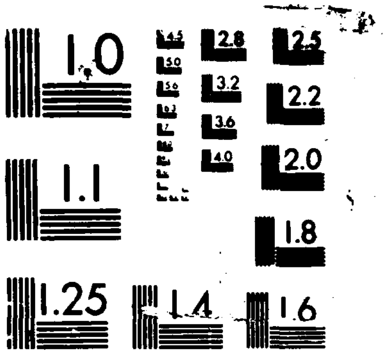
AD-A181 946 HOW MINORITIES CONTINUE TO BE EXCLUDED FROM EQUAL 1/1
EMPLOYMENT OPPORTUNITIE (U) JOHNS HOPKINS UNIV
BALTIMORE MD CENTER FOR SOCIAL ORGANIZATIO
UNCLASSIFIED J H BRADDOCK ET AL APR 87 TR-ONR-2 F/G 5/9 NL


1.0
4.5
5.0
5.6
2.8
2.5
3.2
2.2
3.6
4.0
2.0
1.1
1.8
1.25
1.4
1.6

MICROCOPY RESOLUTION TEST CHART

DTIC FILE COPY

12

Center for Social Organization of Schools

DTIC
ELECTE
JUN 17 1987
S D
D

AD-A181 946

Final Report

April, 1987

HOW MINORITIES CONTINUE TO BE EXCLUDED FROM EQUAL EMPLOYMENT OPPORTUNITIES: RESEARCH ON LABOR MARKET AND INSTITUTIONAL BARRIERS

Jomills Henry Braddock and James M. McPartland

DISTRIBUTION STATEMENT A
Approved for public release;
Distribution Unlimited

CENTER STAFF

Edward L. McDill, Co-Director
James M. McPartland, Co-Director

Karl L. Alexander
Henry J. Becker
Barbara A. Bennett
Jomills H. Braddock II
Barbara S. Colton
Russell L. Dawkins
Doris R. Entwisle
Joyce L. Epstein
Anna Marie Farnish
Denise C. Gottfredson
Gary D. Gottfredson
Edward J. Harsch
John H. Hollifield
Lois G. Hybl
Nancy L. Karweit
Melvin L. Kohn
Nancy A. Madden
Alejandro Portes
Robert E. Slavin
Carleton W. Sterling
Robert J. Stevens
Tammi J. Sweeney
L. Thomas Webb

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS
BEFORE COMPLETING FORM

1. REPORT NUMBER
TR-ONR-2

2. GOVT ACCESSION NO.
AD-A181946

3. RECIPIENT'S CATALOG NUMBER

4. TITLE (and Subtitle).
How Minorities Continue to be Excluded from Equal Employment Opportunities: Research on Labor Market and Institutional Barriers

5. TYPE OF REPORT & PERIOD COVERED
Final Report

6. PERFORMING ORG. REPORT NUMBER

7. AUTHOR(s)
Jomills Henry Braddock II
James M. McPartland

8. CONTRACT OR GRANT NUMBER(s)
N000014-84-K-0007

9. PERFORMING ORGANIZATION NAME AND ADDRESS
Center for Social Organization of Schools
Johns Hopkins University
Baltimore, Maryland 21218

10. PROGRAM ELEMENT PROJECT, TASK AREA & WORK UNIT NUMBERS
NR 170-968

11. CONTROLLING OFFICE NAME AND ADDRESS
Office of Naval Research
Organizational Effective Group (Code 4420E)
Arlington, Virginia 22217

12. REPORT DATE
April 1987

13. NUMBER OF PAGES
75

14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)

15. SECURITY CLASS. (of this report)
Unclassified

15a. DECLASSIFICATION DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited. Reproduction in whole or in part is permitted for any purpose of the U.S. Government.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Organizational Equity; Affirmative Action; Race Relations; Career Mobility

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Barriers to equal occupational opportunities for minorities are examined at three stages of the employment process: the job candidate stage, the job entry stage, and the job promotion stage. Using the authors' recent survey of 4078 employers covering a nationally representative sample of jobs, four types of exclusionary barriers are investigated: "segregated networks" at the candidate stage, "information bias" and "statistical discrimination" at the entry stage and "closed internal markets" at the promotion stage. (over

A

20. ABSTRACT (continued)

Practical implications are drawn for equal employment opportunity policies directed toward occupational processes and employment outcomes.

How Minorities Continue to be Excluded from
Equal Employment Opportunities:
Research on Labor Market and Institutional Barriers

Jomills Henry Braddock and James M. McPartland

Johns Hopkins University

Final Report

April 1987

DTIC
COPY
INSPECTED
7

Accesion For
NTIS CRA&I ☑
DTIC TAB ☐
Unannounced ☐
Justification
By
Distribution /
Availability Codes
Dist | Avail and / or Special
A-1

Work on this report was supported by research grants from the Organizational Effectiveness Group, Office of Naval Research (N000014-84-K-0007), and by the National Institute of Education, U.S. Department of Education (NIE-G-83-0002). The two authors share equal responsibility for the preparation of this report; the opinions expressed do not necessarily reflect the position or policy of the sponsoring agencies and no official endorsement should be inferred.

This article will appear as one of two lead articles along with nine commentaries and authors' responses in a special issue of the Journal of Social Issues (in press).

How Minorities Continue to be Excluded from Equal Employment Opportunities: Research on Labor Market and Institutional Barriers

Jomills H. Braddock II and James M. McPartland
Johns Hopkins University

ABSTRACT

Barriers to equal occupational opportunities for minorities are examined at three stages of the employment process: the job candidate stage, the job entry stage, and the job promotion stage. Using the authors' recent survey of 4078 employers covering a nationally representative sample of jobs, four types of exclusionary barriers are investigated: "segregated networks" at the candidate stage, "information bias" and "statistical discrimination" at the entry stage, and "closed internal markets" at the promotion stage. Practical implications are drawn for equal employment opportunity policies directed toward occupational processes and employment outcomes.

How Minorities Continue to be Excluded from Equal Employment Opportunities: Research on Labor Market and Institutional Barriers

Jomills H. Braddock II and James M. McPartland
Johns Hopkins University

Employment equity policies have been the subject of fierce debates for many years in this country. Arguments have ranged widely in areas of political philosophy, constitutional law, and socio-economic theory (for example, Glazer, 1975; Maguire, 1980). Disagreements have been particularly strong about the preferential affirmative action policies begun in 1965. Rather than review here the various directions of the debates or rehash the opposing sides, this paper will present statistics on current labor market processes that can be used to assess the continuing need for strong policies of equal employment opportunities.

Statistics have frequently been used to evaluate the extent of employment discrimination but they have rarely been used to help us identify the specific barriers that may unfairly inhibit the job chances of women or minorities. Thus, we have numerous statistical studies that estimate the size of sex or race gaps in occupational attainments such as income or job level. The authors of these studies usually try to first statistically control on other characteristics of workers that affect occupational success, such as educational attainment or community location, then they interpret any residual sex or race gap as the result of "discrimination", or the absence of a residual gap as evidence that "discrimination" is a thing of the past. Social scientists often disagree about what variables should be measured and controlled in estimating race or sex occupational gaps, and there are many other technical problems with using such residual statistics to estimate discrimination (McPartland & Crain, 1980). But in the end this use of statistics does not inform discussions of what particular kinds of policies may be needed to combat discrimination because the specific barriers that may stand in the way of fair employment chances are not assessed directly.

The statistics we will present should better inform discussions of particular policy alternatives. Using our recent national survey of 4078 employers, we will describe the distribution of actual practices used in recruiting for and filling different kinds of jobs, and we will identify the practices that have a differential impact on the probability that minorities will wind up in the job. We will also review major theories that have described specific racial-exclusionary processes in employment and we will use our data to assess the empirical validity of these ideas.

Following the research results, we will draw implications for practical programs and policies. We will recommend specific kinds of programs to address the particular employer practices we have empirically identified as unfair employment barriers for minorities. Also, we will use our statistical descriptions of the most common employer practices in recruitment, selection, and promotion for different kinds of jobs to comment on the points in the employment process where different broad policy approaches seem most appropriate, including policies of affirmative action, enforcement of EEO complaints, and voluntary employer programs.

Race Barriers at Different Employment Stages

Blacks and Hispanics can face special employment difficulties at different stages of the occupational process because they are members of a racial or ethnic minority. Barriers can appear at the job candidate stage when employers are recruiting the pool of candidates for job openings, at the job entry stage when an individual is actually selected to fill the vacancy, and at the job promotion stage when transfers are made within a firm to fill spots at higher-levels. We will examine each stage in turn by describing the distribution of employer practices for different kinds of jobs and analyzing the differential impact on individuals from minority groups of certain employer actions. Evidence will be drawn from previous research and from our recent national survey of 4078 employers that covers public and private sector jobs held by a representative sample of workers from major sex, race and education subgroups. (The Appendix describes the national sample of employers being used and the method for defining subcategories of jobs.)

We will focus on the barriers faced by race and ethnic minorities that do not derive from educational deficiencies or sex discrimination in occupations. To be sure, those factors produce major income and occupational inequities and require major public programs in their own right (Aaron & Lougy, 1986; Bielby & Baron, 1986; Reskin & Hartmann, 1986; Wilson, 1978). But this paper will focus primarily on issues of fairness for race and ethnic minorities at different employment stages by investigating employer practices within subcategories of jobs defined by the sex compostion and educational attainments of their current workers.

The Job Candidate Stage

A qualified person's chances for employment in the most desirable job openings begins with finding out about those vacancies and becoming part of a pool of candidates. To determine whether minorities have a fair chance at the job candidate stage, we need to learn how employers most commonly recruit candidates for different kinds of jobs and to assess whether minorities have equal access to these recruitment channels.

Our recent national survey of 4078 employers shows that the type of job to be filled strongly influences the variety of recruitment methods frequently used by employers. At the same time, informal recruitment methods that rely upon social networks of information are among the most frequently used methods for all job types (see Appendix Tables 2 and 3, rows 1 through 10).

Employers are usually not disposed to spend much time or money in recruiting for lower-level jobs that do not require any college education. The most convenient and inexpensive methods dominate employer practices for these jobs. In order of their frequency of use and value for employers, the most important methods include unsolicited "walk-in" applications, informal referrals from current employees, and public employment agencies (see also Becker, 1977; Lippman & McCall, 1976; Rosenfeld, 1975). Apparently employers can get enough qualified applicants for most lower-level jobs by doing nothing more than placing a job opening sign at their establishment, passing the word to their current work force about the vacancy or making a call to the local public employment agency. Other recruitment methods, such as placing ads in local media, are used less frequently and much less frequently than when recruiting to fill higher-level jobs. A similar picture of domination by informal and inexpensive methods emerges from parallel studies of the job search practices of individuals who do not have any college education. These individuals most frequently rely on "word of mouth" job information from friends and relatives and make direct "walk-in" applications for work (Baker et al., 1984; Granovetter, 1972, 1984; Mangum, 1974; Parnes et al., 1970, U.S. Department of Labor, 1975, 1976).

Employer recruitment methods vary much more for upper-level jobs, but the informal methods remain as major sources of college-educated job candidates. Employers will often spend the time and money to seek college-educated job candidates from college placement services, media ads, professional organizations and private employment services, but our recent survey indicates that informal referrals from current employees and unsolicited walk-in applications are also among the most frequent and most important employer methods for creating college-educated candidate pools (Appendix Tables 2 and 3).

Thus the use of informal social networks is a principal method through which employers with job openings are brought together with individual job seekers from outside the firm. How do minorities fare at this job candidate stage? Social scientists have long suspected that blacks are denied equal access to the most valuable informal sources of job information. They have reasoned that black job seekers are primarily tied to social networks composed of other blacks who, on the average, will not be as well situated to know about many desirable job openings as the members of the social networks used by white job seekers (Crain, 1970; McCall, 1972; Rossi et al., 1968, 1974). Thus, an important minority exclusionary barrier which we will call "social network segregation" has been hypothesized to operate at the job candidate stage.

Several empirical studies support this view, although most previous research has not included direct measures of the kinds of informal social networks that link job seekers to job vacancies. One set of studies examined firms with different racial compositions. In 1967, Rossi and his co-workers (1968, 1974) surveyed 434 personnel managers of the largest employers in 15 major cities to investigate factors that are related to the number of blacks who applied for work and were hired for recent vacancies at three different job levels. The authors argued that the past employment practices of a firm, as measured by the percentage of blacks in their current work force, could be used to indirectly assess the importance of social networks in the job recruitment process. According to the authors, if the current racial composition of a firm is the best predictor of the rate of recent black applications, we would have indirect evidence that the social networks through current black employees provide an important recruitment channel to reach potential new black applicants. They found that the percent black in a firm's current work force is indeed a strong predictor of the probability that blacks had recently applied for work at the firm, after statistically controlling on other characteristics of the firm and the labor market (including the racial composition of the city in which the firm was located).

An analogous result is reported by Becker (1980), who used the Equal Employment Opportunity Commission national survey of the racial composition of firms to show that the racial composition of an establishment's work force at one occupational level is strongly related to its racial composition at other levels. This finding also supports the view that black employees in a firm provide useful informal links to other blacks in the labor market to become candidates for employment at the firm.

A second set of earlier studies examined the occupational consequences for blacks of attending segregated or desegregated elementary and secondary schools. If using segregated social networks during the job search process seriously impedes black employment in desegregated jobs and firms, blacks who graduate from segregated black schools -- who are thus most likely to have access to segregated networks only -- should wind up in racially segregated employment. Braddock and coworkers (1984), summarizing the results from five different national surveys conducted since 1970, report that black graduates from desegregated schools are significantly more likely to be employed as adults in desegregated places of work. Although these studies did not measure which graduates used friends to search for jobs, the authors argued that student access to desegregated social networks was a major explanation for the observed relationship between graduating from desegregated schools and entering desegregated work environments, especially since they had statistically controlled for differences in racial proportions in local labor markets.

Our recent survey of 4,078 employers permits more direct study of how social networks affect minorities' job chances because we have measures of employer recruiting practices, individual job search techniques and the employment outcomes that result from using different methods.

Table 1 highlights the results of multiple regression analyses that investigate the relationship between employers' use of the social networks provided by their current employees to recruit new workers and the likelihood that a job opening will be filled by white rather than minority workers. The multiple regression analyses for Table 1 also included measures that controlled for the percent white in the local labor market and the job sector, job sex and education compositions (see Appendix for details).

For college-degree jobs (positions usually filled by workers with a college degree), we find the chances are significantly greater that an opening will be filled by whites when social networks are used as a major employer recruitment method. But for middle-level lower-level jobs (positions usually filled by workers whose highest education level is either some college attainment or only a high school education), there is no sizeable or consistent employment benefit to whites or minorities that depends upon whether the employer recruits through social networks.

We believe that the racial composition of social networks tied to different jobs is the best explanation for the initial finding that employers' reliance on referrals from their current work force results in greater employment chances for whites only for higher-level positions. Accordingly, we will further examine qualitative differences in social networks tied to lower-level jobs to draw our final conclusions about informal barriers in these cases.

