

# Offering a Job: Meritocracy and Social Networks<sup>1</sup>

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This study focuses on the impact of sex, race, and social networks, to analyze the hiring process in a mid-sized high-technology organization, using information on all 35,229 applicants in a 10-year period (1985–94). For gender, the process is entirely meritocratic: age and education account for all sex differences. But even without taking into account the two meritocratic variables, there are small differences between men and women at all stages in the hiring process. For ethnic minorities, the process is partly meritocratic but partly reliant upon social networks. Once referral method is taken into account, all race effects disappear. In hiring, ethnic minorities are thus disadvantaged in the processes that take place before the organization is contacted. They lack access to or utilize less well the social networks that lead to high success in getting hired.

## INTRODUCTION

The hiring process is perhaps the single most important but least understood part of the employment relationship. With extensive internal labor

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markets and important differences between firms and industries, the question of who gets hired where is crucial to understanding subsequent inequality in employment outcomes. Moreover, to the extent that there is illegitimate treatment of women, ethnic minorities, and other groups, one may conjecture that the point of hire is the place where this most likely would occur. Why is this so?

One reason is that subjective assessments carry great weight in hiring. The scope for prejudice is wide and probably harder to detect than in later parts of the employment relationship. Lazear (1991, pp. 13–14) provides, with respect to sex and race differences, “hiring is most important; promotion is second; and wages are third.” It is also difficult for rejected applicants to take action when unfairly treated. As Bloch (1994, p. 1) writes, “Employees are far more likely than applicants to file discrimination lawsuits, and damages awarded to them tend to be greater than those received by applicants.” Epstein (1992, p. 58) elaborates from the employer’s point of view: “Most firms prefer to run the risk of litigation with initial hires, instead of with promotion and dismissal.”

Another reason relates to the role of social networks and contacts that are important in hiring, as demonstrated in research sampling job seekers or current job holders (e.g., Corcoran, Datcher, and Duncan 1980). These need not be discriminatory in intent or design, but women and ethnic minorities may have lower access to social networks having higher rates of success in hiring (e.g., Granovetter [1974] 1995, pp. 147, 169; Roos and Reskin 1984, pp. 241–46).

Despite its importance, the hiring process is poorly understood and hardly studied. It is simply unusually difficult to assemble the relevant data. To assess potential discrimination, one needs to know the decisions made by the agent doing the discrimination, the employer, and how these were made over the complete set of people potentially discriminated against, the applicants to jobs, focusing on both the demand- and supply-side of the market. One cannot rely on sample surveys of job seekers or job holders, their method of job search, and their degree of success (e.g., Hanson and Pratt 1991). These allow no comparison of the entire set of job seekers exposed to the same potentially discriminatory employer, reporting only on the outcomes for separate individuals exposed to different employers. Other studies sample employers about their strategies for filling jobs and sometimes about the hired employees (e.g., Barron, Bishop, and Dunkelberg 1985; Gerhart 1990; Marsden 1994*a*). But these studies also yield no information about the entire applicant pool. What is required is access to information on the entire applicant pool and on the decisions

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made by the employer about which candidates to hire, as well as the rewards offered. “To use Alfred Marshall’s apt metaphor, to analyze a market from only one side is like trying to cut with one blade of a scissors” (Granovetter 1995, p. 155). But the relevant data allowing one to describe both sides of the market are rare. The information is hard to assemble, has rarely been analyzed, and is not likely ever to be made available on a large scale.

We will thus present a quantitative case study of the hiring process in a midsized U.S. high-technology organization. This is, to our knowledge, the first such large-scale study focusing on gender in contemporary organizations. Only two previous studies use the same kind of data on applicant pools; one focuses on gender and race, and the other focuses on social networks, while also presenting the effects of sex. Both studies will be discussed below (Petersen, Saporta, and Seidel 2000; Fernandez and Weinberg 1997). We use information on all 35,229 applicants in a 10-year period, 1985–94. Of these applicants, 3,432 received offers of employment. We know who received offers and who did not, the quality of the offer, whether it was improved in subsequent negotiations, and whether it was accepted, as well as later departures from the organization among accepters. We also know how the applicants got into contact with the organization, including whether it occurred through personal or professional networks. In the analysis, we focus on the role of meritocratic factors, age and education, and of network factors for understanding the impact of gender.

