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ALFRED P. SLOAN SCHOOL OF MANAGEMENT

THE DEFINITION AND MEASUREMENT OF DISCRIMINATION
IN AN INDUSTRIAL PLANT

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I. Introduction

The 1964 Civil Rights Act explicitly prohibits employers from engaging in any hiring, job assignment, promotion practice or any other employment practice which treats members of one race or sex group differently from another and which results in a disparate impact on the affected group's wages or employment opportunities. Since the passage of the Act, a number of major U.S. Supreme Court decisions have followed which have interpreted, in legal terms, what is considered a discriminatory employment pattern or practice. The most important ruling in this regard, applicable to all types of employment practices, excluding seniority systems, is the Griggs v. Duke Power Company decision in 1971. With this decision the Court set the following standards for determining if an employment practice is unlawfully discriminatory.

An employment practice that has a significantly disparate effect on blacks' or women's wages or employment opportunities is considered discriminatory even if the practice is "neutral on its face and in terms of intent."¹ The Griggs rule for determining a prima facie case of discrimination requires that the complainant only show that a regular post-Act employment practice or pattern has a disparate impact on the affected class. In this landmark decision, the Court ruled that it was not necessary to prove intent to discriminate on the part of the employer who instituted such a practice if "it operates to freeze the status quo of prior discriminatory employment practices."² Only if the employer can show that the practice is a business necessity will it be considered legally permissible. Thus, for example, a qualification for a promotion which disproportionately excludes black or women employees from consideration

must be shown to be a valid, job-related credential or skill necessary for adequate performance on the job in order for that qualification not to be considered an unlawfully discriminatory practice.

In the recent case of Teamsters v. United States et al., the Supreme Court provided an exception to the Griggs rule in considering the question of what may be a discriminatory versus a bona fide seniority system. In this case, evidence of a significant disparate effect on minority or women workers was not considered a sufficient standard by which to determine whether or not there is a prima facie case of discrimination. Rather, the Court ruled that seniority provisions of collective bargaining agreements enjoy a special status in the law. Section 703(h) of Title VII of the Civil Rights Act explicitly exempts differences in treatment of employees that result from the application of a bona fide seniority system from being considered unlawful "if such differences are not the result of an intention to discriminate because of race, color, religion, sex, or national origin."³ Nowhere in the Act, however, is defined what is meant by a bona fide seniority system. Thus, that determination has been left up to the courts. In the Teamsters ruling in 1977, the Supreme Court declared that seniority systems that are neutral on their face and in their intent, even if they have significant disparate impacts on women and minority employees, may be considered bona fide. In order to establish that a seniority system is discriminatory, a complainant must show evidence that the system is not neutral on its face or in its intent.

The Court's ruling in this case is a narrow one. It does not resolve the general question of when a seniority system may be considered discriminatory, that is, what the rules of evidence are for determining that it is not neutral on its face or in its intent. Thus, in the wake of Teamsters v.

United States et al., there is still considerable controversy as to what is an unlawfully discriminatory seniority system.

This paper presents an analysis of the patterns of race and sex discrimination in one industrial plant. The general question of how the seniority system affects the wages and employment opportunities of women and minority workers is explored in this analysis. Indeed, I propose a set of indicators which distinguish among the different structural characteristics of the seniority system in order to separate what may be unlawful discriminatory effects from those that have a disparate impact on women and minority workers but may not be considered illegal by the court's ruling in the Teamsters case.

The plant-specific data on workforce characteristics, wages, and job structure and the seniority system itself are company generated data provided me by union sources. For reasons of confidentiality, any references to the identity of the plant, the employer, or the union in question have been obscured. The case, however, can be assumed to be representative of mass-production plants in an industry with a long history of employing women and blacks in blue-collar work. Thus, if discrimination exists, it cannot be attributed to the exclusion of these groups from entry, but rather to the operation of discriminatory mechanisms within the plant's "internal labor market."*

The complex of issues raised by an analysis of how a seniority system may have disparate effects on women and minority workers, only some of which may be considered legally discriminatory, requires that I utilize

*By "internal labor market" I mean the formal and informal mechanisms by which workers are allocated to jobs at different wage levels within an establishment.

those economic and sociological theories of discrimination that take into account the institutional processes by which wages and employment opportunities are determined for the individual in a particular establishment. In the first section of this paper, I discuss economic and sociological theories of discrimination that seem appropriate for this type of analysis. The second section presents a description of the data. The third section describes the variables used to test for the effects of different aspects of the seniority system. The empirical model developed here is based on a job competition, structuralist view of the wage determination process within an industrial plant. In the fourth section, I present the results of the estimation of that model using ordinary least squares multiple regression techniques. The final section of the paper discusses the implication of these findings and the areas where future research may prove most enlightening on the questions left unresolved by this type of analysis.

II. Labor Market Theory and Discrimination

For the U.S. economy as a whole, Marcia Freedman has characterized the relatively poorer and unstable economic position of women and black workers compared to white men in the labor force as a consequence of their exclusion from those labor market segments which provide employment stability and relatively higher wages. In her view, "the modal activity that occurs in the labor market is not competition among individuals, but bargaining among groups."⁴ High wages accrue to those groups who are best able to gain for themselves protective job shelters with restrictive entry arrangements. Individuals who are unfortunate enough not to be able to gain entry to existing shelters, or who are unable, in fact, to develop

their own shelters in consort with other unprotected workers, will suffer from employment instability and relatively low wages--the vagaries of a competitive labor market--compared to those who have access to the sheltered segments of the labor market.

Protective shelters are institutionalized arrangements designed to restrict entry and regulate earnings. Freedman gives the example of licensing arrangements for certain occupational groups, such as electricians. Without a license, an individual cannot practice a certain trade. Union hiring hall arrangements, where union membership is a prerequisite for employment in certain occupations or industries, are another type of restrictive sheltering mechanism. A third type, that of the establishment with a highly structured internal labor market, restricts competition to entry level positions only. In a unionized workplace of this type, access to higher wage positions is regulated by a seniority system. Within the establishment, jobs are arranged in hierarchically structured promotion ladders. Workers with more years of plant-specific experience are given preference over less senior workers for promotions to high wage jobs in the firm's internal labor market. The case that is analyzed in a later section of this paper involves the operation of just such a highly structured internal labor market.

Similar in some respects to Freedman's more sociological analysis of labor market behavior, Lester Thurow's "job competition" model describes individual, rather than group, behavior in the labor market.⁵ Like Freedman, he does not subscribe to the view that individuals compete for higher wages on the basis of their personal characteristics, but rather, he says, individuals search for jobs that represent high wage and relatively stable or secure employment opportunities. In his model, wages

are attached to job characteristics, not to the characteristics of individuals. In the absence of the active creation of new protective shelters, the search behavior of individuals in Thurow's job competition model seems consistent with Freedman's analysis.

To Thurow, "labor skills do not exist in the labor market,"⁶ but rather, they are acquired, in most cases, after a worker has been hired and assigned to an entry level job. That position is attached to a specific promotion ladder within the firm. One important purpose of these non-competitive promotion ladders is to encourage the transmission of socially held knowledge and skills from the more senior to junior workers. If the two were competitors, and promotions were not rewarded on the basis of seniority, the more experienced worker, in all probability, would be quite reluctant to share the knowledge and skills he/she has acquired with someone who is viewed as a potential threat to his/her own wages and job security. In the job competition model of the labor market, workers compete only for entry to desirable jobs in the protected segments.

Hiring Discrimination.

Hiring discrimination is one way in which women and black workers may be excluded from entry to the employment opportunities within a highly structured internal labor market. Employers' direct refusals to hire an applicant because of his/her race or sex, in light of Title VII prohibitions, are rare occurrences today. More frequently, qualifications for entry and the availability of acceptable black and female candidates are cited as the reasons for exclusion. Hiring discrimination occurs when employers rely on education credentials, test scores, height and weight requirements, or other qualifications which disproportionately screen out black or female applicants for consideration from employment. In an enterprise where skills

necessary to perform a job are usually acquired in on-the-job training, potential employees may be selected on the basis of a variety of ascriptive traits that bear little relationship to actual job performance but are used as convenient screening devices by managers to distinguish what are thought of as the "better" candidates from the overall applicant pool.⁷ When employers use screening criteria that disproportionately exclude black or female applicants from consideration and which cannot be shown to be directly related to job performance, then hiring discrimination is said to occur.