The measure of the frequency of employer reliance on informal networks used in Table 1 is likely to incorporate the qualitative advantages to whites of this recruitment method for college-level jobs because of the racial demography of current employment in these jobs. The current work force in most college-level jobs is predominantly white, so the informal social networks of relatives and friends linked to these jobs will also be predominantly white. Therefore, most college educated minorities will not have access to the white informal networks tied to these college-level jobs, and will be cut off from the candidate pools when informal word-of-mouth referrals from current employees is the primary recruitment method for these jobs, as shown in Table 1.

However the overall frequency of use of social networks is not a good measure of informal recruitment barriers at lower-level jobs, because despite smaller overall differences in the racial representations in lower-level employment, within the same education category of work white social networks may be tied to higher quality jobs than minority social networks. In other words, we could find no racial differences in overall employment rates for lower-level jobs that depend upon the employers' use of word-of-mouth referrals because both whites and minorities frequently find jobs through these methods -- although whites find better jobs than minorities in this way. As Lin (1982) has pointed out, in studying social networks in employment, we need to pay attention to how networks differ in their instrumental value due to how they provide access to different resources and positions. When whites are currently employed in better jobs than blacks of the same education level and informal networks of information about job openings follow racial lines, we need to study not just the frequency of use but the qualitative worth of different social networks to evaluate racial barriers for lower-level jobs.

We used job information from our recent survey of employers in combination with the National Longitudinal Survey of individuals that parallels our sample to study the details of social networks that black high school graduates used to search for jobs. To compensate for the lack of direct measures of the racial composition of the social networks used by black job seekers, we used the racial characteristics of the high school from which each individual graduated to identify their social networks as segregated or desegregated. Table 2 presents selected average job outcomes for black high school graduates who used segregated social networks, did not use any social networks, or used desegregated social networks. It shows that black high school graduates who used desegregated social networks to find their jobs are in the highest paying positions in firms and in jobs with the highest percent of white co-workers. Those who used segregated black social networks on the average are in the lowest paying positions in firms and in jobs with the lowest percent of white co-workers. Black high school graduates who did not use social networks to find their job fall in-between the other groups in pay level and desegregation of co-workers. Thus the value of social networks for finding good jobs by black male high school graduates depends upon the kind of social networks being used: segregated networks lead to poor paying, more segregated jobs (it is better on the average to depend on some other job search technique), and desegregated networks lead to better paying, less segregated work.

Based on the Table 1 results for higher-level jobs, the Table 2 results for lower-level jobs, and previous research that is consistent with these findings, we conclude that segregated social networks constitute an important racial barrier at the job candidate stage. Minorities often miss any chance to be hired in many good jobs because they do not have equal access to one of the most important employer recruitment channels that create the actual pool of candidates for the job openings. We find this problem continues to exist at all job levels, but it may be especially important for those lower-level jobs where employers' use of informal methods dominate their recruitment practices. For higher-level jobs, employers are more often willing to use a variety of recruitment methods, including the more expensive and time-consuming formal practices that do not seem to have the same racial biases as social network recruitment. Still, informal methods are a major source of job candidates for jobs at all levels, and minorities continue to have unequal access to good jobs because of the frequently segregated nature of these channels.

The Job Entry Stage

An employer selecting whom to hire from a pool of job candidates recruited from outside the firm usually has a mental list of the priority worker traits needed to perform the job and some information about each candidate with which to judge these traits. The selection process is much more difficult when the job applicants have never worked for the firm, because no direct information will exist within the firm on how each candidate performs on a job and gets along with supervisors and fellow-workers. In this case, an employer must rely either on references about each job candidate from other employers and educators or on data that can be obtained through the firm's use of tests, interviews and assessments in its own direct screening. Employers differ widely in the extensiveness of the information they use in choosing new employees from outside the firm.

Most employers first establish a minimum education level for eligibility for each job. Educational diplomas or degrees are used as an initial screening device for different jobs because employers believe a particular educational credential provides a "signal" of the minimum kinds of worker traits possessed by the individual who earned it (Spence, 1971). Although some economists question whether better-educated individuals are actually more productive in all job situations (Berg, 1970), most employers assume that individuals who have gone further in school are most likely to have desirable skills that are related to academic or learning tasks on the job and successful functioning in an organizational environment. In any case, requiring a minimum education level is an easy and inexpensive way to limit the field of job candidates and is usually the basis for the employer's first cut in the hiring process. Some have argued that requiring a candidate to have a general educational credential such as the high school diploma is discriminatory in cases where the credential has not been proved to predict specific traits needed in the job, especially since minorities in most localities are significantly more likely to have dropped out of school before achieving the required credential (U.S. Equal Employment Opportunity Commission, 1974). But even after an initial screening of candidates by education level has been made, other frequent selection practices have been hypothesized as unfairly excluding minority applicants from job opportunities.

The amount of information beyond the applicants' educational level used in the selection process will usually depend upon the importance of the job in the firm and the difficulty of finding candidates with the desired job traits. Certain common combinations of job traits sought by employers and information used in screening candidates can cause serious problems for qualified minority job candidates. Job entry barriers for minorities often occur because employers do not use the kinds of additional screening information that will give minority applicants an equal chance to demonstrate their qualifications on the high-priority job traits.

Job traits in demand

Our recent national survey of employers shows attitudinal traits are at least as important as educational training in hiring decisions for many jobs, especially jobs filled by high school graduates (See Appendix Tables A4 and A5). For example, dependability in coming to work regularly and on time, proper attitudes about work and supervisors, and the ability to get along well with work team members consistently top employers' lists of qualities they seek in filling lower-level entry positions (See also Committee on Economic Development, 1985; National Academy of Sciences, 1984; U.S. Department of Education, 1986). In our survey, employers usually report they do not need high levels of reading and math competencies for these positions, but they do expect basic literacy and computation skills and the ability to learn new things quickly on the job. Employers seem to be generally satisfied with the basic academic skills of most high-school graduate job applicants, but less than satisfied with their work attitudes and on-the-job learning abilities (Crain, 1984; McPartland, Dawkins, & Braddock, 1986a).

Good attitudinal traits are also a high priority for upper-level jobs, but other factors emerge: more advanced levels of language and computational skills and specialized knowledge become in high demand as well as the ability to deal with complex situations and quickly learn new things. Besides knowledge acquired from specialized college courses, employers look for good judgment and leadership potential among applicants who have college training and credentials (Appendix Tables A4 and A5).

The average employer seems to perceive important racial and ethnic group differences on these priority job traits. When generalizing about white and minority group workers of the same sex and education level, many employers see blacks as higher risk employees, in terms of both their attitudes about work and in their previous training in useful skills for the job. In an earlier survey of personnel officers conducted in the late 1960s, significant proportions agreed with derogatory statements about blacks' attitudes toward work when considering members of this racial minority group as potential employees (Rossi, Berk, & Eidson, 1974, pp. 278-279). Our recent national survey of employers provides evidence that employers are more likely to avoid hiring minorities in those jobs that emphasize academic achievement and thinking skills. After describing this result, we will present further evidence on whether the observed racial employment patterns go beyond measured individual differences in the job requirements being given high priority.

Table 3 highlights the results from multiple regression analyses that investigate the relationship between the percent white hired in a job and the importance rating that employers give to selected worker characeristics for the job. These regression analyses included measures to control for percent white in the local labor market, job sector, and job sex and education compositions. (see Appendix for details).

Whites are significantly more likely to be found in lower-level jobs (most often filled by workers whose education went no further than high school) that require both basic and advanced skills in reading and math, as well as in jobs that value quick learners and good judgment in complex situations. Whites are also favored in lower-level jobs that emphasize certain interpersonal attributes, such as client or customer relations, being able to get along with people as good team members, and providing direction or leadership in supervision.<*>

For upper-level jobs (most often filled by college graduates) statistically significant racial differences in hiring patterns disapppear for most of the job traits. But employers continue to show a significant hiring preference for whites in upper-level jobs that emphasize the most advanced academic and reasoning skills, including advanced reading, quick learning and good judgment.

These results do not indicate discriminatory behavior, _if_ employers are making hiring decisions based on actual individual differences on the desired job traits among the job candidates, and the minority candidates often fail to measure up in these individual assessments. For example, even though racial gaps have been closing in recent years on tests of academic skills, segregated schools with unequal resources for large proportions of minority students together with other disadvantages in learning environments continue to produce sizeable average differences between whites and minorities on these tests. Thus, it is conceivable that the racial differences in hiring for jobs that emphasize academic skills could primarily reflect the results of employers' assessments of the individuals who appear as candidates for these jobs. But, another possible process has been identified in employer selection that overlooks individual

---

<*> Our data did not allow a test of racial hiring diffferences in jobs requiring dependability and proper attitudes. Almost all employers rated these traits as very important, which left no variance on these items to analyze.

differences to produce an unfair racial exclusionary barrier.

When employers use negative group images rather than direct assessments of individuals in their selection process, the exclusionary barrier of "statistical discrimination" is said to exist (Aigner & Cain, 1977; Thurow, 1969, 1975). Employers will consider a group identifier such as sex or race in hiring decisions when they believe that the traits on which subgroups differ predict job performance and they are unable or unwilling to determine individual differences within subgroups on these traits. Thus, when information about individual differences is lacking, employers who use a group identifier in selection will expect to have a better statistical chance of getting a desirable worker because of their perception of average group differences on job-relevant traits. Usually, the use of race or ethnic identifiers in job selection means that a white will be chosen over a black or other minority applicant (Thurow 1969, 1975).

If a qualified minority job candidate cannot escape a negative racial group profile in being judged for employment, that individual is being denied an equal employment opportunity. This exclusionary barrier can come into play whether the employer perceptions are based on actual group differences or on entirely uninformed group stereotypes. But, to a minority who has individual qualifications well above the minority group average who is denied employment without those individual traits being considered, it will matter little whether the employer's group perceptions that cost him or her the job are true, partially true or not true at all.

We will look in two ways for evidence of the existence of "statistical discrimination." We will use data that measures both individual differences and racial hiring rates in jobs that emphasize selected worker traits to test whether the observed hiring results can be accounted for by individual differences alone. Then, we will examine the information employers actually use in selecting among candidates for different jobs to study the frequency of the conditions for statistical discrimination.

We can make some direct tests of the hypothesis of "statistical discrimination" because our employer survey information about the requirements and hiring outcomes in a national sample of jobs can be linked to a sample of individuals in each of the sample jobs, and we have measurements of each individual's race, sex, educational attainment and academic test score performance. Thus, we can investigate whether the jobs that whites and blacks hold are equally likely to emphasize academic skills in reading or math or general learning skills, after taking into account individual differences in test score performance on the same job requirements.

Table 4 presents the results of multiple regression analyses conducted on three subsamples of individual workers. The dependent variable is their employer's rating of the importance of a selected job trait, and the independent variables are the individuals' race, test score value in the same job trait, educational attainment, sex, and job sector. The three subsamples are defined by the education level of the majority of the workers in each individual's job. Each value shown in Table 4 is a regression coefficient for the individual race measure: A significant positive value indicates that white workers are more often found in jobs rated high on the selected trait, even after individual differences in the same trait are statistically controlled. This condition would be produced from "statistical discrimination" practices by employers -- it means that equally qualified blacks have not been hired with the same frequency as whites in jobs that emphasize the selected trait. A significant negative value indicates that black workers are overrepresented in jobs that are rated highly on the selected trait, given the same individual qualifications. This condition would be consistent with certain "affirmative action" programs that establish an acceptable job trait criterion level for hiring above which all candidates would be qualified and then hire some qualified blacks even though their individual scores might be below some white candidates not hired.

Table 4 provides consistent evidence of the existence of "statistical discrimination" for those lower-level (high school) jobs when academic and learning traits are highly valued. Occasional statistically significant positive values are also found for middle-level (some-college) jobs, suggesting problems of "statistical discrimination" may also occur in these cases. For the highest-level (college-degree) jobs, no values are statistically significant, but most have negative signs. Thus, we find no evidence for "statistical discrimination" in these jobs usually filled by college graduates, and there is a hint that hiring policies may admit some blacks whose tested level of academic skills is not at the same point as whites in the same jobs.

We have only been able to study "statistical discrimination" for a limited set of academic job traits on which individual data was available. There are numerous other traits that are often important for hiring decisions where qualified blacks may also be unable to escape employer group stereotypes in the selection decision. These include the work attitude dimensions and other characteristics that research has shown are highly valued and where racial group stereotypes are often held by employers. In the case of academic job traits, we conclude from Table 4 that "statistical discrimination" is often a significant problem for blacks who have not completed a college degree.

We can learn about possible exclusionary barriers at the job entry stage not only by studying how employers react to a candidates' race when different job traits are in demand, but also by describing how employers actually use information in their selection processes and establish the conditions for equal or unequal employment opportunities.

Information used in selection

Our recent survey of employers shows the types of information that are used most frequently and are most influential in employers' hiring decisions for jobs that recruit candidates at different education levels (see appendix Tables 2 and 3, rows 11 through 18). We find that job level influences both the type of information that is used and the general effort employers make to gather outside data.

For middle-level and upper-level jobs that require some college or a college degree, employers are often interested in the specialized knowledge that further education produces. They use screening information about the type and reputation of the applicants' college program, the applicants' grades in college, and recommendations from college officials. But even more important than information about educational training in the final decision of whom to hire for upper-level jobs is references or recommendations from previous employers. Employers want to know not only whether a candidate has the proper educational training, but also how the candidate has worked out in other actual job situations.

For most lower-level jobs, employers rarely use detailed specific information about an individual's education or skills to choose among applicants who have graduated from high school. In fact, the final screening process is often quick and superficial. Our research, consistent with previous studies, shows that only two sources of information are frequently used and highly valued in most hiring decisions for lower-level jobs: (1) impressions gained from the job application form or during the personal interview with the candidate, and (2) recommendations from previous employers when available (Bishop, 1986; Hollenbeck, 1984; McPartland, Dawkins, & Braddock, 1986).

It may be surprising that other information such as school records or tests of candidates are not used in the hiring process, but employers often have good reasons for not trying to get better information with which to screen their applicants for lower-level entry jobs.

Employers often have little time to gather outside information on job applicants at this level because openings often come without much notice (due to unexpected quits or moves of current employees) and vacancies must be filled quickly to maintain routine work flows. Employers who need to move rapidly cannot wait for schools to provide transcripts or recommendations, and in any case most schools are not well-equipped to provide records on graduates to employers (Hollenbeck, 1984; Bishop, 1986). Except for some clerical positions, written tests are infrequently used to screen for most jobs at this level (Freidman & Williams, 1982) because they can be costly and there can be uncertainties about their legal standing for hiring decisions (Tenopyr, 1981). Moreover, most school records or test information will pertain to academic and learning skills rather than to the attitudinal traits given highest priority by employers for most of these jobs. Worries about legal obligations in hiring processes may also hinder the value of checking references by telephone, because previous employers who are asked to serve as references may often provide only dates of service with no qualitative assessments, to avoid potential involvement in legal proceedings (Bishop, 1986). More generally, employers may simply be unwilling to invest much in screening for low-level positions because they feel new hires may not stay long in these spots and they can find equally good replacements from walk-in applicants who meet their established-minimum education level for the job (Kalleberg & Sorensen, 1979; Berg, 1981).

