative cohort of adolescents born in the early 1960s (NLSY79) and a later cohort born in the early 1980s (NLSY97). They found that those who experienced incarceration or a conviction for a felony or misdemeanor offense sustained large penalties in annual earnings in the subsequent 30-year period.[148] Individuals who were incarcerated saw a 52% reduction in annual earnings, while those with felony convictions but no incarceration experienced a 22% reduction. Those with just misdemeanor convictions saw only a 16% reduction in annual earnings. Blacks and Latinos suffered the greatest lifetime earnings losses, totaling $358,900 and $511,500 respectively, compared to $267,000 for

147 National Research Council. 2014. *The Growth of Incarceration in the United States: Exploring Causes and Consequences*. Washington, DC: The National Academies Press

148 Craigie, T., Grawert, A., Kimble, C. and Stiglitz, J. E. (2020). *Conviction, Imprisonment and Lost Earnings: How Involvement with the Criminal Justice System Deepens Inequality*. Brennan Center for Justice.
https://www.brennancenter.org/our-work/research-reports/conviction-imprisonment-and-lost-earnings-how-involvement-criminal

their White counterparts. Apel and Powell (2019) also utilized a quasi-experimental design applied to a nationally representative sample of adults born 1980-1984 (NLSY97) to assess the effect of incarceration on early adult wages (at a median age of 32).[149] They found that a wage penalty associated with incarceration occurred for Blacks, but not for Latinos or Whites. Additionally, the size of the effect of incarceration on wages for Blacks varied across the wage distribution, with those at the bottom and top quartiles experiencing a roughly 38% wage penalty.

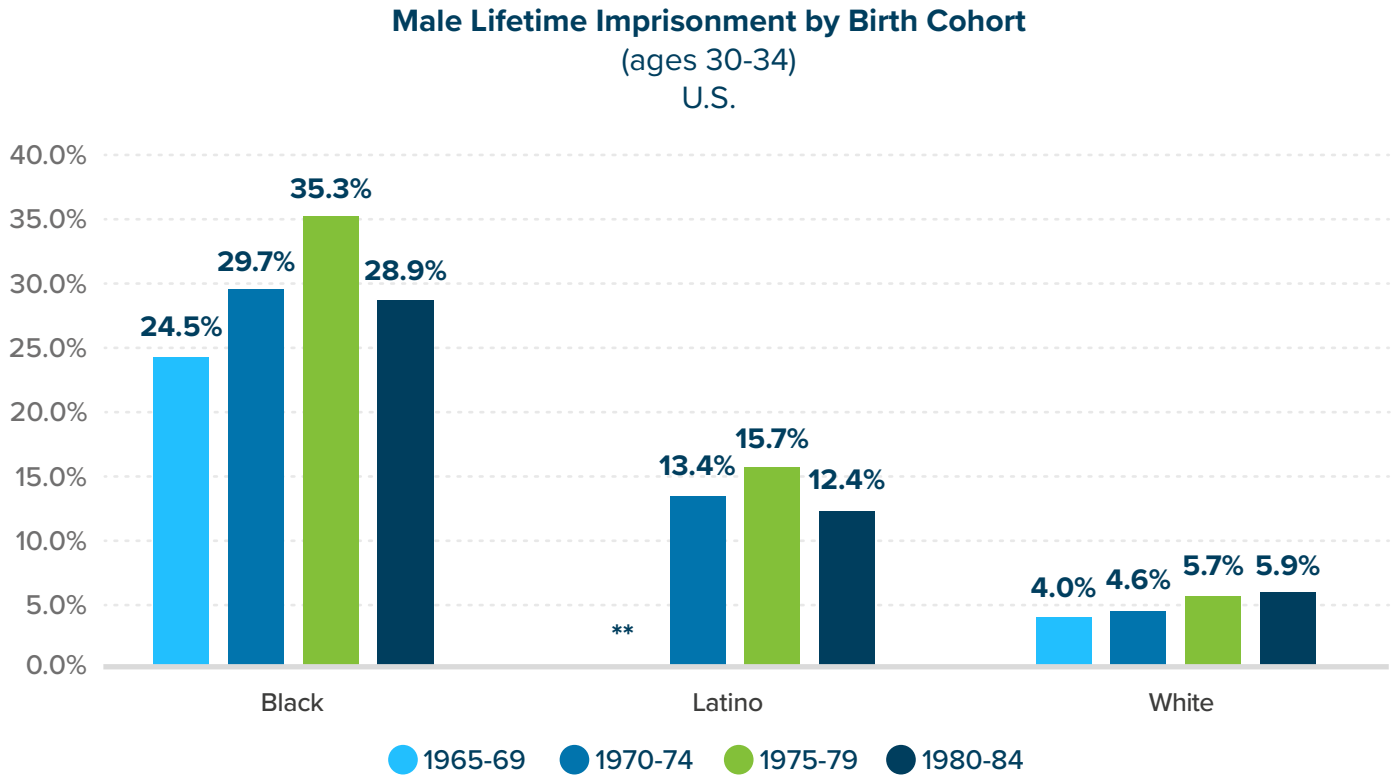
Mueller-Smith and Schepel (2021) conducted a quasi-experimental study showing a strong causal link between a felony conviction and long-term declines in employment and income. Their research in Harris County, Texas, used a regression discontinuity analysis to evaluate two natural experiments where abrupt policy shifts dramatically altered the chances that first-time felony defendants would face imprisonment.[150] They found that defendants who avoided a felony conviction through court diversion saw a 45% reduction in the probability of future convictions and a 50% improvement in quarterly employment over a 20-year period. These effects were particularly pronounced for young Black men with no prior felony convictions.

Racial Gaps: The dramatic rise in incarceration since the 1970s has been experienced most prominently by males of color and those who dropped out of high school. Roehrkasse and Wildeman (2022) estimate large disparities in the lifetime risk of imprisonment for males. Figure 26 shows the cumulative risk of imprisonment for men by the time they reach their early 30s for different birth cohorts. Unfortunately, the underlying data samples do not yield statistically reliable estimates for Native Americans.

Black males showed by far the highest risk of imprisonment in their lifetimes across birth cohorts. Their risk escalated from 25% for those born the late 1960s to 35% for those born in the late 1970s. Also during this period, rates for Latino males were around 13-16%, while those for White males ranged from 4-6%. For women, lifetime imprisonment rates averaged 2.8% for Black women, 1.3% for Latina women and 0.8% for White women over this same time period.[151]

149 Apel, R., and Powell, K. (2019). Level of Criminal Justice Contact and Early Adult Wage Inequality." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 5(1): 198–222.
150 Mueller-Smith, M., & Schnepel, K. T. (2020). *Diversion in the Criminal Justice System. The Review of Economic Studies*. doi:10.1093/restud/rdaa030
151 Roehrkasse, A. F., & Wildeman, C. (2022). Lifetime risk of imprisonment in the United States remains high and starkly unequal. *Science Advances*, 8(48)

Figure 26. Estimated Lifetime Risk of Imprisonment for Men by Race and Birth Cohort

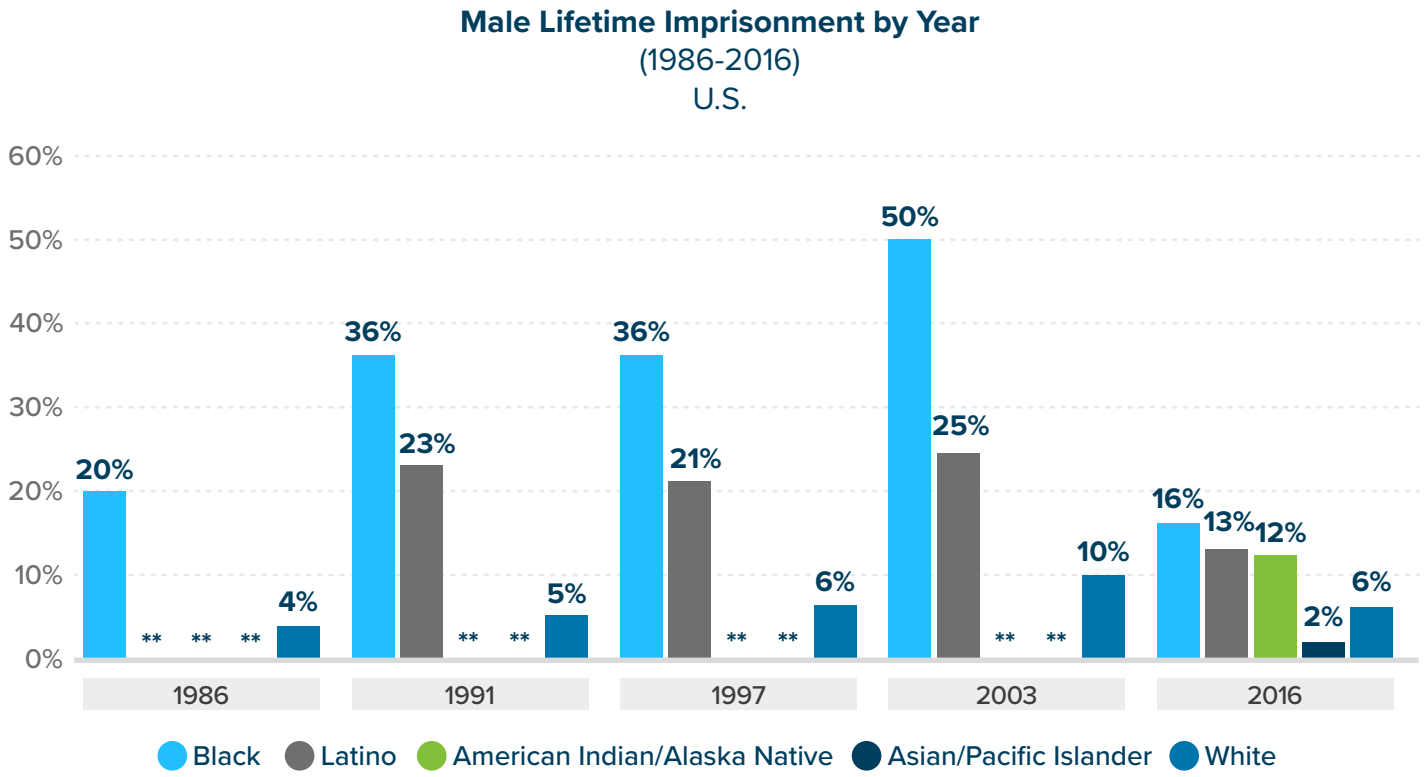


SOURCE: Roehrkasse, A. F., & Wildeman, C. (2022). Lifetime risk of imprisonment in the United States remains high and starkly unequal. *Science Advances,* 8(48)

Roehrkasse and Wildeman (2022) also estimate the lifetime risk of imprisonment for all U.S. men by race for particular years. Figure 27 shows that Black men in 2003 had a 50% chance of going to prison in their lifetime compared to 25% for Latino men and 10% for White men. In 2016, those rates for men had fallen to 16% for Blacks, 13% for Latinos, and 6% for Whites. Also in 2016, lifetime imprisonment rates for American Indian men were 12% and 2% for Asian American Pacific Islander men.[152]

152 Roehrkasse, A. F., & Wildeman, C. (2022). Lifetime risk of imprisonment in the United States remains high and starkly unequal. *Science Advances,* 8(48); Supplementary Materials Table S2

Figure 27. Estimated Lifetime Risk of Imprisonment for All Men by Race for select years



SOURCE: Roehrkasse, A. F., & Wildeman, C. (2022). Lifetime risk of imprisonment in the United States remains high and starkly unequal. *Science Advances*, 8(48); Supplementary Materials Table S2

When broken down by educational attainment, imprisonment disparities are even more pronounced. According to Western and Pettit (2010), about 70% of Black males born in the 1970s who dropped out of high school went to prison in their lifetimes. This contrasted with 21% of Black males in that cohort who completed high school or earned a GED. Lifetime imprisonment rates for White and Latino high school dropouts were 28% and 20% respectively.[153]

Adult Physical and Mental Health

Work-limiting disabilities and depression in young adulthood are associated with significant reductions in employment and earnings over multiple decades.

