Degrees of Inequality: The Advance of Black Male Workers in the Northern Meat Packing and Steel Industries before World War II

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Recent major works on long-term racial inequality in the labor market re-
volve around competing hypotheses concerning the importance of human
capital factors (Smith and Welch 1989) and government policy (Donohue
and Heckman 1991) in promoting black advance. There is, however, another
line of thinking which emphasizes the importance of experimentation and
"demand-side learning": employers' gaining access to accurate information
about the abilities of black workers and adjusting their beliefs in accordance

with this information. Gunnar Myrdal (1964 [1944]: 392–93) wrote of the significance of experimentation and demand-side learning for the progress of black workers half a century ago:

> There is tremendous initial resistance to overcome when attempting to place even superior Negro labor in a plant where Negroes did not work formerly. Negro labor is often superior to the white man's expectation, partly because the thinking in stereotypes makes him underestimate the individual Negro. . . . Employers who do employ Negroes, therefore, often get a higher appreciation of them than employers who do not. . . . There are tremendous elements of inertia which resist the introduction of Negro labor where there has previously been none. If they get in, however, they will have a better chance of staying.

The interaction of race, costly information, and "learning" has been explored extensively in the theoretical literature.[1] However, this topic has not been the focus of much empirical work on racial inequality.[2]

The process of experimenting with and learning about black workers may have been an important determinant of labor market outcomes for these workers in the pre–World War II North. The hiring of black workers by a northern employer in the pre–World War II period was, in many cases, an experiment. Many northern employers simply had very little experience with black workers prior to this time. In particular, northern employers did not have experience with the sort of black worker who presented himself at their gates in the 1920s and 1930s: an agricultural worker recently arrived from the South. Experiments with these workers had to be conducted in the face of strongly pessimistic initial expectations arising from racial prejudice, but successful experience with black workers might cause an employer to modify his expectations and might make him more willing to use black workers in the future.

To identify the impact of this experimentation on black workers' labor market outcomes, the approach taken in this paper is to focus on inter-industry variation in racial inequality in the pre–World War II North, because the cost of conducting the experiment Myrdal describes varied across industries as labor market structure varied across industries. Elements of internal labor market structure—the use of job ladders and internal promotion—directly increased the cost of experimenting with black workers as

they entered northern labor markets. In addition, the low turnover rates and stable internal work force which characterize structured internal labor markets increased the potential impact of racial prejudice on the part of white workers and so prevented black workers from gaining access to new positions. For these reasons, variation in costs of experimentation, arising from variation in internal labor markets, may have allowed black workers access to new jobs in some industries even while they remained confined to unskilled laborer positions in other industries.

Because the concepts of "internal labor market structure" and "costs of experimentation" are not easily quantified, I conduct this investigation as a comparison of the progress of black workers in two industries: the meat packing industry and the steel industry. This approach facilitates examination of qualitative historical evidence relating to labor market structure. These two industries are chosen in part because they were important employers of African American men in the North during this period. In addition, they exhibit strongly contrasting patterns of black progress: more rapid access to better occupations and better relative wages in the meat packing industry than in the steel industry.

Because this analysis proceeds as a comparison of two cases, it cannot establish the generalizability of the model presented here. Further, the analysis deals with male workers only. In part, this restriction is necessitated by the small number of women, particularly the small number of black women, working in these industries in 1940.[3] In part, it reflects the fact that race may matter differently for men and women in the labor market.[4] Even with these limitations, the results indicate that internal labor market structure may well have affected the progress of black male workers in these two industries in the North in the pre–World War II period.

Black Progress in Northern Steel and Meat Packing before World War II

Black workers entered the northern meat packing and steel industries, often as strikebreakers, well before the large-scale migration of the World War I era (Dickerson 1986: 8; Commons 1904). But these strikebreakers were very small in number compared to the black migrants who would seek work in the North beginning in the mid-Teens. Many of the workers who moved

north at the very beginning of the World War I era had some experience with industrial work in the South and had specific positions waiting for them in the North. The migrants who streamed north throughout the twenties and thirties, however, were primarily agricultural workers uprooted by the boll weevil and by poor growing seasons. According to Wright (1986: 205–6), they "generally had no assurances of jobs waiting in the North" but were taking "mere shots in the dark, made possible by the presence of friends and relatives in Northern cities." For a number of black workers, these "shots in the dark" led to employment in the meat packing plants and steel mills of the North. By 1930, 13% of Illinois' black manufacturing workers were found in meat packing plants; another 7% worked in the steel mills. Nearly 20% of Iowa's black manufacturing workers labored in meat packing plants. In Pennsylvania, nearly 20% of black manufacturing workers were steelworkers. The share in steel in Indiana was even higher—nearly 25%.[5]

Most of these workers were initially confined to low-paying, unskilled laborer jobs in both industries (Fogel 1970; Gottlieb 1987). Were there notable differences in the progress of black workers in these industries? In particular, did the relative position of black workers—as reflected in relative wages and relative occupational standing—improve more rapidly in the meat packing industry or in the steel industry? Or were the rates of progress in the two industries about the same?

Table 1 presents the relative wages of black male workers in meat packing and steel, in the northern United States, in 1940. Wages for a number of other industries are presented for purposes of comparison.[6] Note that the black workers considered here—blue-collar workers in northern industries—were doing better on average than the total black work force.[7] Note also that I am focusing on a particular measure of black progress: the black/white wage ratio within an industry. It appears that black meat packing workers received slightly lower wages than did black steelworkers, in absolute terms. This reflects the generally higher wages in the steel industry. We are interested, however, in the black/white wage ratios in the two industries: black meat packing workers earned about 91% of what white meat packing workers earned, while black steelworkers earned only about 82% of white steelworkers' earnings.

This difference in wage ratios is reflected in the occupational distribution of black and white workers in these two industries (see Table 2). In 1940, about half of black meat packing workers held semiskilled operative

Table 1   Weekly wages, black and white male workers in selected northern industries, 1940

	Black		White		
Industry	Wage	N	Wage	N	Wage Ratio
Meat packing	23.76	79	26.00	788	.91
Steel	25.11	166	30.71	3382	.82
Autos	27.22	178	33.10	3640	.82
Chemicals	23.92	32	27.84	976	.86
Construction	19.52	249	28.04	6692	.70
Electrical machinery	22.73	10	28.79	1607	.79
Paper products	20.88	26	24.82	1423	.84
Railroads	21.41	238	32.17	4355	.66
Street transportation	21.50	40	31.55	1186	.68
Textiles	15.35	24	28.61	1386	.54
Trucking	17.96	38	24.84	1308	.72
Water transportation	19.57	42	27.41	460	.71

Source: 1940 Census Public Use Sample.
Notes: Set includes male, currently employed, wage and salary workers in skilled, operative, and laborer occupations. Individuals currently enrolled in school, under age 14, with weekly wages less than $1.50 or greater than $125.00, or with negative potential labor market experience (defined as age—schooling—6), are also omitted.