To avoid potential selection biases arising when focusing on job seekers from different applicant pools, one needs to study what happens at the level of single organizations, using full applicant pool data. But why this particular organization? That is primarily a question of access to data. The ideal data set with information on all applicants and hiring decisions across several hundred establishments is impossible to assemble, and even data on single organizations are hard to come by. So instead of pursuing an impossible ideal, we need to assess the representativeness and broader significance of the current case. As we shall return to in full force in our conclusion, we believe the results to be representative of current practices in midsized to large U.S. organizations. At a minimum, they most likely are representative of practices in high-technology and service organizations, including those in industries such as banking and insurance, the latter often having rather similar personnel systems in terms of careers and rewards. And to paraphrase Geertz (1973, p. 22), we do not study this particular organization, we study *in* this organization. The ideas, concepts, and categories we formulate are general. We attempt to appraise them in the context of a single organization.

Our conceptual focus is on sex, but we compare the effects of sex to

those of race, due to two facts about sex that separates it from other kinds of inequality, making the contrasts relevant. First, men and women are equally distributed on the class and socioeconomic structure by birth. This is not the case for disadvantaged racial or other groups, who at birth are disproportionately allocated into classes with differing economic and cultural resources. Second, women are numerous, not a minority. Their sheer numbers facilitate collective action, and their demands may more easily be heard than various minority demands. For these two reasons, one may expect that women currently face few obstacles relative to men in most spheres of life, whereas blacks, Hispanics, and other disadvantaged groups on average likely face larger obstacles. The labor market, however, may be the exception. This is due to a third and overwhelming fact that separates women from all men: they often bear children, which can lead to unstable work careers (e.g., Elster 1995, pp. 303–5). Hence, it is in the labor market that women currently are likely to face larger obstacles relative to men, putting them in a position closer to minorities, with minority women sometimes but not always being at the largest disadvantage.

Since remarkably little is known about the hiring process, rather than engaging in elaborate and potentially pretentious theorizing, we shall emulate the detective, keeping in mind Sherlock Holmes' dictum: "The temptation to form premature theories upon insufficient data is the bane of our profession" (Doyle 1986, vol. 2, pp. 163–64). When facts are few, an approach of "thick" description is appropriate, doing, so-to-speak, quantitative ethnography. We, nevertheless, need some ideas to cement our approach in the empirical analysis, which we provide in the next section.

#### THE HIRING PROCESS

##### What Employers Do, What They Can Get Away With

Discrimination at the point of hire entails the most complex set of issues, with three processes to be analyzed. The first is the recruitment process, whether it occurs through newspaper ads, employment agencies, or social networks (e.g., Bloch 1994; Granovetter 1995). The second is the hiring decision, who gets hired and who gets turned away when a job is being filled (Bloch 1994). The third is the conditions of employment offered—pay, level, responsibility, fringe benefits, perks, and so on. To understand the extent to which differential treatment occurs at each of these stages, we focus on its documentability and on the availability of a complainant who can raise charges and pursue remedy for illegitimate treatment.

In terms of the recruitment process, discrimination is hard to document

(Collinson, Knights, and Collinson 1990; and on race, see Newman [1978] and Turner, Fix, and Struyk [1991]). For example, if recruitment to a large extent takes place through information networks, these may operate in a manner that is discriminatory toward women, like referrals from male employees or male job networks (Blau and Ferber 1987, p. 51; Hanson and Pratt 1991, 1995, chaps. 6–7). But these processes are difficult to document. There is the complex issue of whether one can document discriminatory intent, not only disparate impact (England 1992, chap. 5). Moreover, the availability of a complainant is problematic. Someone turned down for a job may not have the access to the pertinent information about the applicant pool and the procedures followed nor the desire to spend additional resources. A complaint may as well come from an employee already in the organization, someone who has observed illegitimate treatment and has the relevant information, but incentives to complain are limited.

In terms of who gets hired, discrimination is also difficult to document. Information about the applicant pool is rarely available, and all that may be accessible to outsiders is information about those who get hired. And even if the relevant information were available, it likely is ambiguous, open to many interpretations. Jewson and Mason (1986, p. 59), citing a report by R. Jenkins, provide that “there remains great scope for subjective decisions about ‘personality’ etc. in even the most elaborate selection plans.”<sup>2</sup> As for the availability of a complainant, this is most problematic. Those not hired and possibly discriminated against will rarely know what occurred, and even when they do, it may be impossible to gather the relevant evidence. Additionally, when there were many applicants for a job, in which case a potentially large number of comparisons would need to be made, it is difficult for those currently in the organization and infeasible for most rejected employees to fully understand the process. Those turned down often have gotten other jobs, in which case the incentives for complaining or filing suits are small.<sup>3</sup>

When it comes to quality of offers made and to placement at time of hire, it is typically easy to document the identities of the parties hired and the conditions under which they were hired but not the conditions offered to those who declined the offers. But the subjective element in

<sup>2</sup> Or as Epstein (1992, pp. 371–72) writes, “But again, the process of selection is sufficiently complex that there is no reason to suppose that all the workers within the applicant pool are uniform in quality relative to the jobs in questions, or that they have the same objectives in mind. Subjective preferences continue to exert their influence at every stage of the hiring process.”

