



LIFTING BARRIERS. LIFTING LIVES.

PROMOTING SKILLS

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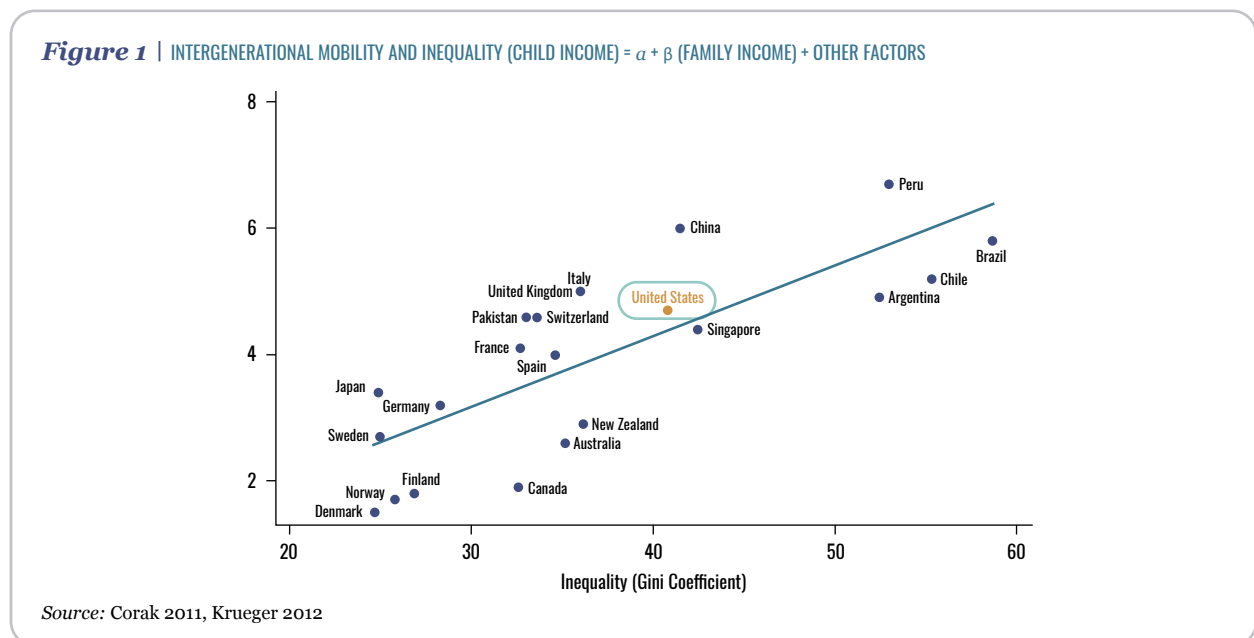
UNIVERSAL PROBLEMS: POVERTY, INEQUALITY, AND ECONOMIC AND SOCIAL IMMOBILITY

Societies everywhere face the problems of poverty, inequality, and economic and social immobility. The severity of these problems differs by country. Governments everywhere, including those in the United States (U.S.), are enacting policies to alleviate them. Historically the U.S. has utilized a strategy of redistributive taxes and income transfers, and a strategy of promoting education by spending on public schools and trying to boost test scores. While such redistributive policies reduce income and consumption disparities, they have failed to significantly reduce and prevent the underlying structural causes of poverty and inequality. Many studies suggest that a major underlying structural issue is the skills gap – or the differences in skills among various groups in the population. By adopting a comprehensive approach to skill development, the U.S. can begin to implement effective policies that address structural poverty and inequality. But to do so, policy makers must understand what skills are needed, when they should be developed, how they are best formed, how they are best measured, and whom these policies should target.

Typically, when people think about skills, they think about education, scores on achievement tests, or “Intelligence Quotients” (IQs). Recent research informs us that there are many different types of skills and that they can all be fostered. They are not solely genetically determined.

Modern understanding of how to foster skills continues to develop as studies delve deeper into the process of human skill formation. Despite growing levels of understanding, many policymakers and concerned citizens fail to realize the connection between skill development and other social problems. Many contemporary social problems are skills-based.

Based on the research of Miles Corak, Alan Krueger (2012) summarized the nature of income inequality and intergenerational immobility in the “Gatsby Curve” shown in **Figure 1**. In this figure, the horizontal axis depicts the Gini coefficient, a measure of inequality in family income after taxes and transfers, for various countries. The vertical axis shows the *intergenerational elasticity (IGE)*, defined as the relationship



between a child's income when they become an adult and the child's family income at the same age. It is the beta coefficient (β) in the equation at the heading of the figure. The lower β , the less dependent is the child's income on their family income, and the higher the level of intergenerational immobility. The graph shows that there is a relationship between income inequality and intergenerational immobility, as countries with high Gini coefficients also tend to have high β coefficients. Family inequality and social mobility are strongly related.

It is not surprising that in very unequal places such as Peru, Brazil, Chile or Argentina, income inequality is higher, and so is intergenerational immobility. Meanwhile, in very equal places such as Finland, Norway, and Denmark, both income inequality and intergenerational immobility are low.

The traditional approach to remedying poverty and inequality has been a version of "alms to the poor," or redistribution of income and wealth from the rich to the poor through the tax and transfer system. Contemporary political discourse is dominated by this concept. Focusing too heavily on a pure redistributive strategy proves ineffective in resolving persistent poverty and inequality. For instance, many people in the U.S. glorify the Scandinavian welfare state, and they believe that economic mobility across generations is higher in Scandinavian countries thanks to their more generous social welfare states, which include progressive taxes and benefits, better schools, universal healthcare, free childcare, and free college at uniform quality levels across the country. Americans have implemented portions of the welfare state. The transfer programs launched by President Lyndon B. Johnson's War on Poverty (1964), known as the Great Society program, managed to reduce not only income inequality among families through large cash transfers, but also the overall Gini coefficient of the U.S. population. The Great Society also attempted to boost skills.

The skills programs launched in the Great Society utilized a *shotgun skills strategy*. They invested in skills at *all* stages of the life cycle under the belief that no citizen was too old to benefit from additional training and education to boost skills. Under such idealistic beliefs, policies during the 1960s assumed that job training for a 60-year old unemployed steelworker and a 15-year old prospective high school graduate were equally effective.

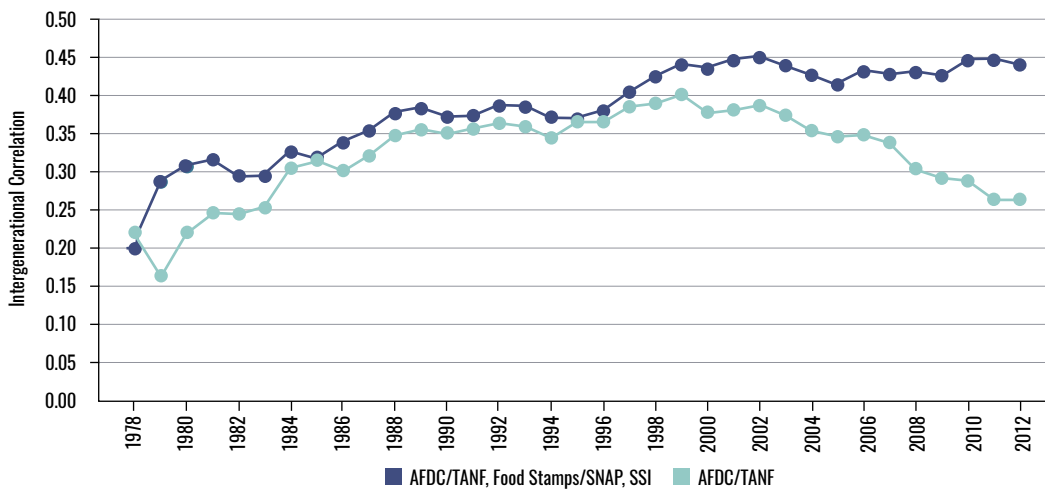
One negative side effect of the Great Society was the creation of poverty enclaves. Since welfare policies at the time were targeting specific portions of the population to guarantee that aid would be granted to those who needed it the most, policies of the Great Society ended up dividing the American poor into enclaves and detaching them from society. Consequently, there were numerous concentrated inner-city neighborhoods that were exclusively poor and sometimes far removed from employment opportunities, thus perpetuating the cycle of poverty across generations.

A recent study done by Hartley et al. (2017) at the University of Kentucky Poverty Center evaluated the success of these programs. When the Great Society initiative was launched, there was only a small correlation (0.10) between a child's participation in welfare programs later in life and their parents' participation. Over time, as cash transfers were made routine and welfare enclaves became established, this correlation rose. The authors show that even though dependency on some programs like AFDC/TANF fell, expanding the definition of the child's welfare participation to include SSI and food stamps, the correlation continued to rise even after President Clinton's work-fare reforms in the 1990s (see **Figure 2**). The Great Society failed to eliminate the intergenerational effects that limited social mobility. Money alone did little to promote mobility across generations.