jobs. The share of black steelworkers in operative jobs was only about 23%, while two-thirds of black steelworkers held unskilled laborer positions.[8] Of course, the two industries differed in overall occupational structure. We can control for this difference by examining the likelihood that a black worker held a particular job, *relative to* the likelihood that a white worker held the same job. For example, consider the ratio of the share of black meat packing workers in laborer jobs to the share of white meat packing workers in these jobs. Focusing on this ratio, we find that black meat packing workers were 1.5 times as likely as white meat packing workers to hold laborer positions. In contrast, black steelworkers were twice as likely as their white counterparts to hold laborer positions. While black workers were .9 times as likely as whites to hold operative jobs in meat packing, they were only about two-thirds as likely as whites to hold such jobs in the steel industry.[9]

OLS wage regressions and ordered logit regressions for occupational position can be used to get a sense of the statistical significance of these differences, controlling for individual characteristics. Means for the wage re-

Table 2   Occupational distribution of black and white male workers in selected northern industries, 1940

	Black	White	Ratio	Black	White	Ratio
	Meat packing			Steel		
Laborer	.482	.317	1.52	.667	.332	2.01
Operative	.506	.559	.905	.226	.335	.675
Skilled	.012	.125	.096	.107	.334	.320
N	81	802		168	3431	
	Construction			Railroads		
Laborer	.708	.304	2.33	.873	.284	3.07
Operative	.075	.099	.758	.082	.293	.280
Skilled	.217	.597	.363	.045	.423	.106
N	267	6969		244	4423	
	Trucking			Water transportation		
Laborer	.500	.154	3.25	.767	.487	1.57
Operative	.500	.801	.624	.209	.397	.526
Skilled	0	.045	0	.023	.116	.198
N	44	1368		43	476	
	Autos			Paper products		
Laborer	.525	.129	4.07	.462	.245	1.89
Operative	.332	.523	.635	.423	.546	.775
Skilled	.144	.349	.413	.115	.210	.548
N	181	3703		26	1448	
	Chemicals			Street transportation		
Laborer	.546	.322	1.70	.850	.087	9.77
Operative	.394	.434	.908	.125	.733	.171
Skilled	.061	.244	.250	.025	.181	.138
N	33	996		40	1202	
	Electrical machinery			Textiles		
Laborer	.600	.147	4.08	.208	.045	4.62
Operative	.300	.484	.620	.667	.728	.916
Skilled	.100	.369	.271	.125	.226	.553
N	10	1656		24	1432	

Source: 1940 Census Public Use Sample.

Notes: Set includes male, currently employed, wage and salary workers. Individuals currently enrolled in school, under age 14, or with negative potential labor market experience (defined as age—schooling—6), are also omitted.

Table 3   Means for regression data set

	Meat packing		Steel	
	Black	White	Black	White
Labor market experience	29.23	22.68	27.56	25.29
Married	.84	.77	.86	.77
Immigrant	0	.23	.01	.28
Years of schooling	7.01	8.20	6.28	7.93
Weekly wage	23.76	26.00	25.11	30.71
Log (weekly wage)	3.11	3.18	3.16	3.35
N	79	788	166	3382

Source: 1940 Census Public Use Sample.

Notes: Set includes male, currently employed, wage and salary workers in the laborer, operative, and skilled occupations in these industries in the North. Labor market experience defined as age—schooling—6. Individuals under the age of 14 or currently enrolled in school are excluded, as are those with weekly wages less than $1.50 or more than $125.00 and those with negative calculated labor market experience.

gression are found in Table 3. Results are in Table 4.[10] In addition to standard individual-level variables, I include an industry dummy ("meat packing") to capture the fact that the meat packing industry was generally a low-wage industry (relative to the steel industry). I also include a race-industry interaction term ("black*meat packing"). The positive coefficient on this term indicates that black men's relative wages were, indeed, greater in meat packing than in steel even after we control for individual-level variables. Further, the magnitude of this coefficient indicates that very little of the difference in black relative wages across industries is explained by the characteristics of the black and white workers in the two industries. Without any controls, the difference between the average black and white log wages in steel exceeded this difference in meat packing by .114.[11] After we control for the characteristics of the workers, .098 of this initial .114 difference remains.[12]

Results of the ordered logit estimation of the determinants of occupational position in these two industries are found in Table 5.[13] Here, the industry dummy ("meat packing") controls for the differing occupational structures of the two industries. The coefficient on the interaction of race and industry ("black*meat packing") indicates the magnitude and significance of the observed difference in the relative position of black workers. The fact that this coefficient is large and statistically significant means that this difference does persist after we control for individual characteristics.[14]

Table 4   Weekly wage regression

	Coefficient	Standard error
Intercept	2.7741[a]	.0460
Labor market experience	.0294[a]	.0020
Experience^2	−.0004[a]	.00003
Married	.0776[a]	.0153
Immigrant	−.0514[a]	.0162
Years of school		
0–7	.0098[b]	.0050
8	.0409[a]	.0183
9–11	.0396[a]	.0089
12	.0115	.0266
More than 12	.1384[a]	.0375
Black	.1038	.1807
*Experience	−.0129	.0100
*Experience^2	.0002	.0002
*Married	−.0186	.0746
*(Years of school)		
*0–7	−.0223	.0176
*8	.0428	.0709
*9–11	−.0454	.0471
*12	.1031	.1551
*More than 12	.0703	.2454
Meat packing	−.1466[a]	.0155
Black*meat packing	.0984[b]	.0551
N 4415		
R^2 .1227		

Notes: The dependent variable is the log of the weekly wage. "Labor market experience" defined as age — schooling — 6. Coefficients on schooling = "0 to 7" and "9 to 11" are returns per year in the interval. Other schooling coefficients refer to dummy variables for 8 or more, 12 or more, and more than 12 years of school. Controls for weeks worked are also included.

[a] $\Rightarrow$ $|t|$ > 1.96.

[b] $\Rightarrow$ $|t|$ > 1.64.

*Indicates interaction terms.

