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This is the first in a series of articles on current urban issues. Each article will present research findings related to Omaha and the surrounding metropolitan area. The articles reflect the Center's commitment to applied urban research.

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AN ANALYSIS OF THE EXPLANATORY VALUE OF EDUCATION ON OBSERVED DIFFERENCES IN OCCUPATIONAL AND INCOME DISTRIBUTIONS OF BLACK AND WHITE WORKERS IN THE OMAHA SMSA¹

Introduction

Although employment conditions in the Omaha SMSA present an overall view of relative prosperity and economic well-being, there is a wide disparity between black and white employment by occupation.² This disparity, along with an equally disturbing income disparity between blacks and whites in similar occupation groups, merits the immediate attention of local businessmen, politicians, and concerned citizens.

In market terms, a common explanation for black-white employment and income differentials hinges on differences in educational (i.e., skill) levels. Hence, a person's employability potential is to a large extent a function of educational preparation, and one would expect rather wide black-white differentials. Accordingly, this study examines the black-white occupational and income distributions and attempts to determine whether different levels of working ability as measured by educational attainment is an adequate justification for existing disparities.

Occupational Distributions for the Omaha SMSA

The limited number of blacks in those occupational groups generally considered more desirable (e.g., professionals, managers, and craftsmen) is quite evident. As can be noted in Figure I, 54.1 per cent of the total whites employed in 1970 were in white-collar occupations and 67.2 per cent were employed in white-collar plus

craftsmen occupations.³ This compares with 28.3 per cent for blacks in white-collar occupations and 35.0 per cent in white-collar plus craftsmen occupations. Assuming for the moment that there are no differences between the employability characteristics of black and white workers, it would require an increase of 3,000 black workers in the white-collar occupation groups and slightly over 3,700 black workers in the white-collar plus craftsmen occupations to equalize the percentages for blacks and whites in similar occupations. In other terms, 32 per cent of the employed black workers in the Omaha SMSA would need to be shifted into white-collar and craftsmen occupations.

¹The Standard Metropolitan Statistical Area (SMSA) includes Douglas and Sarpy Counties in Nebraska and Pottawattamie County in Iowa.

²Data for "white workers" was obtained by subtracting black workers from the total number of employed workers for each occupational group. This procedure leaves a figure which might appropriately be called "nonblack". However, since the vast majority of these workers are white, the authors took the first option and have labeled this group "white workers" throughout the paper.

³All employment, income, and educational data are from the 1970 Census. Although the Census is rapidly becoming out-dated, the principal conclusions concerning the explanatory role of educational attainment are not likely to have changed significantly since 1970. White-collar occupational groups include: (1) professional, technical & kindred workers, (2) managerial & administrative workers, (3) sales workers, and (4) clerical workers.

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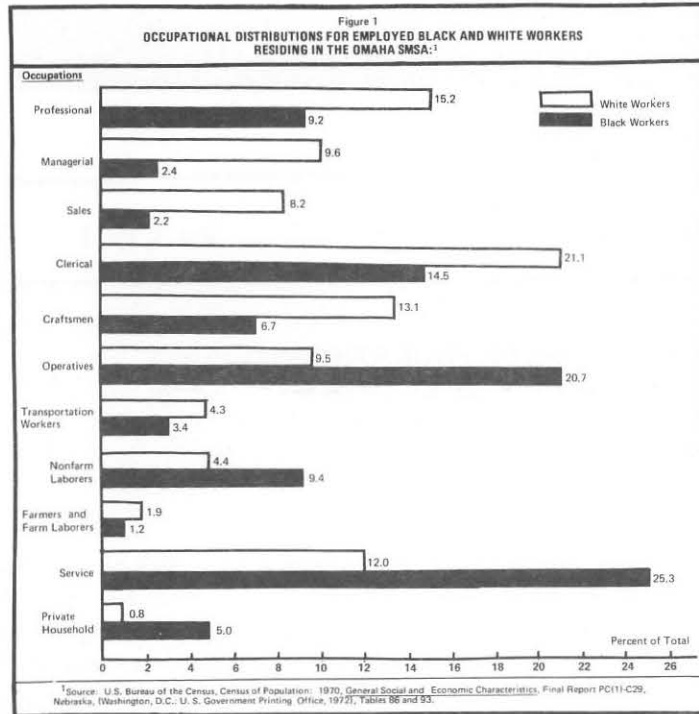
household heads. For example, if the professional and technical occupation group is characterized by a vast majority of college graduates, and if the number of black workers with college educations is small, one might justify the low number of blacks in the occupation group. However, if differences still remain after taking into account the effects of lower levels of education, other forces, such as racial discrimination, must be given consideration.