Even when outside information is actually used in the selection process, another type of exclusionary barrier has been cited that we can also comment on with our data. This barrier, which can be called "*information bias*," will occur when employers select among candidates by using specific information that minorities cannot provide with the same frequency or credibility. It can be argued that minorities' concentration in racially segregated neighborhoods and schools and in economically depressed local labor markets creates a racial bias in the information employers most frequently use to fill certain kinds of jobs.

Minorities may be at a special disadvantage when employers are interested in a candidate's previous employment experiences or in references and recommendations for a candidate from school or employment officials. Because of the higher youth unemployment rates in minority communities, minority job seekers will less frequently be able to list previous work experience on their job applications or to describe previous jobs during an employment interview. Because both employment application forms and interviews are especially important in the selection process for lower-level jobs, the disadvantages that minority youth experience from poor employment opportunities in their own communities can carry over into information bias in later job screening processes that use previous work experience for selection among applicants.

Another type of information bias can occur when the recommendations or references provided by minority applicants carry less weight with employers than the recommendations or references provided by white candidates. Due to segregation of schools and communities, white employers may be less familiar with a black school, a black clergy or a black firm that a minority individual may use for sponsorship of his or her job candidacy, or white employers may be more suspect of information provided by minorities due to stigma or stereotypes attached to minority sources. In a separate study conducted with our employer survey, it was found that employers gave special credibility and weight to minority graduates of suburban schools when they were asked when they might hire minority high school graduates in their firms. This result supports the argument that segregation introduces information bias into the screening process by assigning different credibility to employment sponsors of minority and white applicants.

The Job Promotion Stage

Some job vacancies are filled from within the establishment by finding suitable individuals from the current work force. Our employer survey covers a national sample of all types of jobs, including jobs filled by new hires from the outside, jobs filled from within by internal promotions or transfers, and jobs that have been filled both from within and outside the firm. We will use the survey data to compare promotion opportunities for minorities, and to investigate specific exclusionary barriers that have been cited for minority chances for advancement.

Finding Candidates for Internal Promotion

Employers who plan to fill a job vacancy from within the organization do not necessarily begin by *recruiting* a pool of candidates as they usually would when hiring from the outside. Internal promotions that do resemble the widespread recruitment used in outside hires are those for which a general announcement of job openings is made to current employees by posting a job vacancy notice and inviting applications. More often, specific current employees are in line for certain job openings, because of the way a firm internally organizes its jobs. In many of these cases, a career ladder will have been established within the firm so that lower-level positions are the training grounds for the next level, and the workers currently on these lower rungs automatically become the candidates for promotion when relevant vacancies occur.

If minority workers do not enter the firm in jobs that have training opportunities and are tied to upward career ladders, they will be excluded at the outset from chances for career advancement within the firm. This kind of exclusionary barrier due to the ways a firm organizes its jobs can be called "closed internal labor markets." Minorities may have particular difficulties in being initially hired into those entry jobs that provide training and advancement opportunities because, as we have seen, employers often tend to downgrade minorities' abilities as quick learners, a trait that would seem to be most valued for entry positions with growth potential. To directly test whether minorities are excluded at the outset from promotion possibilities, we analyzed data from our employer survey on internal recruitment methods.

On our survey of employers, we asked how often the following methods were used for different types of jobs: (a) inform current employees of the opening by posting or circulating a written vacancy notice; (b) go directly to a specific current employee to encourage that person to apply; or (c) offer the job directly to a specific current employee. The first method opens the application opportunity to all interested current employees. This method is more likely to be used by public employers than private employers (approximately 80 percent versus 50 percent of the time) and is more likely to be used in larger establishments. The other methods give some current employees the inside track for internal promotion opportunities, and are more likely to be used by private than public employers (approximately 35 percent versus 10 percent of the time) and by smaller establishments.

Table 5 shows the results of multiple regression analyses that estimate the relationship between each employer's internal recruitment method and the percent of white workers selected for the job, with statistical controls on the job sector, establishment size, racial composition of the local labor market, and sex and education level of job incumbents. The table shows statistically significant differences that favor white chances of being hired through internal transfers when employers go directly to specific employees to find applicants and when employees directly offer the job to a specific current employee. On the other hand, the probability that a minority worker will fill the job is significantly greater for jobs for which employers post or circulate a written vacancy notice.

These results indicate that minorities are more often deprived of the opportunity to apply for openings within their firm when these employment opportunities are withheld from the public channels of information or are wired to particular individuals who are favored for promotion or transfer. Our data do not show why employers use these exclusionary methods, so both intentional avoidance of potential minority candidates and unintentional consequences of internal career ladders are possible reasons (Feagin & Feagin, 1978; Fernandez, 1981; Sorensen, 1983, 1984). That is, white managers may give favorable treatment to candidates of their own race, or whites may be in line to fill vacancies because they dominate in the lower career-ladder positions that lead to later promotions. In any case, minorities appear to lose many opportunities to become candidates from within the firm for job openings when informal exclusive channels are used in the internal recruitment process.

Criteria for promotion

Given that minorities are frequently at an initial disadvantage in getting into the candidate pools for many internal promotions, is there evidence for additional structural barriers when the final selection for promotion is being made? Are there forces which make discrimination less likely when an employer selects from an internal candidate pool of current workers than from an external pool of outside candidates? Are there other forces which favor more equal employment selection opportunities in the cases of hiring from the outside? Sorensen (1984) has argued that internal labor markets are less subject to the economic market forces that can make discrimination costly to employers and tend to diminish discimination when employers compete in open markets for outside workers to fill their jobs. On the other hand, because employers will possess direct information on their current employees' actual job performance, they should be less likely to practice "statistical discrimination" -- judging individual minorities by characteristics of their group -- when internal selections are to be made. Several researchers have argued that the exclusion of women and minorities from positions that can lead to promotions within a firm is a major explanation for sex and race gaps in occupational attainments;

these arguments are almost always based on inferences from studies of general attainment models rather than from direct investigations of personnel practices (Baron, 1984, pp. 40-41). Our employer survey presents some research opportunities to look closer at this issue.

We asked employers what kinds of information they use when filling a job opening from within their firm, using a question that closely parallelled (with some additional categories) the question asked about selection information for external hires (see Appendix Tables A2 and A3, lines 19 through 28). Some types of information pertained more to lower-level jobs (especially seniority and union membership), and other types of information applied more to higher-level jobs (such as type of education), but the most important information overall was the job performance of individuals within the firm as indicated by production or sales records, performance ratings, and recommendations by supervisors or colleagues in the firm. In other words, when choosing among internal candidates for a job vacancy, the overriding factor is how well an individual has proved himself or herself by behavior within the firm. To be sure, to the extent that subjective evaluations are included in the performance ratings of individuals, prejudice can still distort the record of minorities (Butler, 1976; Feagin & Feagin, 1978). Also, some skills required for the promotion position may not need to be used in the lower-level jobs of the internal candidates, which still permits group stereotypes to influence selection decisions. The Pettigrew and Martin paper in this issue discusses other powerful interpersonal processes that can weaken the chances of a minority being selected for promotion even when the individual is initially situated in a job that could lead to promotions. Nevertheless, minorities who have been admitted to an internal candidate pool should experience less selection discrimination than those in external candidate pools, due to the availability of direct information about how they have actually performed within the employer's own firm.

Because our employer survey covered both a sample of jobs usually filled from the inside as well as jobs usually filled from the outside, we can contrast racial differentials in the two sets of jobs. Table 6 summarizes the results of these analyses which examined how the beginning hourly wage rate of jobs is related to the percent black in the job, controlling for the distribution of educational attainments of the workers in the job. This relationship between wage rate and percent black was estimated separately for jobs primarily filled from within the firm and jobs primarily filled from the outside, in different labor market sectors (male jobs and female jobs in the private and public sectors). In every comparison between internally and externally filled jobs, the difference in wage rates between jobs due to whether blacks or whites had been selected was smaller for jobs filled from within the firm. Thus blacks who make it into the candidate pool for internal selection seem to face less discrimination in achieving good jobs (at least good paying jobs) than blacks who are job applicants from outside the firm, controlling on education differences among the candidates.

In a study of a large public bureaucracy using different data and methods, Rosenbaum (1981) also identified racial gaps at the point of occupational entry as a more serious problem of discrimination than racial differences in occupational status after entry.

The research results do not mean there are no serious problems due to a candidate's race during internal selections. For example, we find negative salary differences associated with percent black for internally filled jobs in three of our four subgroups, and Rosenbaum's research also consistently finds negative salary gaps for long-term minority workers in his public sector research. But, it does appear in our study that when minority workers are given a chance to prove themselves on internal jobs with growth potential, they have fewer problems with discrimination than when they must rely on the selection information used for external hires. In our view, the most serious problem then becomes the lack of equal opportunity for minorities to enter those jobs that have the best training and advancement possibilities and that form the candidate pools for internal selection.

Practical Implications

Equal employment opportunity policies can be directed toward employment processes or employment outcomes. Policies to improve employment processes are aimed at specific employer practices in recruitment, selection and promotion that create unfair barriers for minorities. Policies about outcomes focus on the degree to which the actual racial/ethnic distribution of employees in a firm matches the distribution of each group in the local labor market with the required job traits. Outcome-based policies often use affirmative action goals and timetables to work toward a better race/ethnic match of a firm's work force and the local labor market demography. Either type of policy can be voluntary or enforced, depending upon the degree to which employers' actions are monitored and responded to by outside agencies. We will briefly review specific policies of each type that have been proposed, and we will comment on thier necessity and efficacy in light of our research results.

Implications for fair employment processes

Employer activities can be identified at each stage of the employment process that would make equal treatment more likely for all qualified potential candidates. Some of these ideas for improving the employment process go back to the 1960's and 1970's, and can be found in government guidelines (U.S. Department of Labor, 1978; U.S. Equal Employment Opportunity Commission) and in academic and professional books on the topic (Faegin & Faegin, 1978; Fernandez, 1975, 1981; Alvarez, Lutterman &

Associates, 1979). Some of these ideas have been developed recently to provide useful new directions.

At the recruitment stage, employers can avoid "word of mouth" or "walk-in" methods, clearly indicate the firm's EEO policy in advertisements and advertise in media specifically directed toward minorities, emphasize the firm's EEO policy with private employment agencies and list jobs at all levels with public employment agencies, and use community agencies that specialize in providing minority job candidates. Also, employers can develop closer working ties with high schools and community colleges, in order to work with school officials who can locate minority candidates and to use part-time, work-study, and summer job programs that will introduce potential long-term minority employees into the firm.

At the job selection stage, employers can use objective rather than subjective screening methods and ensure that these include only job-related and validated selection standards which do not require greater educational credentials or competencies than are actually needed to adequately perform the job. Detailed guidelines on the proper design, content, and use of application forms, interviews and screening tests for selection have been developed over the years.

Recent proposals suggest providing more complete accessible information on young adult applicants at the job selection stage. Schools could develop portable records of academic and non-academic accomplishments that their graduates can carry with them as job applicants. These records, called "career passports" (Charner, 1984) or "job search portfolios" (Bishop, 1986), include official information on a student's behaviors and accomplishments in school that can be used as indicators of job-relevant attitudes and skills in the job selection process. For example, a record of good school attendance would indicate to an employer that the applicant would not have absenteeism problems as an employee. A record of membership or leadership in school extra-curricular activities would imply that the individual would fit well into the work team. A transcript of academic courses and grades in this folder might help an employer appreciate the specialized knowledge a job applicant would bring to the firm, and written recommendations from school officials and instructors could draw attention to other competencies and positive attributes of the candidate. But this information must be available at the time of the screening process to be useful to the job applicant, so collecting it into a portable file that the job seeker brings directly to the employer when applying for the position is essential. If schools can help their graduates assemble such files, it should be especially useful to minority job candidates, who may face unique barriers when extensive objective selection information is not available.

At the promotion stage, employers can post and publicize all job openings to be filled internally and emphasize objective measurable performance factors in selection. Also, employers need to recognize that the problem of minority underrepresentation in higher level positions may begin at the job entry stage, because minorities' chances for advancement often depend upon receiving equal opportunity for training within the firm and beginning in a job that is tied to an upward career track.

Although all these suggestions are certainly worth pursuing to improve equal employment opportunities, our investigations of how specific employer practices are related to the probability of minority employment in jobs at different levels did not produce strong evidence that current variations in most employer practices had much impact. We separately studied each of the 28 practices listed in Appendix Tables A2 and A3. After controlling on the sex and education composition of jobs, few statistically significant and consistent findings identified particular employer recruitment, selection or promotion practices that produced underrepresentation or overrepresentation of minorities. With the exception of the results reported above concerning social networks for entry jobs and identification of internal candidates for job promotions, plus one other major exception, few relationships between specific employer practices and job racial composition were uncovered <*>.

The other exception involved the use of community groups in employer recruitment for outside candidates. Table 7 shows how minorities' chances of being hired improve when employers use community agencies to recruit applicants, even after the race

---

<*> We do not include the Tables is this paper that show the absence of consistent significant relationships for most employer practices. These Tables will be made available on request to other researchers.

composition of the local labor market and other job characteristics are taken into account. Although this recruitment method is used much less frequently than other methods (Appendix Table 2A line 7 shows that less than 15 percent of employers report that they used the method), our finding has important practical implications. When employers are committed to recruiting minority job candidates or are required to do so by affirmative action regulations, they can get practical help from a community agency such as a local branch of the Urban League or Opportunities Industrialization Centers that specialize in providing minority job applicants. Likewise, local agencies that become known as inexpensive and reliable placement services can help individual minority job seekers locate employment opportunities that they would not find in other ways.

Thus, except when employers are motivated to use specialized avenues to accommodate minority candidates, we do not find strong consistent evidence that the current range of variations in most employer recruitment, selection and promotion practices are related to differences in minorities' chances of employment. Under the present conditions that have produced this range of variations in employer practices, we were unable to find convincing evidence that most of the longstanding practical suggestions for simple or straightforward adjustments of current employer practices have resulted in reliable and sizeable improvements in equal employment opportunites.

Implications for outcome-based policies

We interpret the preceding results on the relationships between the frequency of specific employer practices and minority representation in different jobs as one important set of reasons that outcome-based affirmative action policies are required in employment. Although there are viable specialized methods to recruit and hire more minority qualified applicants when an employer is so inclined -- such as using relevant community agencies -- these methods are not frequently implemented and most other employer practices do not penetrate exclusionary barriers under the present conditions of weak employer regulations and incentives.

