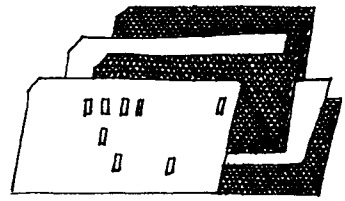
Research Summaries



On-the-job training: differences by race and sex

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Wages of blacks and women are still substantially lower than those for white men. The latest figures for the third quarter of 1980 showed that for full-time wage-and-salary workers, median weekly earnings for black men were about 75 percent of those for white men; the corresponding figures were 63 percent for white women and 58 percent for black women. Careful studies of differences in earnings by race and sex suggest that a sizable portion of the observed differences—perhaps half or more—are *unexplained* by underlying race/sex differences in the average level of apparent worker skills such as education and work experience.[1] The indirect—and unproven—implication of this is that labor market discrimination is still prevalent. We also know that the jobs which women and blacks hold are worse in other ways as well—lower occupational status, less desirable working conditions, and greater vulnerability to cyclical unemployment.

But what about the skills and training that workers receive on the job? Are the jobs of women and blacks worse in that regard also? Do their jobs provide them with less opportunity for on-the-job training? A recent national survey suggests that the answer to this is yes, and that, for young black men especially, the amount of training provided on the job is quite limited.

Virtually all labor economists agree that on-the-job training is an important determinant of individual earnings and especially of the growth of earnings over the life cycle. It is commonplace now for economists to view a job as both a source of current income and as a place to learn new work skills or improve old ones—to acquire on-the-job training. Indeed, it appears that most of the skills actually used on the job are learned there, not in school. Those acquired skills lead to higher future earnings by increasing and enhancing an individual's work skills and productivity. The continued acquisition of work skills on-the-job plays a central role in both the human capital model and even in labor market models which emphasize market segmentation, discrimination, and the role of institutional forces.

Information about the amount of skills and training provided on the job is also important for accurate race/sex wage comparisons. For example, if the jobs held by women and blacks offered fewer opportunities for skill acquisition and improvement, then current average wage differences by race and sex would understate the "true" differences.[2] In that event, we might expect future race/sex earnings differences to grow as average skill levels diverged over the life cycle. Precisely the opposite interpretation would be appropriate if blacks, women, or both were receiving greater training opportunities.

In spite of its acknowledged importance, relatively little of an empirical nature is known about the acquisition of training by individuals or about possible race/sex differences in amounts of training. There is some information, but it is all indirect, usually inferred from cross-sectional earnings regressions. Thus, for instance, virtually all studies of earnings differences by race, sex, or both find that the earnings of blacks and women tend to grow less rapidly with each additional year of work experience. A widely accepted explanation for this—that of the human capital model—interprets work experience as a proxy for investment in training and then concludes that the lower earnings growth per year of experience indicates that, on average, the jobs held by women and blacks provide less on-the-job training. This reasoning is logically consistent, but it is also completely circular. The problem is that the process of acquiring training cannot be observed, but is only "revealed" to have occurred *ex post* by a subsequent growth in individual earnings. This reasoning, by construction, precludes situations in which investment takes place but earnings do not grow and those in which earnings grow in the absence of skill acquisition. Thus it ignores the possibility that blacks, women, or both receive smaller rewards for the skills they do acquire.[3]

Some *direct* evidence on race/sex training differences

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is available in recent data provided by the Panel Study of Income Dynamics. This is a national longitudinal survey of the economic status of more than 5,000 families which has been conducted annually since 1968. In the study's 1976 interviews, questions relating to on-the-job training were included as part of an attempt to develop an extensive data base for the analysis of race and sex earnings differences. Household heads (arbitrarily taken to be the husband) and, for the first time, their wives were interviewed. The couples' answers provide information, when weighted, on a representative national survey of more than 3,100 working men (about 30 percent black) and approximately 2,100 working women (35 percent black) between the ages of 18 and 64.