Another form of hiring discrimination occurs through the process of recruitment. As mentioned previously, Thurow has described labor market behavior as the search for jobs with some measure of employment security and high wages. A unionized workplace with a highly structured internal labor market is one example of where these desirable jobs may be found. Access to information about entry-level job openings in such workplaces may be restricted to an informal network of incumbent employees, their families and friends. In a study conducted during the late 1960's on the hiring and promotion practices of firms characterized as having highly structured internal labor markets, Peter Doeringer and Michael Piore found that informal recruitment networks were the norm, rather than the exception, among these establishments.⁸

If the incumbent workforce is predominantly white or male, then reliance on them as informal channels of communication to potential applicants may perpetuate past patterns of discriminatory hiring practices. The applicant pool which results from that recruitment process may under-represent the availability of potentially acceptable black or female candidates. Women and blacks who may be interested in these jobs simply

would not have been told about them because either they are not part of that informal network, or, if they are, informants may not consider the available openings appropriate for them. The case presented here is not one where blacks and women have been completely excluded from entry. Indeed, there are a few black and female employees in the plant who entered that workforce as early as the 1940's. Thus, hiring discrimination of the form described above is less likely to be the cause of unequal treatment. Rather, other forms of discrimination in the initial job assignment practices, or job evaluation techniques, and in the process by which promotions occur within and across job ladders within the firm are the more likely sources of unequal treatment.

Discriminatory Practices within the Internal Labor Market.

Doeringer and Piore's monograph on the analysis of internal labor market operations provides the most complete description of how employment practices within an industrial plant may be racially discriminatory.⁹ Mary Stevenson has extended their analysis to include the unequal treatment of women.¹⁰ Within a highly structured internal labor market like that which occurs in unionized manufacturing plants, there are four types of discriminatory practices that may adversely affect both black and female workers: 1) initially, upon hire, in the form of discriminatory job assignment practices; 2) by wage discrimination, as a result of sex or race biases in job evaluation techniques; 3) by unequal treatment in promotions within particular job ladders; and 4) through unequal access to promotion opportunities across the plant.

Wage Discrimination. The wage structure in an industrial plant of this type is usually fixed; that is, there are a limited range of different wage levels for all possible production jobs in the plant. Jobs are assigned

to slots or labor grades in the wage schedule on the basis of some kind of ranking system. Individual jobs are "evaluated" relative to other jobs in the plant.¹¹ According to Doeringer and Piore, jobs that have historically been considered appropriate for black workers may be undervalued by such a ranking system. Black jobs, they contend, have in some cases only been compared to other black jobs, and not to jobs filled by whites, even though some black jobs may be comparable to white jobs in terms of skills or tasks. Indeed, Doeringer and Piore cite cases in which white workers were found to be doing the same tasks as black workers but in two different jobs in the same plant.¹² The jobs were not evaluated the same, and therefore not paid the same. This is wage discrimination.

Similarly for women, job classification schemes that have historically distinguished so-called women's jobs from men's in categories such as "light" versus "heavy" assembly work may also be discriminatory. Women's jobs may be undervalued if they are compared only to other women's jobs in the firm. Job evaluation techniques applied to all jobs in the plant but which systematically give lower weight to factors associated with women's production jobs will result in an under-rating of those jobs compared to men's.¹³ The Equal Employment Opportunity Commission, in a number of recent cases, has begun to explore the extent of sex biases in job evaluation techniques used by employers. It is EEOC's contention that biased techniques are discriminatory employment practices under Title VII of the Civil Rights Act.

Wage discrimination as described above is not to be confused with the notion of equal pay for equal work. The jobs that women or black workers hold may not be the same as the ones that men or white workers hold. Wage discrimination refers to historic sex and race biases in the wage determi-

nation process itself, where jobs associated with black and female workers have been treated differently and unequally when compared to other jobs in the plant. The continued post-Act use of biased techniques translates into the perpetuation of lower wages for these job holders.

Discrimination in initial job assignment practices. Upon hire, women and blacks may be assigned to entry level positions that represent unequal wage and employment opportunities compared to the jobs to which white men are initially assigned. Doeringer and Piore cite as an example the case of black men who were always initially assigned to an undifferentiated common labor pool at the bottom of the hierarchy of jobs in a plant.¹⁴ Some white men, on the other hand, were regularly assigned directly to jobs which constituted entry level positions in promotion ladders over the common labor pool. The fact that it was a regular practice to assign only newly hired white men to these positions makes this an example of discriminatory job assignment practice.

Similarly, Stevenson gives an example of a workplace where women were initially assigned to promotion ladders whose entry level wage was lower than that of the entry level jobs to which men were exclusively assigned in other promotion ladders.¹⁵ Of course, the extreme case of totally sex-segregated or race-segregated job assignment practices--even if there are no differences in wages, i.e., "separate but equal" classifications--is also illegally discriminatory.

Assignment practices which result in substantially segregated entry-level jobs may have consequences beyond the immediate discriminatory effect of reserving certain entry-level jobs for white men only. If the race and sex segregated job ladders to which blacks and women have been assigned are also truncated at the low end of the wage structure, then they do not

represent the full range of wage possibilities available in the plant. If, in addition, promotion practices within the internal labor market unduly restrict movement across job ladders, then women and blacks may be denied access to the higher wage opportunities available in other promotion ladders in the plant. Even if the truncated ladders are substantially desegregated by new hires, the discriminatory effect of the initial assignment practices remains for those more senior women or black employees who are unable to move out of these short ladders.

Truncated race or sex-segregated ladders are not the only enduring type of discriminatory assignment practice. In the case where newly hired black or female workers have been assigned to only a limited number of the available job ladders in the plant, they may also suffer some long-range discriminatory effects from that initial assignment practice. Suppose all promotion ladders contain the same number of jobs, that these jobs extend to the full height of the wage structure in the plant, and that progression rates are the same within each ladder. If black or female workers are disproportionately assigned to only a few ladders and they are restricted from lateral transfers to other promotion ladders, then it follows that they are less likely than white or male workers in the plant to be promoted to the highest wage jobs. The phenomenon of "crowding"--that is, the higher concentration of blacks or women in relatively few ladders--will, over time, result in unequal promotion opportunities for black or female workers compared to white or male workers who are not so constrained.

Discriminatory promotion practices. Formal seniority provisions always include clauses that define the importance to be attached by managers to seniority status when weighed against other factors in making promotion decisions. Generally, one can distinguish between a "weak" and a "strong"

seniority clause.¹⁶ A weak clause states that a personnel manager or foreman must give preference to the more senior of two equally qualified candidates. Thus, the decision-maker is given the option of choosing whom he/she may think is a more qualified candidate for a promotion over a more senior but ostensibly less qualified competitor. A strong clause is one in which seniority is supposed to be given greater weight than qualifications in promotion decisions. Thus, for example, a contract may require that the manager give preference to the worker with the most seniority if he/she can meet only the minimum qualifications necessary to learn the job. In this case, the only qualification required for the promotion is evidence that the most senior individual in line for the promotion is capable of learning how to do the job within a designated break-in period.

Local union officials and local company managers administer these contract provisions. They are the formal rules by which the seniority system operates. Informally, years of experience or seniority within a designated unit may be traded off by decision-makers against other, more subjective factors, which can and do inject some flexibility (but also arbitrariness) into the administration of seniority rules regarding promotions. Nevertheless, within any particular seniority unit one would not expect to find that black or female workers per se are significantly less likely to be promoted to higher wage jobs if they have the same seniority status as white or male workers in the unit. When those "subjective factors" are sex or race-related, that constitutes prima facie evidence of discrimination.

Unequal access across job ladders. The seniority system in a unionized workplace formally regulates movement within and across job ladders. There

are three salient features of seniority systems that relate to the question of whether or not unequal access across promotion ladders may mean that the seniority system itself is discriminatory. These are: 1) what the structure of the seniority unit classification scheme looks like; 2) how narrowly or broadly seniority is defined for promotions and layoffs; and 3) whether there are any penalties for moving from one seniority unit classification to another within the plant.

A seniority unit is that relevant cluster of jobs or job ladders in which a person's seniority status matters, or according to the contract, must be given weight by personnel managers or foremen who make decisions regarding promotions or layoffs. In some workplaces, the relevant unit is the plant. In that case, all promotion ladders belong to the same unit. Alternatively, a workplace may be characterized by a departmental classification scheme. Each department in the plant (e.g., the foundry, the machine shop, the final assembly department) is considered a separate seniority unit. Another type of seniority unit is the "job-sequencing" promotion ladder. In this type of classification scheme, seniority units are occupationally-related job clusters that may be plant-wide or department-wide. Thus, in one plant, for example, all the painters would be in the same seniority unit no matter where they're located. Alternatively, the painters in one department and the painters in another might constitute separate seniority units. Plant-wide, departmental and job-sequencing seniority units as discussed above are the most commonly observed classification schemes found in collective bargaining agreements.¹⁷

Discriminatory hiring practices cannot lead to segregated job ladders no matter what the classification scheme unless there are formal or informal restrictions on mobility between job ladders. In collective bargaining

agreements, formal restrictions result from narrow definitions of the relevant seniority status for promotions and layoffs or from contract provisions that penalize transfers between seniority units. Seniority status is usually defined in one of three ways for promotions and layoffs:*

- 1) years of service within the bargaining unit as a whole, i.e., plant-wide seniority status;
- 2) years of experience within a department, i.e., departmental seniority status;
- and 3) years of experience within a particular job, i.e., job seniority status.

