

# Race earnings differentials

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## Glossary

**Ability differences** Refer to innate ability differences as measured by tests before children enter school, but in most economics literature is usually the measured test performance differences among individuals on a school-based test

**AFQT** Armed Forces Qualifying Test—a test developed to screen individuals for service in the military

**Cognitive skills** Mental skills that are used in the process of acquiring knowledge, such as attention, memory, reasoning, symbolic thinking, perception, and self regulation

**Cross-section data** Data collected at one point in time on a sample of individuals

**Educational quality** Refer to the quantity of schooling inputs per student, the quality of inputs per student, such as teacher content knowledge or teacher experience, or the measured outputs of schooling, such as test score gains from year to year

**Ethnic group** A group of people that shares a self-identity, which can be based on language, national heritage, culture (often mixed with religion), and usually a combination of all these

**Labor market discrimination** Differences among race, ethnic, and gender groups in employment, wages, and promotion due to differential treatment of individual characteristics associated with productivity, such as education, experience, and measured ability

**Longitudinal data** Data collected on a sample of a cohort of individuals over a number of years in a series of follow-up questionnaires

**Noncognitive skills** Skills such as persistence, reliability, self-discipline, the ability to work with others, and the capacity to listen

**Racial group** Although controversial for scientific and political reasons, this usually means a category of individuals based on heritable characteristics such as skin color and facial features, but also on self-identification and social construct

**Test score gap** Refers to the difference in average performance on national tests by identifiable social class, gender, ethnic, and race groups

Earnings differentials between racial or ethnic groups exist in most societies. To the extent that they persist over time in democratic political conditions, they are of considerable concern, since they suggest that different groups are not getting either equal access to human capital investment opportunities or equal treatment in labor markets, or both.

The literature on such earnings differences (and more generally, unequal economic and educational opportunities) have been of interest to economists for almost 70 years, especially in the United States, where, in 1944, a Swedish economist, Gunnar Myrdal, published the path-breaking *An American Dilemma: The Negro Problem and Modern Democracy*, and where the civil rights movement in the 1950s and 1960s continued to draw attention to the unequal education and income of African-Americans and Latinos. The pressure exerted by the movement enabled the collection of detailed census statistics that helped researchers estimate the

existence of wage and schooling differences and to posit explanations for them. In other countries where such data are collected, the results also show distinct differences in economic performance between ethnic and race groups, suggesting that discovering differences is largely a function of data-collection politics.

More recently, in the 1990s, a major debate was held over whether racial/ethnic discrimination in labor markets has disappeared, and whether the main problem is that African-Americans and Latinos earn lower incomes for a given level of education because their academic achievement is lower. This then raises the issue of why different race/ethnic groups achieve differently in school (e.g., the Black–White test-score gap), and how important those differences are in explaining earnings differences.

Although the discussion in this article focuses on the United States, this is primarily because of the richness of the data available and the highly developed debate about the explanation of differences. The methodology is applicable to other economies with minor changes of local conditions. Such a comparison is made with Brazil, with a large Black and mulatto population, and Israel, where European immigrants and those of Afro-Asian origin differ considerably in education and cultural background, and a large minority of Israeli Arabs, representing 19% of the population, that faces major barriers to entry into private and public sector jobs and are discriminated against for ideological reasons.

### Race and ethnic earnings differences in the United States

Data on race, ethnicity, and earnings in the United States are available for the period 1939–2006, and can be analyzed by native- and foreign-born percentage (see [Chiswick, 1984](#) for the 1970 census breakdown). It is important to analyze the data by gender since earnings differ by gender across groups, and female labor force

participation rates also differ among groups and over time.

The data suggest that certain ethnic groups, regardless of race, earn more than average and more than the dominant White Anglo (non-Latino) majority. Therefore, for example, Japanese Americans, Chinese-Americans, and Jewish-Americans all earn more than Anglo-Whites and this has been the case since at least the 1960s. African-Americans, Latinos, Filipinos, and Native-Americans are all examples of groups that earn considerably less, on average, than Anglo-Whites and have done so for as long as data have been available on such differences. Among Latinos there is also variation, with Mexican and Puerto Rican Latinos earning much less than those of Cuban origin.

[Table 11.1](#) presents earnings data for the period 1939–2006 according to ethnic group, race group, and gender group. The Asian-American and Latino groupings are broad and contain distinct subgroups that earn significantly more or significantly less than the group average. Estimates of earnings of Latinos of Mexican origin, Puerto Rican origin, and Cuban origin show that Cuban-origin Latinos earn more on an average, than Latinos of Mexican or Puerto Rican origin. Part of the subgroup variation is due to large differences in the socioeconomic origins of different national groups that immigrated to the United States. For example, the first wave of Cuban Americans who came to Florida in the late 1950s and early 1960s were professionals leaving Castro's Cuba. That group of immigrants was markedly different from the unskilled laborers from Mexico who immigrated throughout the same period, and especially after immigration laws changed in 1965.

Yet, despite this variation within broad groups, [Table 11.1](#) suggests that: (1) there are important and persistent ethnic/race differences in earnings in the United States labor market, (2) these differences cut across gender, and (3) they are subject to historical change. In the period

**TABLE 11.1** United States: Annual median earnings by education, race/ethnic group, and gender, 1939–2006 (full-time workers, current dollars, and percent).