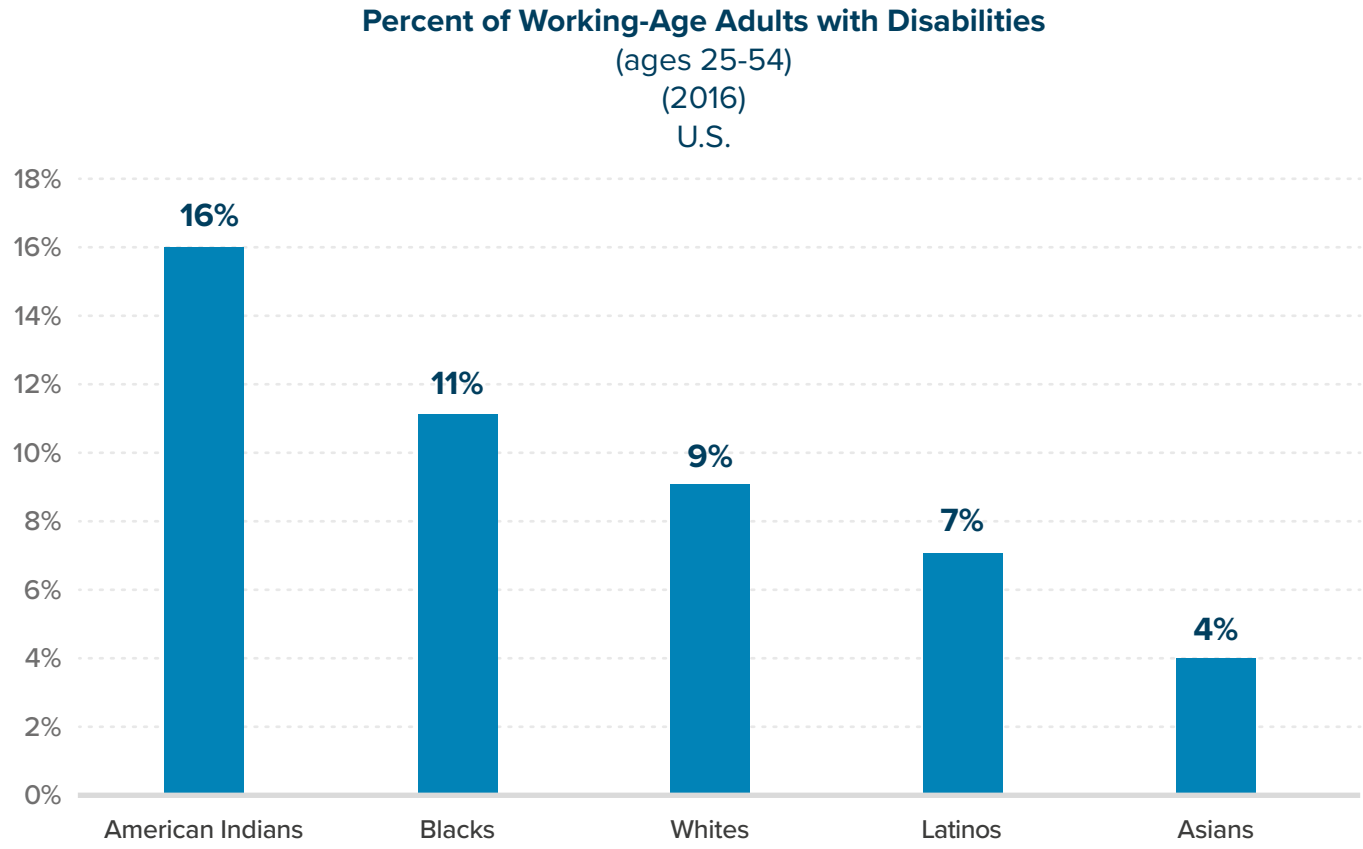
A significant body of research suggests that health affects long-term income through its impact on employment, particularly in the form of work-limiting disabilities.[154] In a study using PSID data, Jolly (2013) employed a quasi-experimental analysis to estimate the impact of disability on subsequent earnings and income mobility for men aged 20 to 62.[155] The results indicate that individuals who suffer a work-limiting disability see their earnings drop by 9% over the ensuing decade. Additionally, there is a marked increase in downward mobility in the earnings distribution and a significant decrease in upward mobility for several years after the onset of the disability. A parallel study by Meyer and Mok (2019) using data from a national cohort of male heads of households (PSID) and quasi-experimental analysis showed that men aged 22-61 with chronic and severe disabilities experienced a staggering 79% decline in earnings a decade after onset.[156]

153 Western, B., & Pettit, B. (2010). Incarceration and social inequality. *Daedalus*, 139(3), 8–19. https://doi.org/10.1162/daed_a_00019
154 O'Donnell, O., Van Doorslaer, E., & Van Ourti, T. (2015). Health and inequality. In *Handbook of income distribution* (Vol. 2, pp. 1419-1533). Elsevier.
155 Jolly, N. A. (2013). The impact of work-limiting disabilities on earnings and income mobility. *Applied Economics, 45(36), 5104–5118*. doi:10.1080/00036846.2013.818212
156 Meyer, B. D., & Mok, W. K. C. (2018). Disability, earnings, income and consumption. *Journal of Public Economics.*

Looking at mental health, Wang et al (2022) used data from a national cohort of adults born 1957 to 1964 (NLSY79) to estimate the effect of depression at ages 27-35 on wages and hours worked at age 50. The study revealed that depression leads to a 10% decrease in hourly wages (adjusted for occupation), and 120-180 fewer hours worked each year. This dual impact ultimately results in a 24% reduction in annual income. The study also suggests that a portion of this income penalty, between 21-39%, can be attributed to the often-chronic nature of depression, which may recur across the life course. However, a significant portion (25-55%) is linked to how depression during early adulthood disrupts the accumulation of human capital. It leads to a decrease in work experience and guides individuals into occupations with skill distributions that offer lower potential for wage growth.[157]

Racial Gaps: As of 2016, data from the American Community Survey shows that Native Americans (16%) and Blacks (11%) have higher rates of disability among working-age adults (ages 25 to 54) compared to Whites (9%), Latinos (7%), and Asians (4%).[158] See Figure 28. Using data from the Current Population Survey covering the period 2005 to 2020, Lundberg (2021) found that among adults aged 25 to 60, 13.1% of Blacks, 8.4% of Whites, and 6.2% of Latinos reported having work-limiting disabilities.[159] Although data on trends in work-limiting disability by race is lacking, data studied by Zajacova & Margolis (2024) representing all U.S. adults ages 18-44 show work limiting disabilities have increased by 17% between 2000 and 2018.[160]

Figure 28. Working Age Adults with Disabilities, 2016



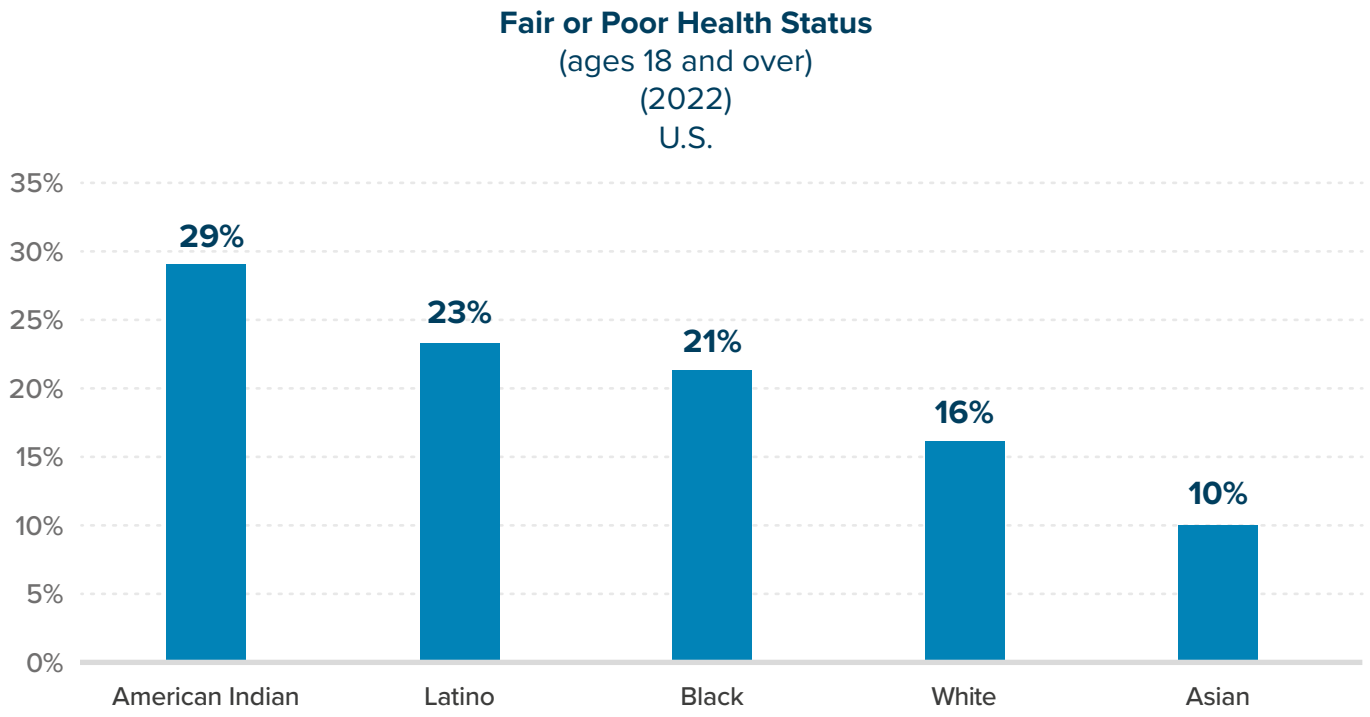
SOURCE: Ross, M., & Bateman, N. (2018). Disability rates among working-age adults are shaped by race, place, and education. Brookings Institute. Retrieved on February 18th, 2025 from https://www.brookings.edu/blog/the-avenue/2018/05/15/disability-rates-among-working-age-adults-are-shaped-by-race-place-and-education/

157 Wang, B., Frank, R. G., & Glied, S. A. (2022). *Lasting Scars: The Impact of Depression in Early Adulthood on Subsequent Labor Market Outcomes* (No. w30776). National Bureau of Economic Research.
158 Ross, M., & Bateman, N. (2018). *Disability rates among working-age adults are shaped by race, place, and education.* Brookings Institute. https://www.brookings.edu/blog/the-avenue/2018/05/15/disability-rates-among-working-age-adults-are-shaped-by-race-place-and-education/
159 Lundberg, I. (2021). Quantifying the contribution of occupational segregation to racial disparities in health: A gap-closing perspective. *SocArXiv.*
160 Zajacova, A., & Margolis, R. (2024). Trends in disability and limitations among US adults age 18-44, 2000-2018. *American Journal of Epidemiology*, kwae262.

With regard to depression, a national study of depression rates in the United States found that while Whites had a higher lifetime prevalence of major depression throughout the life course, Blacks (OR=1.6) and Mexican Americans (OR=1.5) had significantly higher rates of chronic major depression compared to Whites.[161]

Regarding overall self-reported health status, there were significant racial gaps in reporting fair or poor health in 2022 as shown in Figure 29. American Indians (29%), Latinos (23%), and Blacks (21%) were all significantly more likely to report fair or poor health than Whites (16%).

Figure 29. Adults Reporting Fair or Poor Health Status, 2022



SOURCE: KFF analysis of 2022 Behavioral Risk Factor Surveillance System. Retrieved on February 25th, 2025 from https://www.kff.org/key-data-on-health-and-health-care-by-race-and-ethnicity/?entry=health-status-and-outcomes-birth-risks-and-outcomes

Employment in a High Demand Industry or Sector

Starting a working career in an industry with slow employment growth is associated with substantial long-term reductions in earnings compared to higher growth industries. The contraction in the manufacturing industry since the 1960s has been particularly damaging to the wages of Black men.