<sup>3</sup> Donohue and Siegelman (1991, p. 1031) show that by 1985, most lawsuits are filed by fired employees, followed by current employees (about 10% of cases), while fewest cases are filed by those not hired.

deciding which conditions to offer is usually high, simply because less is known at the point of hire than at later promotion. So unless an employer determines the conditions offered at initial hire exclusively on the basis of formal qualifications such as degree, grades, and experience, this is a point in time when differential treatment of men and women easily can occur and is relatively easy to justify. Even when conditions are determined primarily on the basis of formal qualifications, there is still the difficulty of lack of comparability. For example, it is well known that it is harder to get good grades at good schools, but "there is no general formula to translate grades from one school into their equivalents at another," except for special procedures tailored to college admissions (Stinchcombe 1990, p. 247). So the subjective element is likely to be pronounced. But one should expect less disparate treatment in conditions at initial offer and employment than in who gets offers and who gets turned away. Conditions at initial employment among those hired often become known among colleagues and can hence form the basis for comparison processes. Disparate offers may lead to feelings of injustice as well as formal complaints, which management likely wants to avoid.

On all accounts then, hiring is the stage in the employment relationship where there is wide scope for highly subjective assessments, and thus differential treatment is most likely. Added to this, if or when employers want to discriminate, it seems irrational to do so in wages and promotions but not in hiring. Why should one engage in illegal behaviors where they are most transparent and detectable and refrain from doing so when they are less transparent? There is thus little reason to expect employers to treat men and women fairly at the point of hire but then to initiate unfair treatment at a later stage. As Olson (1997, p. 61) comments, "One should expect bigotry to manifest itself more in refusals to hire people than in the self-defeating practice of hiring them only to turn around and fire them."

#### Social Networks

Turning to the role of networks, their importance in getting jobs is unambiguously and extensively documented for several countries, as reviewed in Granovetter (1995, pp. 139–82). In the United States around 50% of job seekers find their jobs through personal networks. Their role in hiring is thus difficult to exaggerate. For gender, Roos and Reskin (1984, p. 245) provide, "With respect to sex segregation, the questions of interest are whether the sexes have equal access to personal networks, whether they are equally likely to use them, and whether networks are equally effective for women and men." It is not only a question of having access, but also one of utilizing it and of its eventual success.

## Meritocracy and Social Networks

The networks may take many forms and are often interwoven in complex and opaque ways. Their primary consequence, though not necessarily intent, is to provide information about opportunities to job seekers and about prospective hires to employers.

One reason for potential male advantage in such networks is simply men's more extensive attachment to the labor force, which in turn yields more opportunities to gather information. By working more hours, doing more jobs, and travelling more, men get exposed to more possible jobs. This occurs through the sheer frequency of their contacts with others, where information is collected and professional networks and affiliations are built as a by-product. And for this, there is no easy substitute or remedy, little that can be done to diminish female disadvantage in access to those professional networks that increase in size with the amount of attachment to the labor force.<sup>4</sup> Employers will continue to use referral networks for recruiting employees, and through work, people will learn about opportunities from personal contacts. Munch, McPherson, and Smith-Lovin (1997) show how women raising small children have more restricted networks. This may in turn have detrimental effects for employment at a later stage.<sup>5</sup>

Another form of potential male advantage in network access comes from informal and social networks, through comradery at work, through social activities, possibly in clubs and sports, where women often are excluded. By such means men might accrue more relevant information. Discussing how such differences might have led to sex segregation in the insurance industry, Thomas (1990, pp. 188–89) reports that “a major advantage men have is being able to take male clients hunting or fishing or to play racketball or golf.”

There are good reasons to suspect that different access to networks presents a considerable disadvantage to women. Roos and Reskin (1984, p. 245) argue that “Occupational sex segregation persists in white-collar jobs in part because information networks are sex segregated.” Reskin and Hartmann (1986, p. 51) elaborate, “Not only are such networks sex

<sup>4</sup> One institutional remedy unlikely to be adopted in the United States was in operation in Israel between 1959 and March 1991. All private-sector jobs not requiring a college degree had to be matched through a centralized employment service agency, which put job seekers and job vacancies into contact (Berman 1997, p. S266). Such a system clearly dampens the role of social networks in finding jobs. Much search still occurred outside the centralized agency, but prior to any appointment, the parties had to register vacancies and applications with the agency.