Some suggest that the intergenerational persistence was due to concentration of the poor and resulting negative peer effects, or to the nature of the welfare programs that discouraged people from working. For

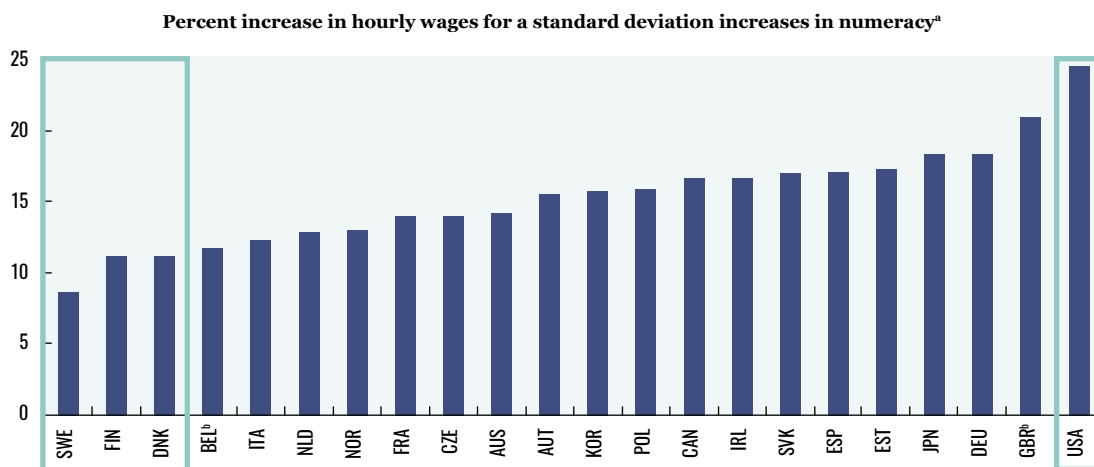
instance, many of the programs of the War on Poverty had strongly regressive components. Individuals who fell far below the poverty line faced tax rates on earnings close to 100%. If they were on welfare programs, most of the money they earned was taken away because they became ineligible for the programs. This diminished incentives for those on welfare programs to work. The same problem currently exists in Denmark, where a strategy of heavily taxing and transferring money leads to a very low returns to skills and hence minimizes the incentive to acquire skills (see **Figure 3**).¹ Taking lessons from the War on Poverty and the current state of intergenerational inequality in Denmark, I will argue that the Scandinavian model of redistribution is not a good solution for eliminating structural (skills-based) inequality in the U.S.

Figure 2 | U.S. TAXES AND TRANSFERS SYSTEM FAILED TO PROMOTE SOCIAL MOBILITY



Source: Hartley et al. (2017)

Figure 3 | RETURNS TO SKILLS IN SELECTED COUNTRIES



a) The graph shows the coefficients on numeracy scores from country-specific regressions of log hourly wages (including bonuses) of wage and salary earnings (in PPP adjusted USD) on proficiency scores standardised at the country level.

b) The Survey of Adult Skills only covered Flanders (BEL) and England/Northern Ireland (GBR).

Source: *Survey of Adult Skills (PIAAC) 2012*

Source: OECD (2015)

In the past 15-20 years, American tax policies for the poor have become more progressive. Since the time of the War on Poverty, rates of taxation of the earnings of the poor have been greatly reduced, work has been incentivized, and the wealth and tax transfer system for the poor has improved dramatically.

However, since the Great Society, social-welfare policies have continued to follow Johnson's shotgun approach to fostering skills. We need to target the stages of the life cycle that prove to be the most effective for investment in skills. Lessons learned from the Great Society and more recent public welfare programs suggest that in order to alleviate poverty it is crucial to build skills and not rely solely on tax and transfer policy. Inequality in skills leads to economic inequality and immobility. By building skills, not only can long-term poverty be eliminated, but economic and social mobility can be promoted, creating equity without any tradeoff in economic efficiency (Heckman, 2008). Moreover, enhancing skills also enhances people's dignity, agency, and the ability to engage in the larger society. Rather than excluding people from participating productively in the larger society by keeping them in welfare programs or sending them off to separate housing projects as was done during the Great Society, investing in human capital and fostering skills is a policy for promoting inclusion.

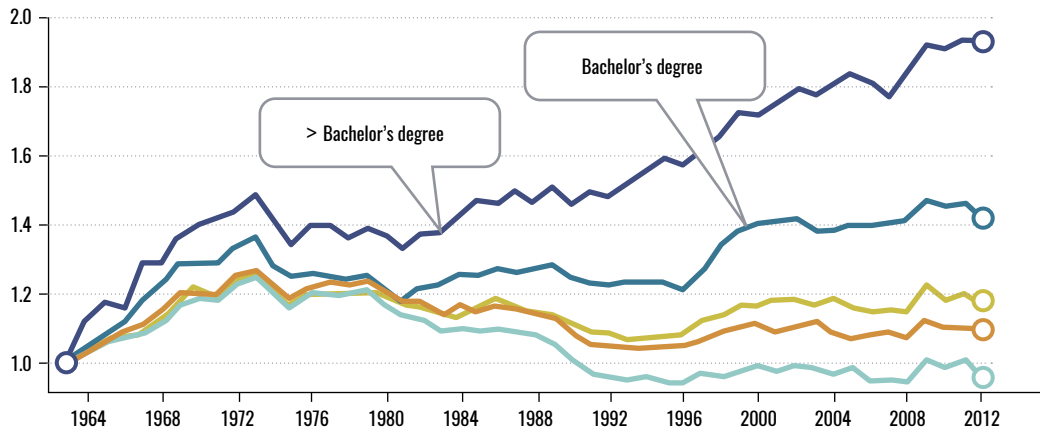
SOURCES OF ECONOMIC AND SOCIAL INEQUALITY AND IMMOBILITY IN THE UNITED STATES

The Difference Between Skills and Education

Some of the most commonly identified factors of inequality in the U.S. include race, gender, sex, and education. Policies aimed at reducing inequality through skill formation have primarily worked to improve the education system. Some of the most successful reforms build incentives into education so that principals and parents have more say over what schools do and in evaluating their efforts (see Walters, 2015). In proposing new policies for skill formation, it is important to acknowledge the difference between skills and education. Today the term "skill" has become synonymous with education. Education can promote valuable life skills, however, there are other skills that are as important, if not more important than those that are not taught in schools. Cognition and the ability to deal with complexity are important life skills. "Soft skills," such as social and emotional skills, play a powerful role in making people adaptive, promoting economic productivity, and enhancing personal welfare of those with such skills. Further, there are important sources of skill formation other than schools.

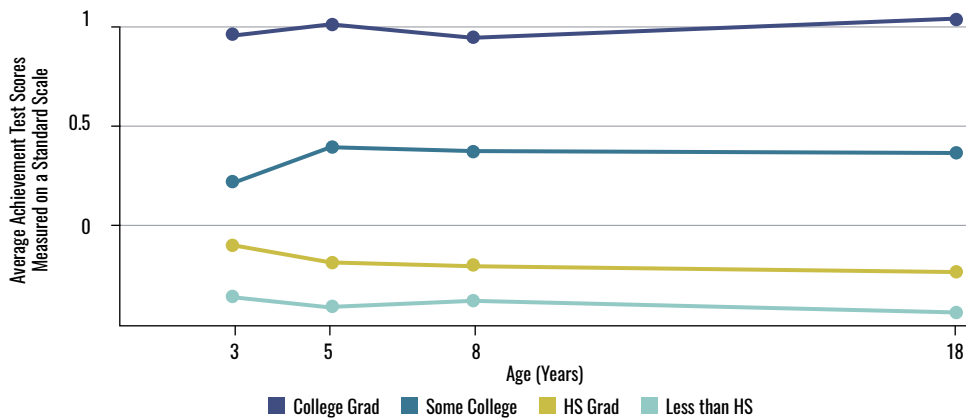
The current emphasis placed on the importance of education and the reliance on the education system to single-handedly close skills gaps stem from two sources: available information on income or wage inequality within the U.S. population, and an overemphasis on the role of IQ in determining wages. First, data from **Figure 4** reveal that the rise in real wages of full-time workers has been substantial for those with at least a bachelor's degree. Wages of workers at every other education level have stagnated. In fact, over stretches of time during much of the past 30 years, the real wages of the least skilled have not only stagnated but declined. This reinforces the belief that education determines potential income and wealth. Second, trends in achievement test scores such as PISA² clearly show that children whose mothers completed more education tended to have higher scores (see **Figure 5**, of which more later). However, only 4-5% of the lifetime variation in earnings can be explained by differences in IQ. The gaps present in achievement test scores when children are 18 are more or less present when they enter the school system (see Brooks-Gunn et al.,

Figure 4 | CHANGES IN REAL WAGE LEVELS OF FULL-TIME U.S. WORKERS BY EDUCATION, 1963-2012, MALES



Source: Autor (2014)

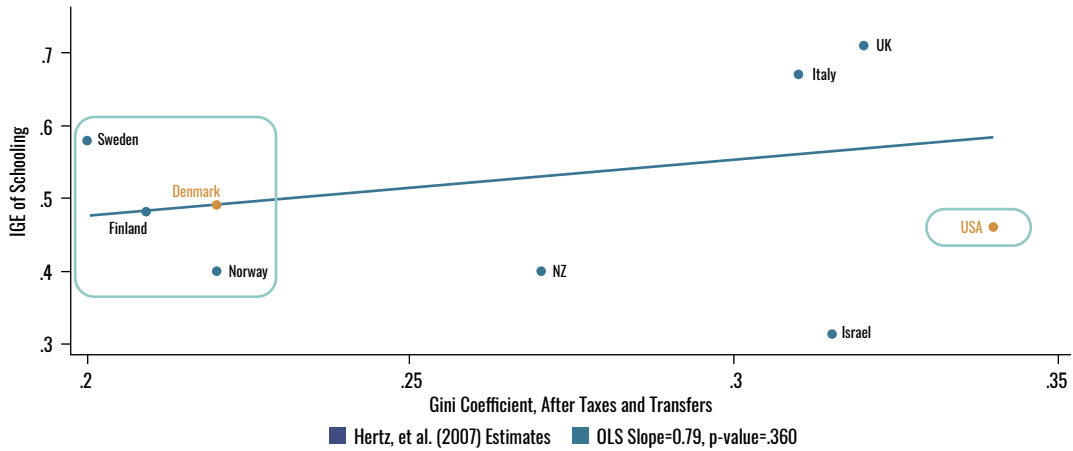
Figure 5 | MEAN ACHIEVEMENT TEST SCORES BY AGE BY MATERNAL EDUCATION



Source: Brooks-Gunn et al. (2006)

2006). Such evidence suggests that differences in family life explain learning disparities. American schools are very unequal. Schools in neighborhoods with more educated parents are generally of higher quality, yet Figure 5 suggests that test score gaps emerge long before children enter school and are not much affected by schooling quality.