In some agreements, the definition of seniority status is simply consistent with the type of classification scheme in place. Thus, for example, in a plant with a departmental classification system in which seniority status is defined as years of experience within a particular department, an individual in one department would have no seniority status in any other. In this case, even without any formal restrictions on transfer rights between units, there is a penalty imposed on anyone who transfers to a job in another department. He/she loses seniority protection as a result of that move and may be treated as a new employee in the event of a layoff, or may be required to start at the bottom of the job ladder in that department, depending on how important seniority status is considered in these personnel decisions.

In other agreements, seniority status may be more broadly defined,

*In many collective bargaining agreements, seniority status is defined differently for promotions than it is for layoffs. Thus, for example, in the same contract, in the event of a layoff, years of service with the company, or within the bargaining unit, rather than years of experience in a particular job, may be the relevant definition; whereas, for promotions, years of experience in a particular job may be what counts. Similarly, in the event of a layoff, an individual with more years of service with the company may be able to "bump" a less senior worker out of his/her job in another unit. Yet with regard to promotions to higher-rated jobs in another unit, his/her seniority status may not be considered.

but there are formal restrictions on mobility between units.* Thus, for example, seniority may be defined as years of service with the company, or within the bargaining unit, but seniority units are classified along departmental or occupational lines. Restrictions on transfer rights in the agreement may say that an individual who transfers from one unit to another cannot carry his/her seniority status with him/her. Thus, the transferring employee is treated as a new hire with no seniority status whatsoever in the new unit he/she has moved to. This penalty may be permanent or only temporary, that is, the contract provision may allow for an individual to regain his/her lost seniority status if he/she is able to stay in that new job for a certain period of time (e.g., a year) without being laid off. Penalties of this sort make it very risky for an individual to transfer from one unit to another in the same way that a more narrow definition of seniority status would. A seniority system can be said to provide unequal access to all job opportunities for some workers, irrespective of their race or sex, if: a) the structure of the system embodies a departmental or a job-sequencing type of classification of mobility clusters; and b) seniority status is defined in other than plant-wide terms, i.e., along job or departmental lines; or c) there are penalties or restrictions on transfers between seniority units within the plant. A seniority system has a disparate impact on black or female workers if it provides unequal access to all the job opportunities available in the plant and there has been an initially discriminatory job assignment practice.

*Otherwise, departmental or job-sequencing seniority unit classification schemes would be meaningless.

Discriminatory v. Bona Fide Seniority Systems.

The Supreme Court ruling. According to the Supreme Court's decision in Teamsters v. United States et al., a seniority system may have a disparate impact on black or female employees and still be considered bona fide. In this case, the Court outlined what factors distinguish a bona fide system from a discriminatory one. In brief, a seniority system enacted after the Civil Rights Act came into effect on July 2, 1965 is considered bona fide if it:

- a) has a unit classification scheme that is rational and consistent;
- b) applies equally to all race, ethnic (and sex) groups;
- c) did not have its genesis in racial (and sexual) discrimination;
- d) was negotiated and has been maintained free from any illegal discriminatory purpose.¹⁸

A seniority system enacted before the effective date of the Civil Rights Act cannot be considered bona fide if it "perpetuates the effects of pre-Act discrimination" and "if an intent to discriminate entered into its very adoption."¹⁹

A unit classification system is considered "rational" in the Court's eyes, if it follows normal industry practices, that is, if it follows a commonly accepted departmental or occupational clustering of jobs in the plant. By "consistent," the Court means with reference to the National Labor Relations Board rulings regarding what it considered an appropriate bargaining unit.* The Court is silent on the questions of what constitutes

*In the Teamsters case, one of the questions before the Court was whether or not the separation of two different types of drivers into different bargaining units and, therefore, separate union locals was legitimate or not since the company had only hired minority drivers into one type of drivers' job and not the other. Generally, workers in one bargaining unit have a separate agreement with the company and do not have collective bargaining rights with respect to jobs in another bargaining unit, or local union. In the context of a discriminatory hiring practice which excluded minorities from one bargaining unit, the question before the Court was whether or not minority workers in one local union should be given transferrable seniority rights to jobs under the jurisdiction of another local union.

proof of intent to discriminate and how one might infer discriminatory purpose in the maintenance or continued operation of a seniority system.

Discriminatory intent in the inception of a system. Where the Supreme Court has been silent, the EEOC has not. In light of Teamsters, the EEOC has developed its own rules of evidence as to what constitutes "discriminatory" intent in the inception or maintenance of a seniority system. According to the Commission, "discriminatory intent in the institution of a seniority system," formulated along departmental lines or job-sequencing promotion ladders, can be inferred if the "units were previously segregated."²⁰ In addition, if the company has indulged in a discriminatory job assignment practice among seniority units within a bargaining unit, then the contract provisions which penalize transfers from one unit to another are also unlawfully discriminatory. In other words, it is EEOC's position that the Teamsters ruling only exempts as a bona fide practice the special case where employees belong to separate locals, or bargaining units, generally do not have transferrable seniority rights between the two units, and where there has been no history of discriminatory treatment within the bargaining units.

Discriminatory intent in the maintenance of a system. Discriminatory intent in the maintenance of a seniority system can be inferred, says the Commission, if the "employer or union is made aware that it is locking in minorities or females" and the system is maintained or renegotiated when an alternative (non-discriminatory) system is available."²¹ Charges filed with federal or state anti-discrimination agencies and grievances filed by employees, which allege that the seniority system as it operates is discriminatory, are the ways in which the employer or the union can be expected to have known, or been "made aware" of the problem. Thus, if they continue

to operate the existing system without modification, then intent to discriminate can be inferred by their actions. Informal promotion practices, which may even violate the formal seniority provisions of the collective bargaining agreement can also be considered evidence that the seniority system--as it actually operates--discriminates against women and minorities.

Information about job openings and the procedures for actually applying for a promotion can occur through an informal system of communication, vis-a-vis the "grapevine," i.e., by talking with co-workers and supervisors about what they know about job openings elsewhere in the plant. In some cases, contract provisions may include a formal job posting arrangement, by which the personnel office is required to post information about openings at different bulletin boards in the workplace. In order to be considered for a promotion, eligible individuals may be required to speak to the hiring foreman directly or go to the employment office of the personnel department and fill out a formal application.

Job posting provisions that are restrictive, i.e., posting only in certain departments, or in relatively inaccessible places, or postings that list only certain types of openings, may have a de facto discriminatory effect if they deny information about job openings elsewhere in the plant to blacks or women confined to substantially segregated job ladders. Indeed, where there are no job posting arrangements, a woman or black may hear that there are no job openings for her/him. Thus, if women or blacks with high seniority status are not told about potential openings, they effectively cannot outbid low seniority males or whites for those jobs. Similarly, if the application process is a highly informal one and there is little monitoring by union officials to ensure that seniority provisions are indeed being followed, then, in the absence of a strong affirmative

action commitment by management, previously discriminatory practices are likely to continue.

The EEOC will consider a seniority system to be informally operating in a discriminatory manner if evidence is shown that: a) women or blacks are being denied access to information about openings outside the job ladders to which they have been discriminatorily assigned; and b) they have protested this fact to union or company officials in the form of grievances or formal charges of discrimination filed with an outside agency. Alternatively, discriminatory intent can also be inferred if: c) women or blacks are disproportionately being denied promotions they apply for, given that they have the same seniority status as men or white employees; and again if d) there is evidence that individuals so affected have formally protested this treatment.*

EEOC and the Court: some conclusions. Fundamentally, the Supreme Court and the EEOC agree that in order for a seniority system to be considered discriminatory, it must first be shown that black or female employees do not get the same returns, in terms of promotions to higher wage jobs, for the same years of seniority when compared to men or white workers in the same bargaining unit. This is one type of proof of disparate effect. Evidence of current or past discriminatory job assignment practices within the bargaining unit is another. The structure of the seniority unit classification system then needs to be examined to see if substantial race or sex segregation by job ladder exists. If so, then the seniority

*In the context of a past history of discriminatory job assignment practices, the Commission may require that the company show that it has provided alternative training opportunities through which women or blacks can qualify for higher rated jobs, if, in fact, the segregated job ladders to which they had been confined had little or no training associated with them.

system is discriminatory as far as EEOC is concerned. If the current seniority system is no longer segregated, but had been so in the past, and if blacks or women still do not have equal access to high-wage opportunities because they have been unable to move out of low-wage seniority units, then EEOC says the seniority system itself and any contract provisions restricting mobility can be considered discriminatory. Indeed, EEOC goes even further to suggest that the informal operation of the seniority system may show it to be discriminatory, independent of what the contract says.

The Supreme Court's ruling in Teamsters v. United States et al. does not contradict the Commission's view that discriminatory intent can be inferred from a past history of segregation within the bargaining unit, or from evidence that the current classification scheme is substantially segregated. The Court, however, does take a second look at the structure of the seniority system to see if there is a rational application of a departmental or job-sequencing classification scheme in operation. The standard the Court applies in Teamsters suggests that if the classification scheme is irrational and substantially sex or race segregated, then there is proof that the seniority system from its inception was intended to discriminate. Doeringer and Piore give an example of just such a case where:

"apparently efficient training sequences (were) being interrupted to limit the advancement opportunities of persons in the lower-paying job classifications..."²²

These authors observe that the separated job ladders were segregated, with the low paying classifications going to blacks and the high paying ones to whites.