Category	Year 1939	1949	1959	1969	1979	1989	1999	2006
<i>All schooling (males, 25–34 years)</i>								
White	1356	3001	5438	8633	17,389	28,578	35,603	40,964
Black	42	55	58	63	70	71	78	77
Latino	62	71	72	76	70	67	62	66
Asian-American	65	76	86	101	96	98	—	124
<i>High school graduate (males, 25–34 years)</i>								
White	1353	3026	5241	8082	14,830	22,288	30,496	34,387
Black	58	73	69	73	80	80	88	88
Latino	88	83	82	85	89	85	73	79
Asian-American	75	85	99	100	86	89	—	93
<i>College graduates (males, 25–34 years)</i>								
White	2719	3760	6788	10,549	18,394	31,279	42,173	50,471
Black	59	72	67	68	82	70	87	80
Latino	99	66	78	76	88	83	90	88
Asian-American	73	85	85	110	91	100	—	112
<i>All schooling (females 25–34 years)</i>								
White	816	2038	3032	4956	10,226	18,613	27,296	34,034
Black	39	57	63	77	91	90	84	81
Latino	61	87	75	90	87	82	76	77
Asian-American	83	89	99	113	109	109	—	119
<i>High school graduate (females, 25–34 years)</i>								
White	935	2212	3470	5121	9523	15,421	20,655	25,058
Black	51	75	73	84	95	90	88	88
Latino	94	103	95	103	93	95	91	92
Asian-American	85	69	100	94	92	119	—	—
<i>College graduates (females, 25–34 years)</i>								
White	1128	2491	4378	6336	12,228	23,732	34,377	40,614
Black	67	89	71	101	95	94	90	91
Latino	—	—	—	99	94	98	94	92
Asian-American	—	—	—	104	110	106	—	109

From US Department of Commerce, Bureau of the Census, Public Use Census Sample, 1940, 1950, 1960, 1970, 1980, 1990, 1996, and 2007.

1939–79, non-Anglo men and women made large gains relative to Anglos, and after 1979, these gains leveled off, with some notable continued gains (Black male high school graduates), and notable reversals for Black and Latina women. Even with the large gains over four decades, African-Americans and Latinos have remained at a lower level of median income than either Anglos or Asian-Americans. It also should be noted that these data are reported for full-time, full-year workers, so they do not reflect the higher rates of unemployment among minority workers, and that, in real terms (adjusted for inflation), the average earnings reported for White male high school and college graduates, 25–34 years old declined, from US\$14 830 in 1979 to US\$12 369 in 2006 in the case of high school graduates, and from US\$18 394 in 1979 to US\$18 155 in 2006 for college graduates. Female high school graduates also had a 12% decline in real earnings in this period. Thus, except in the case of Black male high school graduates, after the 1970s, Blacks and Latinos generally maintained a constant or declining share of declining real earnings. It is also fairly evident from Table 11.1 that once education and age are accounted for, Latinos earn relatively more than African-Americans with a college education, but males earn less at the high school graduate level.

The two important questions that the literature has addressed about these earnings differences, logically, are:

- (1) Why do some groups do better or worse than others?
- (2) What causes them to change over time?

### A model for explaining earnings differences

The human capital model has typically been used to understand race and ethnic differences in earnings (Becker, 1957; Chiswick, 1984; Freeman, 1973, 1976; Hanushek, 1981; Welch,

1973). This model characterizes individual earnings as a function of education and experience in the labor force. The premise is that earnings of various groups would be explained largely, if not entirely, by their average education and experience. This still leaves the issue of why average education differs among different groups. Is the difference voluntary, or the result of discrimination in the supply of educational services? However, leaving this issue aside, if the human capital model is a correct representation of the market for labor, then race or ethnicity should play no significant role once the human capital of individuals is controlled for, that is, the coefficients of education and experience in the earnings function should be equal of all ethnic groups. The model is as follows:

$$\ln Y_i = a + b_j \sum_{j=1}^m S_{ij} + C_k \sum_{k=m+1}^n E_{ik} + e_i$$

where  $Y_i$  = income of the individual  $i$ ;  $S_{ij}$  = dummy for schooling level  $j$ ;  $E_{ik}$  = dummy for experience level  $k$ ; and  $e_i$  = unexplained variance.

Other models are more elaborate, including the possibility that earnings for different groups vary because of employment in different industries (with significantly lower or higher pay), in public versus private employment, different parts of the country, and because of differences in civil status, and in native versus foreign parentage, which could represent English-language skill differences (Bean & Tienda, 1988; Carnoy et al., 1976, 1990; Farley, 1986). Time worked per week or per year is also an important potential factor affecting earnings differences, since some groups may have higher average levels of voluntary unemployment and part-time employment than others.

Most recently, in the 1990s, the argument on race/ethnic earnings differences focused on the achievement score differences between these groups even when they have the same number of years of schooling and similar experience in

the labor force (Herrnstein & Murray, 1994; Murnane, Willet, & Levy, 1995; Neal & Johnson, 1996; Thernstrom & Thernstrom, 1997). Such achievement differences can reflect varying initial endowments, varying family and community investments in children's academic ability, and possible differences in the quality of schooling available to different race/ethnic groups. Some analysts are persuaded that the Black-White and Latino-White test gaps are the main obstruction to Black and Latino economic progress. In their view, the test gap indicates that the cognitive ability of many Blacks and Latinos is weak and therefore the main reason their wages and income lag behind whites. In the human capital explanation, academic ability among those with the same number of years of schooling needs to be added to the model to measure human capital more fully.

We take these arguments step by step; first, we use cross-section data over a long period of time to estimate how much school attainment and other variables (not including academic ability) may contribute to earnings differences between race/ethnic groups. Then we look at studies that use longitudinal data to test the contribution of ability differences to these earnings differences. We also comment on how the contribution of various factors to earnings differences may be changing over time.