<sup>5</sup> Some of the detrimental effects of sex-segregated networks may be alleviated by the fact that the majority of men and women live together and that much information exchange occurs within families so that it might diffuse across gender lines. Kinship networks have historically been important for allocating jobs.

segregated as a rule, but women are less likely than men to find their jobs through such informal methods.” At the same time, they acknowledge the difficulty of elucidating these processes, stating (pp. 54–55) that “although some have observed that women lack access to these networks . . . , the actual processes through which access is limited are difficult to pinpoint, because of the subtle ways that discrimination occurs in network systems and the difficulty of quantifying the kinds of resources being distributed.”

There is also the problem of whether there was discriminatory intent, not only impact. Many such informal procedures are used not primarily to exclude women but are efficient recruitment tools. Networks might reduce uncertainty through the quality of the information that can be extracted.<sup>6</sup> But in one famous court case against State Farm Insurance “the judge ruled that State Farm had excluded women from positions as agents by (1) relying on a virtually all-male ‘talking network’ to locate recruits” (Thomas 1990, p. 196).<sup>7</sup>

#### Research Evidence

Research evidence on discrimination at the point of hire is limited for each of the three processes. A few but growing number of studies address recruitment practices (see Marsden 1994*a*), but little has been written about gender-based processes at this stage. Much the same is the case for who gets hired and who gets turned away, with a few studies of selection procedures (e.g., Marsden 1994*b*). One single extensive study addresses both recruitment and the hiring decision, based on direct observations of the hiring processes in several British organizations around 1985 (Collinson, Knights, and Collinson 1990). They show considerable amount of

<sup>6</sup> Spence (1974, p. 6) writes that when “the employer and potential employee confront each other in the market (the confrontation may be preceded by a considerable amount of search by either party or both) neither is certain about the qualities of characteristics of the service which the other is offering for sale.” Granovetter (1981) discusses how contact or social networks may reduce this uncertainty by providing more reliable information. Fernandez and Weinberg (1997, pp. 898–99) offer additional discussion on the role of referrals, including how referrals may be easier to socialize, motivate, and “control” once hired.

<sup>7</sup> In a case involving racial discrimination, a firm that did most of its hiring through Hispanic networks was as a result found to discriminate against blacks and was ordered to pay penalties (Epstein 1992, pp. 70–71). A similar case was raised against a Korean laundry (Olson 1997, p. 25). The plaintiff (EEOC) lost, but the company went out of business as a result of the legal expenses incurred.



discrimination at this stage.<sup>8</sup> DiPrete (1989, chap. 8) reports the extent to which a job is filled by a woman or a man, but not based on which applicant from the applicant pool succeeded. Perhaps the most extensive evidence on discrimination in who gets hired comes from laboratory experiments. The studies are often conceptually transparent but invariably lack external validity in terms of inferring what goes on in actual hiring situations. In a review of about 20 experimental studies on sex discrimination in hiring decisions, Olian, Schwab, and Haberfeld (1988) conclude that the evidence for gender discrimination in hiring is marginal.

One study, using data on all applicants to a large California service organization in 1993–94, finds no evidence of female disadvantage in rating at first interview or in being hired (Petersen et al. 2000). There is a slight disadvantage to being black, which withstands controls for age and education. Another study, using data on the entire applicant pool to entry-level positions in a large bank, though not with an emphasis on gender, finds a small positive effect of being female on getting a job offer, though not commented upon (Fernandez and Weinberg 1997; Fernandez, Castilla, and Moore 2000). These two studies using the relevant kind of data from recent years find no evidence of female disadvantage in the hiring process.<sup>9</sup>

Goldin and Rouse (2000) imaginatively address hiring discrimination for positions in eight major American symphony orchestras, using information on musicians who competed in live auditions from the late 1950s through 1995. Since 1970, most orchestras have shifted from open to “blind” auditions where the evaluation committee cannot observe the sex of the candidate but can hear the playing. Overall, women do worse than men under sex-blind while better under open auditions, in each of four types of audition rounds. But for the subset of about 5% of the musicians who participate in more than one sex-integrated audition round of a given type and do so under both open and blind conditions, women do better than men under blind in each of four types of audition rounds while better than men under open conditions in only two. Since the quality of playing is the same under open and blind auditions, this shows disadvantage to women in two of four types of audition rounds when their sex is known.

<sup>8</sup> There are a number of psychological studies addressing the role of gender in recruitment interviews, for example, how the genders of interviewer and interviewee affect the interactions, but little in terms of how this affects the outcomes (see, e.g., Graves 1999).