The need for strong outcome-based policies is best understood when we also consider the specific nature of the current barriers to equal employment opportunities and the absence of voluntary incentives for employers to confront them. Our research also indicates that exclusionary barriers (1) continue to restrict equal employment even in the absence of intentional discrimination, (2) are imbedded in the structure of labor markets and major institutions of society, and (3) are reinforced by the usual unregulated incentive systems for employers.

We find that many minorities continue to face the exclusionary barriers of segregated social networks, information bias and statistical discrimination in finding entry positions, and these barriers contribute to the problems of closed internal markets frequently faced by minorities within the firm. Minorities face special difficulties in the employment process not only because they are victims of past discrimination in educational and occupational opportunities, but also because of the specific barriers that qualified individuals often encounter at present because of their membership in a race or ethnic minority group. These barriers continue to unfairly exclude minorities even when there is no intention by employers to treat minorities any differently than other potential employees.

We find these barriers are kept in place in part because they are tied to the persisting racial segregation of schools and neighborhoods that persists in modern society and to the white perceptions of racial group differences that derive from unequal educational and employment opportunities of the past and present. Continued segregation supports the exclusionary barrier of social networks in finding job opportunities because the most serious inequalities occur when networks operate along racial lines. Segregation also can produce racial bias of information used in selection because white employers will be less familiar and less impressed with the references from segregated sources often used by minority candidates. Similarly, the practice of statistical discrimination, which introduces group perceptions of racial group differences into individual hiring decisions, is based on broad societal factors. Under current conditions, employers often use convenient group images, which are the product of past and continuing racial inequalities in education and other institutions, to make employment decisions in the absence of clear information about individuals.

Not only are the continuing barriers sustained by major institutions of American society, but there are few strong incentives for employers to overcome these barriers. Indeed, cost-efficiency motives contribute strongly to keeping these barriers in effect. We find that employers have strong incentives to use the simplest and least expensive methods for recruitment and hiring that will yield an effective work force. But the use of simple inexpensive methods often creates the primary conditions for racial exclusionary barriers in employment, such as the use of racial group indicators rather than individual traits in statistical discrimination, and the use of informal recruitment and selection methods invloving segregated networks and biased information.

It will often cost more for employers to find minority applicants and to obtain selection information that gives each individual a fair chance. But employers are unlikely to assume even modest added costs. Employers do have a strong desire to avoid errors of selecting individuals who will fail as employees, so they will invest in practices to avoid doing so. On the other hand, employers will usually experience no real losses when they discard candidates who would have been equally acceptable to those they actually hired, so employers are not often willing to invest their resources to be more fair to all potential candidates. Thus public policy cannot rely on the usual incentives of employers to penetrate exclusionary barriers and ensure that the rejection of an individual's job candidacy or the unequal access to pools of job applicants is not related to a person's race or ethnicity.

Because employers need to be strongly motivated to use the specialized methods that can produce qualified minority employees, we believe strong outcome-based policies are required. Because the barriers that unfairly exclude minorities continue to exist and are deeply ingrained in present American institutions, we also conclude that effective public regulatory actions in employment will be needed as long as racial segregation and stereotypes are so deeply embedded in major institutions of our society. And because employers usually do not have strong business incentives to surmount racial exclusionary barriers and in many cases follow incentives that produce likely conditions for some of these barriers, we also recommend outcome-based public policies that can overcome these labor market factors by requiring fair treatment in employment.

Table 1

The Effects of Employers' Use of Social Networks on the Probability that a Job is Filled by Whites, by Education Level of the Job, Controlling for Five Labor Market Variables.

	Employers Using Social Networks	Employers Not Using Social Networks	
College-Degree Jobs (N= 850)	.83	.75	
Some-College Jobs (N=1048)	.74	.72	(NS)*
High School Jobs (N=2396)	.64	.66	(NS)

---

* NS= not statistically significant at .05 level.

Table 2

Job Characteristics of Black High School Graduates Who Used Different Types of Networks in their Job Search (Private Sector).

Job Outcome	Used Segregated Networks	Did Not Use Networks	Used Desegregated Networks
Percent white of fellow workers	.462 (75)	.504 (277)	.560 (42)
Percent white in the firm	.523 (70)	.596 (252)	.694 (41)
Hourly Wage	$5.69 (78)	$5.74 (287)	$6.45 (41)

Table 3

Probability Job is Filled by Whites When Selected Worker Traits Are Important, by Education Level of the Job, Controlling for Six Job Conditions

Worker Trait	High School Jobs (n=2396) Trait Is Not Important	High School Jobs (n=2396) Trait Is Very Important	College Degree Jobs (n=850) Trait Is Not Important	College Degree Jobs (n=850) Trait Is Very Important	
Basic Adult Literacy	.59	.68	.83	.82	NS*
Advanced Reader	.63	.73	.74	.80	
Basic Arithmetic	.55	.71	.77	.79	NS
Excellent at Math	.64	.74	.77	.80	NS
Quick Learner	.56	.68	.65	.81	
Good Judgment	.55	.69	.69	.79	
Client Relations	.63	.70	.78	.78	NS
Good Team Member	.56	.67	.77	.79	NS
Can Supervise	.63	.70	.78	.79	NS

---

* NS = not statistically significant at .05 level.

Table 4

How White Workers' Jobs Differ from Black Workers' Jobs in the Importance Rating Given by Employers to Selected Job Traits, Controlling on Individual Differences in the Same Trait and Three Other Worker Characteristics, by Education Level of the Job.

(unstandardized regression coefficient; standard error in parentheses)

Job Trait Being Rated (dependent variable)	High School Jobs (n=2396)	Some-College Jobs (n=1048)	College-Degree Jobs (n=850)
Quick Learner	.109 (.031)	.065 ns* (.041)	-.020 ns (.052)
Basic Adult Literacy	-.035 ns (.035)	-.055 ns (.037)	-.031 ns (.048)
Advanced Readers	.113 (.043)	.004 ns (.060)	.028 ns (.060)
Basic Arithmetic	.102 (.041)	.156 (.053)	-.085 ns (.059)
Excellent at Math	.172 (.045)	.019 ns (.068)	-.149 ns (.079)
Good Judgment	.093 (.035)	.087 (.040)	-.038 ns (.033)

Table 5

Probability Job is Filled by Whites When Different Internal Recruitment Methods Are Used, Controlling on Job Sector, Firm Size, and Three Other Labor Market Conditions (n = 2284 jobs)

Internal Recruitment Method	Method Used	Method Not Used
Go directly to specific employees for applicants	.71	.67
Offer job to specific current employee	.72	.68
Post or circulate a written vacancy notice	.67	.72

Table 6

Relationship Between Job Hourly Wage Rate and Percent Black Workers in the Job, Controlling for Educational Levels of Workers in the Job, By Job Sector and Sex

(unstandardized regression coefficients; standard error in parentheses, n=number of jobs)

	Jobs Filled From Inside	Jobs Filled From Outside
Private sector Male Jobs	-$.97 NS (.52) n=681	-$2.33 (.38) n=976
Private Sector Female Jobs	-$.51 NS (.35) n=572	-$.78 (.21) n=1110
Public Sector Male Jobs	$.25 NS (.83) n=135	-$1.25 (.58) n=275
Public Sector Female Jobs	-$.64 NS (.43) n=213	-$.79 (.27) n-445

---

* NS = not statististically significant at .05

Table 7

The Effects of Employers Use of Community Agencies in Recruitment on the Probability that a Job is Filled by Whites, by Education Level of the Job, Controlling for Five Labor Market Variables

	Employers Using Community Agencies	Employers Not Using Community Agencies
College - Degree Jobs (n = 850)	.72	.81
Some - College jobs (n = 1048)	.64	.73
High School Jobs (n = 2396)	.61	.67

References

Aaron, H.J. & Lougy, C.M. (1986). The Comparable Worth Controversy. Washington, DC: Brookings.

Aigner, D.J. & Cain, G.G. (1977). Statistical theories of discrimination in labor markets. Industrial and Labor Relations Review, 30, 175-187.

Alvarez, R. (1979). Institutional discrimination in organizations and their environments. In Alverez, R. and K.G. Lutterman (eds.) Discrimination in organizations (Pp. 1-4a). San Francisco: Jossey-Bass.

Baker, P., Carpenter, S., Crowley, J.E., D'Amico, R., Kim, C., Morgan, W., & Weilgosz, J. (1984). Pathways to the future: A longitudinal study of young Americans, Vol. IV. Columbus, OH: Center for Human Resource Research: Ohio State University.

Baron, J.N. (1984). Organizational perspectives on stratification. Annual Review of Sociology, 10: 37-69. Palo Alto, CA: Annual Reviews.

Baron, J. N. and Bielby, W. T. (1980). Bringing the firms back in: Stratification, segmentation, and the organization of work. American Sociological Review, 45: 737-65.

Baron, J. N. and Bielby, W. T. (1982). Technical relations in the workplace. American Sociological Review, 47: 175-88.

Becker, H.J. (1977). How young people find career-entry jobs: A review of the literature (Report No. 241). Baltimore, MD: Johns Hopkins University Center for Social Organization of Schools.

Becker, H.J. (1979). Personal networks of opportunity in obtaining jobs: Racial differences and effects of segregation (Report No. 281). Baltimore, MD: Johns Hopkins University Center for Social Organization of Schools.

Becker, H. J. (1980). Racial segregation among places of employment. Social Forces, 58, 761-776.

Bell, D.A. (1982). Preferential affirmative action. Harvard Civil Rights Civil Liberties Law Review, 16, 855-873.

Berg, I. (1971). Education and jobs: The great training robbery. Boston: Beacon Press.

Berg, I. (Ed.). (1981). Sociological perspectives on labor markets. New York: Academic Press.

Bielby, W. T. (1981). Models of status attainment. Pp. 3-26 in R. V. Robinson D. J. Treiman (Eds.) Annual Review of Research in Social Stratification and Mobility, Vol. I. Greenwich, CT: JAI Press.

Bielby, W. T. & Baron, J. N. (1984). A woman's place is with other women: Sex segregation within organizations. Pp. 27-55 in Reskin, B. F. (Ed.) Sex segregation in the workplace. Washington, DC: National Academy Press.

Bielby, W.T. & Baron, J.N. (1986). Men and women at work: sex segregation and statistical discrimination, American Journal of Sociology, 91, 759-799.

Bishop, J. (1986). Preparing youth for employment: Does learning basic skills payoff? Paper presented at American Educational Research Association meetings, San Francisco, CA.

Blau, F. (1977). Equal pay in the office. Lexington, MA: Lexington Books.

Bowles, S. and Gintis, H. (1975). Schooling in capitalist America. New York: Basic Books.

Braddock, J. H. (1985). School desegregation and black assimilation. Journal of Social Issues, 41: 9-22.

Braddock, J.H., Crain, R.L., & McPartland, J.M. (1984). A long-term view of school desegregation: Some recent studies of graduates as adults. Phi Delta Kappan, 66, 259-264.

Braddock, J. H. and McPartland, J. M. (in press). How minorities continue to be excluded from equal employment opportunities: Research on labor market and institutional barriers. Journal of Social Issues.

Butler, J. S. (1976). Inequality in the military: an examination of promotion time for black and white enlisted men. American Sociological Review, 41: 807-818.

Charner, I. (undated). The Career Passport: Documenting youth experience and making the job connection. Washington, DC: National Institute for Work and Learning.

Collins, R. (1979). The credential society. New York: Academic Press.

Committee on Economic Development. (1985). Investing in our children. New York: Author.

Congressional Budget Office (1977). Income disparities between black and white Americans. Washington, DC: U.S. Government Printing Office.

Crain, R.L. (1970). School integration and occupational achievement of Negroes. American Journal of Sociology, 75, 593-606.

Crain, R.L. (1984). The quality of American high school graduates: What personnel officers say and do about it (Report No. 354). Baltimore, MD: Johns Hopkins University Center for Social Organization of Schools.

Doeringer, P. B. and Piore, M. J. (1971). Internal labor markets and manpower analysis. Lexington, MA: D.C. Heath.

Duncan, G. (1984). Years of Poverty, Years of Plenty. Ann Arbor, MI: Institute for Social Research, University of Michigan.

Farley, R. (1984). Blacks and whites: Narrowing the gap? Cambridge, MA: Harvard University Press.

Feagin, J.R., & Feagin, C.B. (1978). Discrimination American style: Institutional racism and sexism. Englewood Cliffs, NJ: Prentice-Hall.

Featherman, D. L. and Carter, T. M. (1976). Discontinuities in schooling and the socioeconomic life cycle. Pp. 133-160 in Sewell, W. H., Hauser, R. M. and Featherman, D. L. (Eds.) Schooling and achievement in American society. New York: Academic Press.

Fernandez, J. P. (1975). Black managers in white corporations. New York: Wiley.

Fernandez, J.P. (1981). Racism and sexism in corporate life. Lexington, MA: Lexington Books.

Freeman, R. B. and Wise, D. A. (Eds.) (1982). The youth labor market problem: Its nature, causes and consequences. Chicago: National Bureau of Economic Research, University of Chicago Press.

Freidman, T., & Williams, E. (1982). Current use of tests for employment. In A. Wigdor and W. Garner (Eds.) Ability testing. Washington, DC: National Academy Press.

Glazer, N. (1975). Affirmative discrimination. New York: Basic Bookks

Gottfredson, L. S. (1981). Circumscription and compromise: A developmental theory of occupational aspirations. Journal of Counseling Psychology Monograph, 28: 545-79.

Grandjean, B.D. (1981). History and career in a bureaucratic labor market. American Journal of Sociology, 86: 1057-1092.

Granovetter, M.S. (1974). *Getting a job: A study of contacts and careers*. Cambridge, MA: Harvard University Press.

Granovetter, M. (1982). The strength of weak ties: A network theory revisited. In Marsden, P.V. and Lin, N. (Eds.), *Social structure and network analysis* (Pp. 105-130). Beverly Hills, CA: Sage.

Griffin, L. J., Kalleberg, A. L. and Alexander, K. L. (1981). Determinants of early labor market entry and attainment: A study of labor market segmentation. *Sociology of Education*, *54*: 206-221.

Griggs v. Duke Power (1971). 401 U.S. 424.

Hartmann, H. I. (Ed.) (1985). *Comparable worth: New directions for research*. Washington, DC: National Academy Press.

Hollenbeck, K. (1984). *Hiring decisions: An analysis of Columbus employer assessments of youthful job applicants*. Columbus, OH: Ohio State University, National Center for Research in Vocational Education.

Jencks, C. (1980). Structural versus individual explanations of inequality: Where do we go from here? *Contemporary Sociology*, *9*: 762-767.

Jencks, C. et al. (1979) *Who gets ahead*? New York: Basic Books.

Kalleberg, A.L., & Sorensen, A.B. (1979). The sociology of labor markets. *Annual Review of Sociology*, *5*, 351-379.