Figure 6 | INTERGENERATIONAL EDUCATIONAL MOBILITY AND INEQUALITY

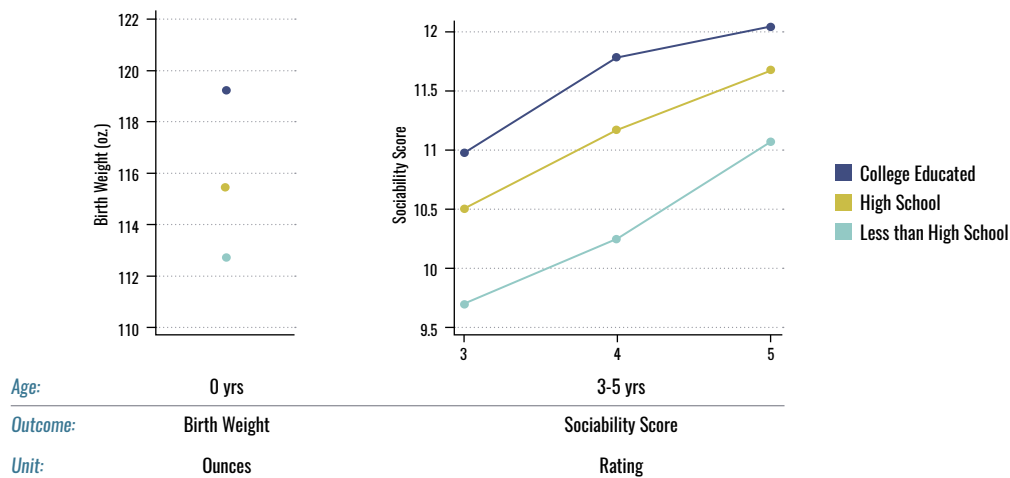


Notes: IGE of schooling: coefficient on education on parents in a regression of child's equation on parent's education.
 Source: Landersø and Heckman (2020)

The Important Role of Family Structure and Environment

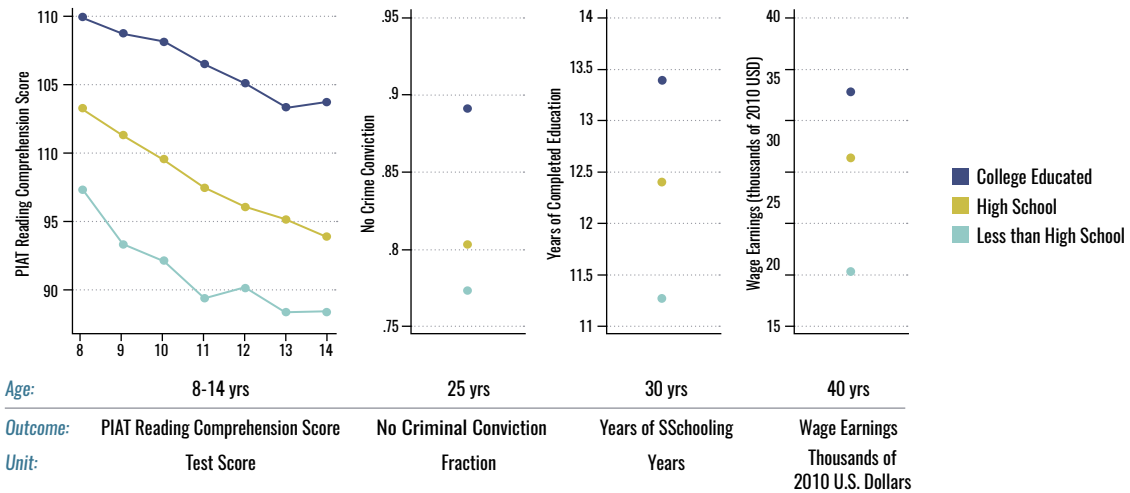
Data from Denmark supports the claim that differences in family structure perpetuate inequality. Denmark boasts universally high-quality schools with no apparent disparity in expenditure across regions or groups, yet the country has the same high level of educational inequality as the U.S. (see **Figure 6**). Despite universal and equal access to health care, childcare, free college and secondary schooling, there are large gaps in children's outcomes between those of highly educated mothers and those of less educated mothers that are equally high in the US and Denmark. Compare the series of **figures 7 and 8**, which show gaps by family background of equal magnitude in the U.S. and Denmark. In light of the equalizing policy of the Danish government in making expenditures on the schools in all neighborhoods, it can be surmised that family factors play a powerful role in perpetuating inequality.

Figure 7a | GAPS BY MOTHER'S EDUCATION | U.S. CNLSY



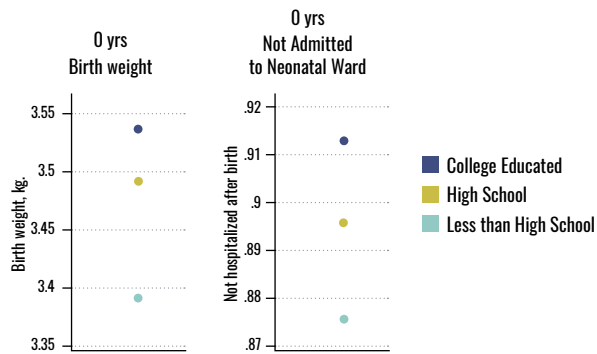
Source: Author's tabulation from Children of NLSY survey

Figure 7b | GAPS BY MOTHER'S EDUCATION—U.S. CNLSY, CONT.



Source: Author's tabulation from Children of NLSY survey

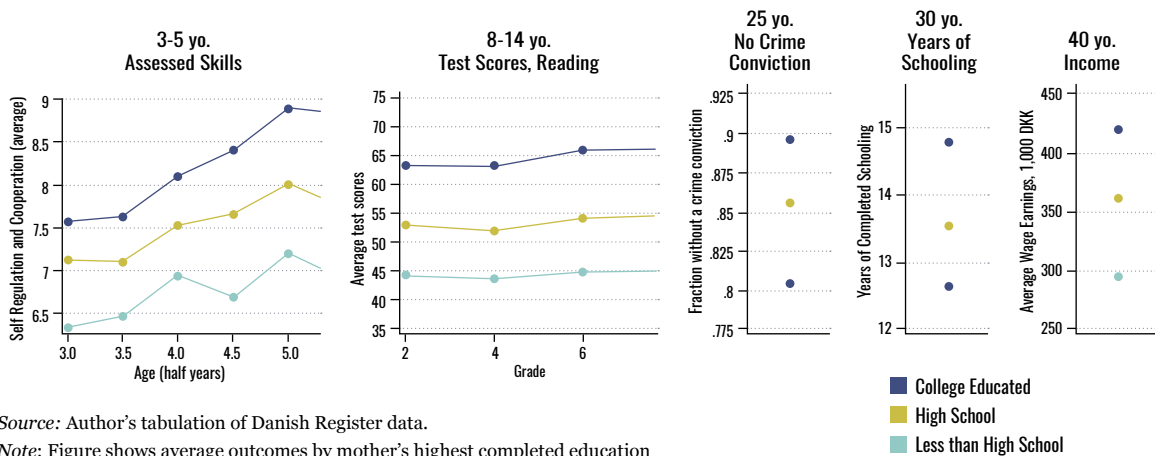
Figure 8a | GAPS BY MOTHER'S EDUCATION



Source: Author's tabulation of Danish Register data.

Note: Figure shows average outcomes by mother's highest completed education

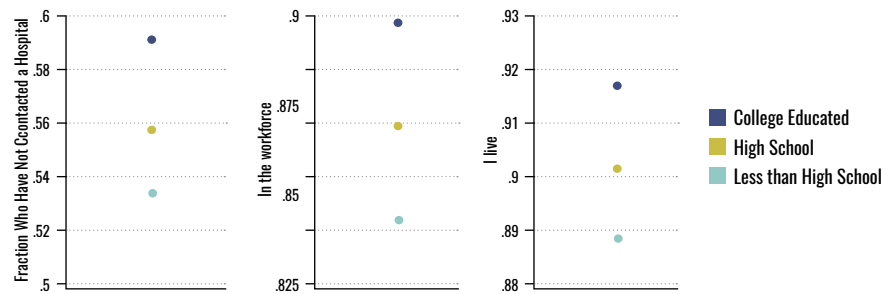
Figure 8b | GAPS BY MOTHER'S EDUCATION



Source: Author's tabulation of Danish Register data.