### Explaining earnings differences with cross-section data

Empirical results of cross-sectional studies in a single year show that schooling level attained is a significant correlate of earnings differences among groups. African-Americans, Latinos, and Native-Americans take significantly less schooling than Anglo Whites and, particularly less than, Asian-Americans. The importance of education in explaining differences in income between various ethnic/gender groups can be simulated with log income equations, estimating

how much equalizing education differences would equalize income between groups. For each year and each ethnic/gender group shown in Table 11.2, the figure in the table represents the percentage point increase in average income the group would have had if its education were equal to that of White males in the same year. For example, in 1939, Black males would have had 27% points higher income if their education were equal to White males', taking account of age differences. White females, on the contrary, would have had 9% points lower income if their education were equal to White males', implying that that working White females were more educated than males in the 1930s. Adding work-experience differences changes these percentages marginally, except for Latinos in the 1970s, when the Latino labor force became significantly younger than other groups. The additional effect of Latino experience decreased sharply in the 1980s.

Observable factors other than the quantity of schooling and age may explain part of the gap in the earnings of Black and Latino workers compared to Whites. Some of these factors are industry and region worked in, English-language limitation (foreign birth/language spoken at home), and the quality of education taken by different groups, including differential investment in education at home.

Excluding measures of ability differences, which are not available in the census cross-section census samples, the graphs in Fig. 1 show the percentage points of income difference remaining when all the observable factors (school attainment, work experience, region of work, marital status, foreign/native birth, and industry of work) of each group are equalized by simulation to that of White full-time employed adult males (see Oaxaca (1973), Carnoy et al. (1990), and Carnoy (1994), for the standard model of such a simulation). This residual fell significantly for full-time-employed Black males between 1939 and 1982 and for Latino and Asian-American males between 1939 and 1969. The residual

TABLE 11.2 Percentage points of income gain that would result from equalizing minority education to White male education, by ethnicity and gender, full-time employed, 1939–89.<sup>a</sup>

Year	Latino males	Latina females	Black males	Black females	White females
1939	29	18	27	22	-9
1949	17	12	18	11	-8
1959	15	10	15	9	-2
1969	12	9	14	7	0
1973	16	9	12	5	0
1979	16	8	11	6	2
1982	15	10	11	6	2
1985	15	10	11	6	2
1987	15	8	10	6	1
1989	20	14	10	7	0

From Department of Commerce, United States Census, Public Use Sample. 1940, 1950, 1960, 1970, 1980 and Current Population Survey, 1974, 1983, 1986, 1988, 1990.

<sup>a</sup> The education variable is measured in 1940, 1950, 1960, 1970, 1974, 1980, 1983, 1986, 1988, and 1990; incomes refer to the previous year - hence, the years in the table refer to the income year. The education gap is estimated from a simulation using a regression equation with human capital variables (years of schooling, labor-force experience, and, in census years, native or foreign born). The percentages in the table should be read as the number of percentage points that a given group would have gained just from getting the same distribution of education in its labor force as White males. A negative sign means that White females would receive lower incomes, all other variables equal, were education equalized with that of White males (White females in the labor market in those years had higher education than White males).

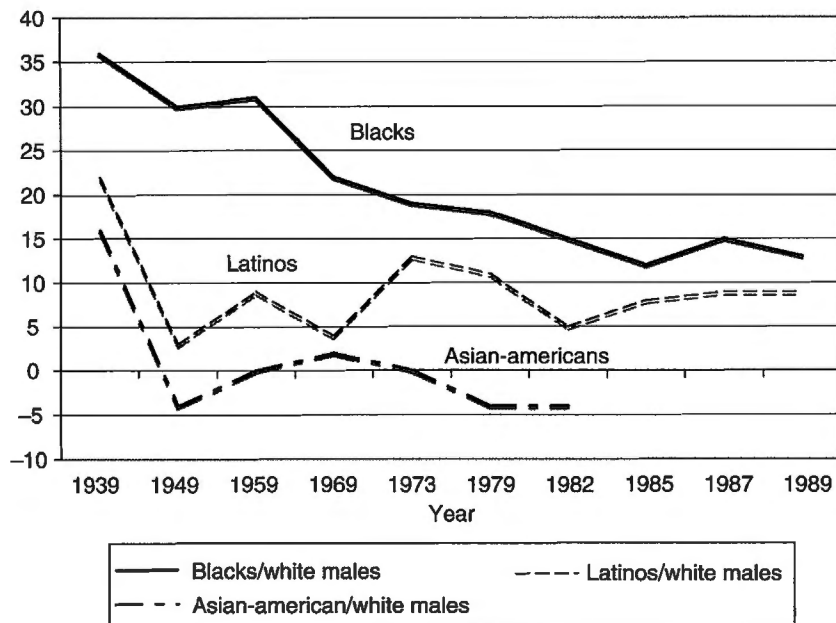


FIG. 1 Minority-White income gap explained by wage discrimination (does not include adjustment for ability differences), 1939–89.



shown in Fig. 1 is measured as percentage points of the earnings gap for each group that is not explained when minorities are made to look like White males educationally and in terms of experience and of place of work. In the 1980s, the residual rose for all three groups. The residual was essentially zero by the end of the 1940s for Asian-Americans, and has been, until the new Latino immigration after 1965, much lower for Latinos than for Blacks. In the 1980s, it represented about 16% points of White male income for Blacks and 13% points for Latinos. It is probable that the residual continued to rise for Latinos and may have fallen for Blacks between 1989 and 2006 (see Table 11.1). Part of the residual for Latinos is associated with foreign birth, and this, in turn, may be a function of English-language capability. When Latinos of Mexican origin are separated into native- and foreign-born, the corresponding residuals for the native-born are 3% points in 1960, 3 in 1970, and 6 in 1980, and for foreign-born, 27% points in 1960, 14 in 1970, and 14 in 1980 (Carnoy et al., 1990). The low residuals for native-born Latinos of Mexican origin suggests that the main explanation of lower incomes for Latinos, once English-language capacity is accounted for, is observable differences in educational attainment, experience, and place and type of work.