Developing an objective, quantitative measure of the amount of on-the-job training provided by a job and received by a worker is not a simple matter. The human capital model, which has given the most theoretical attention to investment in training, measures the amount of training by the fraction of worktime devoted to learning and improving skills rather than working; thus, for example, one might spend 80 percent of the day working and 20 percent learning. This approach is useful theoretically, but it is not easily amenable to measurement—imagine trying to divide your workday into working and learning components. (It is usually assumed that you cannot do both simultaneously.) What the Panel Study researchers did in order to develop a measure of training was ask individuals about the length of time—how many months or years—it would take "the average new person to become fully trained and qualified" on their job. (The question asked about the "average new person" rather than "you" to minimize reported differences in training time because of experiences or skills unique to that individual.)

The answers to this question can be used to develop two measures of training. One is how many months or years it takes to become fully trained and qualified, the idea being that jobs with longer training periods provide more skills and training. Implicitly, this assumes that the "quality" or "intensity" of training does not vary among jobs, so that a 1-year training period represents exactly twice as much as that given in 6 months. While this measure of training clearly has flaws, it certainly seems preferable to the circular measure of usual training. The other training measure is whether or not an individual is currently receiving training—whether his or her job tenure is greater than or less than the reported length of the training period.

Whatever its possible problems are, the reported training periods seem to make sense. If we look at the average training time for various occupational groups the answers are generally consistent with conventional notions of occupational status and skill requirements. (See table 1.) The average training period for all jobs was about a year and 8 months, but it ranged from nearly 3 years for professional and technical workers and managers down to approximately 6 to 9 months for the bottom of the blue-collar distribution. Skilled blue-collar workers (foremen and craftsworkers) reported an average training period of more than 2-1/2 years, compared with about 9 months for secretaries and clerical help. There are really no anomalous results in the table.

We can look at the question we originally asked: In addition to carrying lower wages and a higher probability of unemployment, do the jobs of blacks and women provide less on-the-job training? The answer, according to the Panel Study data, is yes. The average training period for white men is 2.25 years, while that for white women and for black men and black women is less than 1 year.[4] And as table 2 shows, the same order of difference—more than 2 to 1 persists even when white men are compared with blacks and women within the same age group or educational category. Thus, the lower training periods are not explained by race/sex differences in age or educational attainment.

The same race/sex pattern exists when we examine the other training variable (see table 3). While more than a quarter of white men were currently receiving training on their jobs (that is, their training period exceeded their job tenure), the corresponding figure was about 14 percent for white women and less than 9 per-

Table 1. Average length of training period by occupation

Occupation	Unweighted number of observations	Weighted percent of observations	Average length of training (in years)
Physicians, dentists	13	0.4	5.21
Other medical	63	1.5	1.95
Accountants	56	1.3	2.40
Teachers, primary and secondary	199	4.6	2.57
Teachers, college	50	1.3	3.29
Engineers, architects, chemists	92	2.8	2.89
Technicians	113	2.7	1.96
Public advisors	79	1.7	2.09
Judges, lawyers	22	0.5	2.51
Other professional	35	0.8	2.32
Managers, not self-employed	422	11.3	2.76
Managers, self-employed	126	3.0	2.14
Secretaries	198	4.3	.80
Other clerical	644	12.2	.81
Sales workers	238	5.6	1.40
Foremen	95	2.4	3.13
Other craftsworkers	580	11.3	2.54
Police, firefighters	54	1.1	2.25
Armed forces	78	1.2	1.52
Transport equipment operatives	222	3.2	.52
Other operatives	762	12.0	.71
Unskilled laborers, nonfarm	204	2.1	.63
Farm laborers	56	0.6	.65
Private household workers	73	0.6	.52
Other service workers	662	9.9	.60
Farmers	78	1.9	2.86

cent for both black men and black women. Again, these race/sex differences remain even within age and educational groups. The differences between black and white men are especially large for workers between the ages of 18 and 35. Among white men, about 35 percent in this age group were receiving training compared with less than 10 percent for blacks.

Finally, the lower amounts of training for blacks and women do not appear to be because they hold low-wage jobs more often than white men. If we compare workers within the same hourly wage rate bracket, large differences in the percentages receiving training remain. Nearly a quarter of the white men in low-wage jobs (less than $4 per hour) were still receiving training, compared with 11 percent for white women and only about 5 to 6 percent for black men and women.