To determine the occupational distribution of black workers based on educational attainment, the distribution of white workers among the occupations was calculated for each level of education (i.e., eighth grade and less, 1 to 3 years of high school, high school, 1 to 3 years of college, and 4 or more years of college).⁴ This percentage distribution was then multiplied by the total number of black workers at similar education levels. Finally, the results for each education level in each occupation group were summed to arrive at the anticipated number of employed blacks (based upon the importance of education levels for whites) in each occupation group.

Results. Table I presents computations for male and female workers residing in the low-income area of Omaha. A comparison of employed (full-time) black and white males in the professional and technical occupations indicates an actual disparity of 2.7 percentage points (7.0 - 4.3). Taking into account the anticipated number of blacks employed according to levels of educational attainment, we find an "explained" (by education) difference of 1.8 percentage points (7.0 - 5.2). The "unexplained" portion is 0.9 percentage points. In the case of professional occupations, educational levels explain most of the difference.

However, this is not the case for total white-collar plus craftsmen occupations. The disparity between black and white employment would have been only 1.8 percentage points (52.8 -

⁴Educational attainment data by occupational group were not available for the complete SMSA. However, the 1970 Census does report this data for selected low-income areas, and the analysis of the effects of different levels of education was completed from this source. For Omaha, the low-income area includes all of Northeast Omaha and selected portions of Southeast Omaha. Twenty-nine census tracts are included in the area; none west of 42nd Street. For the exact geographical boundaries, the reader is referred to: U.S. Bureau of Census, Census of Population: 1970, *Employment Profiles of Selected Low-Income Areas*, Final Report PHC(3)-63, Omaha, Nebraska (Washington, D.C.: U.S. Government Printing Office, 1972).



Education Levels and Occupational Disparities

A rational and quite plausible market explanation for the black-white occupational disparity rests with the knowledge that blacks have lower education levels and, consequently, do not have the necessary skills to enter many of the attractive white-collar positions. Hence, a concentration of blacks in the lesser-skilled occupation groups is explained by lower educational backgrounds.

The following analysis seeks to determine the role of educational attainment in explaining differences in occupational distributions. By determining the amount of black-white disparity explained by different levels of educational attainment, one can also measure the residual explained by such forces as the failure of Omaha's labor market to communicate supply-demand conditions, different age structures (i.e., blacks have a slightly lower age structure), racial discrimination, differences in the quality of education, and location decisions of

	Actual & Anticipated Occupational Distributions	Total Employed (full time)	Professional Technical & Kindred (%)	Managerial & Administrative (%)	Sales (%)	Clerical (%)	Craftsmen & Foremen (%)	Total White-Collar Plus Craftsmen (%)	Operatives, Except Transportation (%)	Transport Equipment Operatives (%)	Laborer, Except Farm (%)	Service Worker Except Private Household (%)	Private Household (%)
MALE													
Total Employed:													
White (Actual)	8,545		7.0	7.3	3.0	9.2	26.3	52.8	15.3	10.1	9.9	11.4	0.2
Black (Actual)	3,617		4.3	3.8	0.3	7.6	12.7	28.7	26.4	7.5	17.7	19.0	0.6
Black (Anticipated) ²	3,617		5.2	6.6	2.8	9.2	27.2	51.0	15.6	11.1	10.1	11.7	0.2
Unexplained ³			-0.9	-2.8	-2.5	-1.6	-14.5	-22.3	10.8	-3.6	7.6	7.3	0.4
Explained ⁴			1.8	0.7	0.2	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0
FEMALE													
Total Employed:													
White (Actual)	5,225		7.8	4.5	3.5	41.8	4.9	62.5	16.5	0.0	0.4	19.2	1.4
Black (Actual)	2,887		5.4	2.6	1.2	22.3	4.6	36.1	25.4	0.4	2.9	29.5	5.6
Black (Anticipated) ²	2,887		6.8	4.3	3.2	41.9	4.6	60.8	17.3	0.0	0.4	19.7	1.6
Unexplained ³			-1.4	-1.7	-2.0	-19.6	0.0	-24.7	8.1	0.4	2.5	9.8	4.0
Explained ⁴			1.0	0.2	0.3	0.0	0.3	1.7	0.0	0.0	0.0	0.0	0.0