The residual can be interpreted as reflecting lower-quality education taken by minorities (Welch, 1973; Card & Krueger, 1992a, 1992b), lower returns to experience, such as in the choice of or access to jobs that have a smaller training component, hence flatter experience-earnings profiles, and possibly a strong interaction between the quality of schooling and access to training in jobs. The differences in quality of education received may not only reflect differences in the quality of schools attended by different groups, but also the amount invested in them by their families and the interaction between family background and school performance, which is discussed in detail below. Eliminating

discriminatory practices in school access does not necessarily equalize outcomes (the quality of an individual's education) because of the cumulative nature of learning before and during school and also because of interaction effects. Differences in returns to education and in access to jobs with more training for different groups may also simply be the result of discriminatory practices in the labor market.

Why labor market discrimination occurs has been the subject of considerable controversy. In his pioneering work on racial discrimination, Myrdal (1944) argued that it was historically institutionalized in the fabric of society and required public intervention to change.

Becker's (1957) model of discrimination focused on the taste for discrimination on the part of White workers and consumers, which drives the earnings of Black workers down relative to White workers. Reich (1982) refutes the claim by Becker that White workers profit when there is discrimination, showing that the lowest White earnings are in those states where the greatest discrimination exists. He argues that labor-market discrimination serves owners of capital, since it keeps all workers' wages lower.

### Earnings differences for minority women

Racial and ethnic earnings differentials vary by gender. Table 11.1 suggests that full-time-employed minority women in the United States had, by the late 1960s/early 1970s, come to earn approximately the same income as full-time-employed White women when the level of schooling was the same, and, on an hourly basis, may actually have earned more than White women (Chiswick, 1987). By 2006, Black male high school and college graduates earned about 90% and 80% of the annual income of Whites, and Black women graduates earned about 90% of full-time White female incomes at both levels of schooling. Latino men high school graduates

earned a much lower fraction of White male incomes than did Latina women relative to White women, but only slightly lower at the college graduate level - this is the opposite of the pattern for Blacks.

If Black women and Latinas are subject to the same race/ethnic discrimination as men, why should they earn higher relative incomes compared to their White gender counterparts? The answer lies partly in the gender segregation of the labor market and the willingness of White male employers to group minority and White women in the same category of labor. This was not always the case, and, recently, differences in pay are beginning to emerge again in favor of White women, perhaps for somewhat different reasons than in the past. Black (but not Latina) female earnings were much lower than those of Whites in the 1940s and 1950s, when Black women were highly concentrated in domestic service. As Black women moved into manufacturing and clerical jobs and received much more schooling, the differences between White and Black female earnings tended to disappear, at least until the 1970s. After that time, with the steady increase in the labor-force participation of White women, the ratio of Black and Latina women's earnings to White female earning has gradually declined. Even so, [Neal \(2004\)](#) argues that the measured wage gap between Black and White women continues to be too small because of the failure to correct for differential labor-force participation.

Besides the continued gender segregation of the labor market, one reason that Black women may continue to earn a higher ratio of White salaries than Black men, particularly among college graduates, is that a higher fraction of college graduate Black women work in the public sector, where female salaries are much higher than in the private sector. Public sector employment was especially important in the late 1960s and in the 1970s, when such employment was at its peak.

## **Do ability/educational quality differences explain race/ethnic earnings differences?**

The most recent debates center on whether discrimination has been eliminated or still exists in US labor markets (see, for example, [Thernstrom & Thernstrom, 1997](#) vs.; [Brown et al., 2003](#)). The discussion centers in part on whether earnings differences not explained by education and experience differences are the result of continued discrimination or of race/ethnic differences in ability as measured by test-score differences ([Neal & Johnson, 1996](#)) - in part such test-score gaps are the result of family education differences (initial endowments) and, in part, of differences in the quality of schooling taken by Blacks/Latinos and Whites.

Estimates of the contribution of higher ability, as measured by scores on mathematics tests taken in high school, to individual earnings later in life suggest that its value is significant even when years of schooling are accounted for ([Murnane et al., 1995](#)), and that the return to academic skills may have increased in the 1980s ([Blackburn & Neumark, 1993](#); [Murnane et al., 1995](#)). (However, this is not a universally held view. Some economists, such as Samuel Bowles and Herbert Gintis have long argued that cognitive skills explain relatively little of the variance of earnings and productivity ([Bowles, Gintis, & Osborne, 2001](#); [Bowles & Gintis, 1975](#)).