<sup>9</sup> An earlier study uses data on all 20,576 applicants to an insurance company in 1981 (Kirnan, Farley, and Geisinger 1989). They find that while 26.6% of males are hired, only 17.6% of females are. There is no control for education, age, or other personal characteristics in this study. The findings may reflect the less favorable conditions faced by women in the early 1980s.

The interpretation of these results depends on how one assesses the two opposite findings and how much weight to attach to an analysis pertaining to a small subset of the women.<sup>10</sup> This is of course a rather unusual labor market.

An audit study addresses sex discrimination in restaurant hiring (Neumark, Bank, and Nort 1996). Matched pairs of equally qualified men and women applied for jobs as waiters and waitresses to the same 65 restaurants in Philadelphia. They find that men have much higher success in getting job offers in high-priced restaurants where pay also is high. Women have much higher success in getting offers at low-priced restaurants. Heckman (1998) has criticized audit studies claiming they may find evidence of discrimination where none exists and no evidence where it does exist.<sup>11</sup> Again, this is an unusual labor market.

As for placement at initial hire among those hired, a Canadian study addresses this. Using data on 107 managers in a company as of 1987, the study finds little evidence of differences in how the men and women were placed at the time they were hired (Bernard and Smith 1991). Hagan and Kay (1995, chap. 3) find some gender differences among Canadian law school graduates in initial conditions at hire, but cannot assess the extent to which this is due to choice or differential treatment. DiPrete (1989, chap. 9) finds that women tend to be placed lower in the grade hierarchy than men in the U.S. federal bureaucracy. Gerhart (1990) finds that women received lower starting salaries than men among employees who remained in a large U.S. firm, thus having a self-selected sample of those who remained in the organization rather than the pool of all hires at a given point in time.

The evidence on the impact of social networks for men and women is limited. Granovetter (1995, pp. 147, 169–77) reviews much of the empirical literature, reporting that “the proportion using contacts shows no consistent pattern by race, ethnicity, or gender, and the correlation between contact use and the quality of job obtained, as measured by satisfaction

<sup>10</sup> For the 7,065 musicians on which their main results are based, only an estimated 364 contribute to the analysis showing disadvantage for women in two of four types of audition rounds. This is the subset of musicians that participated in sex-integrated auditions under both open and blind conditions for a given type of audition round (see Goldin and Rouse 2000, table 5 and n. 38).

<sup>11</sup> Perhaps more problematic is that these studies do not take into account the sex composition of the entire applicant pool and current employees at the restaurants. When two equally qualified applicants show up, from the viewpoint of the applicant, each should have an equal chance of being hired. But this need not be so for the employer. In making a decision, they will consider also the sex composition of their entire applicant pool and their current stock of employees. Employers may want to achieve the same hiring rates for men and women across their entire applicant pool, not necessarily across the sex-balanced pool of applicants in the audit studies.

or wages, also varies by study.” One relevant study finds that women are more likely to use localized networks, which in turn give fewer opportunities (Hanson and Pratt 1991, pp. 240–42). But this is related to travel patterns where men travel longer to work, and it reflects adaptations to family obligations probably as much as differential access to information networks (Hanson and Pratt 1995, tables 5.8 and 7.2). Reskin and Hartmann (1986, see esp. pp. 51–55) discuss findings mostly from the 1970s reporting differences between men and women in access to information networks. Fernandez and Weinberg (1997), with data on the entire applicant pool, find that networks are important for whether one gets a job offer or not.

Having reviewed the evidence, our assessment is that it is still sparse. Within this research area the impact of networks on inequality is according to Granovetter (1995, p. 177) “the single research gap most in need of filling.”<sup>12</sup>

As mentioned, our focus is on gender. However, in the empirical analysis, we also include results for race groups. The reason is simply that ethnic minorities also often are disadvantaged in employment and hence constitute relevant comparisons groups. But unlike women as a group, ethnic minorities as a group are less favorably distributed on the class structure by birth. Women cut across all class distinctions in a way that ethnic minorities do not. So ethnic minorities first face the disadvantage of ethnic discrimination and then a potential disadvantage stemming from class background through lack of economic or cultural resources and personal networks. One may thus expect ethnic minorities as a group compared to whites potentially to face larger disadvantages in the employment process than women as a group compared to men.