What do these findings tell us about the prospects for narrowing race/sex earnings differences? First, they suggest that current variations in earnings understate the true differences: blacks and women receive less training on their jobs than white men and a smaller percentage are currently receiving training. Assuming this training usually translates into higher future earnings, then we may expect the earnings gap to widen as these individuals become older.[5] Second, there is some evidence that the low-wage jobs held by white men are very dissimilar from those of blacks and women. Many of these jobs for white men also provide training, so the low wage is probably only temporary; for the other groups, the proportion of low-wage workers receiving training is much less, suggesting a more permanent low-wage condition. Finally, the results imply that young black men continue to lag behind their white counterparts—the training differential was extremely large for this age group.

One thing this study does not tell us is *why* blacks and women tend to receive less training. We could, of course, use the training differential as yet another example of labor market discrimination, but that does not really provide much explanation or insight. Economists still know very little about the ways in which different people wind up in different jobs—some with high wages or extensive training, some with less of both—and even less about the reasons. □

Table 2. Average length of training period by age and education

Age and education (in years)	Men		Women	
	White	Black	White	Black
Total	2.25	.99	.94	.81
Age:				
Less than 25	1.28	.50	.59	.45
25 to 34	1.95	.70	.96	.62
35 to 44	2.52	1.09	1.06	.82
45 to 54	2.65	1.64	.96	1.05
55 to 64	2.69	1.13	1.08	1.30
Education:				
0 to 5	1.65	.61	. . .	. . .
6 to 8	1.77	.78	.41	.32
9 to 11	1.82	.43	.34	.38
12. High school diploma	1.81	1.31	.70	.90
High school plus nonacademic training	2.28	1.01	.94	.52
Some college	2.33	.93	.95	.78
Bachelor of Arts	2.79	. . .	1.50	2.58
Advanced degree	3.20	. . .	2.86	. . .

NOTE: Dashes indicate less than 25 observations.

Table 3. Proportion of workers receiving on-the-job training by age, education, and hourly earnings

Item	Men		Women	
	White	Black	White	Black
Total	258	019	141	088
Age (in years):				
Less than 25	353	074	189	094
25 to 34	349	103	167	101
35 to 44	230	073	135	063
45 to 54	176	113	109	131
55 to 64	135	079	084	011
Education (in years):				
0 to 5	145	059	. . .	. . .
6 to 8	079	024	103	012
9 to 11	232	079	051	006
High school graduate	191	086	099	165
High school plus nonacademic training	254	102	152	058
Some college	312	141	177	163
Bachelor of Arts	363	. . .	222	253
Advanced degree	335	. . .	276	. . .
Hourly earnings:				
Less than $2.00	220	107	115	021
$2.00 to $2.99	226	055	115	058
$3.00 to $3.99	287	049	114	090
$4.00 to $5.99	240	072	170	105
$6.00 to $7.99	266	110	159	180
More than $8.00	272	239	207	. . .

NOTE: Dashes indicate less than 25 observations.

FOOTNOTES

[1] For an analysis along these lines, see Corcoran and Duncan, "Work History, Labor Force Attachment, and Earnings Differences Between Races and Sexes," *Journal of Human Resources*, Winter 1979, pp. 3–20.

[2] Edward Lazear has recently provided some empirical evidence on this, arguing that the current narrowing of observed black/white earnings differences for men reflects growing differences in current on-the-job training. For more on this, see Edward Lazear, "The Narrowing of Black-White Wage Differentials is Illusory," *The American Economic Review*, September 1979, pp. 553–63.

[3] Another example of the first situation is acquisition of job skills with declining market value, while the latter could reflect increasing demand for a particular skill.

[4] It is tempting to try to explain these differences as being the result of different perceptions, rather than different situations—for example, white men are self-aggrandizing while women and blacks tend to downgrade themselves and their jobs. However, this explanation is doubtful because the results were reversed when sample members were asked another question about whether they were learning things which could lead to a future job or promotion.

[5] The predicted widening of the earnings gap for these individuals does not necessarily mean that aggregate black/white earnings differences will also increase. Changes in aggregate earnings differences over time are affected not only by these "within-cohort" earnings changes, but also by differences in the income standing of older workers who retire from the labor force relative to the income standing of younger workers who enter the labor force.