Those estimates paid little attention to the role of race/ethnicity, but [Carnoy and DeAngelis \(1999\)](#) used the National Longitudinal Survey of Youth (NLSY) and High School and Beyond data to estimate the role of mathematics achievement and race/ethnicity in wages by gender group for the 1972 and 1982 high school senior cohorts in various years after graduation. They made these estimates separately for high school graduates, those who had completed some college, and for college graduates. They found that in the 1972 cohort, mathematics test score in high school had little direct effect on the wages



of high school male graduates. Being Hispanic had no significant effect on earnings, but being Black had a strong negative effect; about 20–25% lower wages when education, mathematics achievement, and work experience were controlled for. The race effect was somewhat smaller but significant for those with some college, but was negligible for college graduates, whereas one standard deviation higher mathematics test score was worth 31% for those males with some college and 8–9% higher wages for college graduates. Higher mathematics score had a similar size effect for female college graduates, but neither race nor ethnicity had a significant relationship to wages.

For the 1982 cohort, only annual earnings (not wages) were available as the dependent variable. For male high school graduates, mathematics score is related to earnings in the 1991 follow-up, but so is race (being Black), although less so (10–18% lower earnings) than for the 1972 cohort. For those males with college education, race is unrelated to earnings when education and mathematics score is accounted for, but math score is related to earnings for college graduates to about the same degree as in the 1972 cohort. For females with college education, mathematics score is related to higher earnings, but race is generally not.

This analysis suggests that the labor market for high school graduates placed relatively less value on ability differences in the 1970s and 1980s and paid Black males considerably less even when all these human capital variables were accounted for. This did not appear to be the case for Hispanics with high school degrees or Hispanic/Black college graduates even in the 1970s, and by the 1980s and early 1990s, was not the case for even those males with some college. For females, race and ethnicity do not seem to have been correlated with wages or earnings even in the 1970s.

Thus, race discrimination for Blacks seems to have been important in the labor market for males with lower levels of schooling even in the 1980s and early 1990s, whereas it seems to have

played little role in the labor market for college-educated males by the late 1980s and for females with both high school and college education.

For the latter groups, mathematics ability was related to earnings; so if Blacks and Latinos had lower mathematics ability, they would have received somewhat lower earnings (about 10% lower earnings for one standard deviation difference in mathematics test score). If we extrapolated these results to the earnings differences in [Table 11.1](#), most of the differences observed in Black/White male high school graduate earnings in 1989 and 1999 could be attributed to racial discrimination, and most of the observed Black/White differences in college graduate earnings for males and females, to mathematics achievement differences.

An analysis of yet another data set, the NLSY, which includes the armed forces qualifying test (AFQT) as a measure of ability among a sample of 16–23-year-olds in 1979, [Carneiro, Heckman, and Masterov \(2005\)](#) explores wage differences between Blacks and Whites and Hispanic and Whites, males and females, in that sample followed over the period 1991–2000. When the AFQT scores are corrected for the level of schooling attained by the test taker in order to get a purer ability effect, one standard deviation higher AFQT score is associated with 9–10% higher male wages whereas being a Black male is associated with 14–19% percent lower wages than White males. Once AFQT scores are taken into account, Hispanic and White males do not have significantly different wages. Being a Black woman is associated with 7–8% lower wages than White women earn when ability is taken into account, and being a Hispanic woman is associated with a wage premium of 7–14% compared to White women. The payoff to ability is somewhat higher than for men, about 9–13% for one standard deviation higher AFQT score. These results are generally consistent with the results for the High School and Beyond Survey, but the test-score effect is somewhat larger in the NLSY, and being Black seems to have a

negative effect on men and women's wages, although the coefficient is not large for women.

### What are the sources of the black/white test-score gap?

Although it is beyond the scope of this article to provide a comprehensive review of the literature on the Black/White test-score gap, the overall question of race/ethnic difference in earnings merits at least some discussion of whether Blacks and Hispanics choose to invest less in themselves academically, hence achieve less, or whether the schools they attend and the society around them are the main source of their lower achievement - hence, it is the civil society and state that makes them less productive (this would be akin to the discrimination argument in labor markets).

Earlier [Jencks and Phillips \(1998\)](#) and more recently [Rothstein \(2004\)](#) summarized the empirical research on this issue. Rothstein argues that much of the achievement gap between Blacks and Whites exists at age 5 years when children enter kindergarten. His main point is that the achievement gap is largely the result of differences in the social context in which most Blacks and Latinos live in the United States and that the potential for schools to overcome achievement gaps is relatively limited. Thus, he concludes that a more productive strategy to reduce the achievement gap would be improving minorities' social conditions - nutrition, healthcare, and sense of being full participants in American society.

Part of those conditions is also the degree to which Blacks feel discriminated against in labor markets. A number of opinion surveys suggest that Whites believe that the United States is free of racial discrimination, and Blacks believe that despite great improvement in race relations over the past 40 years, racial discrimination is still a major feature of their lives ([Brown et al., 2003](#)). This could influence their desire to perform well in school and their test performance ([Steele, 1997](#)).

Evidence from national- and state-level data on whether the Black-White test score changes during schooling is contradictory:

Data from [longitudinal] ECLS-K and SEC-CYD suggest the gap is large at the start of kindergarten, and grows in the early elementary grades (particularly from first to third grade in ECLS-K), though the patterns differ somewhat depending on the gap metric used. Data from NAEP suggests that the gap continues to grow from age 9 to 13 (fourth to eighth grades, roughly), but [longitudinal] state-level data from Texas and North Carolina seem to contradict this finding, at least during the late 1990s and early 2000s, suggesting that the gap grows relatively little in standard deviation units over the latter half of elementary school. Finally, data from NAEP and NELS suggest the gaps change relatively little following eighth grade, though there is some uncertainty in these estimates, since most are based on analysis of repeated cross-sectional data ([Reardon, 2007](#), p. 8).