#### DATA

For this study, we use data on all applicants to a U.S. high-technology company. Due to concerns about confidentiality, we are somewhat restricted in the amount of contextual information we can provide about the company. A vivid description of hiring in one part of the high-technology labor market is, however, given in Lewis (2000, chap. 8). We have access to information for an 11-year period (1985–95), with 38,512 applicants, 3,662 job offers, and 3,056 accepted offers. But we restricted the

<sup>12</sup> There is some evidence that African-Americans have both more restricted access to networks and that these are less efficacious for finding jobs (Holzer 1987, pp. 449–52) and for wages (Granovetter 1995, p. 151). Waldinger (1996, chaps. 5–6) discusses the role of networks in hiring in construction, hotels, and the garment industry and the disadvantages that blacks especially, but also other minorities, face in that regard.

analysis to the 10-year period 1985–94, dropping the 3,283 applicants in 1995, losing 8.5% of the observations. This leaves us with 35,229 applicants, 3,432 with offers, and 2,870 acceptances. We did this due to a right-censoring problem for some of the applicants in 1995. Of those receiving offers and accepting them over the period 1985–94, about 57% started work within six months of the initial application, and a total 98.0% within the first 12 months. The longest elapsed time from initial application to starting work was 19 months. But for those applying in 1995, especially in the second half of 1995, we would have a right-censoring problem for about 60 applicants in this period that received offers and had neither accepted nor rejected them by the end of 1995. We therefore dropped those who applied in 1995 from the analysis. There may still be a slight right-censoring problem among a few of those who applied in 1994, who received an offer but had not made up their mind by the end of 1995. At most, there will be 5–6 such persons.

We have access to the following background characteristics on the applicants: sex, age, years of education, and race (five groups). We also have considerable information about the hiring process itself. Related to the recruitment part, we know the method by which applicants got referred to the company, through an ad, friend, having been a previous contractor, headhunter, and so on. All applicants were given a brief initial interview. We know where the interview took place, for the first through as many as four interviews: at a college or university campus, the hiring (placement) department within the organization, and so on. The durations between interviews were recorded. Each applicant received a rating on a scale from 0 to 100 after the first interview, based on a psychological profile test designed to assess the fit of the applicant to the organization. We know whether a job offer was extended or not, and for those who received an offer, we know the salary at the initial and final offer, irrespective of whether it was accepted or not. Among those receiving an offer, we have information on whether they had received offers from other employers and, if so, how many. This variable was, according to the placement department, quite accurate for those who accepted their offer but somewhat less so for those who declined. We also know whether an offer was accepted or not. The date of the initial offer was recorded, and if the final offer was accepted, we know the date employment started. For those that declined an offer, we do not know when that occurred. For hired applicants, we know whether they quit or not before the end of 1995, and if they did, the date it occurred.

We have no information on occupation or job title. But these are not important in the organization. It tries to hire the best people and assign them to broad functional and hierarchical groups. As will be shown in

the next section, the spread in salary offers reflects what one would expect to find across a diverse set of occupations and hierarchical levels.

The referral method turns out to be important. The data on it records how the actual match was made, which is an amalgam or a meeting of the strategies used by the job seeker and the employer. It does not necessarily describe the full range of strategies used by the job seeker and possibly not by the employer either. A job seeker might have used multiple strategies, including newspaper ads, cold calls, and social networks. All we record is which of these led to the match with this organization.

Table 1 accounts for each stage in the hiring process analyzed. It shows the declining set of applicants included at each stage, the methods used, and the tables in which the results are presented.

#### RESULTS: DESCRIPTIVE STATISTICS

Table 2 gives a distribution of the applicants on several individual-level characteristics and on success in the hiring process, first for all applicants (first three columns), then for those who did not receive an offer (middle three columns), and finally for those who did (last three columns), in each case given for both sexes and separately by sex. Females account for 25.1% of the applicants, with 25.3% among those not receiving an offer and 24.0% among those receiving one. The mean evaluation at initial interview is the same for men and women. It is considerably higher for those who received an offer than those who did not. Only 9.7% of applicants received an offer, somewhat higher for men than women (9.9% vs. 9.3%). Of those receiving an offer, 83.6% accepted, with a somewhat lower acceptance rate for men than for women. In the end, 8.1% of applicants were hired.

Women applicants are on average 3.6 years younger than men and have somewhat lower educational attainment. The distribution on ethnic categories is more or less the same for men and women. Whites make up 49.1% of applicants but an entire 60.1% of those who received offers, with correspondingly smaller percentages receiving offers in other ethnic groups.