In their 2021 study, Ross and Ukil utilize data from a national cohort of adults born 1957 to 1964 (NLSY79) to examine the impact of employment growth within a male worker's first industry on their earnings growth over the next 20 years. To account for workers' characteristics prior to entering the labor market, the researchers adjusted for several individual and family background characteristics including a variety of cognitive and non-cognitive ability measures, age at industry entry, the effects of the year of entry, and potential influence from the geographical region of residence at the time of entering the industry. They found that a 1 standard deviation increase in employment growth was associated with 9 percent of a standard deviation increase in earnings over a 20-year period.[162]

161 González, H. M., Tarraf, W., Whitfield, K. E., & Vega, W. A. (2010). The epidemiology of major depression and ethnicity in the United States. *Journal of psychiatric research*, 44(15), 1043-1051.
162 Ross, S. L., & Ukil, P. (2021, May). Initial Industry and Long-Term Earnings Growth. In *AEA Papers and Proceedings* (Vol. 111, pp. 476-480). 2014 Broadway, Suite 305, Nashville, TN 37203: American Economic Association.

Racial Gaps: Blacks have been disproportionately concentrated in the manufacturing sector, which has seen substantial contraction over the past few decades. Gould's (2018) analysis of Census data from 1960 to 2010 linked this decline in manufacturing employment to a 13.3% decrease in wages for Black males and an 8 percentage-point rise in the poverty rate for Black women. Additionally, this contraction in manufacturing jobs corresponds to a 12% increase in the Black-White wage gap for men.[163] Seltzer (2020) further noted that this reduction in manufacturing jobs has caused more damage to intergenerational income mobility for Blacks than for Whites.[164] Specifically, the negative impact of the manufacturing decline on upward income mobility for Black men is three times greater than for White men. This effect isn't statistically significant for Latino men or women from any racial group.

Stable Employment

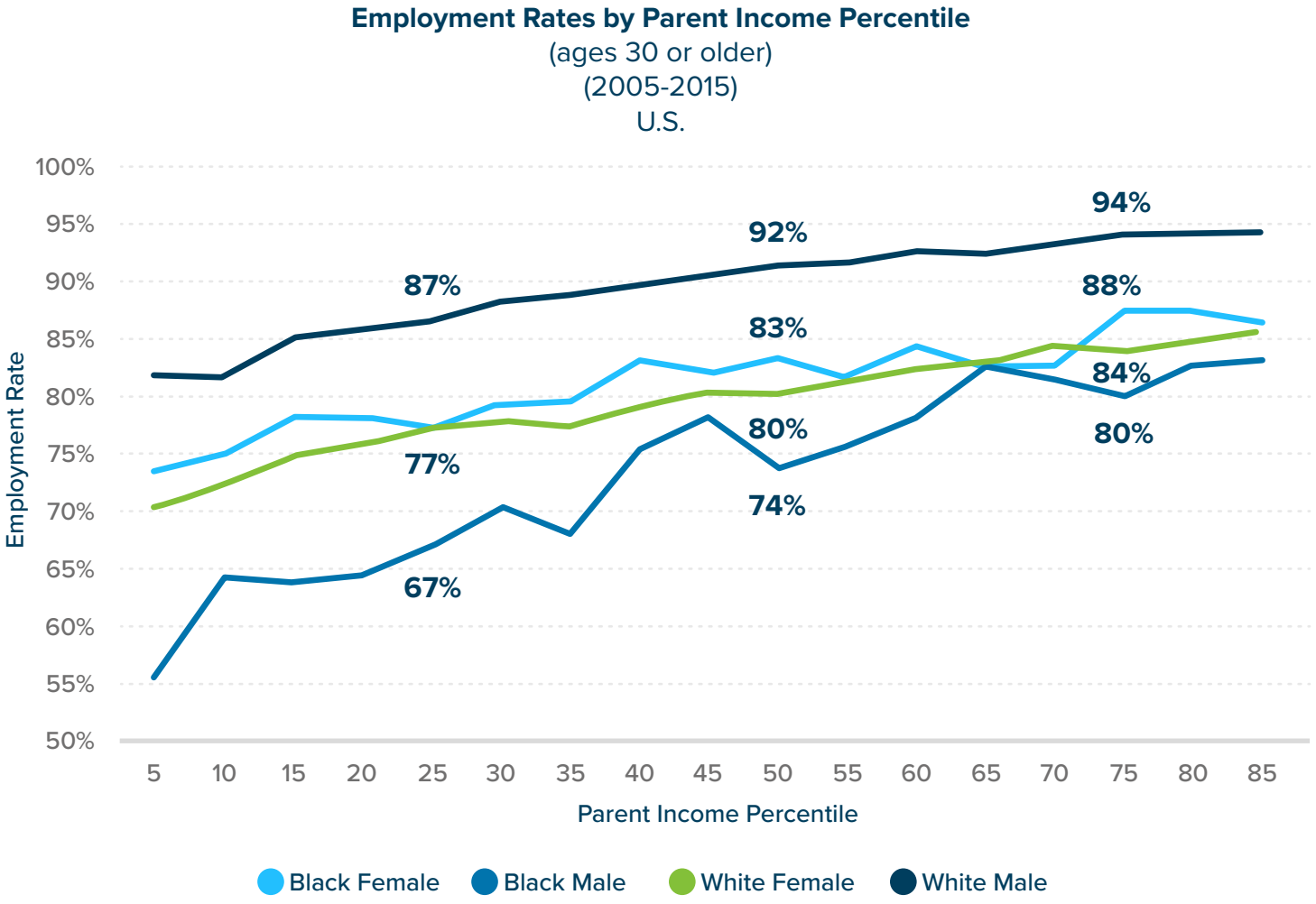
Blacks and Latinos experience substantial employment instability which is associated with large wage penalties in middle age.

Chetty et al (2020), who studied data from a national cohort of 20 million children born between 1978 and 1983, identified lengthy unemployment periods as significant factors in the income mobility gaps between Black and White males. As shown in Figure 30, they found that Black men from low-income families (at the 25th income percentile) are approximately 20 percentage points less likely to work in a given year than their White counterparts. This disparity persists even among Black men from higher-income families (75th percentile), where the gap stands at 11.4 percentage points.[165]

Weisshar and Cabello-Hutt (2020) used NLSY79 data from a subset of participants born between 1959 and 1964 to assess the connection between employment trajectories and wage outcomes.[166] Studying the period when participants were age 22 to age 50, they discovered that Black and Latino men, along with women of all races, are more likely to experience unstable employment trajectories. These patterns include: 1) low employment during their 20s, occasionally extending into their 30s, followed by increased employment stability, and 2) consistent employment until their 30s, followed by a steady employment decline. Both patterns correlate with significant wage penalties later in life. Those exhibiting the first pattern incur wage penalties ranging from 39% to 53%, while those fitting the second pattern experience wage losses of around 45%.

163 Gould, E. D. (2018). Torn Apart? The Impact of Manufacturing Employment Decline on Black and White Americans. *The Review of Economics and Statistics*, 1-46.
164 Seltzer, N. (2024). Cohort-Specific Experiences of Industrial Decline and Intergenerational Income Mobility. *Social Forces*, 102(4), 1223-1248.
165 Chetty, R., Hendren, N., Jones, M., & Porter, S. (2020). Race and economic opportunity in the United States: An intergenerational perspective. *The Quarterly Journal of Economics* 135, 711-783. Low-income families were those at the 25th percentile of the family income while higher-income families were those at the 75th percentile.
166 Weisshaar, K., & Cabello-Hutt, T. (2020). Labor force participation over the life course: The long-term effects of employment trajectories on wages and the gendered payoff to employment. *Demography,* 57(1), 33-60.

Figure 30. Employment Rates for Children at Age 30 or Older by Parent Income Percentiles: Blacks and Whites



SOURCE: Opportunity Insights (2018) "National Statistics by Parent Income Percentile, Gender, and Race." Retrieved on February 2, 2025 from https://opportunityinsights.org/wp-content/uploads/2018/04/table_1.csv

Long-Term Unemployment

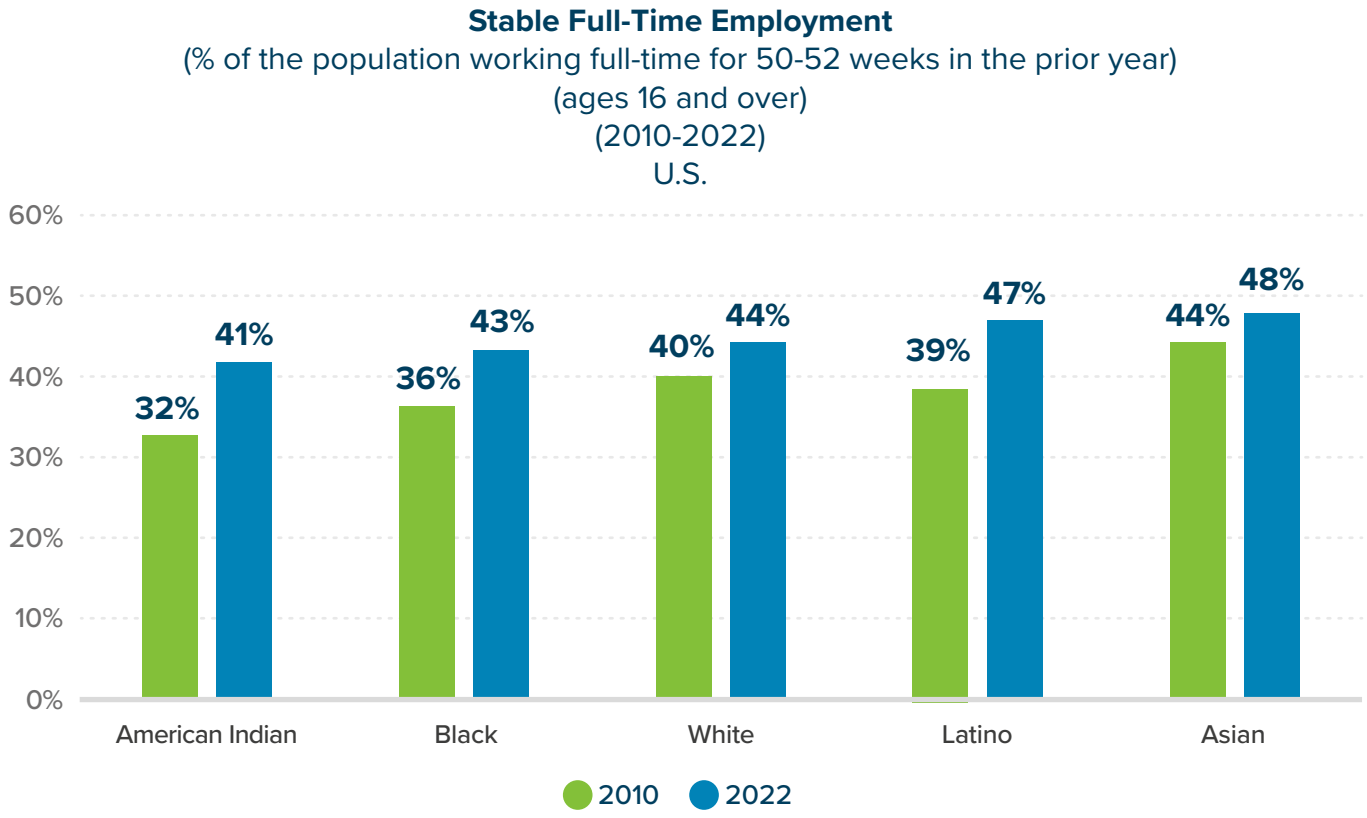
Research using national study samples has found significant negative impacts of lengthy unemployment spells on subsequent employment probabilities. In other words, those who enter long periods without a job tend to stay there much longer than those who only experience shorter durations of unemployment. Kruger et al (2014) studying national cross-sectional data (CPS) covering the period from 1994 to 2007, found that unemployment durations of greater than 6.5 months were associated with a 20% to 40% lower probability of being reemployed in the subsequent 1 to 2 years compared to those with unemployment durations of 3.5 months or less.[167] Also, Abraham et al (2019) found, using cross-sectional data (CPS) linked to longitudinal administrative data (LEHD) for the period of 1998 to 2012, that those that experienced a year or more of unemployment suffered a roughly 20 percentage-point reduction in their probability of being reemployed over the next 2.8 years compared to those who were unemployed for just 3.5 months or less.[168]

Racial Gaps in Stable Employment: Ideally, the best data to examine employment stability across racial groups would be recent longitudinal data, which unfortunately was not available for this study. Cross-sectional census data, however, can help paint a picture of the nature of employment disparities across both race and gender.