[Reardon \(2007\)](#) does a careful analysis of changes in the Black-White test-score gap between kindergarten and fifth grade and concludes that the gap in both math and reading scores widens between kindergarten and fifth grade, and that the gap grows faster among higher-scoring students, suggesting that part of the widening gap may result from "... black students with high skill levels in kindergarten being more likely than equally high-scoring white students to be in schools where the median skill level is far below their skills (because they are more likely to be in schools with predominantly black student populations)" ([Reardon, 2007](#), p. 31). Thus, the increasing Black-White test-score gap might be the result of poorer schools, but schools whose quality is derived from the concentration of low-income students, in turn the result of residential segregation. Even so, the Black-White test-score gap at kindergarten entrance explains the bulk of the gap at grade five.

[Carneiro et al. \(2005\)](#) also argue that early environment rather than poor schooling is likely

the most important reason that Blacks have lower test scores (academic skills) than Whites.

Minority deficits in cognitive and non-cognitive skills emerge early and widen. Unequal schooling, neighborhoods and peers may account for this differential growth in skills, but the main story in the data is not about growth rates but rather about the size of early deficits... The failure of the Hispanic-white gap to widen with schooling or age casts doubt on the claim that poor schools and bad neighborhoods are the reasons for the slow growth rate in black test scores. (Carneiro et al. 21).

### Explaining changes in earnings differences over time

Why has the gap in earnings between Whites and minority groups changed over time? [Table 11.1](#) shows that full-time-employed Black males and females made large gains in relative earnings in the period 1939–79, especially in the 1940s and 1960s. The gains in the 1980s were negligible (the relative earnings of Black male college graduates fell), and Black males high school graduates made some gains in the 1990s, whereas Black female college graduates saw a decline in their earnings relative to White females. Latino males and females also made big gains in the period 1939–69, but then lost ground, particularly male high school graduates. Asian-Americans made large gains in the 1940s, 1950s, and 1960s, and college graduates continued to make gains in the 1990s and early 2000s.

The principal debate that has developed over these changes is whether they are the result of supply side forces, specifically changes in the relative investment in human capital made by the different groups, or demand side forces, specifically legal and direct employment intervention by government. [Freeman \(1976\)](#) maintained that the large gains in relative earnings of Blacks in the 1960s came as a result of

the passage of the 1964 Civil Rights Act and subsequent federal employment legislation in 1965. Others ([Card & Krueger, 1993](#); [Donohue & Heckman, 1991](#); [Heckman & Payner, 1989](#)) have supported this explanation. [Smith and Welch \(1989\)](#), on the contrary, have argued that the single best explanation for the gains in the period 1939–79 was the relative increase in Black education, and that federal intervention had only a minor effect, primarily in raising the earnings of young Black college graduates in the early 1970s. [Card and Krueger \(1992b\)](#) claim that about one-fourth of the gain in Black earnings attributed to government intervention in labor markets in the 1960s and 1970s is the result of improvements in Black education in the South in the 1930s and 1940s. [Juhn, Murphy, and Pierce \(1991\)](#) argues that the slowdown in Black-White convergence in the 1980s was due to unmeasured skill effects, namely that the payoff to educational quality increased in the 1980s, and Blacks still received lower-quality education than Whites.

If the analysis is done decade by decade in the 50-year period 1939–89, the supply-side argument is weakened. [Table 11.2](#) suggests that education gains by Blacks between 1939 and 1979 were correlated with a reduction in the Black-White earnings gap in those four decades. But other factors appear to have been much more important than education in that reduction. For example, [Table 11.3](#) corrects that contribution of education differences to the income gap estimated in [Table 11.2](#) for changes in the income distribution (specifically the income weights attached to different levels of schooling) in each decade. Wage compression in the 1940s was much more important than Black male educational gains in reducing the Black-White income gap, and was as important as education for Latinos. Although Black males' education did not increase much relative to Whites in the 1940s and racial discrimination declined only slightly, the enormous increases in incomes for all low-income earners relative to high-income

TABLE 11.3 Change in education gap adjusted for changing income weights, by decade, full-time workers, 1939–89 (percentage points of income).

Year	Latino males	Latina females	Black males	Black females
1939	29	18	27	22
1949	23	16	24	15
1949	17	12	18	11
1959	16	10	16	9
1959	15	10	15	9
1969	12	9	14	7
1969	12	9	14	7
1979	16	8	11	6
1979	16	8	11	6
1989	19	13	9	7

earners - irrespective of race - during that decade lifted Black male relative incomes more than in any decade since. In the 1940s, there was also a job shift from agriculture to manufacturing that had a power effect on Black male incomes. As a point of comparison, in the 1950s -a period of significant educational gains for minorities but no reduction in overall income inequality, much-reduced sectoral job shift, and no reductions in job discrimination – gains in relative incomes for Blacks were minimal. In the 1960s and particularly, the 1970s, Blacks made large education gains, but the major gains in income for Blacks came from the reduction in wage discrimination. In the 1980s, when the political climate on affirmative action changed, Black male and female incomes stopped rising relative to Whites' (particularly for Black male college graduates), and in the 1990s, when the climate became more favorable again, Black male relative earnings rose again. Another possible influence on Blacks' relative incomes in the 1990s may have been the relative increase in fourth- and

eighth-grade mathematics test scores in the late 1970s and 1980s, which could have been reflected in the higher relative test scores of both 25–34-year-old high school and college graduates in the 1990s and early 2000s.