It is not apparent from the language of the Teamsters decision if the

Court meant that this condition applied only to the special case before it (that of two bargaining units) or whether the Justices intended to set a more general standard. If so, a more general application would imply that a seniority system must be shown to be "irrational" or "inconsistent" (the Court's terms) in addition to being segregated in order to infer that it is unlawfully discriminatory.

For systems enacted before the effective date of the Civil Rights Act, the Court is quite clear on one point, at any rate. There must be evidence that employment opportunities have arisen after the passage of the Act, and that blacks or women have been disproportionately excluded. If no new hires or promotions have occurred since July 2, 1965, then despite proof that the pre-Act seniority system was set up to discriminate, and indeed even remains segregated after that date, it is exempt from the law.

III. Case Description

For the specific case I have been studying, information on contract provisions and the history of the collective bargaining relationship between the employer and the union was gathered from published sources and from internal union documents. The workforce data were generated from company personnel records which were provided to the union in the course of its contract negotiations with that employer in 1976. The data base applies to the entire plant's production workforce employed as of March 1976. For each worker, information was available on: date of hire, current job title, hourly wage rate, seniority unit classification, and his/her race and sex. For comparative purposes, the wage distributions of the December 1972 workforce were also available, but only by sex, not race.

Workforce Characteristics

In March 1976, seven hundred and fifty workers were employed in blue-collar production jobs at the plant. Table 1 shows the race and sex composition of the workforce at that time. As is evident in this table, women constituted about thirty-five percent of the total number of production workers; black workers of both sexes made up seventeen percent; and fifty-three percent of those employed at that time were white men.

Table 1: Sex and Race Composition of the 1976 Workforce

	Men	Women	Total
White	398	222	620
Black	86	44	130
Total	484	266	750

Turnover from voluntary quits, retirements or deaths had been quite low over the preceding three-year period: ninety-four percent of those employed at the end of 1972 were still on board in 1976. There is no evidence that women or blacks exhibited higher rates of turnover than white males during this period.

There was, however, substantial employment growth during these years. Approximately two hundred and thirty more individuals were employed as of March 1976 than had been employed in December of 1972. Thus, the 1976 workforce was nearly one and a half times as large as that employed at the end of 1972.

Sixty-seven percent of all new hires since January 1, 1973 were non-minority males. In fact, some forty-two percent of the overall male workforce employed in 1976 were hired since that date, whereas over seventy-eight

percent of the female workforce had been hired before 1973. Indeed, by 1976, women had on the average accumulated one and a half years more continuous work experience than men. Nevertheless, women--and black--workers both averaged about six percent lower wages per hour than men and white workers, respectively.*

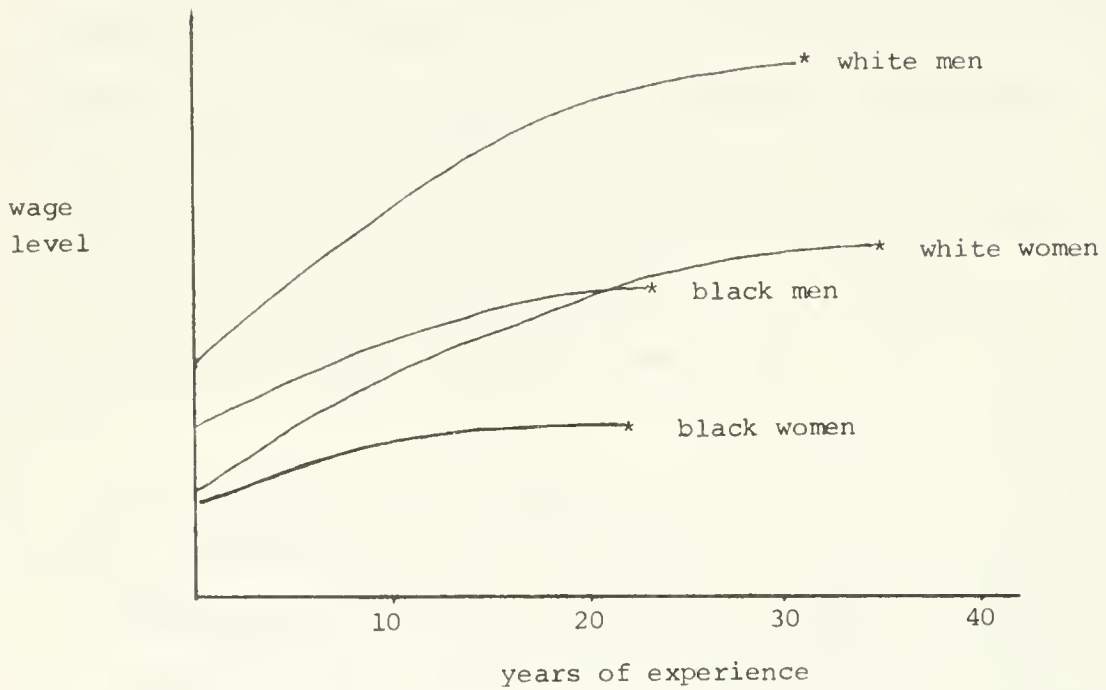
Figure 1 illustrates promotion paths for each sex and race group in the plant. The paths shown here are plots of expected wages as a function of years of experience in the plant, controlling for race and sex differences in initial levels and in progression rates.²³ As expected, wages of all workers increase with experience, but there are clear differences among the subgroups. Women get a much lower wage upon hire (i.e., with zero experience) than men do. And the maximum attained return to experience is lower for blacks than for whites.

In addition to their higher initial wage, white men progress at a slightly faster rate, such that the women are never able to make up that initial difference. Indeed, the wage gap between white men and women widens with increased experience. White women also start at a lower initial wage than black men, but progress at a faster rate until eventually, after twenty years, they catch up to them. After that point, white women experience greater returns to experience than do black men.

For black men and women, not only do they start at a lower wage than their white counterparts, but their promotion paths are flatter and shorter. Thus, for example, black women start at a lower initial wage and make smaller wage gains for each additional year of experience when compared

*See tables A-1 and A-2 in the appendix for the means and standard deviations of wages and years of experience, respectively, for each race and sex group.

Figure 1: Representative Promotion Paths by Sex and Race



*denotes the limit on returns to years of experience.

to white women. After she has accumulated some twenty-one years of service in the plant, there are no more gains associated with additional experience for a black woman. Both white men and white women continue to receive returns, in terms of higher wages, for additional years of experience until they have accumulated over thirty years in the plant. For black men and women, however, their marginal returns from experience cease after twenty-two years.

From the above description, one can see that it is quite likely that black workers have had a distinctly different set of promotion opportunities over a smaller and lower range of wage levels than those of white workers in the plant; and, at the very least, white women have suffered from an initial disadvantage, compared to white men, from which they never recovered. One needs to turn to an analysis of the seniority unit classification system and the seniority rules themselves to see how promotion opportunities facing all workers have been structured, in order to determine if these differences result from unequal access to high-wage job ladders or other factors.

Internal Labor Market Structure

In this plant, all production workers are covered by the same collective bargaining agreement, and are all potential members of the same local union.* The local is an affiliate of a national union, and the plant is one of several operated by a multi-plant employer. The company and the union have a national agreement which includes provisions that state the

*Theoretically speaking, not all of the workers employed in the plant may be required to be union members; however, the union does have a "modified union shop" agreement with the employer that requires all new employees to join the union within thirty days from their date of hire.²⁴

general principles by which seniority status is determined and how strongly seniority is to be considered by management with regard to promotions and layoffs. The local union negotiates its own supplement to the national agreement, specifying how the general provisions apply to this plant. The local can negotiate specific seniority unit classifications and restrictions on transfer rights but the seniority clauses of the national agreement cannot be modified by a local agreement in any way.

Unlike a craft-type union organization, this industrial, non-referral type union characteristically has had no formal say in the hiring and initial job assignment decisions made by management.²⁵ In addition, the organizing principles of the national union have historically emphasized that all non-managerial employees in the workplace should be included in the same bargaining unit and that there be no special distinctions made between more and less skilled workers in their collective bargaining rights. In some of the plants in this industry, there are in fact plant-wide seniority systems in effect, but in many others, there are not. There is simply no consistent industry-wide pattern.

In the national agreement between the company and the union, effective from 1973-76, there was a "strong" seniority clause which stipulated:

"In all cases of transfers and upgradings to fill open jobs, accumulated length of service will govern if the employee's experience, although not necessarily in the same type of work, indicates that he/she can do the job.*

Service, or seniority status, was defined in the contract to mean years of continuous service with the company. The contract further stated that all skills needed to adequately perform the job were expected to be learned on the job. Only under exceptional circumstances (e.g., in the event of

*This provision and that which defines seniority status have been included in the national agreement with the company since 1950.

unforeseen and rapid technological change) might the employer be justified in filling a non-entry level position from outside the incumbent workforce.