167 Krueger, A. B., Cramer, J., & Cho, D. (2014). Are the long-term unemployed on the margins of the labor market?. *Brookings papers on economic activity*, 2014(1), 229-299.
168 Abraham, K. G., Haltiwanger, J., Sandusky, K., & Spletzer, J. R. (2019). The consequences of long-term unemployment: Evidence from linked survey and administrative data. *ILR Review*, 72(2), 266-299.

Figure 31 depicts racial and gender gaps in stable full-time employment for the years 2010, 2015, and 2022. They show the percentage of those over the age of 16 that were employed full-time for at least 50-52 weeks out of the year. Rates of stable full-time employment compared to Whites (44%) are about even for Blacks (43%), lower for American Indians (41%), and higher for Latinos (47%) and Asians (48%).

Figure 31. Stable Full-Time Employment, 2010, 2022

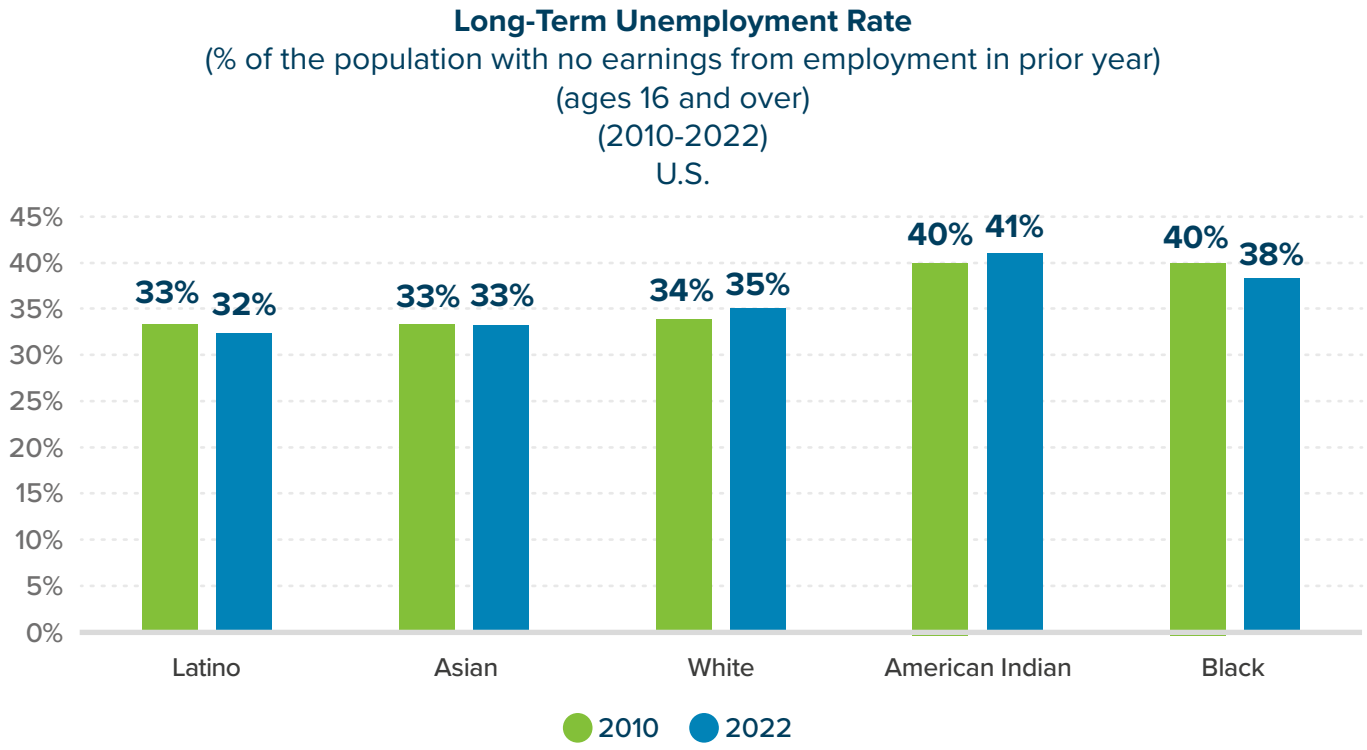


SOURCE: U.S. Census Bureau, 2010, 2015 and 2022 American Community Survey 1-Year Estimates

Racial Gaps in Long-Term Unemployment: Following Hirsch & Winters (2014), Figure 32 displays long-term unemployment rates by race for the years 2010 and 2022.[169] Long-term unemployment refers to those who have had no earnings from employment for at least a year or more. When comparing long-term unemployment rates across racial groups, American Indians (40%) and Blacks (38%) have higher rates than Whites (35%), while Latinos (32%) and Asians (33%) have lower rates.

169 Hirsch, B. T., & Winters, J. V. (2014). An anatomy of racial and ethnic trends in male earnings in the US. *Review of Income and Wealth,* 60(4), 930-947.

Figure 32. Long-Term Unemployment Rates by Race, 2011, 2022



SOURCE: U.S. Census Bureau, 2010 and 2022 American Community Survey 1-Year Estimates

Earnings Growth

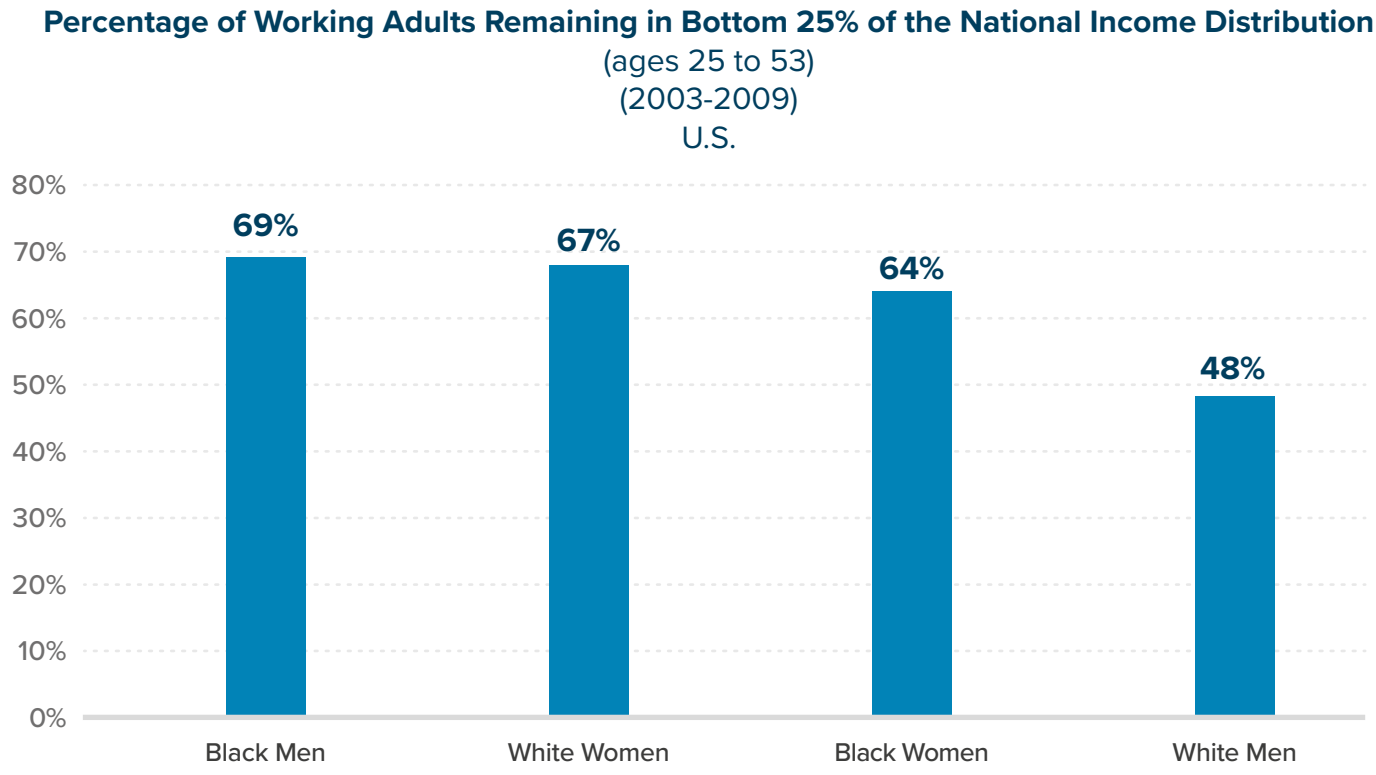
Low earnings and low earnings growth are primary determinants of income mobility and racial mobility gaps.

In their exploration of key factors influencing income mobility, Chetty et al (2020), who studied data from a national cohort of 20 million children born between 1978 and 1983, concluded that wages and earnings are the most direct explanatory factors for racial income mobility gaps. For instance, Black males earn wages that are 7 percentiles lower than White males, conditional on their parents' incomes in childhood.[170] Using quantile regression, Census data from 1940-2000, and American Community Survey data from 2005-2014, Bayer and Charles (2018) found that the Black-White gap in median annual earnings among men is as large today as it was in 1950.[171] A big driver of this growing gap is the increase in the share of Black men that have zero earnings, a trend shaped by educational attainment. The authors note that being employed was essentially uncorrelated with education in the 1960s and 1970s. However, having a full-time job today is increasingly tied to educational attainment.

Racial Gaps: Earnings trajectories over multiple years, also known as intragenerational income mobility, represent another key potential factor explaining racial mobility gaps. Analyzing PSID data for individuals aged 22-53, Bishop et al (2021) found that Black men were 26 percentage points more likely (69% vs. 43%) to remain in the bottom 25% of the earnings distribution between 2003 and 2009 compared to White men. Black women (64%) actually had lower rates of persistence in the bottom 25% than White women (67%). See Figure 33.[172]

170 Chetty, R., Hendren, N., Jones, M., & Porter, S. (2020). Race and economic opportunity in the United States: An intergenerational perspective. *The Quarterly Journal of Economics* 135, 711-783.
171 Bayer, P., & Charles, K. K. (2018). Divergent paths: A new perspective on earnings differences between black and white men since 1940. *The Quarterly Journal of Economics*, 133(3), 1459-1501.
172 Bishop, J. A., Rodríguez, J. G., & Zeager, L. A. (2021). Race and Earnings Mobility in the US. *Journal of Economics, Race, and Policy*, 1-17.

Figure 33. Percentage of Working Adults Remaining in the Bottom 25% of the National Income Distribution, 2003 to 2009



SOURCE: Bishop, J. A., Rodríguez, J. G., & Zeager, L. A. (2021). Race and Earnings Mobility in the US. Journal of Economics, Race, and Policy, 1-17.

HEALTH MOBILITY MILESTONES

This section outlines the results of the literature review focused on identifying long-term predictors of adult and midlife health outcomes, with an emphasis on cardiometabolic health and overall self-rated health. A total of 9 predictive factors were identified, as seen in Table 5 below. All milestones with prevalence data fell in the medium or high prevalence ranges.