Note: Figure shows average outcomes by mother's highest completed education

Figure 8c | GAPS BY MOTHER'S EDUCATION



Source: Author's tabulation of Danish Register data.
 Note: Figure shows average outcomes by mother's highest completed education

Figure 9 | INEQUALITY MEASURES AND THEIR FACTOR COMPONENTS, US 1979-2007
Estimated Average Annual Percentage Change in Various Inequality Measures Accounted for by Factor Components, US 1979 – 2007

	Gini	P90/P10*
Actual	0.4	0.82
Household Structure	23%	33%
Men's Employment	5%	5%
Men's Earning Disparity	73%	50%
Women's Employment	-25%	-22%
Women's Earning Disparity	20%	29%
Assortative Mating	10%	11%
Other	-5%	-6%

Note: Household Structure: Marriage Rate, Men's Employment: Male Head Employment, Men's Earning Disparity: Male Head Earnings Distribution, Women's Employment: Female Head Employment, Women's Earning Disparity: Female Head Earnings Distribution, Assortative Mating: Spouse's earning correlation

Notes: *This is the gap between the top 10% (90) and the bottom 10% (10).

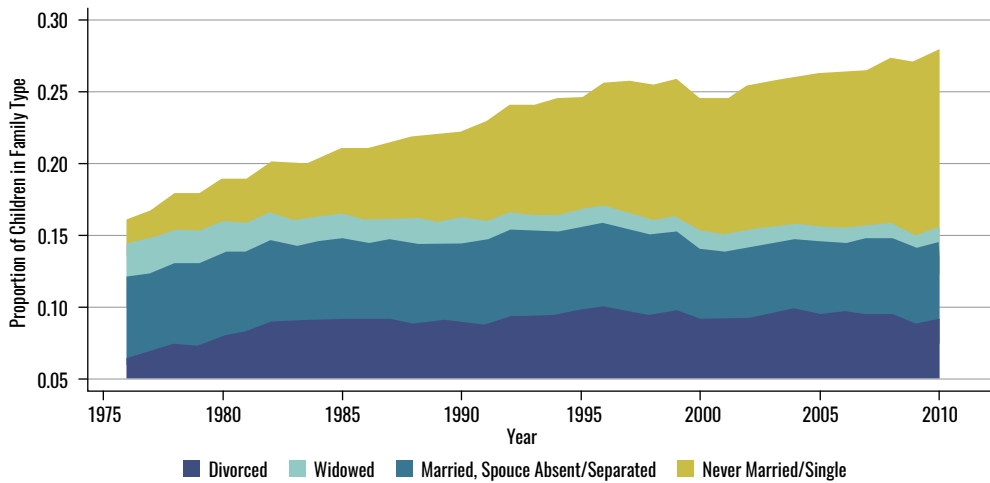
Source: Larrimore (2014)

The Coleman Report (1966) in the U.S. demonstrated that family structure and family environment have a much stronger influence on learning disparities than school quality. Household structure plays a major role in shaping US inequality (see **Figure 9**). There is an inherent difference between single-parent households and two-parent households: on average, the single-parent household has fewer resources than a two-parent household. Single-parent families in which a child's parents never married, usually have the mother as the sole earner. She is typically less educated and hence earns a lower wage. Single-mother households tend to have substantially fewer financial resources compared to nuclear families. In fact, modern American society's highest family income quintile largely consists of two-parent families with both partners being high-earners and highly educated.

Inequality due to family structure is increasing as family life fractures. Between 1976 and 2016, the number of children under 18 living with a single parent rose substantially (see **Figure 10**).

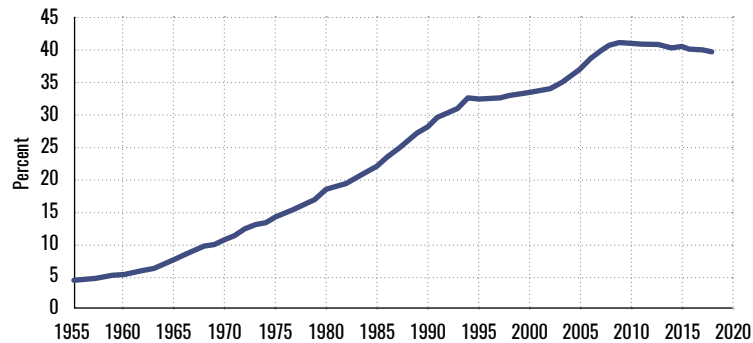
The number of births to unmarried women across all ethnic groups increased from 5% in 1940 to 40% in 2016 (see **Figure 11**). Such trends mean that less time and financial resources are devoted to the early development and learning of these children.

Figure 10 | PERCENT OF CHILDREN LIVING IN SINGLE PARENT HOUSEHOLDS, U.S. (1976-2010)



Source: IPUMS March CPS 1976-2010. Heckman, 2011. Note: Parents are defined as the head of the household. Children are defined as individuals under 18, living in the household, and the child of the head of household. Children who have been married or are not living with their parents are excluded from the calculation. Separated parents are included in “Married, Spouse Absent” Category.

Figure 11 | BIRTHS TO UNMARRIED WOMEN, U.S. (1955-2018)



Source: Centers for Disease Control and Prevention, National Center for Health Statistics, various National Vital Statistics Reports. See note 29 for details.

Source: Social Capital Project (2020)

A 2011 study by Duncan and Murnane found that between 1972 and the late 2000s, the amount of money spent on children has greatly increased in households in the top income quintile but stagnated in households in the bottom income quintile, leading to a vast and widening divide between the two groups (see **Figure 12**). Given that families are the main producers of skills who impact children’s skill formation prior to when they attend schools, and considering the widening differential in family resources, it becomes clear that the gaps in children’s skill formation and other outcomes are driven by differences in family structures and environments.

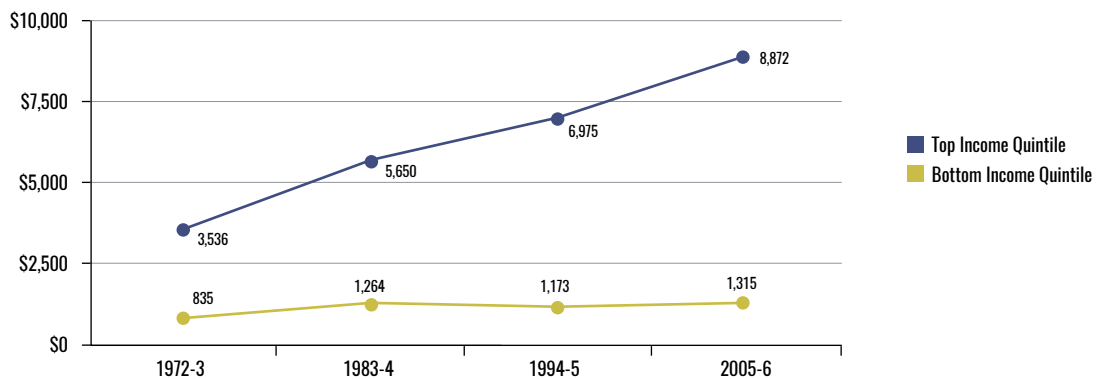
Today, more and more children are facing different household environments than those of the past, resulting in profound effects on their skill development. Beyond diminished access to financial resources, a 1995 study by developmental psychologists Hart and Risley found that children growing up in disadvantaged families suffer a learning disadvantage as early as age three (see **Figure 13**; Hart and Risley, 1995). For

the children of disadvantaged families, the verbal environment consists of hearing roughly 600 words an hour. In comparison, children of highly educated parents might hear more than an average of 2000 words, roughly 3.5 times more words per hour. By age three, the cumulative vocabulary of a child living in a disadvantaged family is 500 words, far below the 1,100-word cumulative vocabulary possessed by a child from a professional family. The effects of this difference cumulate, resulting in the “30-million word gap” at age five, popularized by Suskind et al. (2015). This early gap of basic skills tends to persist throughout life, leading to economic inequality and social immobility.

Assortative mating further exacerbates inequalities (see Figure 9). Highly educated people marry other highly educated people, tend to live in separate neighborhoods, and create a more affluent environment for themselves and their families.

More generally, sorting is an issue in both the U.S. and Denmark. In Denmark, despite equal pay across schools, teachers with superior test score performance in college sort into the more affluent districts where kids have ample family support and resources and tend to be more motivated and easier to teach. In the U.S., sorting occurs more broadly within both the high and low ends of the income distribution, reinforcing many disparities that the education system and the tax and transfer system fail to address (see **Figure 14**). Although governments lack the ability to intervene in personal family affairs and alter family structures and voluntary association of people, governments can enact policies that remedy underlying skills deficits caused by differences in family structures and socioeconomic backgrounds. We discuss these policies below.

Figure 12 | PER CAPITA ENRICHMENT EXPENDITURES ON CHILDREN (2008 US\$) TOP VERSUS BOTTOM INCOME QUINTILES



Source: Duncan and Murnane (2011)

In summary, there is abundant evidence that the persistence of poverty and inequality and differences in children’s educational outcomes are caused in part by differences in family structures and environments. American society needs to move beyond focusing on education as the producer of life-relevant skills and begin to promote social inclusion and social mobility by addressing skills gaps resulting from family differences.