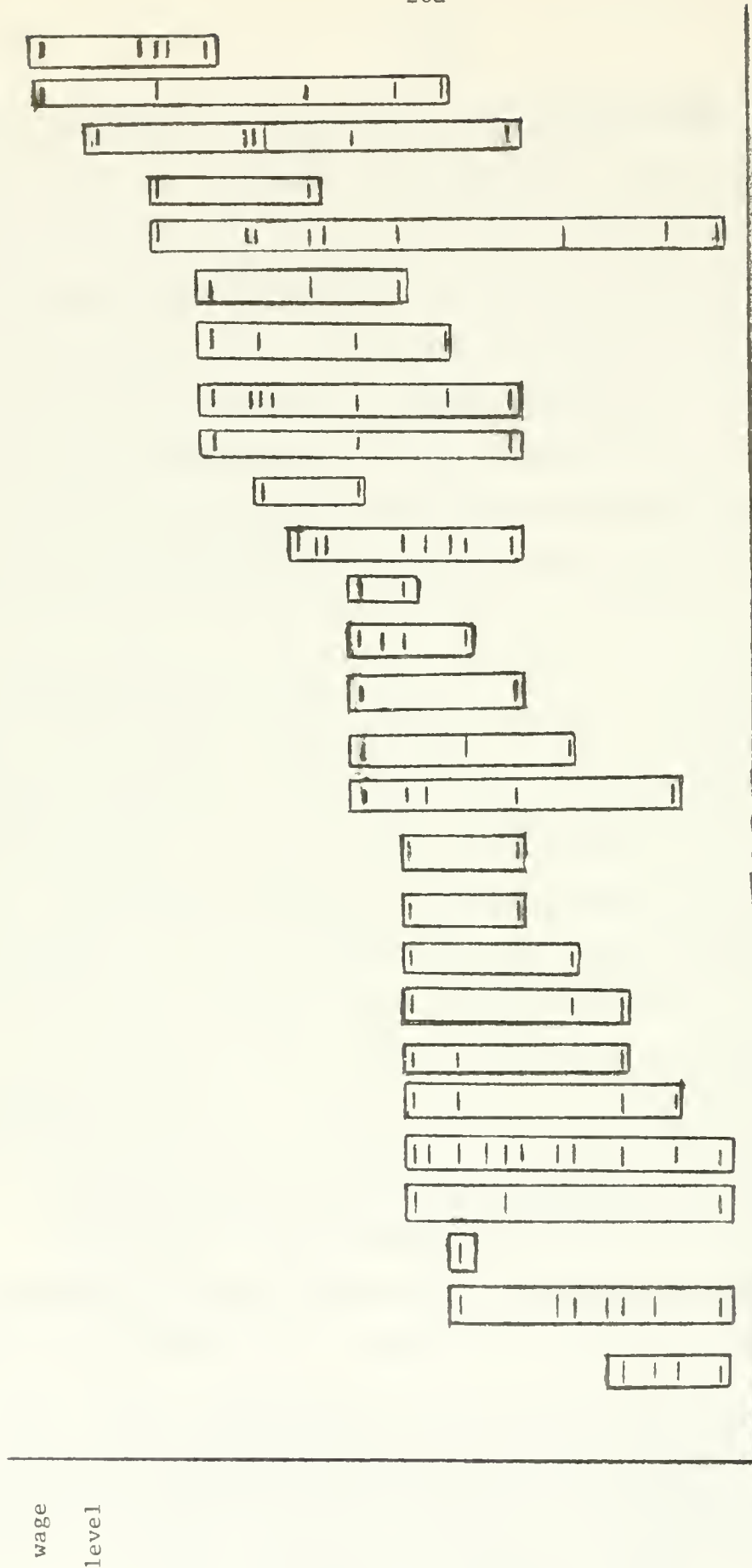
There are twenty-seven different seniority units in the plant and over one hundred different job titles. The 1973-76 local supplementary agreement restricted transfers between units, and there were no provisions for job posting and job bidding procedures plant-wide.* Thus, workers can be assumed to enter at the bottom of a seniority unit and progress on the basis of years of experience in the plant to higher wage positions within that unit. Only rarely would one expect to find lateral transfers occurring across units.

Within the plant, seniority units seem to vary along a number of important dimensions. There are differences in the wage levels of entry positions, the heights of promotion ladders, the sex and race compositions of the units, and how densely populated the units are. Figure 2 illustrates the structure of the wage opportunities associated with the various units. There are no seniority units that extend over the full range of the wage opportunities available in the plant. Some units only include jobs at one or two wage levels, and others include jobs at as many as seven different levels, extending over a total of twelve of the fifteen potential levels in the plant's overall wage structure. Even job ladders with the same "ceilings" can have different "floors."

The relative size of the seniority unit's membership is another important characteristic that distinguishes its wage opportunities. Promotion

*The exact nature of the restriction on transfer rights across units in the plant is not known. However, during the 1973-76 contract period, the national union had urged its local affiliates to negotiate plant-wide systems of job bidding and job posting in order to remedy any discriminatory treatment that might have occurred in the past. I have no evidence that this local changed its agreement accordingly in 1976.

Figure 2
Seniority Units With Their Constituent Jobs, by Wage Level



seniority units*
(arranged hierarchically by highest wage job)

* note: dashes within ladders indicate jobs with their associated wage levels

ladders may be of the same height and have the same entry level wage, but vary in the number of people vying for promotions at lower levels within the unit. More densely populated units can be expected to be more pyramid-like than less dense units with the same range of wage opportunities. Thus, being in a less dense unit with a higher entry level wage and a taller ladder should mean an individual assigned to such a unit has a better chance at getting a high wage job, ceteris paribus, than someone who is not.

If a seniority system is to be considered discriminatory, then there must be some evidence of race or sex segregation in the plant. In this case, in 1976, thirteen of the twenty-seven units had no women at all assigned to them, and seven had no black workers. There were only three units (all of them low-wage) from which white men were completely excluded. In addition to these three totally segregated and low-wage units, there were six other units that could be considered substantially segregated, i.e., with more than a fifty percent black or female membership. These numbers suggest that the classification system is indeed a highly segregated one, which may provide unequal promotion opportunities for blacks and women. In fact, seven of the eight lowest wage units in the plant (starting from the left, in figure 2) were found to have more than a sixty percent black or female membership.

The seniority system in the plant was enacted some time before the effective date of the Civil Rights Act. In the Teamsters ruling, the Supreme Court requires that even if a pre-Act seniority system was discriminatory on its face or in its intent, there still must be sufficient evidence of regular post-Act employment and promotion decisions to warrant the conclusion that women or blacks have suffered specifically from a post-Act practice, covered under the law. Clearly, in this plant, many new

employment and promotion opportunities have arisen during the 1973 to 1976 period alone. Because of restrictions on transfer rights and the presence of segregated jobs, incumbent blacks and women could never even be considered for some of these jobs.

As has been mentioned previously, there was considerable employment growth from January 1, 1973 to March 1976. In December 1972, forty-two percent of the workforce were women. By March 1976, they constituted only thirty-five percent of the workforce. Sixty-seven percent of all new hires during the intervening years were non-minority males. They were responsible for desegregating one all-female unit and reducing the racial and sexual imbalances in twelve others.

Eleven of the thirteen all-male units had also experienced employment growth. White males comprised thirty-eight of the forty-one new hires in these units. One of the seven seniority units that excluded blacks in 1976 was a newly created all-white female unit which had not existed in December 1972. Three of the remaining six all-white units experienced some employment growth and all of these new jobs went to white males.

Since transfers are restricted across units, incumbent blacks and women were not able to take advantage of these openings. While white male new hires may have changed the race and sex composition of certain low-wage units, their presence did not improve the economic position of the more senior women and blacks situated there. Permitting transfers to new jobs in other, higher wage seniority units, however, would have improved their promotion opportunities.

Not all blacks or women were confined to low-wage units. Some had been assigned to relatively tall ladders and the employment opportunities in these units expanded in the 1973-76 period as well. One needs to

examine whether the women and blacks in these units were able to take advantage of the higher wage opportunities compared to white men with the same seniority status. In any case, there has certainly been sufficient post-Act growth in employment and promotion opportunities occurring in these three years alone to show that incumbent black and female workers could still be suffering from post-Act discriminatory effects as a result of a seniority system initiated sometime before the effective date of the Civil Rights Act.

The question remains whether the seniority unit classification scheme is "rational," though segregated. The seniority units in this plant are not departmental in scope, nor are they all, strictly speaking, occupationally-related job clusters. There are some units that appear to have only occupationally-related jobs, where an individual progresses in a skill sequence. In other cases, skill-related jobs are separated into two or more different units. For example, a certain type of assembly job is found at the top of one low-wage ladder, and constitutes the entry-level position at the same wage rate in another unit. In another case, one "unit" consists of a single job, not a job ladder! There are so many job classifications in which job titles are similar but not exactly the same as others that the logic behind the classification scheme is not at all apparent. The available case material suggests that there is no consistent application of any one type of seniority unit classification system in effect at this plant and there is no particular industry-wide pattern which supports its continued use. The fact that there are interrupted job sequences and a pattern of segregation is indicative of a discriminatory system within the meaning of the Teamsters ruling in this case.