Karweit, N. (1977). *Patterns of educational activities: Discontinuities and sequences*. Baltimore, MD: Center for Social Organization of Schools, Johns Hopkins University.

Lin, N. (1982). Social resources and instrumental action. In P.V. Marsden and N. Lin (Eds.), *Social structure and network analysis* (Pp. 131-145). Beverly Hills, CA: Sage.

Lippman, S., & McCall, J. (1976). The economics of job search: A survey. *Economic Inquiry*, *14*, 155-189.

Lord, G. F. III and Falk, W. W. (1980). An exploratory analysis of individualist versus structuralist explanations of income. *Social Forces*, *59*: 376-91.

Maguire, D.C. (1980) *A new American justice*. New York: Doubleday.

Mangum, S.I. (1982). *Job search: A review of the literature*. Report submitted to U.S. Department of Labor, Employment and Training Administration, Office of Research and Development.

Marini, M. M. and Brinton, M. C. (1984). Sex typing in occupational socialization. Pp. 192-232 in Reskin, B. F. (Ed.), *Sex segregation in the workplace*. Washington, DC: National Academy Press.

Marsden, P. V. and Lin, N. (Eds.) (1982). Social structure and network analysis. Beverly Hills, CA: Sage.

Marshall, R. (1974). The economics of racial discrimination: A survey. Journal of Economic Literature, 12, 849-871.

Martin, J. & Pettigrew, T. F. (1987). Shaping the organizational context for minority inclusion. Journal of Social Issues (forthcoming).

Masters, S. H. (1975). Black-White Income Differentials. New York: Academic Press.

McCall, J.J. (1972). The simple mathematics of information, job search and prejudice. Pp. 205-224 in A.H. Pascal (ed.), Racial discrimination in economic life. Lexington, MA: D.C. Heath.

McGahey, R. & Jeffries, J. (1985). Minorities and the labor market: Twenty years of misguided policy. Washington, DC: Joint Center for Political Studies.

McLaughlin, S. D. (1978). Occupational sex identification and the assessment of male inequality. American Sociological Review, 43, 909-21.

McPartland, J.M., & Crain, R.L. (1980). Racial discrimination, segregation and processes of social mobility. In V. Corello (Ed.) Poverty and public policy (Pp. 97-125). Boston: G.K. Hall.

McPartland, J.M., Dawkins, R.L., & Braddock, J.H. (1986a). The school's role in the transition from education to work: Current conditions and future prospects (Report No. 362). Baltimore, MD: Johns Hopkins University Center for Social Organization of Schools.

McPartland, J. M., Braddock, J. H. II & Dawkins, R. L. (1968b). Education and work: How American firms use schools and education information at different stages of the employment process. Baltimore, MD: Johns Hopkins University Center for Social Organization of Schools.

National Academy of Science, National Academy of Engineering, Institute of Medicine, and Committee on Science, Engineering and Public Policy (1984). High schools and the changing workplace: The employer's view. Washington, DC: National Academy Press.

Pallas, A. M. (1987). School dropouts in the United States. Pp. 158-174 in U. S. Department of Education, Conditions of Education, 1986. Washington, DC: U.S. Government Printing Office.

Parcel, T. L. and Mueller, C. W. (1983). Ascription and labor markets: Race and sex differences in earnings. New York: Academic Press.

Parnes, H.S., Miljus, R.C., Spitz, R.S. and Associates. (1970). Career Thresholds, Volume 1. Washington, DC: U.S. Department of Labor Manpower Research.

Piore, M. J. (1977). The dual labor market. Pp. 93-97 in D. Gordon (Ed.), Problems in political economy, (Second Edition). Lexington, MA: Lexington Books.

Plisko, V. W. & Stern, J. D. (ed.). (1985). The condition of education, 1985 edition. Washington, DC: U.S. Government Printing Office.

Quinn, R.P., Tabor, J.M., & Gordon, L.K. (1968). The decision to discriminate: A study of executive selection. Ann Arbor, MI: Institute for Social Research, University of Michigan.

Reskin, B. F. (Ed.) (1984). Sex segregation in the workplace: Trends, explanations, remedies. Washington, DC: National Academy Press.

Reskin, B. F. and Hartmann, H. J. (Eds.) (1986). Women's work, men's work: Sex segregation on the job. Washington, DC: National Academy Press.

Rosenbaum, J. E. (1979) Career paths and advancement opportunities. Pp. 69-85 in Rudolfo Alvarez, Kenneth G. Lutterman, and Asssociates (ed.). Discrimination in Organizations. San Francisco, CA: Jessey-Bass

Rosenbaum, J. E. (1984). Career mobility in a corporate hierarchy. New York: Academic Press.

Rosenfeld, C. (1975). Jobseeking methods used by American workers. Monthly Labor Review, 98, no. 8, 39-42.

Rosenfeld, R.A. (1980). Race and sex differences in career dynamics. American Sociological Review, 45, 583-609.

Rosenfeld, R. A. (1984). Job changing and occupational sex segregation: Sex and race comparisons. Pp. 56-86 in Reskin, B. F. (Ed.) Sex segregation in the workplace. Washington, DC: National Academy Press.

Rossi, P.H., Berk, R.A., Boessel, D.P., Eidson, B.K., & Groves, W.E. (1968). Between white and black: The faces of American institutions in the ghetto. In National Advisory Commission on Civil Disorders, Supplemental studies. Washington, DC: U.S. Government Printing Office.

Rossi, P.H., Berk, R.A., & Eidson, B.K. (1974). The roots of urban discontent: Public policy, municipal institutions and the ghetto. New York: Wiley.

Sorensen, A.B. (1983). Processes of allocation to open and closed positions in social structure. Zeitschrift fur Soziologie, 12, 203-224.

Sorenson, A. B. (1974). A model for occupational careers. *American Journal of Sociology, 80*: 44-57.

Sorensen, A.B., & Kalleberg, A.L. (1981). An outline of a theory of the matching of persons to jobs. In I. Berg (Ed.) *Sociological perspectives on labor markets* (Pp. 49-74). New York: Academic Press.

Sorensen, A.B. (1984). Inequality of opportunity in internal and competitive labor markets. Paper presented at Office of Naval Research/ Chief of Navy Education and Training Symposium on Minorities and High-Technology Organizational Success, Pensacola, Florida.

Spaeth, J. L. (1976). Cognitive complexity: A dimension underlying the socioeconomic achievement process. Pp. 103-31 in W. H. Sewell, R. M. Hauser, and D. L. Featherman (Eds.) *Schooling and achievement in American society*. New York: Academic Press.

Spence, M.A. (1973). Job market signaling. *Quarterly Journal of Economics, 87*, 355-74.

Spenner, K. I., Otto, L. B. and Call, V. R. A. (1982). *Career Lines and Careers, Vol. III: Entry into careers series*. Lexington, MA: Lexington Books.

Spilerman, S. (1977). Careers, labor market structure, and socioeconomic achievement. *American Journal of Sociology, 83*: 551-93.

Stinchcombe, A. L. (1965). Social structure and organizations. Pp. 142-93 in J. G. March (Ed.) *Handbook of Organizations*. Chicago: Rand McNally.

Stolzenberg, R. M. (1975). Education, occupation, and wage differences between black and white men. *American Journal of Sociology, 81*: 299-323.

Stolzenberg, R. M. (1978). Bringing the boss back in: Employer size, employee schooling, and socioeconomic achievement. *American Sociological Review, 43*: 813-28.

Stolzenberg, R. M., and D'Amico, R. J. (1977). City differences and nondifferences in the effect of race and sex on occupational distribution. *American Sociological Review, 42*: 937-950.

Szafran, R. (1982). What kinds of firms hire and promote women and blacks? A review of the literature. *Sociological Quarterly, 23*, 171-190.

Thomas, G. E. (1986). The Access and Success of Blacks and Hispanics in U. S. Graduate and Professional Education. National Research Council, Washington, D. C.: National Academy Press.

Thomas, G. E. (1980). Race and sex group equity in higher education: Institutional and major field enrollment statuses. *American Educational Research Journal*, *17*, 171-181.

Tenopyr, M.L. (1981). The realities of employment testing. *American Psychologist*, *36*, 1120-1127.

Thurow, L. (1975). *Generating inequality*. New York: Basic Books.

Thurow, L. (1969). *Poverty and discrimination*. Washington, DC: The Brookways Institution.

U.S. Bureau of Census. (1983). *Statistical abstract of the United States* (104th Edition). Washington, DC: U.S. Government Printing Office.

U.S. Commission on Civil Rights. (1984). *Comparable worth: Issue for the 80's*. Washington: U.S. Government Printing Office.

U.S. Department of Labor. (1975). *Job-seeking methods used by American workers* (Bulletin 1886). Washington, DC: U.S. Government Printing Office.

U.S. Department of Labor (1976). *Recruitment, job search and the United States Employment Service*. R&D Monograph 43. Washington, DC: U.S. Government Printing Office.

U.S. Equal Employment Opportunity Commission. (1974). *Affirmative action and equal employment: A guidebook for employers*. Washington, DC: U.S. Government Printing Office.

U.S. Department of Education. (1986). *What works: Research about teaching and learning*. Washington, DC: U.S. Government Printing Office.

Wielgosz, J., & Carpenter, S. (1984). The effectiveness ofjob search and job finding methods of young Americans. In P. Baker et al. *Pathways to the future: A longitudinal study of young Americans, Vol. IV*. Columbus, OH: Center for Human Resource Research, Ohio State University.

Wilms, W.W. (1983). *Technology, job skills, and education: A reassement of the links*. Los Angeles: University of California.

Wilson, W.J. (1978) *The declining significance of race*. Chicago: University of Chicago Press.

Appendix

We developed a sampling plan and instrument design to provide more direct tests of how certain employment practices may affect the occupational chances of minorities. The sampling plan used strata stratification approach that would yield large samples of jobs typically filled by each of the three major race-ethnic subgroups in our nation (whites, blacks, and Hispanics). The survey instrument asked questions of employment officials that focused on a specific job title and description, to identify the major recruitment, selection, training and promotion practices involved.

The Sample

We defined the sampling strata and directory for the selection of jobs by using a nationally representative sample of young adult workers covering large numbers of each race-ethnic target group that provided information on each individual's job, employment location, sex, race-ethnicity, age, and educational attainment. This initial sample of workers was the 1976 and 1979 follow-up surveys of the "National Longitudinal Survey of the High School Graduating Class of 1972" (NLS), available from the U. S. Department of Education National Center for Education Statistics. We used NLS to establish the sampling frame of jobs within six strata defined by the NLS respondents' sex and race/ethnicity. Because enough time had passed since the high school graduation of NLS respondents to permit most individuals who had gone to college to complete their degree (four years for the 1976 job and seven years for the 1979 job), the NLS data file offered a large nationally representative sample of jobs recently held by young adults with different amounts of completed education within each sex/race-ethnicity stratum. We used telephone directory services to find the mailing addresses and phone numbers of NLS employers, derived from the information on the NLS questionnaires providing employers' names and respondents' residential locations. A brief telephone call was made to each identified employer to check the NLS sample job title and job duties at that place of work and to request participation in the survey. This process produced usable addresses for 90.2 percent of the initial sample frame of employers and jobs, for a sample of 5493. Through a series of mail and telephone surveys in 1983, we received completed questionnaires from 4078 employers -- 74.2 percent of the sample -- for whom accurate addresses and job descriptions had been obtained. Because we had established sampling strata to provide representation in each major sex/race-ethnicity group, our achieved sample included jobs held by 1960 white NLS respondents, 1518 black NLS respondents and 600 Hispanic respondents. Thus, our sample is both a sample of individuals and a sample of jobs. Depending upon the analyses, weights were calculated to accurately reflect either the sampling proportions used in the original NLS sampling frame of individuals or in our sampling strata of jobs.

Table 1 presents a comparison of 1983 U.S. Census national distributions of job characteristics and our 1983 weighted sample of jobs, to investigate the representativeness of the sample used in this paper. The actual achieved sample size in major job categories is also shown in Table 1, to reflect the actual sampling variation available for studies of relationships between job characteristics. With occasional exceptions, Table 1 provides reassurance that our 1983 sample of 4078 jobs is an adequate representation of jobs in the various sectors, industries, demographic categories and labor market locations of our nation.

Because our initial source for the sampling frame of jobs was a national sample of young adult workers who had at least graduated from high school, we expected some bias in our achieved sample towards higher level jobs held by younger workers. On the other hand, because many job titles filled by young workers are usually also held in the firm by other workers from throughout the age and educational attainment distributions, we expected our sampling approach to yield large numbers of cases and the full range of variability for all categories and segments of the American occupational structure. Table 1 shows some sample bias, reflecting more jobs held by younger workers who had a least achieved a high school education, but a sufficient sample base across all major job segments minimizes the likelihood that estimates of relationships among job attributes would be misleading. In particular, Table 1 shows the weighted sample to be a good representation of the national distributions of (a) job sector; (b) industry; (c) occupation, except that the sample underrepresents low-level factory jobs (operators, fabricators and laborers) and overrepresents high level and supervisory positions (managerial and professional specialties); (d) job location and size of establishment, and (e) demographic characteristics of job incumbents, except that the sample underrepresents jobs held by workers aged 40 or over, overrepresents jobs held by workers in the age range 26-39, and overrepresents jobs held by workers with some college. Because the actual achieved sample includes large numbers of cases in the job categories which are proportionally under- or overrepresented, we believe estimates of relationships between job attributes will be accurately estimated by our sample, although caution for possible bias needs to accompany point estimates of averages, percents and standard deviations based on our sample.

The Measures and Methodology

We sent an 18-page questionnaire to each employer in our sample. Most of the questions focused on the specific sample job that had been identified by an individual NLS respondent. Some of these questions covered the demographic distribution of current workers in the sample job, including their sex, ages, race-ethnicity, and educational attainments. We also asked about specific employer practices used to recruit candidates and information used to hire from within the firm and from outside to fill openings in the sample job. We asked employers to indicate how frequently each practice was used and to rank the most important practices for the final determination of who would fill the job. We also asked each employer to rate the importance of 16 specific worker qualifications for successfully filling the sample job, and to estimate the percent of recent openings that were filled by promotions or external hires and the usual starting salary in the sample job. We also asked some questions about the establishment as a whole, including the size and race and sex distribution of the total work force, and the policies, if any, concerning affirmative action.

Data analyses

Three types of analyses were conducted for this paper: (a) descriptive tabulations of the distribution of employer practices shown in Appendix Tables A2, A3, A4 and A5; (b) estimates of the relationships between job characteristics, shown in Tables 1, 3, 5, 6 and 7; and (c) estimates of the relationships between individual worker characteristics and job outcomes, shown in Tables 2 and 4.

In each type of analysis, we use demographic characteristics of current workers in each job to create different job categories. We categorize "male jobs" or "female jobs" depending upon whether males constitute at least 50 percent of the current job incumbents or females constitute at least 50 percent of the current job incumbents. Similarly, we categorize jobs by their education level either as "high school jobs", "some college jobs" or "college degree jobs" depending upon which level of education has been completed by 50 percent or more of the current employees in each job. Employment sector (private or public employer) is an additional variable on which we categorize jobs.