Health Mobility Section Summary

Table 5. Summary of Health Mobility Milestones, Prevalence Levels, Racial Gaps and Trends

Milestone	***Prevalence Range** (for Blacks, American Indians or Latinos)*	***Year(s) Measured***	***Racial Gap** between Whites and the racial group with highest prevalence*	***% Change in Annual Rates (time period):** for the racial group with highest prevalence*
Medium Prevalence Milestone				
1. Elevated blood lead levels (ages 0-5)	2-12%	2003-06	10pp	**-96%** (1991-2016)
2. Low birthweight	7.9-14.8%	2022	7.7pp	**+3%** (1980-2016)
3. Incarceration (young adult)	12-16%	2016	10pp	**-56%** (1991-2016)
4. Housing insecurity	15.1-15.4%	2024	7.4pp	N/A
5. Juvenile delinquency	25%-27%	1990s	7pp	N/A
6. Downward intragenerational income mobility from the 50th percentile	38-41%	1993-2008	3pp	N/A
High Prevalence Milestones				
7. No bachelor's degree (ages 25-34)	73-86%	2023	32pp	**-2%** (2009-2023)
Unclear Prevalence Milestones				
8. Lack of positive early childhood development	N/A	N/A	N/A	N/A
9. High conscientiousness and high striving	N/A	N/A	N/A	N/A

Medium Prevalence Milestones

Medium prevalence milestones, including elevated blood lead levels, low birthweight, young adult incarceration (before age 24), housing insecurity, juvenile delinquency and downward intragenerational income mobility from the 50th percentile of the income distributions are associated with a decrease in self-rated health and an increase in a variety of health conditions including higher depression, BMI, hypertension, and cardiovascular disease. Elevated blood lead levels and incarceration are also associated with increased risk of mortality. Looking at racial gaps, adult incarceration (10pp) and elevated blood lead levels (10pp) showed the largest absolute racial gaps among all medium-prevalence milestone with disparities of at least 7 percentage points. In terms of trends, rates of adult incarceration (-56% for 1991-2016) and elevated blood lead levels (-96% for 1991-2016) have been falling precipitously for decades. The prevalence and racial disparity in low birthweight, however, has stubbornly persisted with little change (+3% 1980-2016) in decades. Long-term trend data could not be identified for housing insecurity, juvenile delinquency and downward intragenerational income mobility from the 50th percentile.

High Prevalence Milestones

Prevalence rates for not earning a bachelor's degree (ages 25-34) was the only milestone to fall into the high-prevalence range with large racial gaps (32pp) and relatively little change (-2%) in the past decade (2009-2023). This is a complicated marker, however, because college completion has been shown to be associated with adverse health outcomes for young adults of color. For example, obtaining a bachelor's degree or upward educational mobility has been shown to predict increased allostatic load, metabolic syndrome and mortality for Blacks and Latinos, especially those from disadvantaged backgrounds, but not for Whites.

Unclear Prevalence Milestones

The lack of positive early childhood development, marked particularly by exposure to poverty, is associated with increased hypertension and arthritis in adulthood. High conscientiousness and high striving predict increased low-grade inflammation for youth from low-SES backgrounds and increased type 2 diabetes for Blacks from high disadvantage backgrounds. The current and historical prevalence rates for these milestones could not be determined making it difficult to assess their significance for health mobility gaps.

Low Birthweight

Low birthweight increases the risk of disease in adulthood including asthma, hypertension, insulin resistance, higher cholesterol levels, stroke, heart disease and heart attack.

Low birthweight has been shown to contribute to elevated risks of chronic disease in both young adulthood and middle age. Johnson and Schoeni (2011) applied a quasi-experimental analysis to data from a nationally representative sample (PSID) of individuals born 1951 to 1976, and found that low birthweight contributed to a higher likelihood of developing multiple chronic diseases at age 50. In sibling comparison models, low birthweight doubled the odds of asthma (OR=2.0) and increased the odds of hypertension by nearly 50% (OR=1.45). The risk of having a stroke, heart attack, or heart disease was nearly seven-fold higher (OR=6.8) for those born low-birthweight compared to their normal birthweight siblings.[173] In a separate quasi-experimental study using data from the Bogalusa Heart Study, a longitudinal study of cardiovascular risk factors for a sample of children first interviewed in 1973-1974 in Bogalusa, Louisiana, Mzayek et al (2016) found that low birthweight increased the risk of both insulin resistance and higher cholesterol.[174]

173 Johnson, R. C., & Schoeni, R. F. (2011). Early-life origins of adult disease: national longitudinal population-based study of the United States. *American journal of public health*, 101(12), 2317-2324.
174 Mzayek, F., Cruickshank, J. K., Amoah, D., Srinivasan, S., Chen, W., & Berenson, G. S. (2016). Birth weight was longitudinally associated with cardiometabolic risk markers in mid-adulthood. *Annals of epidemiology,* 26(9), 643-647

Racial Gaps: Data from 2022 reveals a considerable disparity in the risk of low birthweight between Black (14.8%), American Indian (8.8%), Asian (9.4%), Pacific Islander (8.5%), Latino (7.9%), and White (7.1%) infants.[175] Large racial disparities in preterm birth have persisted for decades. See Figure 1 on page 30.

Elevated Blood Lead Levels

Elevated blood lead levels predict worse physical and mental health across the lifespan.

A large epidemiological literature finds that elevated blood lead levels in young children worsen several neurodevelopmental and psychological outcomes.[176] In one quasi-experimental study using data from the Project on Human Development in Chicago Neighborhoods (PHDCN), a sample of Chicago children and adolescents first interviewed in the late 1990s, Sampson (2017) found that a 1 microgram per deciliter increase in average childhood blood levels predicted a .37 standard deviation increase in body mass index during adolescence.[177] National studies have also shown blood lead levels in adults to be associated with cardiovascular health.[178] In a national longitudinal study comprised of adults (NHNES) first interviewed in 1988 or 1994 and again in 2010, Cook et al (2022) studied the harmful health effects of elevated blood levels. They found that 16 to 22 years after baseline, those with high blood lead levels (>6.23 mg/dl for men and >3.74 mg/dl for women) and those with moderate blood lead levels (2.64-6.22 md/dl for men and 1.39-3.73 mg/dl for women) had a 35% higher risk of mortality from cardiovascular disease than those with low blood lead levels after controlling for several potential confounders. Moreover, cardiovascular death was associated with blood lead levels in a linear fashion with no apparent thresholds below which blood lead levels were safe.[179]

Racial Gaps: Rates of elevated blood lead levels in children have declined precipitously over the past 40 years. In 2011-16, the percentage of children under the age of 5 with elevated blood levels was 2.4% for Blacks, 1.5% for non-Hispanic Whites, and .3% for Mexican Americans, suggesting that blood lead levels may exert less importance on long-term outcomes for children born today. However, relatively large shares of children born in the 1980s and 1990s had elevated blood lead levels with sharp racial disparities. As noted previously, almost all of the more than 15 million children born in the late 1970s had elevated blood levels. One recent study estimates

175 Osterman, M. J., Hamilton, B. E., Martin, J. A., Driscoll, A. K., & Valenzuela, C. P. (2024). *Births: Final Data for 2022*. National Vital Statistics Reports: From the Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System, 73(2), 1-56.
176 Payne-Sturges, D. C., Taiwo, T. K., Ellickson, K., Mullen, H., Tchangalova, N., Anderko, L., ... & Swanson, M. (2023). Disparities in toxic chemical exposures and associated neurodevelopmental outcomes: a scoping review and systematic evidence map of the epidemiological literature. *Environmental Health Perspectives,* 131(9), 096001.
177 Winter, A. S., & Sampson, R. J. (2017). From lead exposure in early childhood to adolescent health: A Chicago birth cohort. *American journal of public health*, 107(9), 1496-1501.
178 Navas-Acien, A., Guallar, E., Silbergeld, E. K., & Rothenberg, S. J. (2007). Lead exposure and cardiovascular disease—a systematic review. *Environmental health perspectives*, 115(3), 472-482.
179 Cook, M. K., Zhang, J., & Wei, Y. (2022). Blood lead levels and risk of deaths from cardiovascular disease. *The American Journal of Cardiology,* 173, 132-138.

that almost half the U.S. population alive today was exposed to adverse lead levels in early childhood.[180] Thus, while lead exposure has fallen substantially for recent cohorts, a large segment of young adults today was adversely exposed to lead in childhood. See Figure 2 on page 31.

Early Child Development

Early child development, particularly that which is influenced by family income, is a predictor of health outcomes into middle age.

Much as with long-term income, early childhood development is predictive of long-term health. Zio-Guest et al (2012) examined this relationship using data for a nationally representative cohort of adults (PSID) born between 1968 and 1975. After adjusting for several variables, they found that children from families earning less than $25,000 annually between birth and age two reported hypertension (19%) and arthritis (11%) rates in their 30s that were approximately double those for children from families earning over $25,000 annually. Moreover, they noted that the link between childhood parental income and later adult health outcomes was significantly stronger during the birth-to-age-two period than later in childhood.[181]

Racial Gaps: Approximately a third (32.4%) of Black children and a quarter (24.3%) of Latino children under age five lived in poverty in 2018, compared to 9% of non-Hispanic White children.[182]

Juvenile Delinquency

Juvenile delinquency during adolescence increases the risk of depression and cardiovascular disease for young adults.

Engaging in adolescent delinquency strongly predicts a higher risk of cardiovascular disease and depressive symptoms for young adults ages 24 to 32. In a quasi-experimental analysis of data for a nationally representative cohort of adolescents born between 1976 and 1982 (Add Health), Kim et al (2020) found that, when comparing siblings, a one standard deviation increase in juvenile delinquency increased the risk of cardiovascular illness by .08 standard deviations. Moreover, juvenile delinquency increased the risk of adult depressive symptoms by .06 of a standard deviation.[183]

Racial Gaps: Racial differences in self-reported offending are relatively small, particularly when important covariates are taken into account.[184] For example, in a study using a nationally representative sample of adolescents in the 1990s, Haynie & Payne (2006) found that 20% of White adolescents reported engaging in violent delinquency compared to 25% and 27% of Black and Latino adolescents respectively.[185]

180 McFarland, M. J., Hauer, M. E., & Reuben, A. (2022). Half of US population exposed to adverse lead levels in early childhood. *Proceedings of the National Academy of Sciences*, 119(11), e2118631119.
181 Ziol-Guest, K. M., Duncan, G. J., Kalil, A., & Boyce, W. T. (2012). Early childhood poverty, immune-mediated disease processes, and adult productivity. *Proceedings of the National Academy of Sciences,* 109(Supplement_2), 17289–17293. doi:10.1073/pnas.1203167109
182 Paschall, K., & Bartlett, J. D. (2019). *Child poverty declines even as disparities persist among the nation's youngest children*. Child Trends blog.
183 Kim, J., Kim, R., Oh, H., Lippert, A. M., & Subramanian, S. V. (2020). Estimating the influence of adolescent delinquent behavior on adult health using sibling fixed effects. *Social Science & Medicine,* 265, 113397
184 Sohoni, T. W., Ousey, G. C., Bower, E., & Mehdi, A. (2021). Understanding the gap in self-reported offending by race: A meta-analysis. *American Journal of Criminal Justice*, 46, 770-792.
185 Haynie, D. L., & Payne, D. C. (2006). Race, friendship networks, and violent delinquency. *Criminology*, 44(4), 775-805.

Educational Attainment

While educational attainment is associated with lower health problems in later adulthood, the relationship has proven less auspicious for Black individuals who appear to reap much lower health benefits, or in some cases, worse health outcomes as a result of greater educational attainment.

Educational attainment has consistently been linked to adult health outcomes.[186] In a study exploring the intergenerational correlation in health status between parents and children, Halliday et al (2020) utilized data from a nationally representative cohort of adults (PSID) spanning the period 1984 to 2013. They found that educational attainment can decrease the intergenerational transmission of self-rated health status by approximately a third. However, they found that education and income together could only reduce, not erase, the Black-White disparity in self-rated health.[187]

Noppert et al (2021) studied data for a nationally representative cohort of adolescents born between 1976 and 1982 (Add Health) to evaluate the connection between educational attainment and cardiometabolic health among different racial groups, observing outcomes from adolescence (ages 12-19) to young adulthood (ages 24-32).[188] The study used five cardiometabolic health biomarkers — blood pressure, waist circumference, cholesterol, high blood sugar (prediabetes/diabetes), and inflammation. They found that educational attainment showed the most substantial correlation with waist circumference and prediabetes/diabetes. Individuals with a high school diploma or less had 1.83 times higher odds of a large waist circumference and 1.74 times higher odds of diabetes/prediabetes compared to those with a college degree or higher. This pattern, however, did not hold for Blacks. Educational attainment did not moderate their risk of prediabetes or diabetes, which remained twice as high at every educational level compared to non-Hispanic Whites. The risk of high blood pressure, high cholesterol, and high inflammation also did not vary by educational attainment for non-White individuals. This research challenges the prevailing notion that educational attainment is a key means of closing health outcome disparities in young adulthood.