IV. A Structural Model of the Wage Determination Process

For production workers in an industrial plant, wages are assumed to be fixed, that is, attached to jobs. An individual's initial job assignment provides access to a certain set of promotion opportunities in the plant. Once this assignment occurs, if one assumes that workers cannot make lateral transfers across seniority units, then it follows that the only way a worker can increase his/her hourly wage relative to others in the plant is by getting a promotion to a higher wage job. Promotions are assumed to be strongly related to seniority status within a given unit. According to the contract, seniority is defined as years of experience in the plant. Thus, once seniority unit assignment is controlled for, one would expect wages to be a function of years of experience in the plant.

Seniority units in this plant have a number of characteristics which seem to be related to wage opportunities. The wage of the entry-level job, the height of the job ladder, the density, and the sex and race composition of the unit have all been identified as structural features of the seniority system which are related to higher- or lower-wage job opportunities in the plant. In this model, I propose measures for each of these characteristics. To examine whether women or black are treated unequally, race and sex interaction terms are also included. The hypotheses being tested are of three types: 1) do the structural variables included in the model have their expected effects on the wages of individuals? 2) do structural features of the system have a different impact on blacks' or women's wages than they do on whites' or men's? and 3) once seniority unit characteristics are controlled for, is there any evidence that blacks or women progress at slower rates than whites or men for the same years of experience? A formal description of the model, and the variables included in it, follows.

For each worker_i in job_k and seniority unit_j,

$$\begin{aligned} \text{WAGE}_{ik} = f(\text{EXPERIENCE}_i, \text{EXPERIENCE}_i^2, \text{DENSITY}_{ij}, \text{ENTRY}_{ij}, \\ \text{RANGE}_{ij}, \% \text{ FEMALE}_{ij}, \% \text{ BLACK}_{ij}, \text{SEX}_i * \text{EXPERIENCE}_i, \\ \text{SEX}_i * \text{EXPERIENCE}_i^2, \text{RACE}_i * \text{EXPERIENCE}_i, \text{RACE}_i * \text{EXPERIENCE}_i^2, \\ \text{SEX}_i * \text{DENSITY}_{ij}, \text{RACE}_i * \text{DENSITY}_{ij}, \text{SEX}_i * \text{ENTRY}_{ij}, \text{RACE}_i * \text{ENTRY}_{ij}, \\ \text{SEX}_i * \text{RANGE}_{ij}, \text{RACE}_i * \text{RANGE}_{ij}, \text{SEX}_i * \% \text{ FEMALE}_{ij}, \text{RACE}_i * \% \text{ BLACK}_{ij}) \end{aligned}$$

where:

(1) WAGE_{ik} = the *i*th worker's hourly wage rate in job_k and

(2) EXPERIENCE_i = the *i*th worker's cumulative years of experience in the plant, as of March 1976. EXPERIENCE is the indicator of a worker's seniority status. One would expect that the WAGE-EXPERIENCE relationship closely approximates an age-earnings profile for the cross-section of individuals in this plant. Thus, the variable EXPERIENCE is specified in the quadratic form $(\text{EXPERIENCE}, \text{EXPERIENCE}^2)$, where wages are assumed to increase with years of experience but at a decreasing rate.

(3) $\text{DENSITY}_j = 100 * N_j / N$, where N_j = the number of workers assigned to seniority unit_j, and $N=750$, the total number of workers employed in the plant. DENSITY is an indicator of the effect of crowding on promotion opportunities in the unit. The higher the percentage of the plant's workforce that is assigned to a unit, the more dense it will be. The denser the unit, the slower the progression rate is likely to be, and the harder it is for an individual to get to a higher wage job, ceteris paribus.

(4) ENTRY_j = Wage of the entry-level job in seniority unit_j. The higher the wage of the entry job at the bottom of a promotion ladder, then the higher one can expect the wage opportunities of all jobs in that unit to be.

(5) $RANGE_j = \text{Wage of the highest paying job in seniority unit}_j \text{ minus } ENTRY_j$. This is an indicator of the range of wage opportunities (or length of ladder) associated with a particular unit. The effect of RANGE on WAGE is somewhat ambiguous. Both short and tall ladders are associated with high-wage jobs. However, if the entry-level wage is held constant, the taller the ladder (or the greater the RANGE), the higher the wage opportunities associated with that unit will be.

(6) $\% FEMALE_j = 100 * F_j / N_j$, where F_j = the number of women in seniority unit_j, and N_j = the number of workers in seniority unit_j. $\% FEMALE$ is an indicator for how sex-segregated a seniority unit is. The higher the percentage of women in a unit, the more likely that unit is to have low-wage jobs in it. Conversely, the smaller the percentage of women in a unit, the higher the wages of the individuals in that unit are likely to be.

(7) $\% BLACK_j = 100 * B_j / N_j$, where B_j = the number of blacks in seniority unit_j, and N_j = the number of workers in seniority unit_j. $\% BLACK$ is an indicator for how race-segregated a seniority unit is. The higher the percentage of blacks in a unit, the more likely it is that the jobs in that unit will be low-wage.

$$(8) \text{SEX}_i = \begin{cases} 1, & \text{if female} \\ 0, & \text{if male} \end{cases}$$

$$(9) \text{RACE}_i = \begin{cases} 1, & \text{if black} \\ 0, & \text{if white} \end{cases}$$

The major structural variables in the model seem to measure quite independent characteristics of the seniority system. As shown in Table 2, the pairwise correlations among these variables are generally quite low. DENSITY and RANGE are the only two variables with a simple correlation coefficient greater than .5.

Table 2: Simple Correlations Among the Structural Variables

	DENSITY	ENTRY	RANGE	% FEMALE	% BLACK
DENSITY		-.01	.77	.49	-.27
ENTRY			.13	-.19	-.01
RANGE				.11	-.49
% FEMALE					-.09

DENSITY, % FEMALE, % BLACK and EXPERIENCE² are all expected to be negatively correlated with WAGE, ceteris paribus; whereas, ENTRY, RANGE and EXPERIENCE are expected to have positive effects on WAGE. Sex and race dummy variables are interacted with these structural variables and EXPERIENCE, EXPERIENCE². These interaction terms are included in the model to see if blacks or women are affected differently than whites or men by the seniority system. Certainly % BLACK and % FEMALE are two direct measures of discriminatory effects of the system which are likely to have a more negative impact on blacks and women, respectively, than they do on whites or men. However, in a complex system like this, there may be other sex or race differences in the impact of certain structural characteristics of the system on the individual's wage. Thus, sex and race dummies are interacted with the three other structural variables in the model, ENTRY, RANGE and DENSITY. To test for the presence of discriminatory treatment in promotions, sex and race dummies are also interacted with EXPERIENCE and EXPERIENCE².

V. Regression Results

Using ordinary least squares multiple regression techniques, the theoretical model presented in the previous section was estimated for all workers in the plant. Separate regressions were also run for sex and race stratified samples. For the samples of men and women only, variables interacted with SEX were excluded from the model. For the regressions run on the samples of blacks and whites, the estimated equations did not include variables interacted with RACE. The results from these various regressions are shown in Table 3.²⁶

On the whole, a structural model of the wage determination process in this plant appears to be a good predictor of the individual's wage. Nearly three-fourths of the variation in wages among all workers in the plant are explained by the variables included in this model, and all of the structural variables exert significant effects on WAGE, independent of the individual's seniority status.

ENTRY, RANGE and DENSITY all have the hypothesized effects on WAGE. As expected, the higher the wage of the entry-level job in a unit, the higher will be the wage of anyone assigned to it. The effect seems to be insensitive to race or sex. Once differences in the entry wage are removed, the taller the job ladder (i.e., the greater the RANGE), the higher an individual's expected wage. However, both women and blacks experience significantly smaller gains from assignment to taller units than the gains received by men and whites. Crowding (DENSITY) has the same effect on wages for both black and white workers--the denser the unit, ceteris paribus, the lower the individual's wage. Men experience a negative impact from assignment to a more crowded unit, but for women, there is no effect.