The racial composition of hires into this organization is typical of high-technology companies. In Silicon Valley, for example, there is massive underrepresentation of minorities relative to their representation in the Bay Area workforce.<sup>13</sup> Anecdotal evidence from other high-technology

<sup>13</sup> Across 33 high-technology companies for which information was available in the Bay Area, the representation of blacks, Asians, and Hispanics in 1997 was 4%, 28%, and 7%, whereas their representation in the workforce in the area was 8%, 21%, and 14%, thus with blacks and Hispanics heavily underrepresented. See Angwin and Cas-

TABLE 1  
STAGES IN THE HIRING PROCESS ANALYZED

Stages Analyzed	Applicants	N	Methods	Tables
Referral method	All	35,229	ML	4A, 5A, 5B
Place of first interview	All	35,229	ML	4B, 4C, 5C, 5D, 5E
Rating at first interview	All	35,229	LR	6A
Second interview or not	All	35,229	BL	6B
Offer or not	All	35,229	BL	6C
Offer or not among those with a second interview*	Those with a second interview	19,869	BL	6D
Initial salary offer	Those with an offer	3,432	LR	7A
Final salary offer	Those with an offer	3,432	LR	7D
Increase or not in final offer†	Those with an offer	3,432	LR	7B
Amount of increase in final offer†	Those with an increase in final salary offer	3,305	LR	7C
Accept or not	Those with an offer	3,432	BL	8A
Amount of increase in starting salary†	Those accepting the offer	2,870	LR	8B
Starting salary	Those accepting the offer	2,870	LR	8C
Departures	Those accepting the offer	2,870	HR	8D

NOTE.—The stages in parentheses are derived from the other stages. ML = multinomial logit; LR = linear regression; BL = binary logit; HR = hazard rate.

\* Derived from previous stage.

† Derived from stages "initial salary offer" and "final salary offer."

centers supports this (e.g., Austin, Tx.; Research Triangle, N.C.; Seattle, Wash.; and Route 128, Mass.).

The main referral method is through a friend (51.0% of applicants), but cold calls, campus recruiters, and having worked as a previous contractor are also important referral methods, accounting for 14.3%, 14.8%, and 9.4% of applicants. There is no difference between men and women in this respect. Among those offered a job, being referred by a friend is by far the most important referral method, accounting for two out of three offers, followed by having been a previous contractor, which makes up 13.2% of those receiving an offer. Ads represent 5.9% of all applicants but only 1.4% of those receiving an offer. There is hence no question that two kinds of social networks are the main avenues for entry into the organization. Personal networks, through a friend, and professional networks, from having been a previous contractor, cover 67.7% and 13.2% of those receiving an offer, a total of 80.9% of offers. This is typical of high-technology companies. As the 1998 head of human resources for Sun Microsystems expressed it: "About 60% of our jobs are filled by referrals by employees" (Angwin and Castañeda 1998, p. A9).

First interview of applicants occurred several places, with human resource and placement departments being the most important, covering 23.7% and 55.4% of cases. Among those receiving an offer, the first interview occurred in 82.8% of cases in the placement department, the group within the organization with a job to fill. Note that every applicant who was referred by a campus recruiter also had their first interview on campus. Those referred by other methods did not have the first interview on campus. So what we see is that the way one gets into contact with the organization has a strong impact on the likelihood of receiving an offer, first through the referral method where two types of social networks account for 80.9% of offers, and next through where the first interview took place, with the placement department accounting for 82.8% of offers given.

Among those receiving an offer, everyone had two or more interviews; among those not receiving an offer, about half had more than one interview. Of extended offers, 99.9% were made within the same month as the second interview, and none were made before that interview.

The amount of time that elapsed between interviews was short: 95% of second interviews occurred within 3 months, while all third and fourth interviews occurred within one month of the previous interview. There were only marginal differences between the groups in this respect, and the numbers are not given in the table.

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tañeda (1998) or the web site <http://www.sfgate.com> for May 4, 1998. Our numbers were computed from information given in their article.

TABLE 2  
CHARACTERISTICS OF APPLICANTS

VARIABLE	ALL APPLICANTS			NOT OFFERED JOB			OFFERED JOB		
	All	Men	Women	All	Men	Women	All	Men	Women
%female .....	25.1			25.3			24.0		
%offered a job .....	9.7	9.9	9.3						
%hired .....	8.1	8.2	8.0				83.6	83.0	85.6
Evaluation/rating:*									
Mean .....	70.8	70.9	70.7	68.9	68.9	68.8	88.9	88.9	89.1
SD .....	18.3	18.3	18.3	17.7	17.7	17.7	13.5	13.7	13.2
Min .....	.0	.0	.0	.0	.0	.0	2.0	2.0	2.8
Age (years): <sup>†</sup>									
Mean .....	27.0	27.9	24.3	26.9	27.8	24.3	27.6	28.4	24.9
SD .....	7.4	7.7	5.7	7.4	7.6	5.7	7.7	7.9	6.3
Education (years): <sup>‡</sup>									
Mean .....	16.7	17.0	15.8	16.7	17.0	15.8	16.9	17.2	16.0
SD .....	3.5	3.6	3.0	3.4	3.5	3.0	3.6	3.7	3.2
Race (%):									
White .....	49.1	50.4	45.4	47.9	43.3	44.0	60.1	60.6	58.5
Black .....	7.2	7.1	7.5	7.5	7.3	7.9	4.5	4.8	3.4
Asian .....	38.7	37.6	42.0	39.5	38.4	43.0	31.3	31.1	31.9
Hispanic .....	4.8	4.8	5.0	4.9	4.9	4.9	4.1	3.5	6.2
Native American .....	.1	.1	.1	.1	.1	.1	.1	.1	.0