From See Table 11.2 for figures based on the education gap estimated using same-year White male income weights. Figures in this table compare the education gap in 1939 with the gap in 1949 figures based on average education differences between ethnic groups in 1949 weighted by White male coefficients estimated using 1939 census data; compare the 1949 figures from Table 11.2 with 1959 figures based on average education differences in 1959 weighted by White male coefficients using 1949 census data, and so forth, for various census years. This permits comparison for each decade of the effect on income of the education gain net of changes in the distribution of income among education groups in that particular decade.

A similar analysis for Latinos and Asian-American males and females suggests that education is a more important explainer of their relative income gains than for Black and White females, although changes in sector of work (shifts from agriculture to manufacturing) are also crucial in understanding their gains in the 1940s (Latinos and Asian-Americans) and 1950s (Latinos). Both groups also profited from reduced labor-market discrimination in the 1940s and 1960s.

The recent work focusing on the relation to relative wages of pre-market skill differences between minorities and Whites has been interpreted by many as a mandate to improve the quality of education taken by Blacks and Hispanics (e.g., by [Thernstrom & Thernstrom, 2003](#)). However, both [Carneiro et al. \(2005\)](#) and [Rothstein \(2004\)](#) make convincing cases that most of the ability differences between Blacks and Whites as measured by teenage test scores of those with similar levels of schooling occur before children enter school and persist through the schooling process. This is apparently not the same pattern for Hispanics,

who are able to close the ability gap as they acquire more schooling. Furthermore, almost all studies with longitudinal data show that even in the 1990s, at least for Blacks, education and test-score differences compared to Whites do not explain even part of Black-White wage differences, particularly for males.

### Comparing results for Brazil and Israel

Brazil has a large Black (*preto*) and mulatto (*pardo*) population. For many years, the official ideology in Brazil was that its racial inequality was softened by the acceptance of intermarriage. In the past 10 years, however, research has identified large earnings differences between Whites and both *pretos* and *pardos* in the Brazilian labor market. The most recent of these studies uses 1996 household survey data for urban male workers and a rough proxy for the educational quality received by the individual worker (teacher–pupil ratios by state of birth and year of birth) to estimate wages of male household heads as a function of education, age, parents education, and industry worked in (Arias, Yamada, & Tejerina, 2004). The study finds that the bulk of wage differences between Whites and workers of color is explained by productivity-related worker characteristics, but unexplained wage differences remain large at higher-income levels. In the fifth quintile of income, the residual wage gap is 15% for *pretos* and 12% for *pardos*, and this increases in the top-income decile to 25% for *pretos* and 16% for *pardos*. This is reflected in lower rates of return to education for males of color than for Whites. Nevertheless, whereas *pretos* face a larger gap in education returns at the top of the income distribution, the opposite is true for *pardos*. Apparently, the common belief in Brazil that in higher socioeconomic levels, interracial marriage softens racial discrimination probably holds true.

Similar estimates have been made for Israel, where ethnic origin (European-origin vs. North African-Asian- origin immigrants) and being an

Israeli Arab are potentially a source of wage discrimination (Amirs, 1983, 1988; Margalioth, 2005). The results of such estimates show that in the 1970s, the wage differential between the foreign-born males of the two ethnic groups in the Jewish population fell substantially from 25% to 16% mainly because of demographic factors such as a change in the relative age structures and period of immigration of the two groups. Unexplained differentials (wage discrimination plus quality of schooling differences) also fell from 15% to 12%. When the same estimates are made for first generation Israeli-born of North African-Asian and European extraction, the wage differential is shown to have become larger than for the foreign-born in the 1970s, rising from 26% in 1970–72 to 30% in 1980–82. This is explained mainly by an increasing age difference over the decade, with European-origin Israelis becoming increasingly older in relative terms. Nevertheless, the results also show that educational differences (larger than between the foreign born of the two ethnic groups) continued to persist even though average levels in both groups rose significantly relative to their parents. The results also show that wage discrimination fell during the decade and was relatively low (about 6% in 1980–82). Other estimates of wage differences between Israeli Arabs and Jews suggest that it is mainly the segregation of the labor market that contributes to the wage gap between the two groups. The gap is quite large: Israeli Arab employees earned about 28% less than Jewish employees. Arabs are highly overrepresented in low-paying industries such as agriculture and construction, whereas they are underrepresented in financial and business services (Margalioth, 2005). Although education differences, particularly a lower likelihood that Israeli Arabs attended university, contribute to wage differences, there is considerable evidence that an important source of wage differences is discrimination against Arabs in access to jobs on security threat and ideological grounds. Arabs also face a



number of other barriers to entry, such as the requirement that potential employees have completed military service (Arabs normally do not serve in the Israeli defense forces).

### See also

Human Capital; Returns to Education in Developed Countries; Returns to Education in Developing Countries; School Quality and Earnings; Education and Inequality; Desegregation, Academic Achievement and Earnings.