Figure 13 | HOME ENVIRONMENTS MATTER (CHILDREN ENTER SCHOOL WITH “MEANINGFUL DIFFERENCES” IN VOCABULARY KNOWLEDGE)

Emergence of the Problem. In a typical hour, the average child hears:

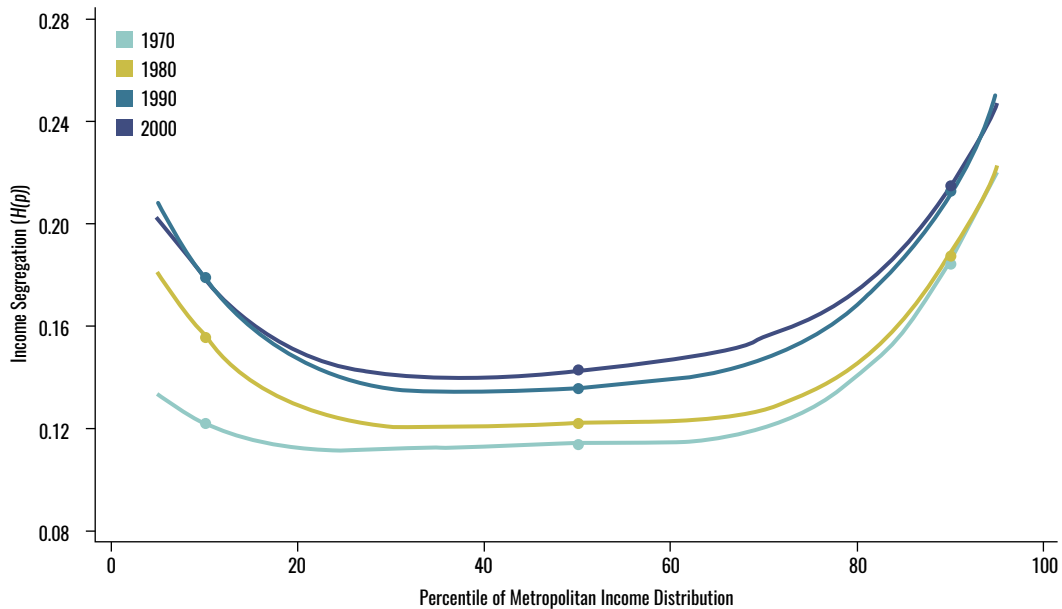
Family Status	Actual Differences in Quantity of Words Heard	
Welfare	616 Words	5 affirmatives, 11 prohibitions
Working Class	1,251 Words	12 affirmatives, 7 prohibitions
Professional	2,153 Words	32 affirmatives, 5 prohibitions

Cumulative Vocabulary at Age 3

Cumulative Vocabulary at Age 3	Words
Children from welfare families	500 Words
Children from working class families	700 Words
Children from professional families	1,100 Words

Source: Hart and Risley (1995)

Figure 14 | INCOME SEGREGATION PATTERNS IN THE U.S. (HIGHER LEVELS, MORE SORTING)



Source: Reardon and Bischoff (2011)

The Role of Race and Ethnicity

Current gaps associated with race and ethnicity are largely skills-based. This was not always true. During his War on Poverty, Johnson launched affirmative action programs and enacted the Civil Rights Bill, both of which had profound effects on elevating African American status (Donohue and Heckman, 1991). However, Johnson wasn't solely focused on legal equity, but also equity in human ability — in skills. Thanks to policies such as affirmative action and other programs, overt discrimination in the labor market and in college admissions is no longer a first-order problem in American society. It has been documented that the gap between people of different races and ethnicities in the labor market with the same job qualifications is very small. Neal and Johnson (1996) and others have found that while gaps do exist, when adjusting for cognitive and socio-emotional skills, the gaps are significantly reduced. Were skills of minorities further developed,

Figure 15 | SHORTFALLS IN HOURLY WAGES FOR BLACKS AND HISPANICS IN THE LAST TWENTY YEARS: ACTUAL DISPARITY AND DISPARITY ADJUSTED FOR ABILITY

	Male		Female	
	Actual	Adjusted	Actual	Adjusted
Black	-29%	-7%	-20%	5%
Hispanic	-14%	2%*	-9%	10%

*Denotes not statistically significant from zero. No strong evidence of any difference

Note: The racial gaps were adjusted for observed AFQT and AFQT squared scores.

Source: Heckman (2011)

Figure 16 | DIFFERENCES IN COLLEGE ENTRY PROPORTIONS BETWEEN MINORITIES AND WHITES, ADJUSTED FOR ABILITY, MID-1990S

	Black-White	Hispanic-White
Actual	-0.12	-0.14
Adjusted	0.16	0.15

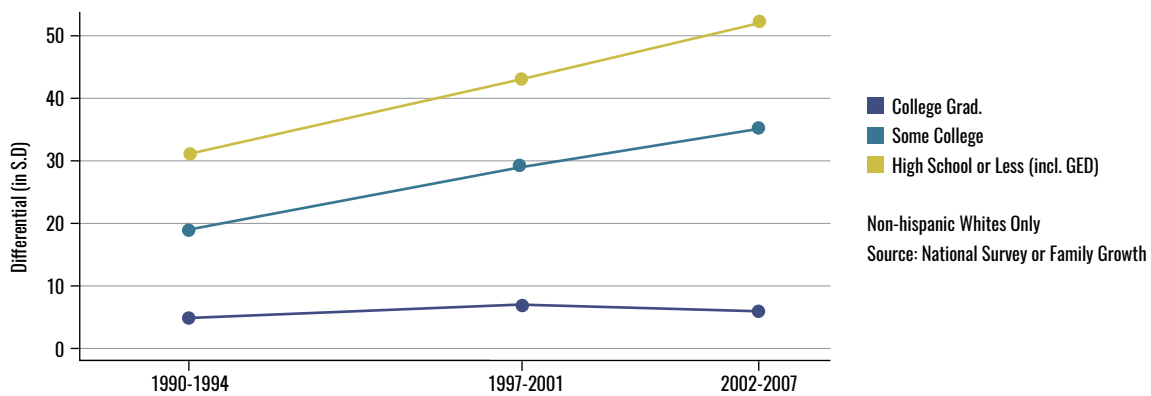
Source: Cameron and Heckman (2001)

any remaining would be eliminated (see **Figure 15**). Already, college admission rates when adjusted for ability show preferences for minorities embodied in affirmative action programs (see **Figure 16**).

There is ample evidence that racial skills gaps exist, and that they are largely driven by what goes on in the family. **Figure 17** shows a growing class gap in the rise in births to unmarried mothers. **Figure 18** and **19** indicate that within the distribution of AFQT scores³ for whites, roughly 50% of the African American population would be in the bottom 10% of whites. For PIAT scores⁴ it's 40%. **Figures 20, 21, and 22** reveal that after adjusting for family background, broken families, less educated mothers and other sources of disadvantaged, the gaps between races can more or less be eliminated.

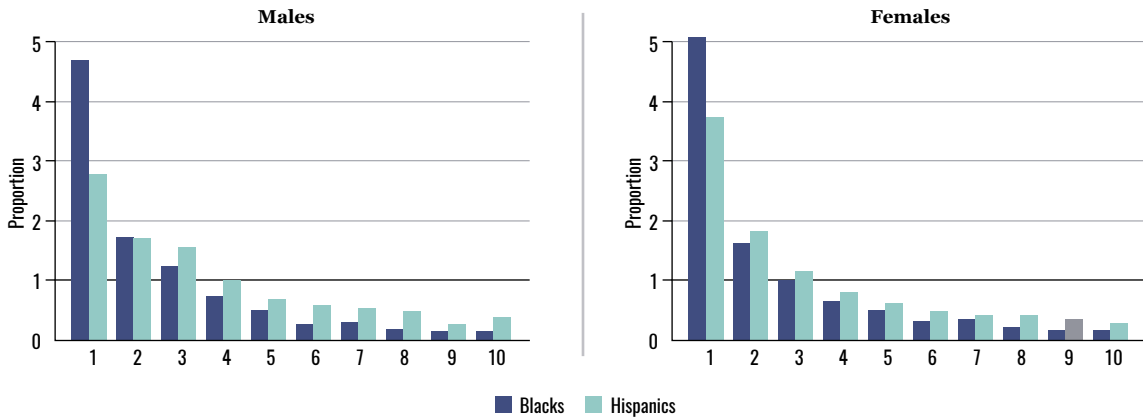
An influential challenge to the claim that inequality among races and ethnicities is skills-based has been lodged by the literature on the Stereotype Threat (Steele, 2018). The Stereotype Threat literature claim argues that when an African American – or a woman – takes a test that they believe will represent their group identity, they fail to perform well. Therefore, achievement test scores are inaccurate measures of true abilities. There exists little evidence to support a Stereotype Threat of any substantial magnitude, yet it's supposed existence is used to deny the presence of an all too real skills gap (see Carneiro et al., 2005).