Table 31. Regression Results for the Total Workforce and for Sex and Race Stratified Samples

Structural Variables	All Workers		All Men		All Women		All Whites		All Blacks	
	Coefficient	T-Statistic	Coefficient	T-Statistic	Coefficient	T-Statistic	Coefficient	T-Statistic	Coefficient	T-Statistic
Constant	4.5097	--	4.547	--	4.286	--	4.5592	--	4.111	--
ENTRY	.0320	2.498**	.0304	2.010*	.0009	.032	.0251	1.838*	.107	2.904**
RANGE	.5622	11.99**	.5536	10.887**	.4455	4.577**	.5559	11.222**	.391	3.734**
DENSITY	-.0094	2.784**	-.0092	2.548**	-.0035	.854	-.0085	2.352**	-.0054	.616
% FEMALE	-.0072	9.281**	-.0074	8.828**	-.0028	2.991**	-.0078	9.083**	-.0041	2.34**
% BLACK	-.0102	9.457**	-.0114	9.344**	-.0022	.781	-.0106	9.419**	-.0073	4.569**
SEX*ENTRY	-.0054	.302	--	--	--	--	-.0055	.257	-.0448	1.432
SEX*RANGE	-.3098	4.001**	--	--	--	--	-.3568	4.016**	-.1057	.601
SEX*DENSITY	.0118	2.499*	--	--	--	--	.0136	2.624**	.0012	.095
SEX*% FEMALE	.003	2.734**	--	--	--	--	.0031	2.488*	.0026	1.179
RACE*ENTRY	.0134	.616	.0112	.427	.0309	.582	--	--	--	--
RACE*RANGE	-.2295	2.567*	-.2893	2.602**	-.1616	.739	--	--	--	--
RACE*DENSITY	.0085	1.603	.0141	1.971*	-.0017	.164	--	--	--	--
RACE*% BLACK	.0008	.396	.0021	.970	-.0039	.671	--	--	--	--
Seniority Status										
EXPERIENCE	.0248	6.582**	.0248	6.066**	.0111	1.865*	.0248	6.239**	.0245	3.071**
EXPERIENCE ²	-.0001	.926	-.0001	.902	.0001	.499	-.0001	.931	-.0003	1.092
SEX*EXPERIENCE	-.0125	1.787*	--	--	--	--	-.0154	1.969*	-.0192	1.109
SEX*EXPERIENCE ²	.0001	.523	--	--	--	--	.0002	.875	-.0012	1.756*
RACE*EXPERIENCE	.0033	.384	-.0076	.152	.0275	1.581	--	--	--	--
RACE*EXPERIENCE ²	-.0004	1.165	-.0001	.367	-.0014	2.045*	--	--	--	--
R ²	.75		.75		.64		.74		.70	
F-Value	111.43		106.08		34.52		131.26		21.16	
Sample Size	750		484		266		620		130	

*Significant at .05 level. For one-tailed test, t-crit. ≈ 1.645. For two-tailed test, t-crit. ≈ 2.326.

**Significant at .01 level. For one-tailed test, t-crit. ≈ 1.960. For two-tailed test, t-crit. ≈ 2.576.

Once having accounted for the basic structural features of this seniority system--as measured here by ENTRY, RANGE and DENSITY--there is no reason to expect that the sex or race composition of any seniority unit would have any further independent effect on wages. Yet that is precisely what I find. For all workers, expected wage is lower, the greater the percentage of blacks or women in the unit. Women are less adversely affected from assignment to units with higher percentages of women in them than are men. On the other hand, black workers in "blacker" units do no worse (and no better) than white workers in such units.

Thus, we seem to have direct evidence of race and sex discrimination in the structure of the seniority unit classification system itself. Moreover, even after all of this complex structure is held constant, women in the system still (as in figure 1) receive lower returns to years of experience in the plant than do men. There is no comparable differential for blacks vis-a-vis whites, once we have corrected for structure.

The results from the race and sex stratified equations generally confirm these findings. There are, however, some interesting within-group differences worth mentioning. Among men, an individual assigned to a unit with a high percentage of blacks or women will have a lower expected wage, ceteris paribus, than a man assigned to a unit that is nearly all-white or all-male. For women, on the other hand, only assignment to a unit with a higher percentage of women matters. A woman who is assigned to a unit that is mostly female will have a lower wage than a woman in a unit where the percentage of women is very small. There is no significant decrease in wage, for women, the greater the percentage of blacks in a unit. Women in units with high percentages of blacks do no worse (and no better) than women in units where the black percentage

is low.

The differences between white and black women are generally insignificant. Similarly, among blacks, men and women are treated by the system in about the same way. Being black, or being a woman, is what matters.²⁷ There is no advantage that women experience from assignment to units that are less crowded or from assignment to units with higher entry-level wages. Black workers do gain an advantage from being assigned to units with higher entry-level wages, but (like women) they do not experience any wage gains from assignment to less crowded units. White men, when compared to black men or white women in the sex or race stratified equations, have greater gains from assignment to units with higher entry-level wages and experience a distinct advantage from assignment to low-density units. In sum, these results suggest that women (of either race) and blacks (of either sex) are systematically assigned lower-wage jobs in this system than are white men. These patterns, taken together, constitute consistent statistical evidence of discrimination.

VI. Conclusions and Implications

The major findings from this analysis strongly suggest that promotion practices and the seniority system in operation at this plant discriminate against black and women workers. Women and blacks who have the same seniority status as men and white workers receive significantly unequal (smaller) benefits from assignment to taller seniority units. This particular finding supports the inference that there are discriminatory promotion practices at the plant, but it is not sufficient evidence

to infer that the overall seniority system is discriminatory as well.

Low-density units represent a high-wage "shelter" for white men, who, as a result, do not face as much competitive job bidding on the basis of seniority status as do women or blacks, for whom these shelters do not exist. This finding indicates that the seniority system does indeed provide benefits to white males not afforded to women or blacks. Under the disparate impact rule of the Griggs decision, such evidence would have been sufficient to permit an inference that the seniority system is discriminatory in effect. But disparate impact is not sufficient evidence under the recent Teamsters ruling of the Supreme Court. Discriminatory intent in the inception or maintenance of the system must also be established.

In the wake of the Teamsters decision, the EEOC provides the only guidance as to what might constitute discriminatory intent. Where there is some historical evidence of segregation within the bargaining unit, the fact that substantially sex-or race-segregated units exist Post-Act is sufficient proof of discriminatory intent when there is also additional evidence that women or blacks are adversely affected by the system.

In fact, the results of our statistical tests provide even stronger evidence than this. Independent of any bona fide structural feature of the seniority system (and any disparate impacts which might explain away the lower wages of blacks and women), units with high percentages of blacks or women have been shown to represent significantly lower-wage opportunities for all workers assigned to them. This finding is the most definitive evidence available that the seniority system is discriminatory.

Thus, not only are blacks and women adversely affected by the seniority system and by discriminatory promotion practices, but the degree

of race and sex segregation in the seniority unit classification system has been shown to be an important indicator that the seniority system is not bona fide, but illegally discriminatory as well.

There are, however, some questions this data analysis does not answer. From the case material available, there is not enough information to determine if the classification system in effect at the plant is "rational" or not. If the classification scheme could be shown to be efficient and consistent with the practices of other employers in the industry, but, at the same time, not tainted by a discriminatory purpose, then it might prove to be "rational" and thus, bona fide. When there is an historic pattern of segregation within a bargaining unit, however, discriminatory intent can be inferred. Thus, the question of whether or not the seniority system is rational may become moot when considered against the weight of the evidence in this case.

There is no way of telling from the available data if sex or race biases in job evaluation techniques are, in part, responsible for the lower wages of blacks and women in the plant. If such biases exist and are sufficiently large, a re-evaluation of the affected jobs could equalize wages between male and female workers, or between black and white workers in the plant. Without changes in the seniority rules, however, there would still be unequal employment opportunities by race and sex.

In the post-1972 period, the company embarked on a hiring policy which altered the sex composition of the plant's workforce. By 1976, women represented a smaller percentage of the workforce than they had in December 1972. "Affirmative action" hiring at the plant during this period has meant in large measure the substitution of white men for white women in traditionally female job classifications. This hiring policy has not improved the position

of women in the plant. The weight of the evidence in the case suggests that women, in fact, are adversely affected by the seniority system and promotion practices at the plant in more different ways than are blacks. The company's hiring policy has only served to mask these effects to the casual observer.

Actual wage differences among the various sex and race groups in the plant's workforce are not very large. Indeed, the race and sex differences observed in this case are the smallest among all the plants of this employer for which data were available. The findings of significant discriminatory patterns have broader implications in this context. If this plant represents the least discriminatory case, then a similar analysis of any one of the other plants of this employer should yield even more powerful results than those presented here.

This paper demonstrates that structural features of the internal labor market can be measured and tested for discriminatory effects. The approach followed here can be applied more generally to any complex work organization where formal rules play an important part in regulating the flow of individuals to different jobs. The fact that the data were available from the company in a format amenable to the statistical techniques used here is also an important finding in and of itself. It suggests that firms with computerized personnel files have the type of data in an accessible format for measuring the extent and type of discrimination in employment practices. Systematic evaluation of this type of data collected by large employers seems the most fruitful approach for the EEOC to pursue in class action cases.