Descriptive Findings

Table A2 shows the percent of employers who report they frequently use each recruitment, selection or promotion practice for jobs, within three broad categories of the education level of workers in the job. For ease of presentation, percentages are shown for private sector jobs filled primarily by males. Adjustment factors are shown to indicate approximately what would be added or subtracted to obtain percentages for the public sector or for "female" jobs. These adjustment factors are the unstandardized regression coefficients from a multiple regression equation where a particular employer practice is the dependent variable with three independent variables to measure the education level of the job, the sex composition of the job, and the job sector (each with possible values of zero and one to match the categorical presentation of Table A2).

Tables A3, A4 and A5 follow the same format as Table A2 to present, respectively, the percent of employers who rate each practice as "most important" in finding the actual person who is given the job, the percent of employers who rate each worker trait as extremely important, and the percent of employers who chose each trait as most important.

Relationships Between Job Characteristics (Tables 1, 3, 5, 6, 7)

Tables 1, 3, 5 and 7 are derived from multiple regression analyses of jobs, where the dependent variable is the percent white of current workers in each job, and the independent variables include five labor market variables (region, percent white in the local labor market, private or public employment sector, percent male of current workers in the job, and percent of current workers whose education went no further than high school) plus one other variable of interest. The final variable in Table 1 is employer's use of social networks; in Table 3, it is employer's rating of a selected worker trait; in Table 5, it is employer's use of community agencies in recruitment. Following the estimation of the above multiple regression equations, we derive the probabilities shown in each table by substituting the population mean into the equation for the five labor market variables and substituting either the highest or the lowest possible values for the final variable of interest.

Table 6 reports results from multiple regression analyses of two subsamples of jobs; those jobs which are filled from within the firm at least 50 percent of the time, and those jobs which are filled by outside hires at least 50 percent of the time. Multiple regression analyses use job hourly pay rate as the dependent variable and percent black workers in the job (regression coefficient shown in Table 6), percent workers with a college degree in the job, percent male workers in the job, and public or private sector.

Relationships between individual traits and job traits (Tables 2 & 4)

Table 2 is a tabulation of average job outcomes in the private sector for black high school graduates for different types of networks of friends and acquaintances used to find the job. These categories include "did not use networks;" "used segregated networks," defined by those who graduated from segregated schools and used social networks to find their job; and "used desegregated networks," defined by those who graduated from desegregated high schools and used social networks to find their job.

Table 4 shows the results of multiple regression analyses where the dependent variable is the employer's rating of the importance of a selected worker trait on the job and the independent variables are the race of an individual in the job (coefficient shown), the individual's sex, the individual's educational attainment, the job sector, and the individual's score on a test of the selected trait.

APPENDIX TABLE 9

A comparison of the 1983 U.S. Census and the weighted sample of employers on selected job characteristics and the achieved sample size for different job categories

Job Characteristic	U.S. Census 1983 Employed Civilian Labor Force <a>	Weighted Sample of 1983 Jobs	Actual Sample Size (Number of jobs)
Sector (Percent distribution)			
Public	17.6	19.4	978
Private	82.4	80.6	3100
Industry (Percent distribution)			
Agriculture and Mining	4.4	2.3	80
Construction	6.1	4.5	145
Manufacturing	19.8	18.8	739
Transportation	6.9	7.2	291
Trade	21.0	20.5	1429
Finance	6.4	6.6	305
Services	30.7	34.3	1340
Public Administration	4.7	5.6	259
Occupation (Percent distribution)			
Managerial and professional specialty	23.4	34.9	1228
Technical, sales and admin. support	31.0	34.7	1499
Service occupations	13.7	10.1	422
Precision production, craft and repair	12.2	12.5	551
Operators, fabricators, and laborers	16.0	4.8	229
Farming, forestry, and fishing	3.7	3.0	133
Location and Size of Establishment			
Region (Percent distribution)			
Northeast	21.3	23.0	660
Midwest	25.3	30.1	870
South	33.4	30.2	1791
West	20.1	16.7	750
Size of establishment (Percent dist.)			
Under 20 employees	26.8	23.2	827
20 to 99 employees	28.5	26.4	946
100 to 249 employees	14.4	12.8	601
250 or more employees	30.4	38.2	1704
Race, Sex, Education and Age of Job Incumbents <b>			
Percent Male	56.3	48.4	2016
Percent Female	43.7	51.6	2062
Percent White	82.9	82.6	2716
Percent Black	9.3	10.7	584
Percent Hispanic	5.2	4.7	242
Percent Other Ethnicity	2.5	1.7	32
Percent HS Grad or less	56.1	49.4	2396
Percent Some College	18.4	25.7	1048
Percent 4 yr College or more	25.4	24.9	850
Percent Age 25 or Younger	22.8	25.0	823
Percent Age 26-39	36.6	47.0	1874
Percent Age 40 or Older	40.7	22.7	714

<a> Source: Statistical Abstract of the United States, 105th Edition (1985), Tables 654, 657, 658, 659, 667, 674, 676, 678, 690.

<b> The actual sample size of jobs for the final set of characteristics is the number of sample jobs where at least 50 percent of incumbents have the particular race, sex, education or age trait under consideration.

Appendix Table A2

Percent of Employers Using Different Recruitment, Selection and Promotion Methods, by Education Level of Job, with Adjustment Factors for Sector and Sex Composition of Job

	Education Level of Job			Adjustment Factor for	
Employer Practice:	High School	Some College	College Degree	Sector (Public)	Job Sex (Female)
Recruitment Method					
1. Friends of employees	38	37	38	-16	+ 1
2. School placement serv.	14	27	44	+ 2	+ 3
3. Professional orgs.	4	8	17	+ 3	- 1
4. Civil Service	3	4	3	+34	- 3
5. Public employment serv.	32	24	16	+ 4	- 1
6. Private employment serv.	3	10	16	- 5	0
7. Community agencies	13	12	8	+10	- 1
8. Media ads	26	34	34	- 4	+ 5
9. Walk-ins	59	52	51	-15	+ 8
10. Union referral	10	6	5	- 1	- 4
Hiring Information					
11. Employer recommendations	65	68	74	0	+ 2
12. Test results	22	26	19	+22	+ 9
13. Education level or type	22	39	75	+21	+ 6
14. Education grades	4	15	32	+ 3	- 1
15. Education recommendations	10	19	35	+ 5	+ 5
16. Education reputation	8	20	37	- 2	+ 2
17. Union membership	10	4	2	- 1	- 4
18. License or certification	9	12	14	+ 8	+ 5
Promotion Information					
19. Production record	50	60	59	0	+11
20. Seniority	57	38	18	- 5	- 3
21. Internal recommendations	49	65	76	+ 6	+ 6
22. Test results	16	21	12	+20	+ 6
23. Education level or type	16	26	57	+22	+10
24. Education grades	2	8	12	+ 3	+ 3
25. Education recommendations	6	10	17	+ 7	+ 6
26. Education reputation	6	8	25	0	+ 3
27. Union membership	20	11	1	- 5	- 9
28. License or certification	9	7	12	+ 9	+ 5

---

*Percentages shown are for Private Sector, Male Jobs. Add appropriate adjustment factor(s) to obtain other combinations of Sector and Job Sex.

Appendix Table A3

Percent of Employers Who Cite Each Recruitment Selection and Promotion Method as Most Important for their Decision by Education Level of Job, with Adjustment Factors for Sector and Sex Composition of Job*

Employer Practice:	Education Level of Job High School	 Some College	 College Degree	Adjustment Factor for Sector (Public)	 Job Sex (Female)
Recruitment Method					
1. Friends of employees	24	18	17	-10	-3
2. School placement service	4	9	24	0	+1
3. Professional organizations	1	2	5	0	+1
4. Civil Service	3	3	3	+22	-1
5. Public employment service	16	6	6	0	+1
6. Private employment service	2	4	8	-3	0
7. Community agencies	0	1	0	+1	+1
8. Media ads	13	24	17	-8	+6
9. Walk-ins	26	15	11	-5	+2
10. Union referral	4	2	0	-1	-2
10a. Other (miscellaneous)	6	14	8	+5	-3
Hiring Information					
11. Employer recommendations	50	42	31	-13	-1
12. Test results	10	14	6	+14	+1
13. Education level or type	6	9	29	+5	-2
14. Education grades	5	4	2	-3	0
15. Education recommendations	5	7	5	-2	+3
16. Education reputation	0	0	0	0	0
17. Union membership	4	1	0	-1	-2
18. License or certification	2	3	2	+1	+4
18a. Other (interview)	19	20	25	-1	-2
Promotion Information					
19. Production record	25	22	23	-6	+7
20. Seniority	21	7	2	-6	-5
21. Internal recommendations	21	24	27	-3	-5
22. Test results	5	8	4	+11	0
23. Education level or type	4	9	7	+6	+2
24. Education grades	0	0	0	0	0
25. Education recommendations	0	1	1	0	0
26. Education reputation	0	0	0	0	0
27. Union membership	2	1	0	0	-1
28. License or certification	1	2	2	+1	+4
28a. Other (performance ratings)	22	25	33	-2	-3

---

*Percentages shown are for Private Sector, Male Jobs. Add appropriate adjustment factor(s) to obtain other combinations of Sector and Job Sex.

APPENDIX TABLE A4

PERCENT OF EMPLOYERS WHO RATE VARIOUS WORKER QUALIFICATIONS AS EXTREMELY IMPORTANT, BY EDUCATION LEVEL OF THE JOB

(Sample size= 4078)

Worker Qualifications	Education Level of Job			Adjustment Factor* for:	
	High School	Some College	College Degree	Sector (Public)	Job Sex (Female)
Methodical	48	45	31	-3	+14
Manual Dexterity	61	44	22	-11	-6
Quick Learner	47	64	74	-5	+6
Basic Adult Literacy	50	72	88	+4	+14
Advanced Readers	13	28	52	+8	+3
Perform Basic Arithmetic	44	71	80	-11	+6
Excellent at Math	8	16	36	-3	0
Specialized Knowledge	30	34	47	+4	-2
Client Relations	32	48	60	+1	+12
Permanence	36	44	44	-9	-3
Growth Potential	22	28	46	-4	-6
Good Team Members	68	79	85	-2	+7
Proper Attitudes	82	84	80	0	+4
Dependable	96	95	95	-1	+2
Good Judgement	50	72	88	0	+5
Can Supervise	20	32	43	+2	-3

---

[*] Percentages shown are for Private Sector, Male Jobs. Add appropriate adjustment factor(s) to obtain other combinations of Sector and Job Sex.

APPENDIX TABLE A5

PERCENT OF EMPLOYERS WHO SELECT EACH WORKER QUALIFICATION AS THE MOST IMPORTANT IN FILLING A JOB AT DIFFERENT EDUCATIONAL LEVELS

Worker Qualification	Education Level of Job High School	 Some College	 College Degree
Methodical	5.2	3.4	1.7
Manual Dexterity	9.6	4.9	1.0
Quick Learner	9.1	11.4	9.9
Reading Ability	3.7	3.2	2.7
Math Ability	3.5	4.1	2.2
Specialized Knowledge	14.1	23.1	37.2
Client Relations	7.8	7.5	8.9
Permanence	0.9	1.0	0.5
Growth Potential	0.5	1.7	3.2
Good Team Member	5.0	5.3	3.9
Proper Attitudes	11.9	11.2	7.6
Dependable	21.3	12.1	4.4
Good Judgment	2.9	6.6	10.6
Can Supervise	1.3	1.5	2.5
Other	3.1	3.2	3.7
(Sample Size)	(1112)	(412)	(406)

The following pages provide the complete regression equations that were used to generate the tables shown in the body of the paper.

X_1 = Percent White of Job Incumbents (0.00 to 1.00)

X_2 = Percent Black of Job Incumbents (0.00 to 1.00)

X_3 = Employment Sector (Private = 1, Public = 0)

X_4 = Percent Male of Job Incumbents (0.00 to 1.00)

X_5 = Percent of Job Incumbents Whose Educational Attainment is High School Degree or Less (0.00 to 1.00)

X_6 = Percent White of 1980 Population in the Same Labor Market (Same SMSA or county if not in SMSA) (0 to 100.0)

X_7 = Region (1 = North, 0 = South)

X_8 = Percent of Job Incumbents Whose Educational Attainment is College Degree or More (0.00 to 1.00)

X_9 = Size of Establishment (midpoint of categories 1 to 1000 or more)

X_{10} = Frequency with which employer finds outside applicants for sample job openings by "ask(ing) your current employees to recommend their friends and acquaintances." (1 to 5)

X_{11} = Employer's rating of the importance for the sample job of being "able to read materials about as difficult as the daily newspaper; that is, have BASIC ADULT LITERACY."

X_{12} = Employer's rating of the importance of being "able to read complex written materials; that is, are ADVANCED READERS." (1 to 4)

X_{13} = Employer's rating of the importance of being "able to accurately add, subtract, multiply and divide; that is, can PERFORM BASIC ARITHMETIC." (1 to 4)

X_{14} = Employer's rating of the importance of being "able to handle complex numerical calculations; that is, are EXCELLENT AT MATH." (1 to 4)

X_{15} = Employer's rating of the importance of being "able to learn new things quickly; that is, are QUICK LEARNERS." (1 to 4)

X_{16} = Employer's rating of the importance of "can deal with new complex situations; that is, have GOOD JUDGMENT." (1 to 4)

X_{17} = Employer's rating of the importance of being "able to make a good impression outside the organization with clients or customers; that is, are good at CLIENT RELATIONS." (1 to 4)

X_{18} = Employer's rating of the importance of being "able to get along well with people; that is, are GOOD TEAM MEMBERS." (1 to 4)

X_{19} = Employer's rating of the importance of "can provide direction and leadership; that is, CAN SUPERVISE." (1 to 4)

X_{20} = Frequency with which employers find internal applicants by "inform(ing) current employees of the sample job opening by posting or circulating a written vacancy notice." (1 to 5)

X_{21} = Frequency with which employers find internal applicants by "go(ing) directly to a specific current employee to encourage that person to apply for the sample job." (1 to 5)

X_{22} = Frequency with which employers find internal applicants by "go(ing) to a specific current employee and offer the sample job to that person." (1 to 5)

X_{23} = Sample job hourly wage rate, as reported by the employer to the question "What is the approximate hourly wage that would be paid to an average new worker in the sample job?" ($xx.xx)

X_{24} = Frequency with which employer finds outside applicants for sample job openings by using "community action or welfare groups." (1 to 5)

X_{25} = Individual Race (1 = White, 0 = Black, Blank = Other)

X_{26} = Individual Combine Test Score on six tests (Vocabulary, Reading, Math, Picture Number, Letter Groups, and Mosaic Comparisons).