Figure 17 | PERCENTAGE OF BIRTHS TO UNMARRIED MOTHERS BY CLASS



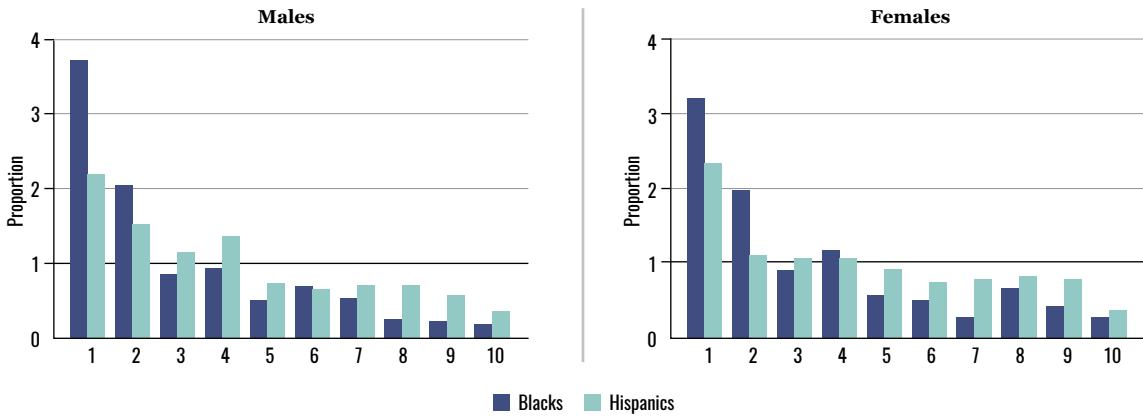
Source: Putnam et al. (2012)

Figure 18 | MINORITY AFQT SCORES PLACED IN THE WHITE DISTRIBUTION



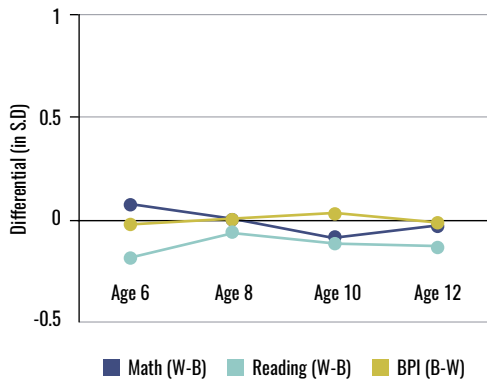
Source: Heckman (2011); Putnam et al. (2012)

Figure 19. MINORITY PIAT SCORES PLACED IN THE WHITE DISTRIBUTION



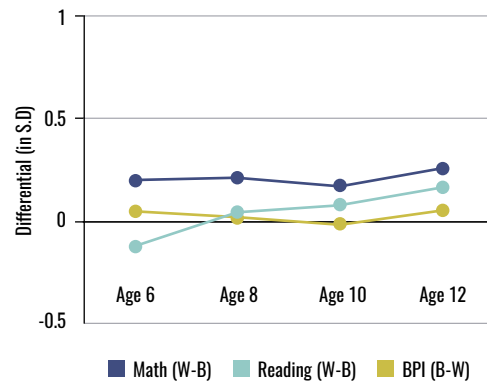
Source: Heckman (2011); Putnam et al. (2012)

Figure 20 | BLACK-WHITE GAPS IN SKILLS MEASURES OVER AGES ADJUSTED FOR FAMILY BACKGROUND, GIRLS



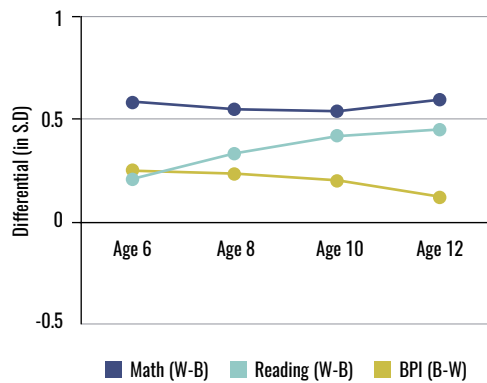
Source: Appendix to Heckman (2011)

Figure 21 | BLACK-WHITE GAPS IN SKILLS MEASURES OVER AGES, ADJUSTED FOR FAMILY BACKGROUND, BOYS



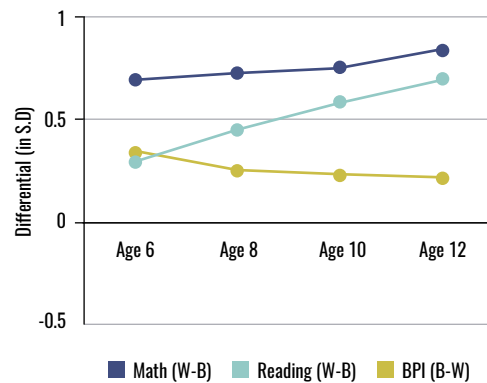
Source: Appendix to Heckman (2011)

Figure 22 | BLACK-WHITE GAPS IN SKILL MEASURES
OVER AGES, GIRLS SCORES



Source: Appendix to Heckman (2011)

Figure 23 | BLACK-WHITE GAPS IN SKILL MEASURES
OVER AGES, BOYS SCORES



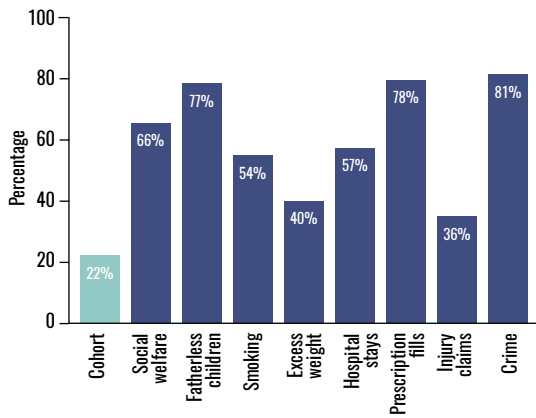
Source: Appendix to Heckman (2011)

A SKILLS-BASED APPROACH

Traditionally, governments are reactive, issuing policies and policy changes in response to a problem that has already arisen. However, simply being responsive is not necessarily as effective as preventing the problem in the first place. Many problems can be traced back to the absence of a common core of skills. Skill formation policies should be comprehensive and preventative rather than addressing problems as they arise. Moreover, in order for a skills approach to effectively reduce inequality, policies must reflect a comprehensive life cycle approach to skills formation: understanding at what stages of the life cycle society should invest and in which specific skills, so that public investments will be the most effective. By formulating policies that clearly recognize which skills matter and how they are produced, society can avoid the fragmented and often ineffective approach to public policy that misses the fundamental importance of skills. Knowing that families are the primary producers of skills, effective policies would initiate programs and policy interventions that benefit American families. We can draw on recent research to understand the consequences of family-based inequalities and develop wise skills-formation policies.

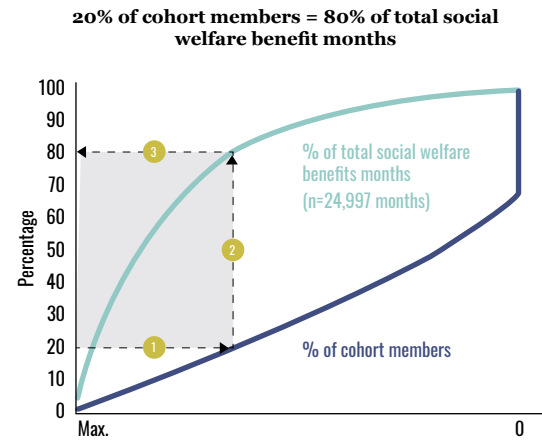
Psychologist and child development expert Terrie Moffit and her co-investigators conducted a study in New Zealand on a group of children known as the Dunedin cohort (Caspi et al., 2016). From the time they were born all the way through their late 30s, Moffit documented their lives in detail, including their physical and mental health and measured various skills. Their study confirmed the accuracy of a 19th-century claim by economist and sociologist Vilfredo Pareto – now called the Pareto Principle – for the New Zealand population. The Pareto principle argues that 20% of the members in a society account for 80% of its problems. In fact, around 20% of the Dunedin cohort utilized 80% of the social welfare benefits (see **Figures 23** and **24**). A set of common and easily identified “early-life risks” characterized the 20% utilizing most of the welfare benefits when assessments are conducted to measure these early-life risk factors when intelligence level, self-control, socioeconomic status, and history of maltreatment. They strongly predict which people are most at risk of falling in the 20% group. Consequently, to reduce inequality, policies to enhance early-life skills and close achievement gaps need to be designed to aid the most at-risk portions of the population.

Figure 24 | 22% OF THE DUNEDIN COHORT UTILIZING 80% OF THE SOCIAL WELFARE BENEFITS



Source: Caspi et al. (2016)

Figure 25 | THE DUNEDIN COHORT AND THE PARETO PRINCIPLE

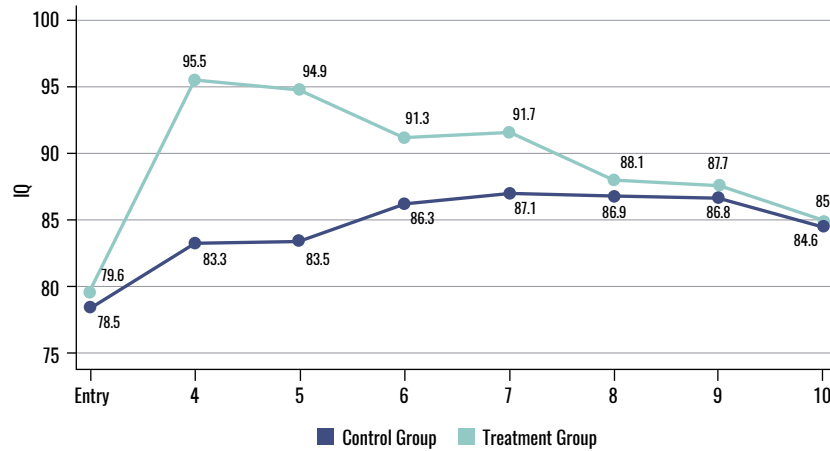


Source: Caspi et al. (2016)

Additionally, it is important that policy makers identify which skills are most appropriately developed at which stages of life. Historically the achievement gap was explained as being the result of genetics: children of intelligent parents inherited their intelligence and are thus more successful. Analysis of data from numerous studies might appear to support this argument. For example, Arthur Jensen examined the Westinghouse Head Start Study and found that while kids who participated in the Head Start program initially had higher IQs than those who did not, after a few years their IQs were equal to those of children who hadn't participated in the program (Jensen, 1969). Jensen concluded that the fadeout in IQ gains proved genetic determination of intelligence, suggesting that early-education programs, such as Head Start, would fail to close the skills gap. Herrnstein and Murray (1994) similarly claimed that there are no solutions to closing the achievement gap because inequality is a consequence of genetic differences.