Footnotes

1. Griggs v. Duke Power Company, 401 U.S. 430(1970).
2. Ibid.
3. "Comment: Title VII and Seniority Systems: Back to the Foot of the Line," Kentucky Law Journal, Vol. 64, 1975, pp. 116, 117.
4. Marcia Freedman, Labor Markets: Segments and Shelters (Montclair, N.J.: Allenheld, Osmun and Co., 1976), p. 114.
5. Lester C. Thurow, "Education and Economic Equality," The Public Interest, No. 28, Summer 1972, pp. 66-81.
6. Ibid., p. 71.
7. See: Ivar Berg, Education and Jobs: The Great Training Robbery (New York: Praeger Publishers, 1970), for an analysis of how educational credentials have become an increasingly important screening device for relatively low-skill jobs in the post-World War II period.
8. Peter Doeringer and Michael Piore, Internal Labor Markets and Manpower Analysis (Lexington, MA: D. C. Heath and Co., 1971), pp. 139, 140.
9. Ibid. See, in particular, Chapter 7, "Racial Discrimination in Internal Labor Markets," pp. 133-162.
10. Mary Stevenson, "Internal Labor Markets and the Employment of Women in Complex Organizations," Working Paper: Center for Research on Women, Wellesley College, January 1977.
11. See: Paul Pigors and Charles A. Myers, Personnel Administration (New York: McGraw-Hill, 8th ed., 1977), pp. 342-348, for a good description of the application of job evaluation techniques in wage setting policies of firms, particularly the steps in the "point-rating plan."
12. Doeringer and Piore, op. cit., pp. 146, 147.
13. Stevenson, op. cit., pp. 21, 22. See also: Winn Newman, "Combatting Occupational Segregation: Policy Issues III," in Martha Blaxall and Barbara Reagan, (eds.) Women and the Workplace (Englewood Cliffs, N.J.: Prentice-Hall, 1976), particularly, pp. 269-272, where he gives an analysis of a recent Title VII case involving sex-biases in job evaluation and job classification techniques.
14. Doeringer and Piore, op. cit., p. 141.
15. Stevenson, op. cit., p. 17.

16. Sumner Slichter, James J. Healey and E. Robert Livernash, The Impact of Collective Bargaining on Management (Washington, D.C.: The Brookings Institution, 1960), pp. 190-200.
17. Ibid.
18. Teamsters v. United States et al., U.S. Law Week 45 LW 4514 (1977).
19. Ibid., 45 LW 4511.
20. "Interpretive Memorandum of EEOC on Supreme Court Rulings in Teamsters vs. U.S. and United Airlines vs. Evans," Daily Labor Report, No. 134, July 12, 1977, pp. D1-2.
21. Ibid.
22. Doeringer and Piore, op. cit., p. 141.
23. I estimated an equation for all workers, where an individual's hourly wage is assumed to be a function of the years of experience he/she has accumulated in the plant. In that regression, the wage-experience profile was assumed to approximate the quadratic form of the typical age-earnings profile. Sex and race interaction terms with sex and race dummy variables were included in the model, where sex=1 is female, and 0 if male; race=1 if black and 0 if white. Results from that estimating procedure, using OLS multiple regression techniques, are shown below. T-statistics are shown in parentheses:

$$\begin{aligned}
 \text{Wage} = & 4.6808 + .0498 \text{ Experience} - .0008 \text{ Experience}^2 \\
 & \quad (9.066) \quad \quad \quad (4.270) \\
 & - .0145 \text{ Sex*Experience} + .0003 \text{ Sex*Experience}^2 \\
 & \quad (1.392) \quad \quad \quad (.787) \\
 & - .0175 \text{ Race*Experience} + .0001 \text{ Race*Experience}^2 \\
 & \quad (1.351) \quad \quad \quad (.257) \\
 & - .3143 \text{ Sex} - .1693 \text{ Race} + .1522 \text{ Sex*Race} \\
 & \quad (4.818) \quad (2.344) \quad (1.913)
 \end{aligned}$$

$$R^2 = .39 \quad \quad \quad F\text{-value} = 53.35$$

The representative promotion paths shown in figure 1 in the text are derived by substituting values into this equation and plotting the results predicted for each race and sex group. From the regression results, I also computed a maximum, or local limit, on the marginal returns to experience expected for each group. The computations are shown below:

Assume that, W=wage, and E=years of experience. (1) The first order condition for a maximum is $\frac{\partial W}{\partial E} = 0$. (2) The second order condition for a maximum is $\frac{\partial^2 W}{\partial E^2} < 0$. It follows then:

1. For white males: $W = 4.6808 + .0498E - .0008E^2$

$$(1) \frac{\partial W}{\partial E} = .0498 - 2(.0008)E = 0$$

$$(2) \frac{\partial^2 W}{\partial E^2} = -.0016 < 0$$

(3) $E = 31.125$ is a maximum.

2. For white females:

$$W = 4.6808 - .3143 + (.0498 - .0145)E + (-.0008 + .0003)E^2 \\ = 4.3665 + .0353E - .0005E^2$$

$$(1) \frac{\partial W}{\partial E} = .0353 - 2(.0005)E = 0$$

$$(2) \frac{\partial^2 W}{\partial E^2} = -.001 < 0$$

(3) $E = 35.3$ is a maximum.

3. For black males:

$$W = 4.6808 - .1693 + (.0498 - .0175)E + (-.0008 + .0001)E^2 \\ = 4.5115 + .0323E - .0007E^2$$

$$(1) \frac{\partial W}{\partial E} = .0323 - 2(.0007)E = 0$$

$$(2) \frac{\partial^2 W}{\partial E^2} = -.0014 < 0$$

(3) $E = 23.07$ is a maximum.

4. For black females:

$$W = (4.6808 - .3143 - .1693 + .1522) + (.0498 - .0145 - .0175)E \\ + (-.0008 + .0003 + .0001)E^2$$

$$W = 4.3494 + .0178E - .0004E^2$$

$$(1) \frac{\partial W}{\partial E} = .0178 - 2(.0004)E = 0$$

$$(2) \frac{\partial^2 W}{\partial E^2} = -.0008 < 0$$

(3) $E = 22.25$ is a maximum.

24. Gordon F. Bloom and Herbert R. Northrup, Economics of Labor Relations (Homewood, Ill.: Richard D. Irwin, Inc., 8th ed., 1977), pp. 174, 175.
25. Peter Doeringer and Michael Piore, op cit. See pp. 47-55, for the distinctions they make between craft and enterprise (i.e., industrial) types of internal labor markets. In the craft type organization, the trade union controls entry and refers members to the employer for hire. In the enterprise type, an industrial union does not make hiring or employment referral decisions, as a general rule. In the latter, company managers make initial hiring and job assignment decisions.
26. A one-tailed statistical test for the significance of a coefficient is conducted where there was a prior hypothesis about the expected direction of the estimated parameter on wage. Two-tailed tests are conducted on the parameters estimating sex and race differences in the impact of the structural features of the system. There were no well-developed hypotheses as to the expected direction of these effects. Table A-3 in the appendix details the null and alternative hypotheses being tested for all of the parameters estimated in the model.
27. The fact that black women do not experience any significantly different impacts from structural features of the system when compared to either black men or white women may be due to a problem of multicollinearity among certain variables in these two equations. For the sample of women, RACE*DENSITY is highly intercorrelated with RACE*ENTRY and RACE*RANGE. For the sample of blacks, SEX*ENTRY is highly intercorrelated with SEX* % FEMALE and similarly, SEX*DENSITY is highly correlated with SEX*RANGE. The high intercorrelations among these variables (all in excess of the multiple R value for the equations) suggests that for black women, there is little variation in the RANGE, ENTRY and DENSITY of the units to which they are assigned. Thus, it is quite difficult to separate out any significant independent effects the different characteristics these units might have.

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Appendix Tables

Table A-1: Mean Wages and Standard Deviations by Race and Sex

	Men	Women
White	\$5.021 (.519)	\$4.699 (.362)
Black	4.705 (.377)	4.445 (.292)

Table A-2: Mean Years of Experience and S.D. by Race and Sex

	Men	Women
White	10.057 (10.383)	12.440 (8.044)
Black	8.643 (7.718)	7.445 (7.073)

Table A-3: Hypothesis Tests for the Parameters Estimated
in the Structural Model of Wage Determination for
the Plant as a Whole

(Null Hypothesis: $b_i=0$)

<u>Variable Name</u>	<u>Alternative Hypothesis</u>	<u>Type of Test</u>
<u>Structural Variables</u>		
ENTRY	$b > 0$	one-tailed test
RANGE	$b > 0$	" " "
DENSITY	$b < 0$	" " "
% FEMALE	$b < 0$	" " "
% BLACK	$b < 0$	" " "
SEX*ENTRY	$b \neq 0$	two-tailed test
SEX*RANGE	$b \neq 0$	" " "
SEX*DENSITY	$b \neq 0$	" " "
SEX* % FEMALE	$b \neq 0$	" " "
RACE*ENTRY	$b \neq 0$	" " "
RACE*RANGE	$b \neq 0$	" " "
RACE*DENSITY	$b \neq 0$	" " "
RACE* % BLACK	$b \neq 0$	" " "

Seniority Status

EXPERIENCE	$b > 0$	one-tailed test
EXPERIENCE ²	$b < 0$	" " "
SEX*EXPERIENCE	$b < 0$	" " "
SEX*EXPERIENCE ²	$b < 0$	" " "
RACE*EXPERIENCE	$b < 0$	" " "
RACE*EXPERIENCE ²	$b < 0$	" " "