Not only does evidence show that educational attainment appears to be less effective in improving health outcomes for Blacks and Latinos, some research also suggests that educational attainment can lead to worse health outcomes for these groups.[189]

Numerous studies show that, for Black and Latino youth, graduating college could be negatively associated with their health. For instance, using data from the Add Health study, Sims and Coley (2019) found that while completing college predicted a decrease in allostatic load (a measure of physiological stress) for White and Asian graduates of -.11 and -.35 standard deviations (SD) respectively, it predicted increased allostatic load for Black (+.16 SD) and Mexican Americans (+.17 SD).[190] Similarly, Gaydosh et al. (2017) studied Black and Latino adolescents from disadvantaged backgrounds and found that those who graduated from college were likely to experience improved mental health, but also an increase in metabolic syndrome - a collection of health conditions including abdominal obesity, high blood pressure, high blood sugar, high cholesterol, and low serum HDL. This effect was not observed for White adolescents.[191]

Tarrence (2022) analyzed a large dataset (n=31,500), drawn from the U.S. General Social Survey covering the years 1972 to 2016 and linked to mortality records, to estimate the association between educational mobility,

186 Zajacova, A., & Lawrence, E. M. (2018). The relationship between education and health: reducing disparities through a contextual approach. *Annual review of public health*, 39, 273-289.
187 Halliday, T. J., Mazumder, B., & Wong, A. (2020). The intergenerational transmission of health in the United States: A latent variables analysis. *Health economics,* 29(3), 367-381.
188 Noppert, G. A., Gaydosh, L., Harris, K. M., Goodwin, A., & Hummer, R. A. (2021). Is educational attainment associated with young adult cardiometabolic health?. *SSM - population health*, 13, 100752. https://doi.org/10.1016/j.ssmph.2021.100752
189 Chen, E., Brody, G. H., & Miller, G. E. (2022). What are the health consequences of upward mobility?. *Annual review of psychology*, 73(1), 599-628.
190 Sims, J., & Coley, R. L. (2019). Variations in links between educational success and health: Implications for enduring health disparities. *Cultural Diversity & Ethnic Minority Psychology*, 25(1), 32–43.
191 Gaydosh, L., Schorpp, K. M., Chen, E., Miller, G. E., & Harris, K. M. (2018). College completion predicts lower depression but higher metabolic syndrome among disadvantaged minorities in young adulthood. *Proceedings of the National Academy of Sciences of the United States of America,* 115(1), 109–114.

self-perceived health, and mortality. The study revealed that Black individuals attaining a higher educational degree than their parents faced a 9.2% higher risk of mortality during the study period, compared to Black individuals who matched their parents' level of education. This mortality risk associated with upward educational mobility was not observed for Whites.[192]

Racial Gaps: There are significant racial gaps in bachelor's degree attainment rates as shown in Figure 23, page 73. However, given the ambiguous association between college completion and health across racial groups, the meaning of educational attainment for health mobility gaps remains unclear.

Conscientiousness and High Striving

Traits like conscientiousness and "high striving" are shown to predict higher educational attainment and income, but for some groups they are associated with worse health outcomes.

Conscientiousness and related constructs, like the traits of self-control or "high striving," have been shown to be positively associated with higher educational attainment and income, but for some subgroups these traits are also negatively associated with health.[193] Conscientiousness is a personality trait that includes dimensions related to being hard working, disciplined, dutiful, and self-controlled. Chen et al (2020) examined the relationship between conscientiousness and low-grade inflammation (indicated by C-reactive protein levels) using a sample of monozygotic twins from a nationally representative cohort of adolescents born between 1976 and 1982 (Add Health).[194] They found that within twin pairs, the one exhibiting higher conscientiousness levels between ages 25 and 35 typically attained higher levels of education and experienced fewer depression symptoms. However, for twins from low-SES families (based on parental education, parental occupation, and total household income during their teenage years), higher conscientiousness was linked with increased levels of low-grade inflammation.

Brody et al (2016) also drew upon data from the Add Health longitudinal study to estimate the association between 'striving' in adolescence (an index based on educational aspirations, school engagement, belief in hard work and optimism, and a strong focus on success) and type 2 diabetes later in life (ages 29 to 31).[195] They discovered that high striving levels were associated with an increased likelihood of college graduation, higher personal incomes, and fewer depression symptoms among both Black and non-Hispanic White youths. However, for Black youths from highly disadvantaged families (assessed through factors such as family poverty, parental education, parental employment, single-parent status, public assistance receipt, and economic hardship), high adolescent striving was associated with an increased risk of type 2 diabetes. This pattern did not hold true for non-Hispanic Whites or Blacks from non-disadvantaged families.

Adult Incarceration

Incarceration, particularly at younger ages, is associated with worse health outcomes in later life.

Research indicates a correlation between incarceration and adverse health outcomes, particularly impacting those incarcerated at a young age. Massoglia (2008) applied a quasi-experimental analysis to data for a national cohort of adults born 1957 to 1964 (NLSY79), finding the impact of incarceration on self-reported physical health around age 40 to be comparable, if not more substantial, than factors like marriage or employment. This

192 Tarrence, J. (2022). Is educational mobility harmful for health?. *Social Science Research*, 107, 102741.
193 Chen, E., Brody, G. H., & Miller, G. E. (2022) What are the Health Consequences of Upward Mobility? *Annual Review of Psychology.*
194 Chen, Edith & Yu, Tianyi & Siliezar, Rebekah & Drage, Jane & Dezil, Johanna & Miller, Gregory & Brody, Gene. (2020). Evidence for Skin-Deep Resilience Using a Co-Twin Control Design: Effects on Low-Grade Inflammation in a Longitudinal Study of Youth. *Brain, Behavior, and Immunity.* 88, 661–667.
195 Brody, G. H., Yu, T., Miller, G. E., & Chen, E. (2016). Resilience in adolescence, health, and psychosocial outcomes. *Pediatrics*, 138(6).

effect persisted even after adjusting for wages.[196] Kim (2015) applied a similar quasi-experimental analysis to NLSY79 data, using 30 variables linked with the risk of incarceration. She found that the connection between incarceration and self-reported general and mental health at age 40 was primarily evident in men who were first incarcerated between 18 and 24. In contrast, men first incarcerated after 25 showed no statistically significant differences in physical and mental health during midlife compared to those never incarcerated.[197] Powell (2021), using data for a more recent cohort of adolescents first interviewed in the late 1990s (NLSY97), carried out quasi-experimental analyses to explore the relationship between incarceration and mental health. He found that significant mental health detriments were associated only with those incarcerated before age 24.[198] Looking at the effect of incarceration on mortality, Daza et al (2020) applied a quasi-experimental analysis to two nationally representative data sets, the NLSY79 and the PSID. They found that the relative risk of mortality by age 45 was 1.7 (NLSY79) to 2.7 (PSID) times higher for those who had been incarcerated compared to those who had not.[199] Lastly, Witteveen (2022) found, when applying a quasi-experimental analysis to NLSY79 data, that a history of incarceration tripled the risk of mortality by age 53 (from 7% to 21%).[200]

Racial Gaps: For lifetime risks of imprisonment see Figure 27, pg. 80. The lifetime risk of imprisonment varied significantly between birth cohorts for those born in the late 1960s and early 1980s, particularly for Black males. Black males faced a lifetime risk of imprisonment that ranged from 25% for those born in the late 1960s to 30% for those born in the early 1980s. Rates for Latino males were around 13-16% while those for White males ranged from 4-6%. For women, lifetime imprisonment rates averaged 2.8% for Black women, 1.3% for Latina women and 0.8% for White women across cohorts born between the late 1960s and early 1980s.[201]

Housing Insecurity

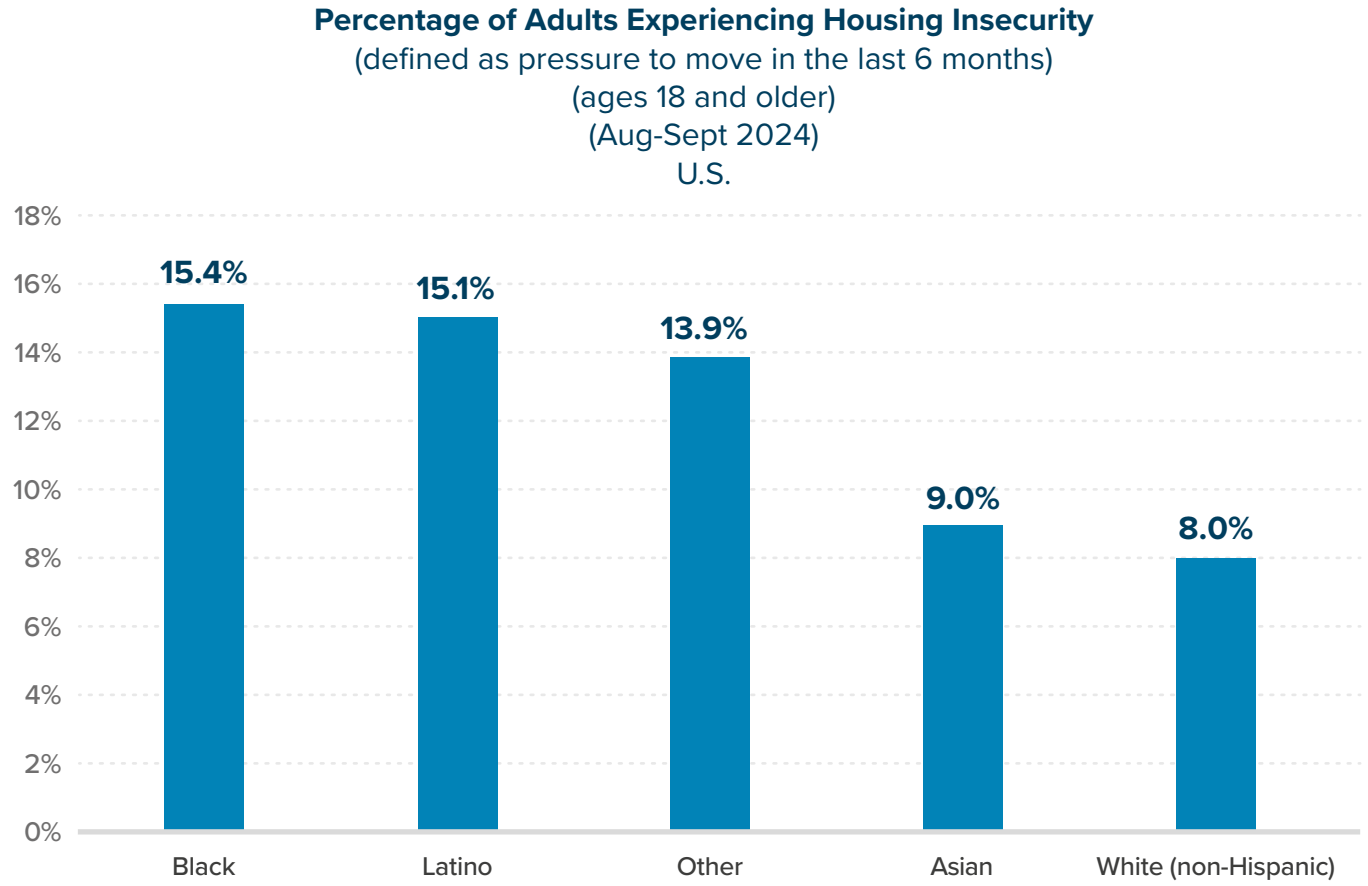
Housing insecurity leads to worse health outcomes in adulthood.