Table 5   Ordered logit estimation of occupation

	Coefficient	Standard error
Intercept 1	−2.1767[a]	.1941
Intercept 2	−3.9098[a]	.2006
Labor market experience	.1168[a]	.0100
Experience^2	−.0016[a]	.0002
Married	.3460[a]	.0749
Immigrant	−.2754[a]	.0798
Years of school		
0–7	.1394[a]	.0252
8	.3217[a]	.0899
9–11	.1470[a]	.0435
12	.2833[a]	.1305
More than 12	.4032[a]	.1883
Black	1.8127[b]	.9831
*Experience	−.1289[a]	.0544
*Experience^2	.0013	.0009
*Married	.3441	.4375
*(Years of school)		
*0–7	−.2086[a]	.0988
*8	.0983	.3786
*9–11	−.1741	.2430
*12	−.8163	.8159
*More than 12	−.3456	1.3739
Meat packing	−.4051[a]	.0745
Black*meat packing	.9632[a]	.2906
N 4482		
−2 (log likelihood) 9253		
χ^2 534.92		

Notes: The dependent variable is a three-category dummy for skilled, operative, or laborer occupation. "Labor market experience" defined as age−schooling−6. Coefficients on schooling = "0 to 7" and "9 to 11" are effects per year in the interval. Other schooling coefficients refer to dummy variables for 8 or more, 12 or more, and more than 12 years of school.
[a] $\Rightarrow |t| > 1.96$.
[b] $\Rightarrow |t| > 1.64$.
*Indicates interaction terms.

Table 6   Effect of race on occupational attainment, based on ordered logit estimation

	Meat packing	Steel
Probability (laborer | white)	.314	.234
Probability (laborer | black)	.537	.670
(Black probability)/(white probability)	1.710	2.863
Probability (operative | white)	.407	.400
Probability (operative | black)	.331	.250
(Black probability)/(white probability)	.812	.626
Probability (skilled | white)	.278	.367
Probability (skilled | black)	.132	.080
(Black probability)/(white probability)	.475	.219

Note: Probabilities calculated for black and white married, non-immigrant workers with mean schooling (7.9 years) and mean experience (24.9 years).

To evaluate the meaning of these logit results, we must construct estimated occupational probabilities from the coefficients. Table 6 presents these probabilities, evaluated at roughly the mean characteristics for the full sample. In the meat packing industry, the total effect of being black (including the direct effect and all interaction effects) is an increase of 22 points in one's probability of holding an unskilled laborer job. In the steel industry, the effect is an increase of about 44 points. All other things equal, a black meat packing worker with mean characteristics was about 1.7 times as likely as an otherwise identical white worker to hold a laborer job. A black steelworker was almost 3 times as likely as a white steelworker to hold such a job. Similarly, while a black meat packing worker was about .81 times as likely as a white to hold a semiskilled operative job, a black steelworker was only .63 times as likely as a white steelworker to hold such a position.

By 1940, then, black workers in the meat packing industry were on a more equal footing with their white counterparts than were black steelworkers. Still, we are interested in having some measure of the pace of progress of black workers in these industries before World War II, rather than just a measure of the level they had reached by 1940. Data on the pre-1940 period are considerably thinner. Nonetheless, there are some measures that we can examine.

First, we can make use of the 1910 Public Use Microdata Sample.

Table 7a   Ordered logit estimation of occupation: pooled 1910 and 1940 data

	Coefficient	Standard error
Intercept 1	-2.2519^a	.2469
Intercept 2	-3.8900^a	.2504
Age	$.1200^a$	.0135
Age^2	$-.0013^a$	.0002
Married	$.3024^a$	.0643
Immigrant	$-.7830^a$	.0600
Black	.5268	1.5774
*Age	$-.0707$	.0836
*Age^2	.0003	.0010
*Married	.2698	.3977
Meat packing	$.4499^a$	.1413
Black*meat packing	-2.0756^b	1.1127
1940	$.4859^a$	.0707
Black*1940	$-.2912$	.4624
Meat packing*1940	$-.8330^a$	.1594
Black*meat packing*1940	3.0319^a	1.1493
N 5869		
-2 (log likelihood) 12113		
χ^2 619.50		

Notes: Set includes male, currently employed, wage and salary workers in laborer, operative, and skilled occupations in these industries in the North. Those younger than 14 and those currently enrolled in school are excluded. (The 1940 data are identical to those used in the 1940 occupation regression). The dependent variable is a three-category dummy for skilled, operative, or laborer occupation.

$^a \Rightarrow |t| > 1.96.$
$^b \Rightarrow |t| > 1.64.$
*Indicates interaction terms.

Though this data set does not contain information on wages or schooling, it does record occupation.[15] We can use these data to estimate a logit equation for occupational position, pooling the 1910 and 1940 data and testing for differences in rates of progress (see Tables 7a and 7b). The interaction of race, industry, and cross-section ("black*meat packing* 1940") captures the difference between black progress in meat packing and black progress in steel. The size and significance of this term are our primary concern. The fact that this term has a positive and significant coefficient suggests that black workers did indeed make more rapid progress in meat packing than in steel,

Table 7b   Occupational distribution of black and white male workers
in the 1910 sample

	Meat packing		Steel	
	Black	White	Black	White
Laborer	.923	.502	.679	.523
Operative	0	.126	.321	.324
Skilled	.077	.372	0	.153
N	13	215	28	1131

in terms of occupational class, even after we control for individual charac-
teristics.[16] However, the small size of the 1910 sample requires us to interpret
these results with caution.[17]

The lack of public use samples for 1920 and 1930 leaves an unfortunate
gap in the picture. We can fill in this gap a bit by turning to published Cen-
sus figures. Complete counts of occupation by industry, race, and region are
not available in published tables for the 1910–40 period. However, counts of
unskilled and semiskilled workers by industry and race are available for a
few northern states for these years. Table 8 presents these numbers for the
steel and meat packing industries.[18] We must be careful what conclusions we
draw from these data, as we can not observe the skilled sector in either in-
dustry. Changes in the racial composition of the skilled sector or in the size
of the skilled sector relative to the other sectors might affect our interpreta-
tion of these numbers.

Even with these caveats, these numbers generally parallel the patterns
observed in the public use samples. The initial wave of new black workers
found themselves largely confined to unskilled labor: in 1920, the ratio of the
share of black workers in laborer jobs to the share of white workers in these
jobs was about 1.2 in both industries.[19] Between 1920 and 1930, though, black
meat packing workers improved their relative position: their relative con-
centration in laborer jobs fell while their relative concentration in operative
jobs increased. The relative position of black steelworkers did not improve to
the same degree. Between 1930 and 1940, the relative concentration of black
workers in laborer positions increased slightly in both industries. However,
black meat packing workers continued to occupy a better relative position,
as was indicated in the occupation regressions reported above.

Table 8   Laborers and operatives in available northern states

	Meat packing			Steel		
	Share of blacks	Share of whites	Ratio	Share of blacks	Share of whites	Ratio
1910						
Laborer	.927	.864	1.07	.843	.748	1.13
Operative	.073	.136	.54	.157	.252	.62
1920						
Laborer	.764	.630	1.21	.885	.732	1.21
Operative	.236	.370	.64	.115	.268	.43
1930						
Laborer	.663	.618	1.07	.854	.701	1.22
Operative	.337	.382	.88	.146	.299	.49
1940						
Laborer	.404	.353	1.14	.722	.510	1.42
Operative	.596	.647	.92	.278	.490	.57

Notes: Figures indicate (no. Laborers)/(no. Laborers + no. Operatives) and (no. Operatives)/(no. Laborers + no. Operatives) in each industry in the northern states for which the data are available. For 1910, 1920, and 1930, "stockyard laborers" are included in the laborer category (see Fogel [1970]: 125). In 1940, service workers are included in the laborer category. In all cases, only males are included.