X_{27} = Individual Reading Test Score

X_{28} = Individual Math Test Score

X_{29} = Individual Sex (1 = Male, 0 = Female)

X_{30} = Individual Educational Attainment (1 = High School, 2 = Some College, 3= College Degree)

		Total Sample		High School Jobs (2396)		Some-College Jobs (1048)		College-degree Jobs (850)	
		μ	σ	μ	σ	μ	σ	μ	σ
X_1	PCTWSJ	.690	.333	.651	.342	.726	.319	.785	.290
X_2	PCTBSJ	.200	.281	.227	.291	.160	.257	.147	.248
X_3	PUB	.760	.427	.803	.398	.754	.431	.656	.472
X_4	PCTMSJ	.474	.410	.498	.424	.404	.406	.473	.363
X_5	PCTNCSJ	.538	.404	.833	.183	.178	.191	.049	.111
X_6	PCTWHT	78.2	15.7	78.5	15.5	78.1	15.3	78.1	16.6
X_7	REGION			.527	.499	.602	.490	.605	.489
X_8	PCTDCSJ	.212	.354	.033	.081	.096	.146	.852	.213
X_9	SIZE	411.9	464.1	391.8	449.8	410.5	263.0	438.0	483.4
X_{10}	BQ2001			2.945	1.28	2.910	1.39	2.850	1.32
X_{11}	25D			3.451	.762	3.741	.531	3.814	.577
X_{12}	E			2.432	.937	2.935	.881	3.478	.746
X_{13}	F			3.233	.881	3.512	.718	3.644	.662
X_{14}	G			2.134	.940	2.558	.928	2.936	.883
X_{15}	C			3.458	.616	3.623	.541	3.640	.547
X_{16}	O			3.419	.705	3.703	.525	3.896	.347
X_{17}	I			2.819	1.16	3.259	.976	3.506	.743
X_{18}	L			3.683	.553	3.781	.441	3.823	.417
X_{19}	P			2.590	.946	2.836	.926	3.308	.754
X_{20}	BQ17B	3.528	1.728						
X_{21}	C	2.697	1.212						
X_{22}	D	2.513	1.396						
X_{23}	HRWAGE	6.58	2.98	6.04	2.75	6.28	2.47	8.41	3.35
X_{24}	BQ2007			2.144	1.20	2.125	1.28	1.898	1.15

Table 1

College-degree jobs (N=850)

$(R^2 = .182)$

$$\begin{array}{ccccccccccccc} X_1 = .1517 & + & .0195X_{10} & - & .0592X_5 & + & .1118X_4 & + & .0732X_3 & + & .0035X_7 & + & .0061X_6 \\ & & (.0070) & & (.0825) & & (.0250) & & (.0198) & & (.0201) & & (.0006) \end{array}$$

Some-college jobs (N=1048)

$(R^2 = .172)$

$$\begin{array}{ccccccccccccc} X_1 = .0383 & + & .0054X_{10} & - & .0869X_5 & + & .0077X_4 & + & .1083X_3 & - & .0149X_7 & + & .0078X_6 \\ & & (.0066) & & (.0471) & & (.0222) & & (.0215) & & (.0192) & & (.0006) \end{array}$$

High school jobs (N=2396)

$(R^2 = .230)$

$$\begin{array}{ccccccccccccc} X_1 = .0462 & - & .0049X_{10} & - & .2359X_5 & - & .0155X_4 & + & .0813X_3 & + & .0334X_7 & + & .0094X_6 \\ & & (.0049) & & (.0338) & & (.0146) & & (.0160) & & (.0129) & & (.0004) \end{array}$$

Table 3 (High School Jobs, N=2396)

$$(R^2 = .239) \qquad X_1 = -.1656 + \underset{(.0084)}{.0434X_{11}} + \underset{(.0156)}{.0829X_3} + \underset{(.0128)}{.0340X_7} - \underset{(.0345)}{.1962X_5} - \underset{(.0147)}{.0034X_4} + \underset{(.0004)}{.0095X_6}$$

$$(R^2 = .247) \qquad X_1 = -.1271 + \underset{(.0066)}{.0488X_{12}} + \underset{(.0155)}{.0874X_3} + \underset{(.0127)}{.0345X_7} - \underset{(.0339)}{.1959X_5} - \underset{(.01445)}{.0063X_4} + \underset{(.0004)}{.0094X_6}$$

$$(R^2 = .269) \qquad X_1 = -.2746 + \underset{(.0070)}{.0794X_{13}} + \underset{(.0153)}{.0628X_3} + \underset{(.0125)}{.0332X_7} - \underset{(.0337)}{.1562X_5} + \underset{(.0143)}{.0049X_4} + \underset{(.0004)}{.0093X_6}$$

$$(R^2 = .248) \qquad X_1 = -.1062 + \underset{(.0066)}{.0498X_{14}} + \underset{(.0155)}{.0754X_3} + \underset{(.0127)}{.0333X_7} - \underset{(.0340)}{.1897X_5} - \underset{(.0144)}{.0076X_4} + \underset{(.0004)}{.0094X_6}$$

$$(R^2 = .242) \qquad X_1 = -.2092 + \underset{(.0101)}{.0636X_{15}} + \underset{(.0155)}{.0732X_3} + \underset{(.0128)}{.0346X_7} - \underset{(.0341)}{.1993X_5} - \underset{(.0146)}{.0042X_4} + \underset{(.0004)}{.0093X_6}$$

$$(R^2 = .252) \qquad X_1 = -.2550 + \underset{(.0088)}{.0725X_{16}} + \underset{(.0154)}{.0780X_3} + \underset{(.0127)}{.0360X_7} - \underset{(.0340)}{.1813X_5} - \underset{(.0144)}{.0125X_4} + \underset{(.0004)}{.0093X_6}$$

$$(R^2 = .242) \qquad X_1 = -.1060 + \underset{(.0055)}{.0338X_{17}} + \underset{(.0156)}{.0854X_3} + \underset{(.0128)}{.0352X_7} + \underset{(.0342)}{.1939X_5} - \underset{(.0147)}{.0004X_4} + \underset{(.0004)}{.0094X_6}$$

$$(R^2 = .237) \qquad X_1 = -.1745 + \underset{(.0111)}{.0521X_{18}} + \underset{(.0156)}{.0804X_3} + \underset{(.0128)}{.0362X_7} - \underset{(.0339)}{.2181X_5} - \underset{(.0146)}{.0102X_4} + \underset{(.0004)}{.0094X_6}$$

$$(R^2 = .238) \qquad X_1 = -.0573 + \underset{(.0065)}{.0336X_{19}} + \underset{(.0156)}{.0759X_3} + \underset{(.0128)}{.0376X_7} - \underset{(.0339)}{.2138X_5} - \underset{(.0145)}{.0196X_4} + \underset{(.0004)}{.0093X_6}$$

Table 3 (College Degree Jobs, N=850)

$$(R^2 = .174) \qquad X_1 = .2153 - \underset{(.0158)}{.0044X_{11}} + \underset{(.0198)}{.0804X_3} + \underset{(.0201)}{.0081X_7} - \underset{(.0826)}{.0417X_5} + \underset{(.0252)}{.1082X_4} + \underset{(.0006)}{.0061X_6}$$

$$(R^2 = .179) \qquad X_1 = .0988 + \underset{(.0128)}{.0280X_{12}} + \underset{(.0198)}{.0853X_3} + \underset{(.0202)}{.0126X_7} + \underset{(.0855)}{.0080X_5} + \underset{(.0251)}{.1111X_4} + \underset{(.0006)}{.0061X_6}$$

$$(R^2 = .175) \qquad X_1 = .1646 + \underset{(.0138)}{.0095X_{13}} + \underset{(.0198)}{.0801X_3} + \underset{(.0202)}{.0096X_7} - \underset{(.0827)}{.0439X_5} + \underset{(.0251)}{.1084X_4} + \underset{(.0006)}{.0061X_6}$$

$$(R^2 = .176) \qquad X_1 = .1557 + \underset{(.0104)}{.0149X_{14}} + \underset{(.0198)}{.0722X_3} + \underset{(.0201)}{.0103X_7} - \underset{(.0835)}{.0233X_5} + \underset{(.0251)}{.1066X_4} + \underset{(.0006)}{.0061X_6}$$

$$(R^2 = .196) \qquad X_1 = -.0901 + \underset{(.0164)}{.0796X_{15}} + \underset{(.0195)}{.0733X_3} + \underset{(.0199)}{.0133X_7} - \underset{(.0816)}{.0653X_5} + \underset{(.0248)}{.1017X_4} + \underset{(.0006)}{.0062X_6}$$

$$(R^2 = .178) \qquad X_1 = .0153 + \underset{(.0266)}{.0480X_{16}} + \underset{(.0197)}{.0784X_3} + \underset{(.0202)}{.0113X_7} - \underset{(.0837)}{.0159X_5} + \underset{(.0251)}{.1113X_4} + \underset{(.0006)}{.0060X_6}$$

$$(R^2 = .174) \qquad X_1 = .1902 + \underset{(.0124)}{.0022X_{17}} + \underset{(.0198)}{.0802X_3} + \underset{(.0202)}{.0083X_7} - \underset{(.0826)}{.0419X_5} + \underset{(.0253)}{.1092X_4} + \underset{(.0006)}{.0062X_6}$$

$$(R^2 = .174) \qquad X_1 = .1625 + \underset{(.0220)}{.0093X_{18}} + \underset{(.0199)}{.0791X_3} + \underset{(.0202)}{.0090X_7} - \underset{(.0828)}{.0397X_5} + \underset{(.0251)}{.1090X_4} + \underset{(.0006)}{.0061X_6}$$

$$(R^2 = .174) \qquad X = .1860 + \underset{(.0121)}{.0036X_{19}} + \underset{(.0198)}{.0802X_3} + \underset{(.0202)}{.0086X_7} - \underset{(.0831)}{.0391X_5} + \underset{(.0251)}{.1087X_4} + \underset{(.0006)}{.0061X_6}$$

Table 4 (High School Jobs, N=2396)

$$(R^2 = .039) \qquad X_{15} = 3.103 + \underset{(.031)}{.109X_{25}} + \underset{(.0004)}{.0011X_{26}} - \underset{(.025)}{.139X_{29}} + \underset{(.021)}{.031X_{30}} + \underset{(.032)}{.030X_{3}}$$

$$(R^2 = .047) \qquad X_{16} = 3.161 - \underset{(.035)}{.0346X_{25}} + \underset{(.0019)}{.0091X_{27}} - \underset{(.030)}{.196X_{29}} + \underset{(.026)}{.085X_{30}} - \underset{(.039)}{.162X_{3}}$$

$$(R^2 = .031) \qquad X_{17} = 2.369 + \underset{(.043)}{.113X_{25}} + \underset{(.0023)}{.0030X_{27}} - \underset{(.037)}{.175X_{29}} + \underset{(.032)}{.104X_{30}} - \underset{(.048)}{.244X_{3}}$$

$$(R^2 = .051) \qquad X_{18} = 2.578 + \underset{(.041)}{.102X_{25}} + \underset{(.0023)}{.0113X_{28}} - \underset{(.035)}{.234X_{29}} + \underset{(.030)}{.072X_{30}} + \underset{(.045)}{.125X_{3}}$$

$$(R^2 = .026) \qquad X_{19} = 1.858 + \underset{(.044)}{.172X_{25}} + \underset{(.0025)}{.0022X_{28}} - \underset{(.038)}{.166X_{29}} + \underset{(.032)}{.121X_{30}} - \underset{(.048)}{.008X_{3}}$$

$$(R^2 = .024) \qquad X_{20} = 3.017 + \underset{(.035)}{.092X_{25}} + \underset{(.0004)}{.0011X_{26}} - \underset{(.029)}{.046X_{29}} + \underset{(.024)}{.070X_{30}} - \underset{(.036)}{.045X_{3}}$$

Table 4 (Some-college Jobs, N=1048)

$$(R^2 = .008) \quad X_{15} = 3.742 + \underset{(.041)}{.065X_{25}} - \underset{(.0005)}{.0004X_{26}} - \underset{(.034)}{.060X_{29}} - \underset{(.027)}{.022X_{30}} + \underset{(.039)}{.058X_{3}}$$

$$(R^2 = .015) \quad X_{16} = 3.768 - \underset{(.037)}{.055X_{25}} + \underset{(.0018)}{.0012X_{27}} - \underset{(.033)}{.097X_{29}} + \underset{(.026)}{.021X_{30}} - \underset{(.038)}{.068X_{3}}$$

$$(R^2 = .031) \quad X_{17} = 2.807 + \underset{(.060)}{.004X_{25}} + \underset{(.0030)}{.0060X_{27}} - \underset{(.054)}{.265X_{29}} + \underset{(.043)}{.017X_{30}} - \underset{(.063)}{.126X_{3}}$$

$$(R^2 = .025) \quad X_{13} = 3.296 + \underset{(.053)}{.156X_{25}} - \underset{(.0028)}{.0018X_{28}} + \underset{(.045)}{.086X_{29}} + \underset{(.035)}{.031X_{30}} + \underset{(.052)}{.153X_{3}}$$

$$(R^2 = .013) \quad X_{19} = 2.446 + \underset{(.068)}{.018X_{25}} + \underset{(.00036)}{.0008X_{28}} - \underset{(.058)}{.155X_{29}} - \underset{(.045)}{.003X_{30}} + \underset{(.067)}{.175X_{3}}$$

$$(R^2 = .016) \quad X_{20} = 3.636 + \underset{(.036)}{.078X_{25}} - \underset{(.0018)}{.0004X_{26}} - \underset{(.033)}{.101X_{29}} + \underset{(.025)}{.034X_{30}} + \underset{(.038)}{.028X_{3}}$$

Table 4 (College Degree Jobs, N=850)

$$\begin{array}{llllllll}
(R^2 = .013) & X_{15} = & 3.409 & - .020X_{25} & + .0006X_{26} & + .086X_{29} & - .018X_{30} & + .070X_{3} \\
 & & & (.052) & (.0006) & (.038) & (.031) & (.041) \\
(R^2 = .013) & X_{16} = & 3.677 & - .031X_{25} & + .0055X_{27} & - .072X_{29} & - .055X_{30} & + .056X_{3} \\
 & & & (.048) & (.0025) & (.040) & (.032) & (.043) \\
(R^2 = .076) & X_{17} = & 2.784 & - .028X_{25} & + .0089X_{27} & - .029X_{29} & + .145X_{30} & - .256X_{3} \\
 & & & (.060) & (.0031) & (.050) & (.040) & (.054) \\
(R^2 = .038) & X_{18} = & 2.887 & - .085X_{25} & + .0146X_{29} & + .005X_{29} & + .012X_{30} & - .008X_{3} \\
 & & & (.059) & (.0031) & (.046) & (.037) & (.049) \\
(R^2 = .047) & X_{19} = & 1.783 & - .150X_{25} & + .0219X_{23} & - .013X_{29} & - .003X_{30} & + .138X_{3} \\
 & & & (.078) & (.0041) & (.061) & (.049) & (.065) \\
(R^2 = .006) & X_{20} = & 3.777 & - .038X_{25} & + .0005X_{26} & + .045X_{29} & - .012X_{30} & - .008X_{3} \\
 & & & (.033) & (.0004) & (.024) & (.020) & (.026)
\end{array}$$