¹Source: U.S. Bureau of the Census, Census of Population: 1970, *Employment Profiles of Selected Low-Income Areas*, Final Report PHC(3)-63, Omaha, Nebraska, (Washington, D.C.: U.S. Government Printing Office, 1972), Tables 4a and 4b. Two sectors, farmers and farm laborers, are not presented because of low employment totals.

²Refers to percent of blacks expected in each occupational group after taking into account lower levels of education.

³Refers to difference between black actual and black anticipated.

⁴Refers to difference between white actual and black anticipated.

51.0) if due only to lower levels of education. However, it was actually 24.1 percentage points. Subtracting the "explained" difference of 1.8 percentage points from the actual difference of 24.1 percentage points yields an "unexplained" difference of 22.3 percentage points. Of this, the greatest disparity is in the craftsmen and foremen occupational group.

Similar results were found for females. Here, the total difference between employed black and white females is 26.4 percentage points for white-collar plus craftsmen occupations. There is an "explained" difference of 1.7 percentage points, leaving a residual of 24.7 percentage points. In other words, 62.5 per cent of the white females are in the white-collar plus craftsmen occupations. If education were the sole factor determining differences between whites and blacks, we would expect to find 60.8 per cent of the black females in similar occupations. Instead we find only 36.1 per cent. For females, clerical occupations account for the largest "unexplained" disparity.

Results for the State. A similar analysis for the State indicates that the largest portion of "unexplained" difference for males is in the agricultural sector: over 20 percentage points. White-collar plus craftsmen occupations account for 52.9 per cent of the employed white males versus 30.7 per cent of all employed black males. Adjusting for education levels, we anticipate that 46.6 per cent of the blacks should be in these occupations, leaving 6.3 percentage points accounted for by education and 15.9 percentage points "unexplained". Table II presents results for each occupation group. The reader should note that as in Omaha, craftsmen and foremen occupations contain the largest "unexplained" disparity.

For females in the State, 62.2 per cent of the white and 40.8 per cent of the blacks are in white-collar plus craftsmen occupations. Again, on the basis of education levels, we anticipate that 54.4 per cent of the black females should have been employed in these occupations. The remaining "unexplained" portion of 13.6 percentage points was the smallest found for the white-collar plus craftsmen occupations.

Summary. The tests for Omaha and the State both provide evidence that the lower level of educational attainment of blacks accounts for some of the disparity in the more attractive occupations. Yet, differences in educational attainment do not account for much of this disparity. This is particularly true in the craftsmen and foremen occupations for males and in the clerical occupations for females. Certainly, not all of the "unexplained" portion can be attributed to discrimination, but just as certain, the argument that blacks are not sufficiently educated to be employed in the upper-income jobs does not hold true for the areas examined in the study.

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Hubert G. Locke, Dean

Center for Applied Urban Research
Ralph H. Todd, Director-Editor
Betty Mayhew, Assistant to the Editor

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TABLE II
ACTUAL AND ANTICIPATED OCCUPATIONAL DISTRIBUTIONS FOR EMPLOYED BLACK WORKERS IN THE STATE OF NEBRASKA: 1970¹