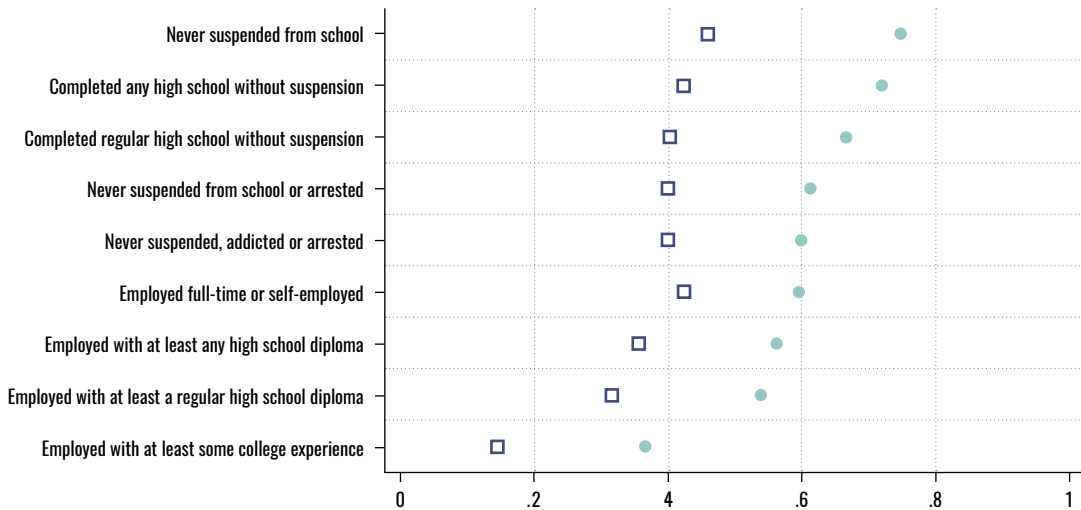
However, recent studies show that targeted early childhood programs can reduce the skills gap, narrowing differences not only in IQ, but also in social and emotional skill development. The Perry Study found that children age 3-4 demonstrated increases in their IQs during and shortly after participating in the program, but as the children grew older their IQ levels began to resemble those of their peers not in the Perry Preschool Project (see Figure 32). Although such a result seemingly supports Jensen's argument that IQ must be genetic, the program was not, in fact, a failure. While the IQ levels of program participants did "fadeout" back to normal, when analyzing their lifetime outcomes — participant earnings, avoidance of crime, health, and so on— the economic rate of return for individuals in the Perry Program was 7-10% per annum after taxes on fadeout (Heckman et al., 2010). This very high rate of return derived from the social and emotional skills the children developed while in the program. So, although their IQs were not higher, participants were more engaged learners and their achievement test scores were higher because they were more active learners.

Figure 26 | PERRY PRESCHOOL PROGRAM, IQ BY AGE AND TREATMENT GROUP



Notes: IQ measured on the Stanford-Binet Intelligence Scale (Terman and Merrill [1960]). Test was administered at program entry and each of the ages indicated.
Source: Heckman (2008)

Figure 27 | INTERGENERATIONAL EFFECTS ON CHILDREN OF ORIGINAL PERRY PARTICIPANTS STATISTICALLY SIGNIFICANT INTERGENERATIONAL EFFECTS AT THE 10% WORST-CASE LEVEL*



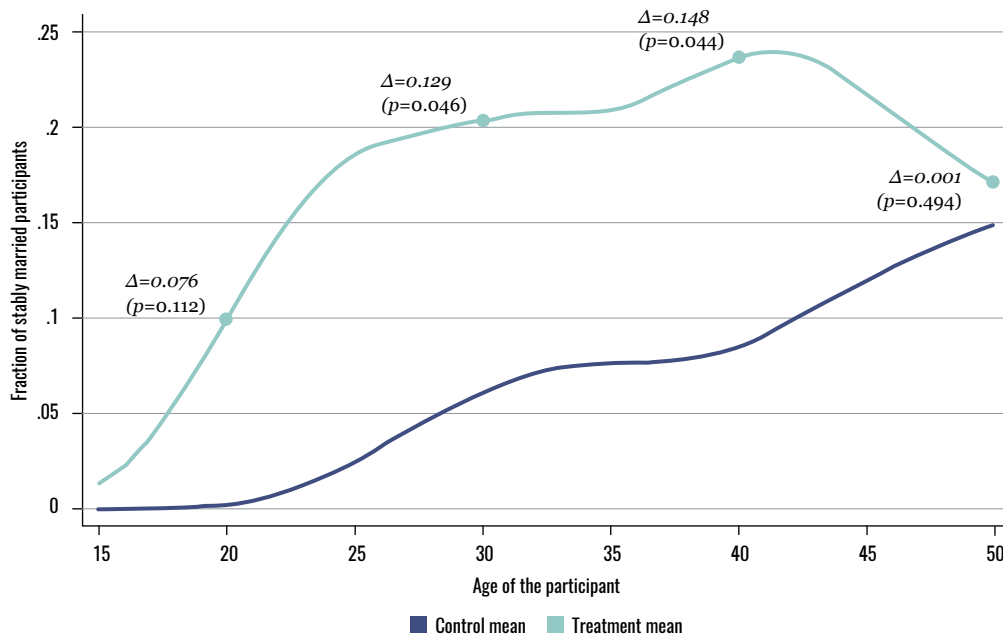
*Note: These estimates of the intergenerational treatment effects are statistically significant at the 10% level using the conservatives worst-case test procedures developed in Heckman and Karapakula (2019)
Source: Heckman and Karapakula (2019)

Perry participants were more engaged in school, with lower suspension rates and arrest rates and higher high school completion rates. These measures of social performance continued into the next generation (i.e. children of original program participants). See **Figure 26**. One possible explanation for why this happened can be seen in **Figure 27**: male participants were much more likely to get married, giving their children the opportunity to grow up under a two-parenting family structure with more income. Programs targeting the development of early-childhood skills produce alums who offer their children better family environments.

This accounts for a beneficial effect on the children of the original Perry participants as adults. They do much better in school and in employment than children of randomized-out nonparticipants.

Similar benefits can be seen in participants of the more intensive Abecedarian (ABC) program which worked with children soon after birth until they were five (García et al., 2020). The program permanently boosted the IQs of the participants. **Figure 28** shows that in addition to substantially boosting IQ, the ABC program improved participants' overall health because the program taught children lifelong skills such as the ability to self-regulate, follow medical instructions, and make wise decisions (Campbell et al., 2014).

Figure 28 | STABLE MARRIAGE RATE OVER THE LIFE COURSE FOR MALE PERRY PROGRAM PARTICIPANTS



Note: Δ =augmented inverse probability weighting estimate (AIPW) of the treatment effect; p=worst-case maximum p-value based on approximate randomization test using studentized AIPW; the control and treatment means are smoothed estimates using the Gaussian kernel with bandwidth of 3.

Source: Heckman and Karapakula (2019)

Figure 29 | ABECEDARIAN PROJECT, HEALTH EFFECTS AT AGE 35 (MALES)

	Treatment Mean	Control Mean	Treatment p-value
Systolic Blood Pressure	125.79	143.33	0.018
Diastolic Blood Pressure	78.53	92.00	0.024
Pre-Hypertension	.68	.78	0.235
Hypertension	0.10	0.44	0.011
HDL Cholesterol	52.21	42.00	0.067
Cholesterol/HDL-C	3.89	4.69	0.057
Abdominal Obesity	0.65	0.87	0.136
Metabolic Syndrome	0.00	0.25	0.009

Source: Campbell et al. (2014)

Since the family environment strongly influences children's development, the nature of parent-child interactions is very important. Studies of early-childhood development programs find that parent-child interaction patterns improved in both Perry and ABC, with many of the parents adopting a primarily authoritative, rather than authoritarian, parenting style (see **Figure 29**).

One drawback to early-childhood development programs such as ABC, Perry, and Head Start, which are based in child-care centers, is that they are often costly. The ABC program cost roughly \$80,000 for the first five years. However, the discounted lifetime benefits of the program are in the hundreds of thousands of dollars, and it has a rate of return close to 14% *per annum*. Any businessman or investor would jump on this investment. Yet, governments only look at costs, and fail to consider benefits, presumably because the benefits are too long-term for election cycles.