Included states for meat packing are 1910: Illinois, New York, and Kansas; 1920: Illinois, Indiana, Iowa, Kansas, Massachusetts, Minnesota, Missouri, Nebraska, New Jersey, New York, Ohio, Pennsylvania, and Wisconsin; 1930: Illinois, Iowa, Kansas, Minnesota, Missouri, and Nebraska; 1940: Only workers in the following cities are included: Chicago, Indianapolis, Detroit, Kansas City (Missouri), St. Louis, Philadelphia, Pittsburgh, Newark, New York City, Cincinnati, Cleveland, and Columbus.

Included states for steel are 1910: Connecticut, Illinois, Indiana, Massachusetts, Michigan, Missouri, New Jersey, New York, Ohio, Pennsylvania, and Rhode Island; 1920: Connecticut, Illinois, Indiana, Massachusetts, Michigan, Minnesota, Missouri, New Jersey, New York, Ohio, Pennsylvania, and Wisconsin; 1930: Connecticut, Illinois, Indiana, New Jersey, New York, Ohio, and Pennsylvania; 1940: Only workers in the following cities are included: Chicago, Indianapolis, Detroit, Kansas City (Missouri), St. Louis, Philadelphia, Pittsburgh, Newark, New York City, Cincinnati, Cleveland, and Columbus.

Sources: *Thirteenth Census of the United States (1910)*, Population Volume 4, Table 7; *Fourteenth Census of the United States (1920)*, Population Volume 4, Chapter 7, Table 1; *Fifteenth Census of the United States (1930)*, Population Volume 4, Table 11; *Sixteenth Census of the United States (1940)*, Population Volume 3, Parts 2 to 5, Table 20.

Of course, these numbers do not control for tenure. Higher growth rates in the steel industry during the years of black migration could lead to more recent black hires in steel than in meat packing, which might in turn depress the observed relative position of black steelworkers. This phenomenon could have some effect on the 1930 numbers, as employment growth in northern

steel outpaced growth in northern meat packing in the late 1920s. However, differences in employment growth cannot explain the 1940 patterns. While employment in both industries declined in the late 1930s, the decline was much more rapid in the steel industry.[20]

In sum, as black migrants came north and sought industrial work, they met with differing degrees of success in the meat packing and steel industries. By 1940, they had begun to move out of laborer jobs in the meat packing industry, and their earnings in this industry were quite close to the earnings of white workers. In steel, black workers made little progress out of laborer jobs, and their relative earnings were considerably lower than the relative earnings of black meat packing workers. Why should the rate of black progress vary across industries? Why was race a more inflexible barrier to advance for black steelworkers than for black meat packing workers?

Organized Labor and Black Advance in Meat Packing and Steel

One place to look for explanations of differences in racial inequality across industries is in the history of labor organizing in these industries. Did the dominant unions in meat packing successfully promote anti-discrimination policies while organized labor in the steel industry took a more exclusionist stance toward black workers? Did racially-inclusive industrial unionism establish itself earlier in meat packing than in steel?

Relations between organized labor and black workers in the steel industry in the first half of this century followed a typical pattern for the time. The craft-based unions which dominated the labor movement through World War I tended to exclude unskilled workers in general and black workers specifically, and the Amalgamated Association of Iron, Steel, and Tin Workers of North America, the major union in the steel industry through World War I, was no exception (Elbaum and Wilkinson 1979: 288–98). One result of the union's exclusionist stance was that black workers were used against the Amalgamated as strikebreakers, including during the Homestead strike of 1891–92 (Gottlieb 1987: 91–92, 153).[21]

When the labor movement revived in the steel industry during World War I, black workers remained outside the movement. Only 12 black workers in all of Pittsburgh joined the 1919 strike, along with 8 of the 1737 black

workers at Homestead, and none of "several hundred" at Duquesne and Braddock (ibid.: 156–59; Clayton and Mitchell 1971: 132–35). Again, black strikebreakers were used, though employers tended to exaggerate their numbers and moved them from place to place in order to convince the strikers that a bottomless well of cheap black labor was available (ibid., p. 136; Hogan 1971, ch. 20). Most of the black workers used to break the strike were replaced once the conflict ended (Gottlieb 1987: 150–51).

There were several incidents of labor unrest in the industry in the 1920s, but none on any large scale. There was no broad-based organizing until the Steel Workers Organizing Committee (SWOC) formed in 1935. Their first major contract was signed in 1937 with the Carnegie-Illinois division of U.S. Steel. By the end of 1937, contracts covered 375,000 workers at 142 companies (Hogan 1971: 1170–84). Black and white workers participated in SWOC with about equal frequency (though not as frequently as immigrants). In addition to being open to black workers in terms of membership, the union supported the desegregation of facilities and equality in seniority and advancement. Moreover, black workers achieved a considerable number of leadership positions in the union (Dickerson 1986: 147; Clayton and Mitchell 1971: 138–53).

In the meat packing industry, as in the steel industry, black workers were excluded from the craft-based organizing that dominated labor activity before World War I and were repeatedly used to break strikes (Fogel 1970, ch. 3; Perry and Kegley 1989; Commons 1904). Even during the World War I period, when the Stockyards Labor Council attempted to create a more inclusive labor movement in meat packing, black workers remained outside the movement (Barrett 1987: 208–14; Cohen 1990: 3–4). They were again used to break strikes in East St. Louis in 1916 and in Chicago in 1921–22 (Fogel 1970, ch. 3).

After the 1921 strike, unions were not a significant force in the meat packing industry until the late thirties. By that time, the Packinghouse Workers Organizing Committee (PWOC), founded in 1937, had learned that the union could not succeed without the support of black workers. In addition, black workers were now more ready to participate in the union, perhaps due to a sense that the gains from strikebreaking had been short-lived. "Whatever their motivation, black workers made a dramatic shift from the apathy and, worse, opposition, to the unionization of steel and packing

they had exhibited in 1919 and now looked to a multiracial union movement for their economic survival" (Cohen 1990: 336). PWOC (which became the United Packinghouse Workers of America (UPWA) in 1943) emerged as the dominant union in the industry by establishing master agreements with Armour, Swift, Wilson, and Cudahy in the early forties (Perry and Kegley 1989: 102–9).