Actual & Anticipated Occupational Distributions	Total Employed	Professional Technical & Kindred (%)	Managerial & Administrative (%)	Sales (%)	Clerical (%)	Craftsmen & Foreman (%)	Total White-Collar Plus Craftsmen (%)	Operatives, Except Transportation (%)	Transport Equipment Operatives (%)	Laborers, Except Farm (%)	Service Worker Except Private Household (%)	Private Household Workers (%)	Farmers & Farm Managers (%)	Farm Laborers (%)
MALE														
Total Employed:														
White (Actual)	357,033	11.0	12.1	6.5	6.2	17.1	52.9	8.7	5.6	5.8	6.8	0.0	16.4	3.7
Black (Actual)	6,431	7.4	4.0	1.6	6.2	11.5	30.7	21.8	6.4	15.4	24.0	0.1	0.8	0.9
Black (Anticipated) ²	6,431	6.5	10.3	5.8	5.7	18.3	46.6	12.0	6.4	7.0	7.9	0.1	17.7	4.4
Unexplained ³		0.9	-6.3	-4.2	0.5	-6.8	-15.9	9.8	0.0	8.4	16.1	0.0	-16.9	-3.5
Explained ⁴		4.5	1.8	0.7	0.5	0.0	6.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FEMALE														
Total Employed:														
White (Actual)	206,478	16.3	4.2	7.7	32.0	2.0	62.2	9.0	0.4	1.1	22.5	3.3	0.7	0.8
Black (Actual)	6,123	11.6	0.8	2.9	23.7	1.8	40.8	17.4	0.0	2.7	28.4	10.1	0.3	0.4
Black (Anticipated) ²	6,123	10.7	3.9	8.2	29.5	2.2	54.5	10.9	3.6	1.4	27.0	4.3	0.8	0.8
Unexplained ³		0.9	-3.1	-5.3	-5.8	-0.4	-13.7	6.5	-3.6	1.3	1.4	5.8	-0.5	-0.4
Explained ⁴		5.6	0.3	0.0	2.5	0.0	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0

¹Source: U.S. Bureau of the Census, Census of Population: 1970, Detailed Characteristics, Final Report PC(1)-D29, Nebraska, (Washington, D.C.: Government Printing Office, 1972), Table 203.
²Refers to percent of blacks expected in each occupation group after taking into account lower levels of education.
³Refers to difference between black actual and black anticipated.
⁴Refers to difference between white actual and black anticipated.

Income Distributions by Occupation Groups

Aside from physical representation in the so-labeled "more attractive" occupation groups, a second measure of the success of individuals is related to income received by occupation. As Table III illustrates, not only are blacks underrepresented in the white-collar occupations, but within each occupation group, black income as a percentage of white income is substantially lower.⁵ Especially noteworthy is the rank of blacks in the white-collar occupations as compared to those in the blue-collar occupations.

Again, a common argument justifying such income disparities is related to education. Basically, it is proposed that lower levels of educational attainment result in lower incomes regardless of the occupational group being considered. Hence, if blacks have lower education levels the positions within the white-collar occupations will be lower level positions and, consequently, lower paying.

To examine the quantitative merits of this argument, the procedures used to determine the impact of educational attainment on occupational differences were applied to income disparities. Results are presented in Table IV. By comparing the actual number of blacks to the anticipated number of blacks in each income group, we find evidence of a large "unexplained" difference for black males with 25.3 percentage points separating the actual and anticipated number of blacks in income groups \$8,000 and above. In short, over 2,100 black males have income lower than expected on the basis of education levels.

Data for black females indicates much less "unexplained"

⁵A recent study provides evidence that the black-white income disparity is growing. See: R. Todd, *Changing Income Patterns of the Omaha Metropolitan Area Black Population*, (Center for Applied Urban Research, University of Nebraska at Omaha, 1972).

TABLE III
INCOME IN 1969 OF FAMILIES WITH HEADS IN EXPERIENCED CIVILIAN LABOR FORCE, BY OCCUPATION AND RACE OF HEAD FOR OMAHA SMSA¹

Occupation	White	Black	Black Median Income as Percent of White Median Income
Professional, technical & kindred	\$13,432	\$9,045	67.3
Managerial & administrative	14,569	9,833	67.5
Sales workers	12,765	7,667	60.1 ²
Clerical workers	10,016	6,734	67.2
Craftsmen & foremen	11,284	8,227	72.9
Operatives, except transport	9,656	7,913	81.9
Transport equipment operatives	10,240	7,225	70.6
Laborers, except farm	8,690	8,327	95.8
Farmers and farm managers	10,267	2,500	24.3 ²
Farm laborers	7,167	3,417	47.7 ²
Service workers	8,783	6,136	69.9
Private household workers	4,500	4,032	89.6
Total	11,433	7,508	65.7

¹Source: U.S. Bureau of the Census of Population: 1970, Detailed Characteristics, Final Report PC (1)-D29 Nebraska (Washington, D.C.: U.S. Government Printing Office, 1972) Table 203.
²The median estimates for clerical workers, farmers, and farm laborers are from low totals for blacks. Consequently they may not reflect the true center of the income group. For clerical workers, the maximum black income as a percent of white would be 62.7 percent; for farmers, 29.2 percent; and for farm laborers, 55.8 percent.