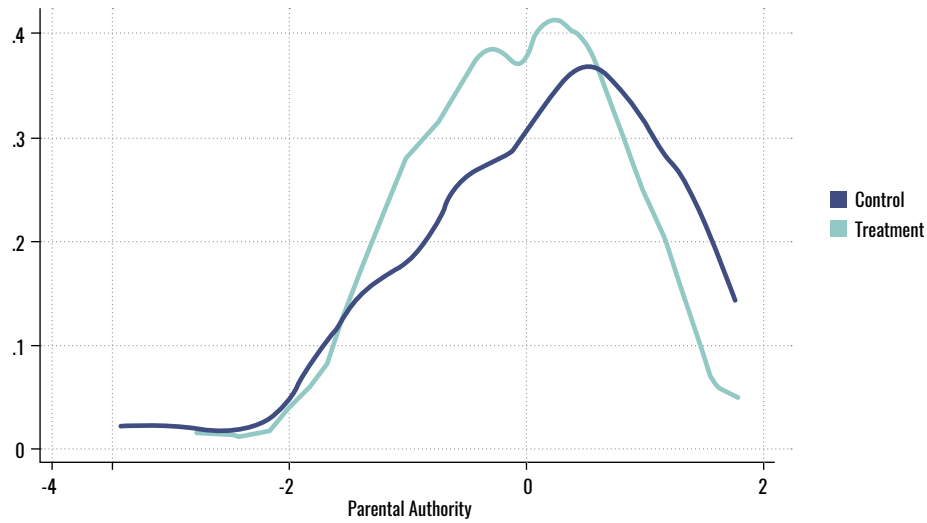
Low-cost alternatives to center-based development programs are home-visiting programs. In such programs, parents are visited by home visitors whose education levels are not necessarily above their own, at most an hour a week. In less developed countries, these programs predominantly take the shape of women living within a village being trained to teach mothers how to interact with their children in order to foster parent-child interaction (Heckman et al., 2020). A study of such a program in Jamaica demonstrates that children whose families participated in the program when their children were 18-36 months of age were more likely by their mid-twenties to have a job, have higher average earnings, more schooling, and stronger cognitive and non-cognitive skills and college attendance for the evidence on schooling (Gertler et al., 2014).

Preparing for Life is a home visiting program in Dublin's poorest neighborhoods in which families are visited one to two hours a month, a very low-intensity program. Over five years, families only received 51 hours of intervention total in which their mothers are taught how to interact with their children. It had substantial benefits on the children through age 10 (Doyle, 2019). Not only were the children's cognitive abilities fostered but compared to children not in the program, they were more autonomous, competent, and had fewer problems with hyperactivity. The program enriched the home lives of children outside of the typical childcare center and kept parental engagement active long after children left the early childhood programs.

There is a strong case to be made for implementing such programs in the U.S. They are less costly than the childcare-centered programs and are very effective. The key principle underlying these programs is that parental support and mentoring play a major role in fostering child development. Age-adapted parenting – sometimes called mentoring – plays a powerful role in shaping skills into adolescence and young adulthood.

Take, as an example, the performance of charter elementary school targeting disadvantaged children in Chicago. Steve Raudenbush, Lisa Rosen, and Tony Bryk established a charter school for disadvantaged students. Children in the program were given counseling and no child was allowed to fail, so if a kid struggled at a specific grade, they would be provided personal assistance catering to their educational needs. This is a form of individualized learning and mentoring. Results from this program indicate a closing of achievement gaps in test scores because the specialized stimulation and mentoring provided them with skills necessary to succeed, giving them an edge over those lacking such guidance. The experimental impacts are impressive (see **Figures 30** and **31**).

Figure 30 | PARENTAL AUTHORITARIANISM, PERRY PRESCHOOL PROGRAM



Source: Heckman (2017)

Figure 31 | EFFECTS OF ACHIEVEMENT OUTCOMES FOR LOTTERY WINNERS AND LOTTERY LOSERS, UNIVERSITY OF CHICAGO ENRICHED CHARTER SCHOOLS (UCCS)

	Grade 3	Grade 4	Grade 5	Middle Grades 6,7,8
Lottery winners ^a	.496	.393	.419	.631
Lottery losers ^{b,c}	.250	.098	.187	.098
Mean difference	.246 (.095)	.285 (.114)	.232 (.114)	.533 (.159)

Notes: a) n = 138 lottery winners produced 276 test scores.

b) n = 319 lottery losers produced 778 test scores.

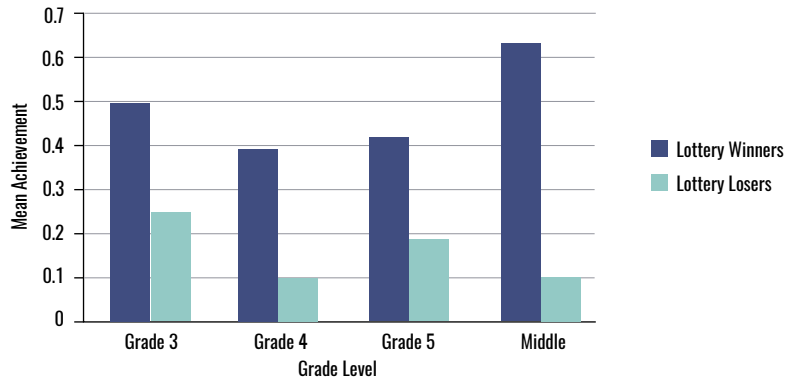
c) Lottery losers produced slightly more test scores on average than did lottery winners because (a) the probability of winning the lottery declines sharply for lotteries for grades after kindergarten, as fewer seats are open in UCCS after kindergarten; and (b) these latter lotteries produced more test scores because testing begins at grade 3.

Source: Hassrick et al. (2017)

Adolescence is another period of opportunity. During adolescence, teenagers actively form their prefrontal cortex which guides regulatory decision making. Providing mentoring programs that foster judgment in decision making has lifetime benefits.

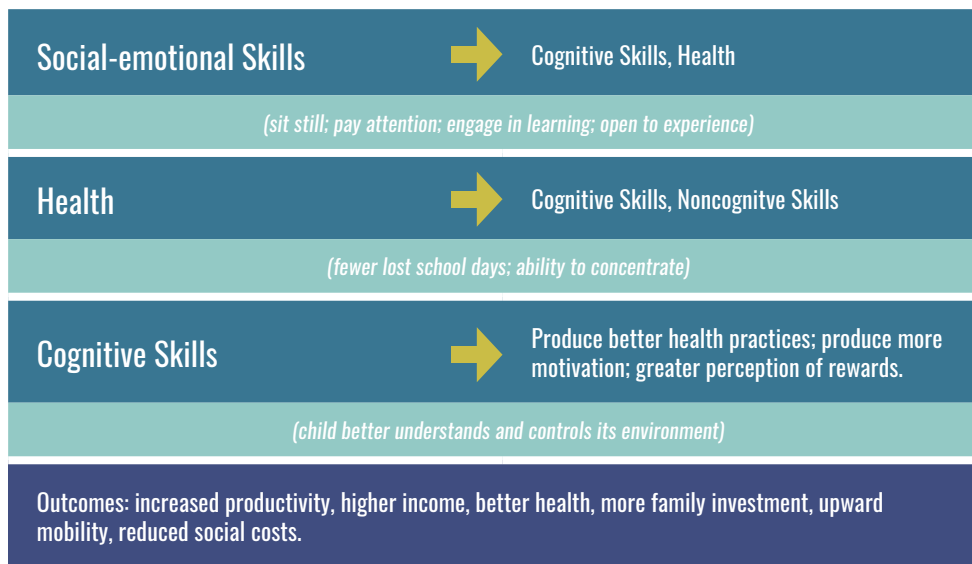
There is an intrinsic dynamic to skill formation. Parenting fosters curiosity, motivation, and wise decision making. More motivated children learn more, have more self-control, and take better care of their health. In turn, healthier kids develop stronger cognitive and socio-emotional skills, demonstrating the positive feedback loop of early childhood skills development. This is the essence of dynamic complementarity (Cunha and Heckman, 2007): early investments build a skill base that makes future investments more productive at later stages in life; the earlier the investment, the greater the effectiveness of future investment: skill begets skill (see **Figure 33**).

Figure 32 | ACHIEVEMENT TEST RESULTS BY GRADE FOR LOTTERY WINNERS AND LOTTERY LOSERS, UNIVERSITY OF CHICAGO ENRICHED CHARTER SCHOOLS (UCCS)



Source: Hassrick et al. (2017)

Figure 33 | SKILLS BEGET SKILLS, UNDERSTANDING THE DYNAMICS OF SKILL FORMATION AND THE IMPORTANCE OF THE EARLY YEARS



Source: Heckman (2017)

CONCLUSION

Skill gaps due to differences in family backgrounds are real and not a figment of test score bias. They matter a lot in predicting life outcomes. Skills are multiple in nature and can be shaped by families and other influences, not only schools. By taking a skills-based approach, governments can solve the root cause of the problems of persistent poverty and inequality, social immobility and racial gaps in the larger society. Instead of centering policies on enhancing skills solely through the education system, policy makers should institute policies aiming to support families in engaging and nurturing their children. Building on lessons learned from effective programs which promote parenting, mentoring, and parent-child interactions, society can design policies to promote childhood skill development and begin to close gaps caused by differences in family structures and environments. More informed and motivated parents foster better schools by sending children to them who are qualified, motivated to learn, and who have already been taught basic skills.

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ENDNOTES

- 1 See Landersø and Heckman, 2017 for evidence on this point.
 - 2 PISA is the OECD's Programme for International Student Assessment. For more information, visit <https://www.oecd.org/pisa/>.
 - 3 The AFQT or Armed Forces Qualification Test consists of four subtests on word knowledge, paragraph comprehension, arithmetic reasoning, and mathematics knowledge.
 - 4 The PIAT or Peabody Individual Achievement Test is a standardized and norm-referenced achievement test and covers content areas including general information, reading recognition, reading comprehension, mathematics and spelling.
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