### References

- Amirs, S. (1983). *Educational structure and wage differentials of the Israeli labor force in the 1970s*. Jerusalem: Bank of Israel. Discussion Paper No. 83.07.
- Amirs, S. (1988). Trends in wage differentials between Jewish males of different ethnic origin during the 1970s. *Bank of Israel Economic Review*, 63, 52–75.
- Arias, O., Yamada, G., & Tejerina, L. (2004). Education, family background, and racial earnings inequality in Brazil. *International Journal of Manpower*, 25(3/4), 355–374.
- Bean, F., & Tienda, M. (1988). *The hispanic population of the United States*. New York: Sage.
- Becker, G. S. (1957). *The economics of discrimination*. Chicago, IL: University of Chicago Press.
- Blackburn, M., & Neumark, D. (1993). Omitted-ability bias and the increase in the return to schooling. *Journal of Labour Economics*, 11, 521–544.
- Bowles, S., & Gintis, H. (1975). *Schooling in capitalist America*. New York: Basic Books.
- Bowles, S., Gintis, H., & Osborne, M. (2001). The determinants of earnings, a behavioral approach. *Journal of Economic Literature*, 39, 1137–1176.
- Brown, M., Carnoy, M., Currie, E., et al. (2003). *Whitewashing race: The myth of a color-blind society*. Berkeley, CA: University of California Press.
- Card, D., & Krueger, A. (1992a). Does school quality matter? Returns to education and the characteristics of public schools in the United States. *Journal of Political Economy*, 100(1), 1–40.
- Card, D., & Krueger, A. (1992b). School quality and black/white relative earnings: A direct assessment. *Quarterly Journal of Economics*, 107(1), 151–200.
- Card, D., & Krueger, A. (1993). Trends in relative Black-White earnings revisited. *American Economic Review*, 83(2), 85–91.
- Carneiro, P., Heckman, J., & Masterov, D. (2005). *Labor market discrimination and racial differences in premarket factors*. Bonn, Germany: Institute for the Study of Labor (IZA). Discussion Paper 1453.
- Carnoy, M. (1994). *Faded dreams*. New York: Cambridge University Press.
- Carnoy, M., Daley, H., & Hlnojosa, R. (1990). *Latinos in a changing economy. Interuniversity program for Latino research*. New York: City University of New York.
- Carnoy, M., & DeAngelis, K. (1999). *Does ability influence individual earnings, and if so, by how much? School of education stanford university*. Stanford, CA: Mimeo.
- Carnoy, M., Girling, R., & Rumberger, R. (1976). *Education and public sector employment*. Stanford, CA: Center for Economic Studies.
- Chiswick, B. R. (1984). Differences in education attainment among racial and ethnic groups: Patterns and preliminary hypotheses. In *Paper presented at the national academy of education conference on the state of education*. Washington, DC: Mimeo.
- Chiswick, B. R. (1987). Race earnings differentials. In G. Psacharopoulos (Ed.), *Economics of education: Research and studies* (pp. 232–237). Oxford: Pergamon.
- Donohue, J., III, & Heckman, J. (1991). Continuous versus episodic change: The impact of civil rights policy on the economic status of Blacks. *Journal of Economic Literature*, 29, 1603–1643.
- Farley, R. (1986). Assessing Black progress: Employment, occupations, earnings, income, poverty. *Economic Outlook United States of America*, 13(3), 14–23.
- Freeman, R. (1973). Decline of labor market discrimination and economic analysis. *American Economic Review*, 63(2), 280–286.
- Freeman, R. (1976). *Black elite: The new market for higher educated black Americans*. New York: McGraw-Hill.
- Hanushek, E. A. (1981). *Sources of black-white earnings differentials*. Stanford, CA: Stanford University. Institute for Educational Finance and Governance.
- Heckman, J., & Payner, B. (1989). Determining the impact of federal antidiscrimination policy in the economic status of blacks: A study of South Carolina. *American Economic Review*, 79(1), 138–177.
- Herrnstein, R., & Murray, C. (1994). *The bell curve: Intelligence and class structure in American life*. New York: Free Press.
- Jencks, C., & Phillips, M. (1998). *The black-white test score gap*. Washington, DC: The Brookings Institution.
- Juhn, C., Murphy, K., & Pierce, B. (1991). Accounting for the slowdown in Black-White convergence. In M. Kostos (Ed.), *Workers and their wages: Changing patterns in the United States* (pp. 107–143). Washington, DC: American Enterprise Institute Press.
- Margalioth, S. R. (2005). Labor market discrimination against Arab Israeli citizens: Can something be done? *International Law and Politics*, 36, 845–884.
- Murnane, R., Willet, J., & Levy, F. (1995). The growing importance of cognitive skills in wage determination. *Review of Economics and Statistics*, 77(2), 251–266.



- Myrdal, G. (1944). *American Dilemma: The Negro problem and modern democracy*. New York: Harper and Row.
- Neal, D. (2004). The measured Black-White wage gap among women is too small. *Journal of Political Economy*, 112, S1–S28.
- Neal, D., & Johnson, W. (1996). The role of premarket factors in Black- White wage differences. *Journal of Political Economy*, 104, 869–895.
- Oaxaca, R. (1973). Male-female wage differentials in urban labor markets. *International Economic Review*, 14(3), 693–709.
- Reardon, S. (2007). *Thirteen ways of looking at the Black-White test score gap*. Stanford, CA: Stanford University School of Education.
- Reich, M. (1982). *Racial discrimination*. Princeton, NJ: Princeton University Press.
- Rothstein, R. (2004). *Class and schools*. New York: Teachers College Press.
- Smith, J., & Welch, F. (1989). Black economic progress after Myrdal. *Journal of Economic Literature*, 27(2), 519–564.
- Steele, C. M. (1997). A threat in the air: How stereotypes shape intellectual identity and performance. *The American Psychologist*, 52(6), 613–629.
- Thernstrom, S., & Thernstrom, A. (1997). *America in black and white: One nation, indivisible*. New York: Simon and Schuster.
- Thernstrom, A., & Thernstrom, S. (2003). *No excuses: Closing the racial gap in learning*. New York: Simon and Schuster.
- Welch, F. (1973). Black-White differences in returns to schooling. *American Economic Review*, 63(5), 893–907.