Several studies demonstrate a relationship between housing insecurity--reflected in experiences like missed rent/mortgage payments, facing eviction/foreclosure, and homelessness—and poor mental and physical health outcomes.[202] Two recent studies show compelling evidence of a negative relationship between indicators of housing insecurity and mental and physical health. Applying a quasi-experimental analysis to a nationally representative cohort of adolescents born between 1976 and 1982 (Add Health), Roberts et al (2025) found that housing insecurity between the ages of 18 and 26, defined as experiencing an eviction or the inability to pay rent/mortgage in the past year, was associated with a significant increase in depressive symptoms among men and women at ages 33 to 43.[203] For adults ages 25 to 65, Bhat et al (2022) studied data from a nationally representative cohort of adults that were first interviewed in 1995 (MIDUS) to assess the relationship between several indicators of housing insecurity and both self-rated health and chronic health conditions measured 11 to 20 years later.[204] They found that housing insecurity—including, among other experiences, missing rent/mortgage payments, being threatened with eviction/foreclosure, and experiencing homelessness—was significantly associated with reporting fair or poor health.[205]

196 Massoglia, M. (2008). Incarceration, Health, and Racial Disparities in Health. *Law & Society Review*, 42(2), 275-306
197 Kim, Y. The Effect of Incarceration on Midlife Health: A Life-Course Approach. *Popul Res Policy Rev 34*, 827–849 (2015)
198 Powell, K. (2021). The Age-Graded Consequences of Justice System Involvement for Mental Health. Journal of Research in Crime and Delinquency. https://doi.org/10.1177/00224278211023988; Wang, E. A., Macmadu, A., & Rich, J. D. (2019). Examining the Impact of Criminal Justice Involvement on Health Through Federally Funded, National Population-Based Surveys in the United States. *Public health reports (Washington, D.C. : 1974)*, 134(1_suppl), 22S–33S. https://doi.org/10.1177/0033354918824324
199 Daza, S., Palloni, A., & Jones, J. (2020). The consequences of incarceration for mortality in the United States. *Demography,* 57(2), 577-598.
200 Witteveen, D. (2022). Premature death risk from young adulthood incarceration. *The Sociological Quarterly*, 63(4), 613-640.
201 Roehrkasse, A. F., & Wildeman, C. (2022). Lifetime risk of imprisonment in the United States remains high and starkly unequal. *Science Advances,* 8(48)
202 Singh, A., Daniel, L., Baker, E., & Bentley, R. (2019). Housing disadvantage and poor mental health: a systematic review. *American journal of preventive medicine*, 57(2), 262-272;
203 Roberts, M. K., Bhat, A. C., & Fenelon, A. (2025). The long-term effects of housing insecurity in young adulthood on subsequent material hardship, physiological and mental health. *Social Science & Medicine*, 117761.
204 Bhat, A. C., Almeida, D. M., Fenelon, A., & Santos-Lozada, A. R. (2022). A longitudinal analysis of the relationship between housing insecurity and physical health among midlife and aging adults in the United States. *SSM-Population Health*, 18, 101128.
205 Bhat, A. C., Almeida, D. M., Fenelon, A., & Santos-Lozada, A. R. (2022). A longitudinal analysis of the relationship between housing insecurity and physical health among midlife and aging adults in the United States. *SSM-Population Health*, 18, 101128.

Racial Gaps: There are significant racial disparities in housing insecurity, with Blacks and Latinos having about double the risk of Whites. Figure 34 shows housing insecurity rates by race measured between September and August of 2024 according to the Census Bureau Household Pulse Survey.[206]

Figure 34. Percentage of Adults Experiencing Housing Insecurity, 2024



SOURCE: U.S. Census Bureau Household Pulse Survey, Cycle 09 (2024), "Housing Table 5: Pressure to Move in the Last 6 Months, by Select Characteristics: The United States." Retrieved on February 1st, 2025 from https://www.census.gov/programs-surveys/household-pulse-survey/data/tables.html

Intragenerational Income Mobility

Upward intragenerational income mobility is associated with better health outcomes, while downward mobility is associated with worse ones.

Numerous studies indicate that intragenerational income mobility can significantly impact long-term health outcomes. Intragenerational income mobility refers to the movement of an individual's (or household's) income or economic status over the course of their own lifetime or working career, contrasting with intergenerational mobility which spans generations. Halliday (2007), using PSID data covering the years 1978 to 1997 and a quasi-experimental analysis, found a correlation between income decline over two decades and a deterioration in self-rated health among individuals aged 30 to 59.[207] This effect was particularly pronounced among men, especially those at the lower end of the income distribution, often linked with transitions into long-term unemployment.

206 U.S. Census Bureau Household Pulse Survey, Cycle 09 (2024), "Housing Table 5: Pressure to Move in the Last 6 Months, by Select Characteristics: The United States." Retrieved on February 1st, 2025 from https://www.census.gov/programs-surveys/household-pulse-survey/data/tables.html

207 Halliday, T. J. (2007) Income Volatility and Health. Discussion Paper No. 3234. IZA. For the Arellano-Bond estimator see Arellano, Manuel and Steven Bond. (1991). Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations. *Review of Economic Studies*. 58, 277-297

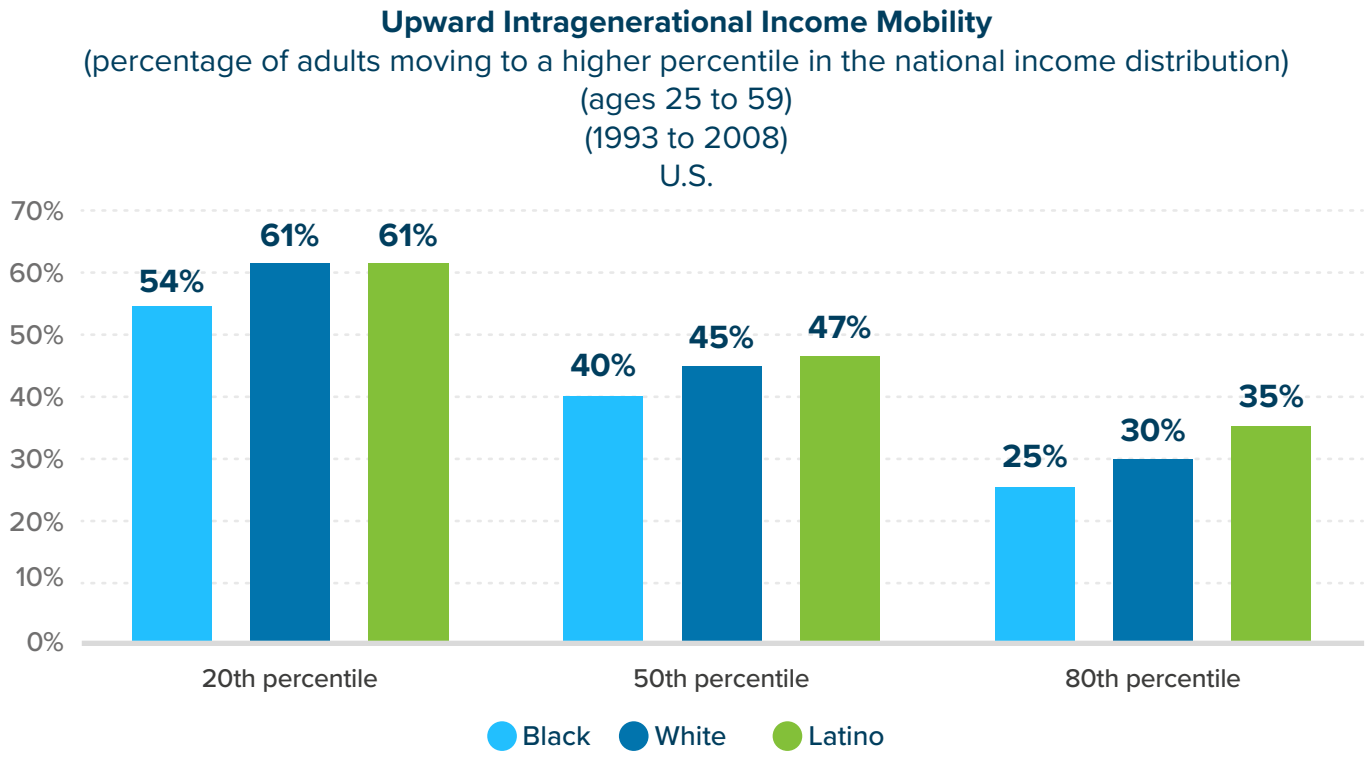
In a later study, Halliday (2017) again utilized PSID data, this time focusing on the relationship between earnings growth from 1984 to 1993 and changes in self-rated health over time for individuals aged 25 to 60.[208] Employing a quasi-experimental analysis, he discovered a positive relationship between earnings growth and self-rated health in married men under 45, with effects largely present in the bottom quartile of the earnings distribution.

Frech and Damaske (2019), meanwhile, estimated the correlation between income changes over 32 years and an index of self-rated physical and mental health for men aged 25 to 49, using data from the NLSY79.[209] They found that upwardly mobile men transitioning from the lowest to middle earnings levels had comparable physical and mental health outcomes at age 50 to those consistently in the highest income stratum. Similarly, men with stable middle-level incomes also had mental health outcomes at age 50 equivalent to high earners. In contrast, men who experienced downward mobility had worse mental and physical health outcomes. After controlling for various factors, they found that early life characteristics, low maternal education, and work-limiting health conditions in young adulthood were all linked to poorer health outcomes at age 50. Furthermore, health behaviors were independently associated with physical health, playing key roles in the poor physical health outcomes seen in individuals with persistently low incomes or downward mobility.

Racial Gaps: Studying a nationally representative sample of data from the Survey of Income and Program Participation (SIPP) linked to detailed earnings records, Carr and Wiemers (2022) summarized patterns of intragenerational income mobility as well as racial gaps.[210] When examining changes in income ranks for adults ages 25 to 59 over the 15-year period from 1993 to 2008, they found that Blacks were less likely to experience upward income mobility than Whites, whereas the reverse was true for Latinos. Figure 35 shows that Blacks were less likely than Whites to experience upward income mobility from the 20th, 50th and 80th percentiles of the income distribution than Whites. Latinos, on the other hand, were more likely to experience upward income mobility at the 50th and 80th percentiles. Looking at downward mobility, Figure 36 shows that rates of downward intragenerational income mobility were modestly higher for Blacks at the 20th, 50th and 80th percentiles of the income distribution than for Whites. Rates for Latinos were lower at the 80th percentile, the same at the 50th percentile, and somewhat higher at the 20th percentile.