In both industries, then, blacks remained outside of the labor movement through the World War I period. Though organizers in meat packing made greater efforts to include blacks than were made in the steel industry, these efforts were largely unsuccessful. From early 1922 through the mid-1930s, there was no widespread organizing in either industry. When successful unions with effective policies of non-discrimination emerged in the late thirties, the timing of their emergence suggests that they were not responsible for the differing rates of black progress in the two industries: While SWOC had organized a large number of plants by 1937, PWOC achieved its major victories in the early forties. It appears that we must look elsewhere for the roots of the rapid advance of black workers in the meat packing industry relative to the steel industry.[22]

Labor Market Structure and Differing Rates of Advance for Black Workers

The relationship between labor market structure and the cost of experimenting with black workers may provide an answer to the puzzle posed by differences in black progress in these two industries. The basic insight here draws on models developed by Spence (1974: chapters 4 and 5), Thurow (1975: chapter 7), and McCall (1972): employers learn about black workers' abilities by observing the performance of the workers they have hired. If racial prejudice and high costs of experimentation cause employers to exclude black workers from certain jobs, they will gain no new information about the ability of black workers to perform these jobs. They will therefore continue to practice exclusion. The lower an employer's costs of experimentation, the more likely he is to try black workers in new positions. The performance of these workers may then cause the employer to revise his expectations about black workers and may make him more willing to hire them in the future.

Here I will consider elements of internal labor market structure which

might affect the cost of experimenting with black workers. I then examine the ways in which these elements were present (or not present) in the steel and meat packing labor markets. My purpose is not so much to establish *why* these labor markets differed but *how* they differed and how the differences might have affected the use of black workers.

Job Ladders, Internal Promotion, and Pre-Hire Screening

The use of job ladders and internal promotion increases the importance of the pre-hire screening of workers. When job ladders are used, the hiring decision must take into account the skill requirements of jobs all along the ladder, not merely the entry job (Doeringer and Piore 1971: 103–4). Because employers need an adequate supply of workers to jobs all along the job ladder, they cannot afford to hire entry-level workers who are not suited for promoted positions. This need to consider the requirements of promoted positions at the time of hire increases the potential cost of experimenting with black workers in entry-level positions. An employer in a firm which relies heavily on internal promotion may believe that black workers are capable of performing entry-level work but that they cannot adequately perform the work of promoted positions. The employer will be unwilling to bring these workers into entry jobs, which he believes they can perform, because he fears that he will find himself with an inadequate supply of workers for promoted positions along the job ladder. If jobs were not tied together in ladders, and if the employer could tap the external market to fill positions along the job ladder, he might be willing to hire black workers into entry positions. He might then find black workers to be more able than expected and may ultimately move some of them into higher-level jobs.

This constraint on the use of black workers will be less binding the more "pyramidal" the job structure. If there are many more entry positions than promoted positions, an employer may bring a small number of black workers into the entry port of a job ladder with no intention of promoting them and still have an adequate number of white workers to staff upper-level positions. On the other hand, if, as part of the nature of the job, all workers in the entry position receive on-the-job training, the employer might expect that using black workers in these jobs will involve a waste of training resources

on unpromotable workers. Finally, employers would expect that any effort-inducing effect of promotion lines would be ineffective for black workers (as long as black workers know that they are considered unpromotable). This expectation would further reduce the employer's willingness to hire black workers into formal job ladders.

What do we know about the use of internal promotion and pre-hire screening in the meat packing and steel industries? Arthur Carver (1928: 41), a member of the industrial relations department at Swift, portrayed the meat packing labor market as marked by very informal hiring practices. While firms in other industries developed lists of detailed job specifications "which determine very accurately the qualifications which applicants should possess . . . few such formal studies have been made [in the meat packing industry]." Even skilled workers were taken in informally (ibid.: 43): "Some industries have made extensive use of trade tests in selecting skilled labor; but, with comparatively few exceptions, the packing house industry has not yet done so." Instead of administering screening tests, employers hired workers on a probationary basis, making continued employment conditional on demonstrated ability (ibid.: 43–44). The employers thus did not have to pre-judge workers based on easily observed characteristics, but rather could experiment with workers, observe performance, and allocate labor accordingly. We would expect such informal hiring policies to be correlated with an absence of formal job ladders and internal lines of promotion. In fact, Herbst found that promotion schemes were not widely used in the 24 Chicago meat packing firms that she studied (Herbst 1932: 69–70).

The situation in the steel industry was quite different. Established lines of internal promotion were being used in steel plants even before World War I. As early as 1908, journalist John Fitch noted the use of "rigid lines of promotion" throughout the steel mill he studied (Stone 1974: 115). Likewise, in describing the steel industry in the years leading to World War I, William Hogan (1971: 451) says, "Modern production established a definite line of promotion under which each worker trained for the next highest position." The tight markets and labor unrest of the World War I period simply increased the use of internal promotion, as employers believed this would make the work force more stable (Lazonick 1983: 127).

The use of job ladders in the steel industry increased the potential cost of experimenting with black workers. Black workers could still get hired as
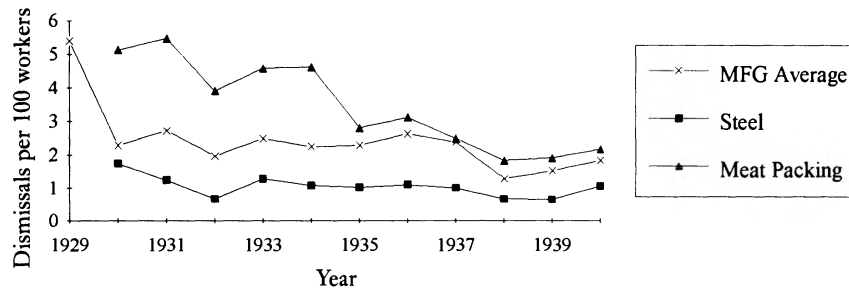
Figure 1   Annual dismissal rates: meat packing, steel, and manufacturing average

casual laborers in steel, since employers "made no commitments to promote or train those in casual labor, preferring to keep them on the payroll only as long as work needed to be done" (Gottlieb 1987: 110).

Indirect evidence concerning the use of pre-hire screening can be found in dismissal rates (see Figure 1; note that these figures reflect the dismissal of workers with prejudice, rather than simple layoffs).[23] Dismissal rates in meat packing tended to be nearly double the manufacturing average through 1935, while the rates in iron and steel tended to be considerably lower than the manufacturing average. Additional evidence on the use of dismissal is found in Emil Frankel's (1919) study of 18 Chicago-area firms, two of which were meat packing firms. The two meat packing firms made considerably greater use of dismissal than did the 16 other establishments. Of the 20,000 dismissals recorded for the 18 firms between June 1917 and June 1918, 15,000 took place in the two meat packing firms. In addition, these two firms had more of their turnover accounted for by dismissal than any of the other firms.[24] This difference in the use of dismissal suggests that meat packing employers screened applicants less rigorously before hire (as Carver describes), preferring instead to hire workers, observe them, and then dismiss them if need be. Employers in the steel industry used dismissal more sparingly, reflecting their need to screen workers more strictly at hire in order to coordinate flows of workers along the job ladder.