Table 5

$$(R^2 = .224) \qquad X_1 = .03915 + \underset{(.0158)}{.0098X_4} - \underset{(.0162)}{.1685X_5} + \underset{(.0054)}{.0093X_{21}} - \underset{(.00001)}{.000032X_9} + \underset{(.0155)}{.0762X_3} + \underset{(.0004)}{.00851X_6}$$

$$(R^2 = .225) \qquad X_1 = .03599 + \underset{(.0158)}{.00758X_4} - \underset{(.0162)}{.1667X_5} + \underset{(.0050)}{.01406X_{22}} - \underset{(.00001)}{.000027X_9} + \underset{(.0159)}{.0670X_3} + \underset{(.0004)}{.00849X_6}$$

$$(R^2 = .226) \qquad X_1 = .1204 + \underset{(.0158)}{.0044X_4} - \underset{(.0161)}{.1691X_5} - \underset{(.0040)}{.0133X_{20}} - \underset{(.00001)}{.000025X_9} + \underset{(.0159)}{.0644X_3} + \underset{(.0004)}{.00851X_6}$$

Table 6

Jobs Filled From Inside

Private Sector Male Jobs (N=681)

$$(R^2 = .026) \qquad X_1 = 7.9167 - \underset{(.5172)}{.9728X_2} + \underset{(.4365)}{1.5221X_8}$$

Private Sector Female Jobs (N=572)

$$(R^2 = .141) \qquad X_1 = 5.5243 - \underset{(.3549)}{.5084X_2} + \underset{(.3054)}{2.929X_8}$$

Public Sector Male Jobs (N=135)

$$(R^2 = .073) \qquad X_1 = 7.2100 + \underset{(.8324)}{.2541X_2} + \underset{(.4847)}{1.5493X_8}$$

Public Sector Female Jobs (N=213)

$$(R^2 = .426) \qquad X_1 = 5.5896 - \underset{(.4335)}{.6407X_2} + \underset{(.3231)}{3.9710X_8}$$

Jobs Filled From Outside

Private Sector Male Jobs (N=976)

$$(R^2 = .172) \qquad X_1 = 6.9625 - \underset{(.3861)}{2.3303X_2} + \underset{(.3008)}{3.2815X_8}$$

Private Sector Female Jobs (N=1,110)

$$(R^2 = .257) \qquad X_1 = 4.9274 - \underset{(.2112)}{.7785X_2} + \underset{(.1775)}{3.3491X_8}$$

Public Sector Male Jobs (N=275)

$$(R^2 = .144) \qquad X_1 = 6.9113 - \underset{(.5787)}{1.2470X_2} + \underset{(.3831)}{2.0785X_8}$$

Public Sector Female Jobs (N=445)

$$(R^2 = .459) \qquad X_1 = 5.1694 - \underset{(.2683)}{.7941X_2} + \underset{(.1986)}{3.6703X_8}$$

Table 7

College-degree jobs (N=850)

$$(R^2 = .191) \qquad X_1 = .2605 - \underset{(.0078)}{.0323X_{24}} + \underset{(.0196)}{.0075X_3} - \underset{(.0818)}{.0393X_5} + \underset{(.0249)}{.1081X_4} + \underset{(.0199)}{.0125X_7} + \underset{(.0006)}{.0061X_6}$$

Some-college jobs (N=1048)

$$(R^2 = .185) \qquad X_1 = .1566 - \underset{(.0072)}{.0309X_{24}} + \underset{(.0210)}{.1011X_3} - \underset{(.0470)}{.0655X_5} + \underset{(.0221)}{.0023X_4} - \underset{(.0192)}{.0047X_7} + \underset{(.0006)}{.0073X_6}$$

High school jobs (N=2396)

$$(R^2 = .235) \qquad X_1 = .0914 - \underset{(.0052)}{.0204X_{24}} + \underset{(.0157)}{.0706X_3} - \underset{(.0338)}{.2411X_5} - \underset{(.0145)}{.1428X_4} + \underset{(.0129)}{.0378X_7} + \underset{(.0004)}{.0094X_6}$$

Manpower R&D Program - List A

(One copy to each addressee except as otherwise noted)

Director Technology Programs
Office of Naval Research (Code 12)
Arlington, VA 22217-5000

Director Research Programs
Office of Naval Research (Code 11)
Arlington, VA 22217-5000

Chairman, Manpower R&D Planning Committee
Office of the Chief of Naval Research
Code 222
Arlington, VA 22217-5000

Life Sciences Technology Program Manager
Office of Naval Research (Code 125)
Arlington, VA 22217-5000

Mathematics Programs
Office of Naval Research (Code 1111MA)
Arlington, VA 22217-5000

Head Information Sciences Division
Office of Naval Research (Code 1133)
Arlington, VA 22217-5000

Associate Director for Life Sciences
Office of Naval Research (Code 114)
Arlington, VA 22217-5000

Head, Psychological Sciences
Office of Naval Research (Code 1142)
Arlington, VA 22217-5000

Engineering Psychology Programs
Office of Naval Research (Code 1142EP)
Arlington, VA 22217-5000

Group Psychology Programs
Office of Naval Research (Code 1142GP)
Arlington, VA 22217-5000

Personnel and Training Research Programs
Office of Naval Research (Code 1142PT)
Arlington, VA 22217-5000

Defense Technical Information Center
(12 copies)*
DTIC/DDA-2
Cameron Station, Building 5
Alexandria, VA 22314

Science and Technology Division
Library of Congress
Washington, DC 20540

Jr. J. S. McMichael
Office of the Assistant Secretary of
the Navy (Manpower & Reserve Affairs)
5D800, The Pentagon
Washington, DC 20350

Assistant for Long Range Requirements
CNO Executive Panel (OP-00K)
2000 North Beauregard Street
Alexandria, VA 22311

Team Head, Manpower, Personnel, and
Training Section
Office of the CNO (OP-914D)
4A578, The Pentagon
Washington, DC 20350-2000

Assistant for Computers and Manpower
Office of the CNO (OP-987H)
5D772, The Pentagon
Washington, DC 20350-2000

Assistant for Planning and MANTRAPERS
Office of the DCNO(MPT) (OP-01B6)
Department of the Navy
Washington, DC 20370-2000

Assistant for Research, Development
and Studies
Office of the DNCO(MPT) (OP-01B7)
Department of the Navy
Washington, DC 20370-2000

---

*If report is ready for un'

Head, Military Compensation
Policy Branch
Office of the DCNO(MPT) (OP-134)
Department of the Navy
Washington, DC 20370

Director, Workforce Information Division
Naval Civilian Personnel Command (NCPC-13)
Department of the Navy
Washington, DC 20350

Assistant for Economic Analysis
Office of the DCNO (OP-01B3)
Department of the Navy
Washington, DC 20350-2000

Headquarters U.S. Marine Corps
Code MPI-20
Washington, DC 20380

Director, Decision Support Systems Div.
Naval Military Personnel Command (N-164)
Department of the Navy
Washington, DC 20370

Director, Distribution Department
Naval Military Personnel Command (N-4)
Department of the Navy
Washington, DC 20370-5004

Director, Overseas Duty Support Program
Naval Military Personnel Command (N-662)
Department of the Navy
Washington, DC 20370-5662

Head, Organizational Effectiveness Branch
Naval Military Personnel Command (N-62F)
Department of the Navy
Washington, DC 20370-5062

Director, Research & Analysis Division
Navy Recruiting Command (Code 22)
4015 Wilson Boulevard
Arlington, VA 22203

Naval School of Health Sciences
Attn: CDR Karen Reider
National Naval Medical Center (Bldg. 141)
Washington, DC 20814

Leadership Management Education and
Training Project Officer
Naval Medical Command (Code 05C)
Washington, DC 20372

Dr. Al Smode
Naval Training Systems Center Code 07A
Orlando, FL 32813

Head, Human Factors Laboratory
Naval Training Systems Center Code 71
Orlando, FL 32813

Commanding Officer
Navy Personnel R&D Center
San Diego, CA 92152-6800

Technical Director
NPRDC (Code 01)
San Diego, CA 92152-6800

Deputy Technical Director
NPRDC (Code 01A)
San Diego, CA 92152-6800

Fleet Support Office
NPRDC (Code 301)
San Diego, CA 92152-6800

Director, Training Laboratory
NPRDC (Code 05)
San Diego, CA 92152-6800

Director, Manpower and Personnel
Laboratory
NPRDC (Code 06)
San Diego, CA 92152-6800

Director, Human Factors and
Organizational Systems Laboratory
NPRDC (Code 07)
San Diego, CA 92152-6800

Department of Administrative Sciences
Naval Postgraduate School (Code 54Ea)
Monterey, CA 93943-5100

Department of Operations Research
Naval Postgraduate School (Code 55mt)
Monterey, CA 93943-5100

Technical Director
Navy Health Research Center
P.O. Box 85122
San Diego, CA 92138

Principal Civilian Advisor on
Education and Training
Naval Education and Training Command
NAS Pensacola, FL 12508

Assistant Chief of Staff for Research,
Development, Test, and Evaluation
Naval Education and Training Command (N-5)
NAS Pensacola, FL 12508

Special Assistant for Research, Experimental Programs, & Academic Programs
Naval Technical Training Command
(Code 016)
NAS Memphis (75)
Millington, TN 38054

Program Director
Manpower Research & Advisory Services
Smithsonian Institution
801 North Pitt Street
Alexandria, VA 22314

Military Assistant for Training and
Personnel Technology
Office of the Under Secretary of
Defense for Research and Engineering
3D129, The Pentagon
Washington, DC 20301-3080

Personnel Analysis Division
AF/MPXA
5C360, the Pentagon
Washington, DC 20330

Technical Director
U.S. Army Research Institute for the
Behavioral and Social Sciences
5001 Eisenhower Avenue
Alexandria, VA 22333

Director, Manpower Support and
Readiness Program
Center for Naval Analyses
2000 North Beauregard Street
Alexandria, VA 22311

Scientific Advisor to the DCNO(MPT)
Manpower Support and Readiness ProgKram
Center for Naval Analyses
2000 North Beauregard Street
Alexandria, VA 22311

Army Research Institute
Attn: PERI-RS
5001) Eisenhower Avenue
Alexandria, VA 22333

Dr. Irwin G. Sarason
Department of Psychology (NI-25)
University of Washington
Seattle, WA 98195

Dr. Benjamin Schneider
Department of Psychology
University of Maryland
College Park, MD 20742

Mr. Richard E. Conaway
Syllogistics, Inc.
5413 Backlick Road
Springfield, VA 22151

Dr. David Kieras
Department of Psychology
The University of Michigan
Ann Arbor, MI 48106

Dr. David Bowers
Rensis Likert Associates
3001 S. State St.
Ann Arbor, MI 48104

Dr. Lawrencce R. James
School of Psychology
Georgia Institute of Technology
Atlanta, GA 30332

Dr. John R. Frederiksen
Bolt Beranek & Newman Inc.
50 Moulton Street
Cambridge, MA 02238

Dr. Lee Roy Beach
Department of Psychology (N1-25)
University of Washington
Seattle, WA 98195

Dr. Cynthia D. Fisher
College of Business Administration
Texas A&M University
College Park, TX 77843

Dr. Barry Riegelhaupt
Human Resources Research Organization
1100 South Washington Street
Alexandria, VA 22314

Dr. Lawrence Goldberg
Economic Research Laboratory
1914 Association Drive
Reston, VA 22091

Dr. James C. Coyne
Mental Research Institute
555 Middlefield Road
Palo Alto, CA 94301

Dr. Robert P. Archer
Eastern Virginia Medical Authority
P. O. Box 1980
Norfolk, VA 23501

Dr. Meg Gerrard
Psychology Department
Iowa State University
Ames, Iowa 50010

Dr. Eric Flamholtz
Graduate School of Management
UCLA
Los Angeles, CA 90024

Dr. Richard C. Morey
Graduate School of Business Admin.
Duke University
Durham, NC 27706

Library
Naval Training Systems Center
Orlando, FL 32813

Library
Naval War College
Newport, RI 02940

Chief, Survey and Market
Analysis Division
Defense Manpower Data Center
1600 Wilson Boulevard, #400
Arlington, VA 22209

Manpower R&D Program - List B

Director, Human Resource Management
Training Department
Naval Amphibious School
NAB Coronado, CA 92155

Commanding Officer
Organizational Effectiveness Center
Naval Training Center Building 304
San Diego, CA 92133

Commanding Officer
Organizational Effectiveness Center
Pearl Harbor, HI 96860

CINCPACFLT
Organizational Effectiveness Division
Code 71
Pearl Harbor, HI 96860

Commanding Officer
Organizational Effectiveness Center
1211 South Fern Street, Room A112
Arlington, VA 22202-2808

Commanding Officer
Organizational Effectiveness Center
5621-23 Tidewater Drive
Norfolk, VA 23509

Commander in Chief, U.S. Atlantic Fleet
Organizational Effectiveness Division
Code N041
Norfolk, VA 23511

Director, Human Resource Management
Training Department
Naval Amphibious School
NAB Little Creek
Norfolk, VA 23521

Dr. Lawrencce R. James
School of Psychology
Georgia Institute of Technology
Atlanta, GA 30332

Dr. John R. Frederiksen
Bolt Beranek & Newman Inc.
50 Moulton Street
Cambridge, MA 02238

Dr. Lee Roy Beach
Department of Psychology (N1-25)
University of Washington
Seattle, WA 98195

Dr. Cynthia D. Fisher
College of Business Administration
Texas A&M University
College Park, TX 77843

Dr. Barry Riegelhaupt
Human Resources Research Organization
1100 South Washington Street
Alexandria, VA 22314

Dr. Lawrence Goldberg
Economic Research Laboratory
1914 Association Drive
Reston, VA 22091

Dr. James C. Coyne
Mental Research Institute
555 Middlefield Road
Palo Alto, CA 94301

Dr. Robert P. Archer
Eastern Virginia Medical Authority
P. O. Box 1980
Norfolk, VA 23501

Dr. Meg Gerrard
Psychology Department
Iowa State University
Ames, Iowa 50010

Dr. Eric Flamholtz
Graduate School of Management
UCLA
Los Angeles, CA 90024

Dr. Richard C. Morey
Graduate School of Business Admin.
Duke University
Durham, NC 27706

Library
Naval Training Systems Center
Orlando, FL 32813

Library
Naval War College
Newport, RI 02940

Chief, Survey and Market
Analysis Division
Defense Manpower Data Center
1600 Wilson Boulevard, #400
Arlington, VA 22209

END
8-87
DTIC