TABLE IV
ACTUAL AND ANTICIPATED INCOME OF BLACK PERSONS COMPARED TO ACTUAL INCOME FOR WHITE PERSONS FOR THE OMAHA SMSA¹

Actual & Anticipated Income	Total	Percent in Income Bracket											
		\$1-999	\$1,000-1,999	\$2,000-2,999	\$3,000-3,999	\$4,000-4,999	\$5,000-5,999	\$6,000-6,999	\$7,000-7,999	\$8,000-9,999	\$10,000-14,999	\$15,000-24,999	\$25,000 or more
Male (total with income)													
White	147,648	4.5	7.6	6.8	6.1	5.7	6.6	8.1	9.4	16.1	19.0	7.2	2.9
Black (Actual)	8,424	10.2	13.4	9.6	10.1	9.8	11.7	11.9	8.1	8.9	5.3	0.8	0.3
Black (Anticipated)	8,424	5.3	9.0	7.7	6.8	6.3	7.4	8.8	9.8	16.0	16.3	4.9	1.7
Actual minus Anticipated ²		4.9	4.4	1.9	3.3	3.5	4.3	3.1	-1.7	-7.1	-11.0	-4.1	-1.4
FEMALE (total with income)													
White	119,133	22.8	19.5	13.2	12.3	10.4	7.0	5.0	3.6	3.3	2.1	0.5	0.3
Black (Actual)	8,752	20.6	22.1	16.0	16.1	10.2	6.0	3.9	2.3	1.6	1.0	0.5	0.0
Black (Anticipated)	8,752	24.4	21.2	13.8	12.6	10.0	6.4	4.2	2.8	2.4	1.5	0.4	0.2
Actual minus Anticipated ²		-3.8	0.9	2.2	3.5	0.2	-0.4	-0.3	-0.5	-0.8	-0.5	-0.4	-0.2

¹Calculated from information provided by: U.S. Bureau of the Census, Census of Population: 1970, Detailed Characteristics, Final Report PC(1)-D29, Nebraska (Washington, D.C.: U.S. Government Printing Office, 1972) Table 197. Includes both full-time and part-time workers.
²Represents "unexplained" difference.

difference and provides the first exception to the general trend. In fact, for the lowest income group (\$1 - \$999), we anticipate more black females than actually exist. Other than this group, the total "unexplained" difference is only 3.1 percentage points, all in income groups \$5,000 or over. Since females typically receive smaller incomes than males and since many females take part-time work or work below their education levels, the small "unexplained" difference is probably realistic.

Summary

Results of the tests on the role of educational attainment as an explanation for differences in occupation and income distributions present rather clear evidence that lower education levels on the part of blacks do play a role in determining the economic status of blacks. However, the residuals or "unexplained" differences are large for both males and females in the occupational comparisons and large for the males in the income comparisons. For these three groups, we are discussing an "unexplained" difference affecting around 25 per cent of the working black population. A rough approximation of the monetary cost of the income differences that are related to "unexplained" forces is 23 million dollars per year for black males and 1.5 million per year for black females.⁶ Similar calculations were made to measure the value of higher educational levels for blacks, assuming those receiving additional education would be employed at high enough incomes to fill those income groups having a discrepancy explained by lower levels of education. Here, we estimate that increased levels of educational attainment could add approximately 10 million dollars for black males and seven million dollars for black females.

Although it would be inappropriate to attribute the blame for the "unexplained" differences to a single factor, we can dismiss the notion that lower education levels primarily account for the occupational and income disparities that exist between blacks and whites.

⁶In those income brackets where there was an unexplained underrepresentation of blacks, the percentage of unexplained difference was multiplied times the total number of blacks with income and this was then multiplied by the median dollar value of the income group. It was assumed that those new entrants in each income group would have incomes equal to the median. For the \$25,000 and more category, it was assumed that all new entrants would have an income of exactly \$25,000. The sum of all calculations for underrepresentation was taken as the increase. Similar calculations were made for those income brackets where there was an unexplained overrepresentation of blacks. The sum of this was subtracted from the first total to obtain the expected increase.