Turnover, Custom, and Co-Worker Prejudice

As job ladders and bureaucratized labor policies take root at a firm, turnover declines and a stable internal work force arises. This stable work force will develop set expectations about how work is to be conducted at the firm. Doeringer and Piore (1971: 22–23) refer to this process as the development of custom. The development of custom regarding the role of black workers is likely to prevent their access to new positions. Stated another way, the importance of co-worker prejudice is likely to be greater in workplaces with stable internal work forces. Donald Dewey discussed the effect of a stable internal work force on the use of black workers. He suggested that "willingness to work with Negroes varies inversely with group solidarity, which in turn depends in large measure upon the rate of turnover" (Dewey 1952: 285). In "The Technique of Introducing Negroes Into the Plant," Herman Feldman advised that high-turnover departments should be used as the initial point of entry for black workers into a plant because "contacts between workers are somewhat casual" in these departments and racial tension was therefore less likely to pose a problem (Feldman 1942: 463). Experimentation with black workers carried a price in the form of resistance from white workers, and this price increased with the stability of the internal work force.

What evidence do we have concerning turnover in these two industries? Figure 2 presents the net turnover rate for the meat packing and steel industries, along with the manufacturing average, for 1929–40.[25] The turnover rate for the meat packing industry clearly exceeded the rate for manufacturing as a whole in the pre–World War II era. Turnover in iron and steel tended to be considerably lower throughout the period. Following Dewey's argument, these low turnover rates in the steel industry may have increased the opposition of incumbent workers to the introduction of black workers.

It would of course be helpful to know what turnover rates looked like in these industries before the onset of the Great Depression. Brissenden and Frankel (1920) provide some additional evidence on turnover rates in the meat packing industry prior to 1930. They present net turnover rates for 1913–14 for meat packing, autos and auto parts, chemical refineries, textiles, furniture, leather and rubber goods, machinery manufacturing, miscellaneous metal products, printing and publishing, and public utilities. The net turnover rate in the meat packing industry was 8.0 employees per 10,000
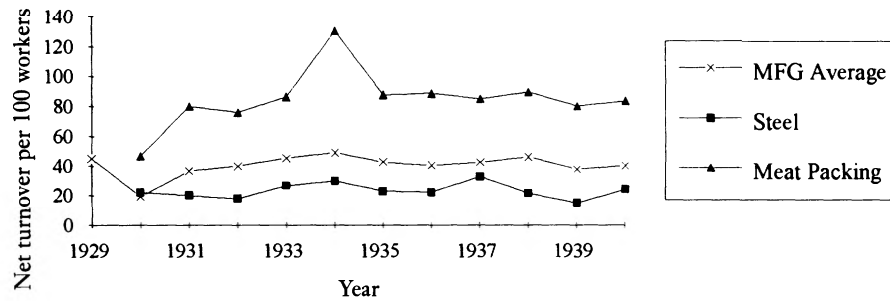
Sources: Monthly Labor Review 32: 358–64 (for 1929 and 1930), 51: 696–708 (for 1931) and Bureau of Labor Statistics Bulletin no. 694: 529–33 (for 1932–40).

Note: Rates reflect turnover among production workers only.

Figure 2   Annual net turnover rates: meat packing, steel, and manufacturing average

labor hours in 1913–14. The next highest net rate was 5.2 in the auto industry. The average over the included industries was 3.1.[26]

The marked differences in turnover rates in these two industries may be partly due to technology. The meat packing industry faced great fluctuations in labor demand, with peak demand in the months from November to January (Herbst 1932: 70). Under these conditions, it may not have been profitable for firms to attempt to reduce turnover, as that would require retaining redundant workers in slack periods. The incentives regarding turnover in the steel industry were quite different. Here, employers were greatly concerned with attaching workers to the firm. Indeed, the development of job ladders cited above may have arisen to promote such attachments. Technological changes in the late 19th and early 20th centuries, especially the development of the open hearth process, and later the mechanization of rolling, greatly increased the pace of steel production. The volume and pace of the flow of material through the plant, along with the increasing integration of the production process, meant that coordination between workers was essential. There was therefore a payoff to maintaining a stable, experienced internal labor force (Lazonick 1983: 117; Nuwer 1988: 837; Graziosi 1981: 537). Whatever the underlying causes, the differences in turnover were quite pronounced.

It appears, then, that the characteristics of the labor markets in these industries promoted lower costs of experimentation with black workers in

the meat packing industry. So what did meat packers learn from these experiments? The employers in the plant studied by Herbst in the mid-1920s learned that, among workers eligible for production bonuses, black men earned their bonuses more often than whites (Herbst 1932: 119). In addition, they learned that black male quit rates were lower than white male quit rates (ibid.: 139). To gain this knowledge, employers in the meat packing industry had to be willing to make the experiment. They were willing because the structure of their labor market kept the cost of the experiment low.[27]

If we look to the fortunes of black workers in other northern industries at this time, do we find any evidence which might corroborate the "cost of experimentation" idea? A complete answer to this question would, of course, require several more case studies examining the personnel practices of a variety of industries. We can, however, glean a little more information from the Census and Bureau of Labor Statistics data gathered here. Unfortunately, BLS turnover series are reported for only two more industries for which we also have a reasonable number of observations in the 1940 public-use sample: autos and electrical machinery. The auto industry was characterized by very high net turnover and dismissal rates, nearly as high as those in the meat packing industry. Turnover rates were much lower in the electrical machinery industry—below the manufacturing average, but slightly higher than in the steel industry.[28]

To see how black workers fared in these additional industries, I re-estimated the wage and occupation equations with workers from all four industries included. Controlling for individual characteristics, the black relative occupational position was significantly higher in the meat packing industry than in any of the three other industries. Black relative wages were also greatest in meat packing, but only the meat packing-steel difference was statistically significant at the 5% level (though both the meat packing-auto and meat packing-electrical machinery differences were significant at the 10% level). Black workers fared better in autos than in electrical machinery or steel, both in terms of relative wages and relative occupational status. These differences were, however, small and not statistically significant. Finally, black steelworkers enjoyed slightly higher relative wages and occupational status than did black electrical machinery workers, but these differences were also small and insignificant.[29] While the rank-ordering of these coefficients is about as we would expect based on turnover in these industries, the lack of

statistical significance and the small difference between black relative wages in the auto industry and black relative wages in the steel industry raise some concerns about the generalizability of the model presented here. We might question, however, whether these turnover series, considered alone, are sufficiently descriptive of internal labor market conditions in these industries. Evidence presented in Baron, Jennings, and Dobbin (1988) suggests that the internal labor market of the auto industry was marked by the presence of job ladders and formal personnel practices by 1935. Why these formal practices coincided with high turnover rates and how these combined forces affected the use of black workers in this industry remain questions for further study.