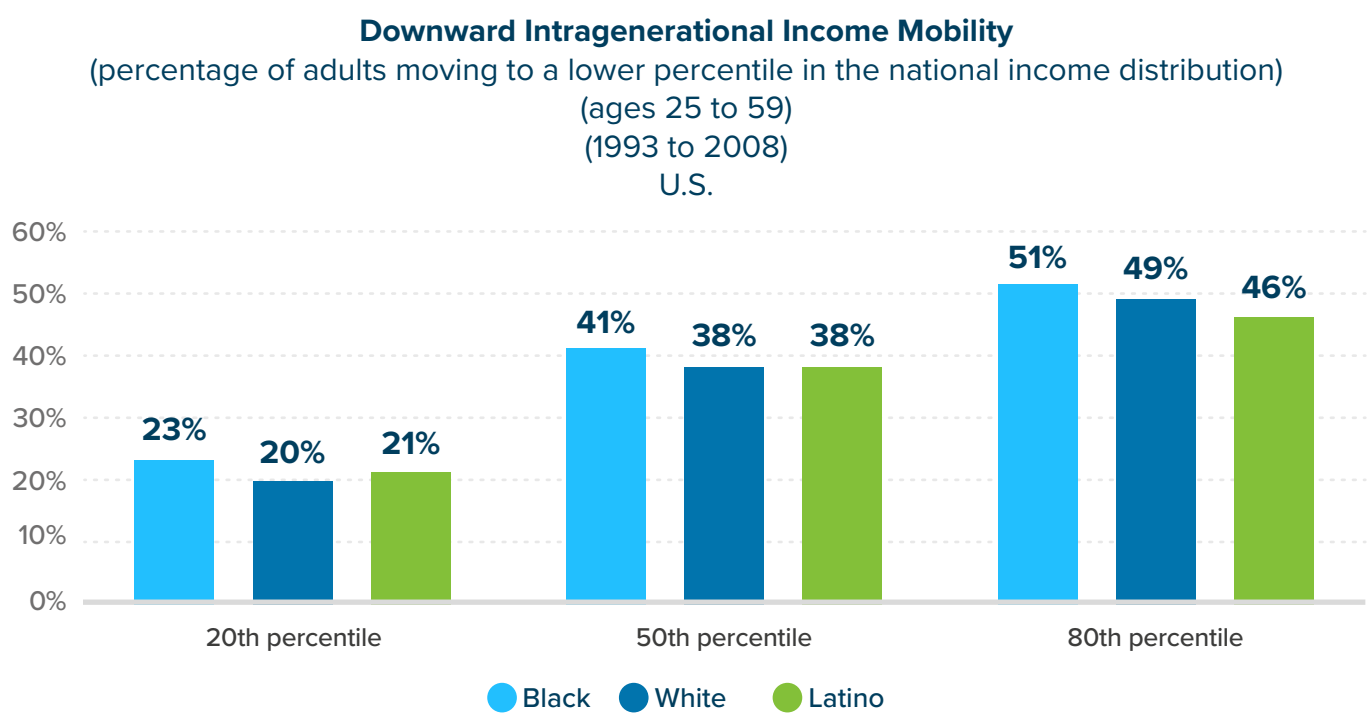
208 Halliday, T.J. (2017), Earnings Growth and Movements in Self-Reported Health. *Review of Income and Wealth, 63*, 760-776
209 Frech, A., & Damaske, S. (2019). Men's income trajectories and physical and mental health at midlife. *American Journal of Sociology*, 124(5), 1372-1412.
210 Carr, M. D., & Wiemers, E. E. (2022). The decline in long-term earnings mobility in the US: Evidence from survey-linked administrative data. *Labour Economics,* 78, 102170.

Figure 35. Upward Intragenerational Income Mobility, 1993-2008 for adults ages 25 to 59



SOURCE: Carr, M. D., & Wiemers, E. E. (2022). The decline in long-term earnings mobility in the US: Evidence from survey-linked administrative data. *Labour Economics,* 78, 102170; "Table B7: Transition Matrices, 1981 - 1996 Period and 1993 - 2008 Period, White"; "Table B8: Transition Matrices, 1981 - 1996 Period and 1993 - 2008 Period, Black"; "Table B9: Transition Matrices, 1981 - 1996 Period and 1993 - 2008 Period, Hispanic" in Supplementary Data S1. Supplementary Raw Research Data.

Figure 36. Downward Intragenerational Income Mobility, 1993-2008 for adults ages 25 to 59



SOURCE: Carr, M. D., & Wiemers, E. E. (2022). The decline in long-term earnings mobility in the US: Evidence from survey-linked administrative data. Labour Economics, 78, 102170; "Table B7: Transition Matrices, 1981 - 1996 Period and 1993 - 2008 Period, White"; "Table B8: Transition Matrices, 1981 - 1996 Period and 1993 - 2008 Period, Black"; "Table B9: Transition Matrices, 1981 - 1996 Period and 1993 - 2008 Period, Hispanic" in Supplementary Data S1. Supplementary Raw Research Data.

CONCLUSION

As the first report in the *Striving and Thriving* series showed, Blacks, American Indians, and Latinos are much less likely to enjoy upward intergenerational mobility and much more likely to be trapped in poverty, fall down the income ladder, attain lower levels of education, and experience poorer health outcomes than their White peers.

This state of affairs calls for a clear and detailed analysis of the factors contributing to—and predictors of—intergenerational mobility, which was the impetus for this study.

This report, the second in the series, provides a comprehensive qualitative research synthesis on the key life course milestones that predict whether individuals are on track for upward intergenerational mobility in education, income, and health, with a focus on how these milestones contribute to racial disparities in mobility outcomes.

Its findings reveal that, despite decades-long efforts, there remain many barriers to achieving upward intergenerational mobility, particularly for people of color, and they are reflected in key milestones spread across the life course.

APPENDIX A: PROJECT FRAMING STUDIES

The task of pinpointing factors that impact income mobility, potentially explaining racial mobility gaps, required a comprehensive review of existing research. This research is guided by previous studies which sought to identify the most important factors influencing income mobility throughout the life course.

Two studies, "**The Social Genome Model**" and "**Escaping Poverty: Predictors of Persistently Poor Children's Economic Success**", laid the groundwork for this report by offering an initial list of mobility factors that helped guide further literature review.

The Social Genome Project

The Social Genome Project, or SGM (https://social-genome.org) is an influential study that identified some of the most salient factors associated with upward income mobility. It is a joint research initiative of The Brookings Institution, The Urban Institute, and Child Trends. The SGM is a microsimulation model of life course outcomes, developed to identify potential pathways to upward mobility.[211] The outcome goal of the model is the attainment of family income of at least 300 percent of the Federal Poverty Level (FPL) by age 40.

The SGM was developed using two nationally representative data sets from the Bureau of Labor Statistics' National Longitudinal Surveys: the "Children of the NLSY79" (CNLSY) and the National Longitudinal Survey of Youth 1979 (NLSY79). The CNLSY, which tracks life outcomes from birth through adolescence (around age 19) for a sample born between 1971 and 2009, is the core data set of the SGM. Since many of the CNLSY cohort hadn't reached adulthood, the researchers used outcomes from the parent generation, NLSY79, to impute CNLSY outcomes through age 40.

For each life stage – early childhood (ages 0-5), middle childhood (6-11), adolescence (12-19), transition to adulthood (19-29), and adulthood (age 40) – a set of variables, informed by human capital formation literature and expert consultation, are used to create "Success Benchmarks" (see Table 2). These benchmarks correlate with outcomes in subsequent life stages and, ultimately, with achieving a family income equal to 300% of the FPL by age 40. The model also includes several covariates as controls.[212]

Table I lists all 17 variables used to construct the SGM success benchmarks as well as their relevant measures.

211 Winship, S., & Owen, S. (2013). Guide to the Brookings social genome model. Washington, DC: Brookings Institution; Sawhill, I. V., & Reeves, R. V. (2016). Modeling equal opportunity. RSF: The Russell Sage Foundation Journal of the Social Sciences, 2(2), 60-97; Sawhill, I. V., Winship, S., & Grannis, K. S. (2013). Pathways to the middle class: Balancing personal and public responsibilities. Issues in Science and Technology, 29(2), 47-54.; Acs, G., Martin, S., Schwabish, J. A., & Sawhill, I. V. (2016). The Social Genome Model: Estimating How Policies Affect Outcomes, Mobility and Inequality across the Life Course. Journal of Social Issues, 72(4), 656-675.
The Social Genome Model was recently updated using the Early Childhood Longitudinal Survey-Kindergarten Cohort (ECLS-K) and the National Longitudinal Survey of Youth 1997 Cohort (NLSY97), however, the analyses conducted in this report are based on the original Social Genome Model. For updates to the model see Acs, G., Werner, K., Blagg, K., & Martin, S. (2021). Identifying Pathways for Upward Mobility. Washington, D.C.: Urban Institute, available at https://www.urban.org/sites/default/files/publication/103547/identifying-pathways-for-upward-mobility.pdf; and Werner, K., Blagg, K., Acs, G., Martin, S., McClay, A., Moore, K. A., ... & Sacks, V. (2021). Social Genome Model 2.0: Technical Documentation and User's Guide.

212 They include: Gender, Race, Maternal Educational Attainment, Maternal Age at Time of Child's Birth, Maternal Age at First Birth, Marital Status of the Child's Parents at the Time of Birth, Family Income at Birth, Low Birth Weight, Mother's AFQT Score, Parenting: Cognitive Stimulation, Parenting: Emotional Support, Early Verbal Ability, Marijuana Use, Other Drug Use, Early Sex, Suspension, Fighting, Hitting, Damaging Property, Self-Esteem Index, Religious Service Attendance, Gender Role Attitudes, Participation in School Clubs

Table I. Key Mobility "Success Benchmarks" Identified from SGM

Life Course Outcome	Measure	Success Benchmark
Early Childhood (age 0-5)		
Math	Age-standardized scores from the math section of the Peabody Individual Achievement Test (PIAT)	Math Score ≥ -1 SD
Reading	Age-standardized scores from the reading recognition section of the Peabody Individual Achievement Test (PIAT)	Reading Score ≥ -1 SD
Antisocial Behavior	Age-standardized antisocial behavior subscale from the Behavior Problems Index (BPI). Scores are reverse coded so that higher is better.	Antisocial Score ≥ -1 SD
Hyperactivity	Age-standardized hyperactivity subscale from the Behavior Problems Index (BPI). Scores are reverse coded so that higher is better.	Hyperactivity Score ≥ -1 SD
Middle Childhood (age 6-11)		
Math	Age-standardized scores from the math section of the Peabody Individual Achievement Test (PIAT)	Math Score ≥ -1 SD
Reading	Age-standardized scores from the reading recognition section of the Peabody Individual Achievement Test (PIAT)	Reading Score ≥ -1 SD
Antisocial Behavior	Age-standardized antisocial behavior subscale from the Behavior Problems Index (BPI). Scores are reverse coded so that higher is better.	Antisocial Score ≥ -1 SD
Hyperactivity	Age-standardized hyperactivity subscale from the Behavior Problems Index (BPI). Scores are reverse coded so that higher is better.	Hyperactivity Score ≥ -1 SD
Adolescence (age 12-19)		
High School Graduation	A dichotomous variable indicating whether the individual received a high school diploma by age 19. GED earners are not counted as high school graduates.	Graduated High School (diploma, not GED)
H.S. Grade Point Average	A continuous variable of average grade in the last year of high school.	GPA ≥ 2.50 in Last Year of High School
Criminal Conviction	A dichotomous variable indicating whether the individual was convicted of any charges other than minor traffic violations by age 19.	Never Convicted by 19
Teen Parenthood	A dichotomous variable indicating whether the individual reported having a child by age 19.	Never was a Parent by 19

Life Course Outcome	Measure	Success Benchmark
Transition to Adulthood (age 20-29)		
Lives independently from parents	A dichotomous variable indicating whether the individual was living	
Family income to needs	[Income] This continuous variable is the log-transformed measure of the family's income during the year the individual was 29 years old. [Needs] This continuous variable is the log-transformed measure of the family's income as a percent of the federal poverty during the year the individual was 29 years old.	Lives Independently from Parents and has either (1) a Family Income to Needs Ratio ≥ 250% or (2) a 4-year College Degree
College Completion	Dichotomous variable indicating whether the individual obtained a 4-year degree or higher.	
Adulthood (age 29-40)		
Family income	This continuous variable is the log-transformed measure of the family's income during the year the individual was 40 years old.	
Family income to needs	This continuous variable is the log-transformed measure of the family's income as a percent of the federal poverty during the year the individual was 40 years old.	Family Income-to-Needs Ratio ≥ 300%

Escaping Poverty: Predictors of Persistently Poor Children's Economic Success

A second study, *Escaping Poverty: Predictors of Persistently Poor Children's Economic Success*, delves into the predictors of escaping poverty by ages 25-30 for children who spent at least half of their childhood in poverty. The researchers used data from the Panel Study of Income Dynamics (PSID) and focused on children born between 1968 and 1985 that were followed until ages 28-30. The findings revealed that a disconcerting 40 percent of Black children lived in persistent poverty, starkly contrasting with the mere 5.5% of White children experiencing similar circumstances. Furthermore, five life course outcomes were identified as salient contributors to the likelihood that the "most successful" youth would escape poverty:

- Not having a teen birth.
- Completing high school by age 20.
- Enrolling in college by age 25.
- Completing a 4-year college degree by age 25.

Mobility Milestones

Key Life Course Milestones Shaping Racial Mobility Gaps

ForwardChange