Conclusion

Just as the progress of black workers appears to have been uneven over time (Donohue and Heckman 1991), their progress was also uneven across industries; in particular, black male workers made more rapid progress in the meat packing industry than in the steel industry in the pre–World War II North. This "progress" is defined purely on the basis of relative wages and occupational position within the industry. Nor is this to suggest that there were no stringent racial barriers to be faced in meat packing. Black meat packing workers certainly had less access than white workers to more prestigious, more pleasant, and more public jobs, such as those in the mechanical department, the smokehouse, and the packing department (Herbst 1932: 112).

Nonetheless, black workers in the meat packing industry gained more ground on their white co-workers before 1940 than did black workers in the steel industry. Differences in workers' individual characteristics cannot account for the differing rates of progress of black steel and meat packing workers. Nor could union activity have produced these industry-specific race effects. Unions in the two industries were simply too weak from the early 1920s through the late 1930s to greatly affect racial policy.

Rather, the evidence presented here indicates that the effect of internal labor markets on experimentation with black workers may explain these differing rates of progress. In the years following World War I, many northern industrial employers had to make decisions about black workers for the first time. In this environment, part of what was essential to the advance of black manufacturing workers was simply getting the opportunity to display their

abilities. A worker had to somehow get the chance to show what he could do. In the meat packing industry, these opportunities came because the employer risked very little in the experiment, and, as a result, black workers were able to improve their relative position in this industry. In the steel industry, the experiment was more costly, the opportunities came less frequently, and progress was made more slowly.

Notes

1   Statistical discrimination models revolve around costly information, while criticisms of these models emphasize the employer's ability to learn from observing workers' performance. See Arrow (1973); Phelps (1972); Aigner and Cain (1977); McCall (1972).
2   Whatley (1990) is an exception, however.
3   17,479 women were employed in blue-collar jobs in the northern meat products industry in 1940, and 5,568 women were employed in blue-collar jobs in northern blast furnaces, steel works, and rolling mills (United States Department of Commerce, Bureau of the Census, Sixteenth Census of the United States (1940), Population Volume 3, Part 1, Table 82). In the 1/100 PUMS sample, applying the sample restrictions described below, we find only 48 white women and no black women in the steel industry, and 150 white women and 2 black women in meat packing. Obviously, these samples will not support an investigation of racial inequality among women in these industries.
4   For an analysis of the effect on black women of changes in the market for domestic help in the pre–World War II period, see Neckerman (1993). For an examination of the importance of experimentation and demand-side learning in determining labor market outcomes for women during and after World War II, see Kiefer and Philips (1993).
5   United States Department of Commerce, Bureau of the Census, Fifteenth Census of the United States (1930), Population Volume 4, Table 11. Only male semiskilled operatives and unskilled laborers are included.
6   These data come from the 1940 Census Public Use Microdata Sample (the full 1/100

sample is used). The set includes male, currently employed wage and salary workers in the North. Only production workers (skilled workers and foremen, operatives, and laborers) are included. Those on government emergency work in 1940 are excluded. Service workers are included in the "laborer" category. "North" refers to the Northeast and North Central Census regions. These two regions include 21 states: Connecticut, Massachusetts, Maine, New Hampshire, Rhode Island, Vermont, Pennsylvania, New York, New Jersey, Illinois, Indiana, Michigan, Ohio, Wisconsin, Iowa, Kansas, Missouri, Minnesota, North Dakota, Nebraska, and South Dakota. Weekly wages are based on annual earnings and weeks worked reported for the previous year (1939). I throw out those under the age of 14, those who are currently enrolled in school, and those with negative calculated labor market experience (age — schooling — 6). For the wage analysis, I also throw out those with calculated weekly wages under $1.50 or over $125.00; these are the cutoffs used by Smith and Welch (1989). All wages are in nominal terms.

7   The overall black/white wage ratio for blue-collar workers in these industries in the North is .76. If we include nonblue-collar workers in these industries, the ratio falls to .71. Smith and Welch, using restrictions on weeks worked and school enrollment, but not on industry, occupation, or region, find a black/white wage ratio of .43 in 1940 (1989: 522).

8   Black steelworkers do seem to be surprisingly well represented at the skilled level given the relatively low black/white wage ratio in steel. Note, though, that the black/white wage ratio among skilled steelworkers was only .70. In fact, black operatives in steel had a slightly higher mean wage ($25.00) than did black skilled steelworkers ($24.27). Thus the presence of black workers in these occupations may not indicate as much progress as appears at first glance.

9   These distributions include only currently employed workers. They may therefore reflect differences in unemployment rates across industries at the end of the Depression, rather than true differences in the progress of black workers. It seems likely that the Depression had a greater impact on workers in heavy industries like steel than those in meat packing. If black workers, especially black workers in semiskilled positions, bore the brunt of Depression-era layoffs, these 1940 distributions might understate the movement of black workers into semiskilled jobs in steel over the pre-1940 period. To address this issue, I recalculated the 1940 occupational distributions for these two industries with unemployed workers included; that is, in addition to currently-employed workers, I included those with a job but not currently at work, unemployed experienced workers, and unemployed new workers. However, including these workers in the skill distributions does not alter the evidence that black meat packing workers enjoyed better relative occupational status than did black steelworkers. Still, even these calculations do not take into account unemployed meat packing or steelworkers who took Public Emergency Work (PEW) positions. These workers were instructed to report their PEW job as their current occupation (though not all did so). Black workers were more likely than white

workers to be on Public Emergency Work (Margo 1991). However, this racial difference in PEW participation would matter here only if, for example, unemployed black steel operatives were more likely to be PEW workers than were unemployed black meat packing operatives. I know of no evidence of such a particular race, occupation, and industry selection into PEW jobs.

10 In both the OLS wage regression and the logit occupation estimation, I allow for graduation effects (separate coefficients for finishing the 8th and 12th years of schooling). I also allow for differing annual effects of schooling in years 0–7 and 9–11, and I include a dummy for those with more than 12 years of school. Equations with linear and quadratic effects of schooling were also estimated. Changing the way schooling enters into the estimation had very little effect on the other coefficients.

11 Average (in white wage)—average (in black wage) = .188 in steel, .074 in meat packing. .188 − .074 = .114.

12 As an illustration, consider a married, non-immigrant black worker with 15 years of experience and 8 years of schooling. If this worker is in the steel industry, race affects his earnings through the coefficients on black, black*married, black*experience and its square, and black*schooling. The sum of these effects is −.177. Race affects a black meat packing worker's wages through all of the above coefficients, plus the coefficient on the black*meat packing term. So the net effect of race for a black meat packing worker with the given characteristics is −.177 + .098 = .079. The difference between the net effect of race on log wages for a black meat packing worker and a black steelworker equals .098, which is the coefficient on black*meat packing. Note that this does *not* mean that a black meat packing worker earned more than a comparable black steelworker in absolute terms.

In addition, note that this specification of the wage equation does not allow for differences in returns to education across industries. Education may have been more necessary for access to better jobs and better pay in the steel industry than in the meat packing industry—if this were the case, then these equations are misspecified. What we have interpreted as industry-specific effects of race on wages might really be industry-specific returns to education, combined with lower educational levels among black workers. To test this possibility, I re-estimated the wage equation, allowing returns to education to differ between the two industries by adding meat packing*education interaction terms. Addition of these interactions to the wage equation reduces the coefficient of the black*meat packing term only slightly, from .098 to .092 (t = 1.65).

13 The data are the same as those used in the wage equations, without the application of the high- and low-wage cutoffs. The means are essentially identical to those found in *Table 3*.

14 Again, it may be important to allow the effect of schooling to differ by industry— access to non-laborer positions in the steel industry may have required greater education than such access in the meat packing industry. As in the wage equation, however, allowing the impact of education to vary by industry reduces the race*industry

coefficient only slightly (from .963 to .903) and does not affect its statistical significance.

15 The selection criteria are the same for 1910 as for 1940: currently employed, male, wage and salary workers in these industries in the North, in blue-collar occupations (skilled workers and foremen, operatives, and laborers). Schooling is not recorded in 1910, so labor market experience cannot be calculated; age and age^2 are included in the estimation instead. The 1910 sample is a 1/250 sample. It includes occupation codes based on the coding scheme used for the 1980 Public Use Sample. This scheme is very similar to the one used in the 1940 sample, at least at the 1-digit level. The occupational classifications used here should therefore be consistent for the two cross-sections.

16 We can calculate estimated occupational probabilities based on this pooled regression, evaluating the coefficients for married, non-immigrant workers of mean age. These calculations indicate that, in 1910, a black meat packing worker was about 4 times as likely as an otherwise identical white meat packing worker to hold a laborer job. By 1940, a black meat packing worker was 1.6 times as likely as a white to hold a laborer job. In steel, a black worker was 2.1 times as likely as a white to hold a laborer job in 1910, and 2.8 times as likely in 1940. A black meat packing worker was .20 times as likely as a white to hold an operative job in 1910, and .90 times as likely in 1940. Comparable figures for black workers in the steel industry are .65 in 1910 and .75 in 1940. Finally, a black meat packing worker was .05 times as likely as a white to hold a skilled position in 1910 and .56 times as likely in 1940. Comparable figures for black workers in the steel industry are .31 in 1910 and .27 in 1940.

17 We cannot control for education in this estimation because schooling is not recorded in 1910. A separate occupation regression for 1910 which includes literacy controls produces a negative and significant ($t = 1.72$) coefficient on the black*meat packing interaction. Again, this result indicates that the better relative position of black meat packing workers in 1940 is the product of more rapid progress in the 1910–40 period.

18 Data from all available northern states are used, but this set changes in each cross-section.

19 Because skilled workers are not included in these calculations, these ratios are not comparable to those presented in *Table 2* and *Table 6*.

20 Between 1927 and 1929, the average annual employment growth rate in the northern steel industry was 4%, compared to about 1% in the meat packing industry. Between 1937 and 1939, northern steel industry employment declined at a 9% annual rate, while meat packing employment declined at a rate of 2.5% per year. These numbers for the steel industry reflect production worker employment in Pennsylvania, New York, Ohio, and Illinois. These four states accounted for roughly 75% of all production workers in the steel industry in the United States. Numbers for the meat packing industry refer to production workers in Pennsylvania, New York, Illinois, Michigan, Ohio, Indiana, Iowa, Kansas, Maine, Massachusetts, Minnesota, Missouri, Nebraska, New Jersey, Rhode Island, and Wisconsin. These states ac-

counted for 75–80% of all production workers in the meat packing industry—see United States Department of Commerce, Bureau of the Census, Fifteenth Census of the United States–Manufactures 1929, Volume 2: Reports by Industries (Washington, 1933), Biennial Census of Manufacturing 1937 (Part 1) (Washington, 1939), and Sixteenth Census of the United States–Manufactures 1939, Volume 2 Part 1: Reports by Industries (Groups 1–10) (Washington, 1942).

21   On the use of black strikebreakers more generally, see Whatley 1993.

22   One might argue that the hiring of black workers to counteract unionism (outside of the use of black workers as strikebreakers) contributed to the more rapid advance of black meat packing workers. Employers in meat packing certainly believed that black workers could not be brought into the union movement and so were useful in preventing unionization (Herbst 1932: xxii). But employers in the steel industry believed this as well (Dickerson 1986: 17; Gottlieb 1987: 161–62; Greene and Woodson 1969: 253). Why should this strategy have led to greater rewards for black meat packing workers than for black steelworkers?

23   These rates refer to the United States as a whole. They are not available separately by region.

24   Unfortunately, turnover rates cannot be calculated from this data because employment is not reported. 25 firms are studied, but only 18 report turnover broken down by type. The other industries represented include "mail order houses," "car works," "iron foundry," "printing presses, mfg.," "machinery (specialties), mfg.," "machinery (coal-mining), mfg.," "brass and metal specialties, mfg.," "agricultural implements, mfg.," "public utilities (telephone)," "public utilities (electric)," "electrical supplies, mfg.," and "clay products, mfg."

25   The net turnover rate is the minimum of the accession and separation rates. It provides a measure of turnover purged of the effects of growth or decline in the size of an industry's labor force. These turnover rates are for the United States as a whole; they are not available separately by region.

26   I have not found similar pre-1929 data on turnover in the steel industry.

27   In investigating whether such observations could alter attitudes toward black workers, I have not found direct, systematic evidence on racial attitudes in the pre–World War II meat packing industry. However, a study of the introduction of black workers into new departments within meat packing plants in the late 1940s found that the longer a department had been integrated, the less prejudicial were the responses of white workers on surveys of racial attitudes (Palmore 1954: chap. 5). Of course, self-selection by white workers into particular departments could bias these responses.

28   See Monthly Labor Review 32: 358–64 and 51: 696–708 and Bureau of Labor Statistics Bulletin no. 694: 529–33 for these turnover series.

29   With steel as the omitted category, the estimated black*industry interaction terms were the following: in the wage equation, $\beta_{black*meat\ packing} = .0901$, $\beta_{black*autos} = .0203$, and $\beta_{black*electrical\ mach.} = -.1067$; in the occupation regression, $\beta_{black*meat\ packing} =$

1.0588, $\beta_{black \cdot autos}$ = .1018, and $\beta_{black \cdot electrical\ mach.}$ = $-.4085$. In the text, "statistical significance" refers to a one-tailed test with α = .05.

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