Referral method (%)	51.0	51.9	48.3	49.2	50.2	46.3	67.7	67.6	68.1
Friend .....	51.0	51.9	48.3	49.2	50.2	46.3	67.7	67.6	68.1
Ad .....	5.9	5.8	6.4	6.4	6.3	6.9	1.4	1.4	1.5
Cold call .....	14.3	13.4	17.1	15.2	14.2	18.2	6.1	6.1	6.2
Headhunter .....	3.5	3.9	2.6	3.4	3.7	2.4	4.9	5.0	4.6
Campus recruiter .....	14.8	15.0	14.4	15.8	16.0	15.4	5.5	5.8	4.6
Previous contractor .....	9.4	9.1	10.2	9.0	8.7	9.8	13.2	13.0	14.0
Other .....	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.2	1.1
Place of first interview (%): <sup>§</sup>									
Campus .....	14.8	15.0	14.4	15.8	16.0	15.4	5.5	5.8	4.6
Human resources .....	23.7	22.8	26.3	25.8	24.8	28.6	4.2	4.2	4.2
Placement department ...	55.4	56.0	53.8	52.5	53.1	50.8	82.8	82.6	83.6
Upper management .....	6.1	6.3	5.5	5.9	6.2	5.3	7.5	7.4	7.5
No. of interviews (%):									
1 .....	43.6	40.1	45.1	48.4	47.9	49.7	.0	.0	.0
2 .....	28.4	28.7	27.7	26.7	27.0	26.1	44.1	44.4	43.3
3 .....	14.5	14.7	14.0	12.0	12.2	11.4	37.8	37.4	39.1
4 .....	13.4	13.5	13.3	12.9	12.9	12.8	18.1	18.3	17.6
<i>N</i> .....	35,229	26,376	8,853	31,797	23,768	8,029	3,432	2,608	824

NOTE.—Data are all applicants to a mid-sized high-technology organization, 1985–94. Percentages do not always sum to 100.0 due to rounding errors.

\* Upon applying, applicants are given a rating between 0 (min) and 100 (max).

† The minimum age is 18, and the maximum, 45.

‡ Not finished high school = 11 (min); high school graduate = 12; some college = 13; two-year college degree = 14; four-year college degree = 16; some graduate work = 17; master's = 18; doctorate = 24 (max). To save space, we treat education as a continuous variable in the descriptive statistics, even though reporting the percentages in each educational category would have been more accurate.

§ More than 90% of the second, third, and fourth interviews took place in the department with the opening, the placement department; the rest occurred with upper management.

There is hardly any difference in personal characteristics between those who declined and those who accepted an extended offer. The numbers are almost identical to those in the last three columns of table 2, where the two groups are combined, and are hence not presented.

However, there were differences in the types of offers and in the number of alternative offers received by those who accepted and those who declined. The results are given in table 3.

The percentage of females is slightly higher among accepters than decliners. Among those who declined, 99.1% had one or more alternative offers, while among those receiving an offer and accepting it, only 67.9% had so. Furthermore, among decliners, 34.5% had three or more offers, whereas among accepters this was only 2.3%. The existence and number of alternative offers is, unsurprisingly, important for whether the offer gets accepted or not.

We standardized the initial salary offer by dividing it by its mean in the year. Thus we need not adjust for general wage increases and inflation. On average, men receive offers 2.7% above the mean in the year, while women receive initial offers 8.5% below the mean, an entire 11.2% below men. Decliners receive slightly better initial offers than accepters. This makes sense since decliners have more alternative job offers than accepters, thus appearing to be more marketable and also probably more difficult to attract.

For the final offer, it is again better for men, by the same percentages as in the initial offer. Those declining the job on average received a worse final offer than those accepting it, 2.3% below versus 0.5% above the mean final offer. The quality of the final offer seems to matter for whether it gets accepted or not.

Among those receiving offers, in 96.3% of cases, the final offer is better than the initial. Among those who accepted, 99.9% increased their salary between initial and final offer, while only 77.9% did so among those who declined. That may be part of the reasons why they declined. But it may also be the case that those planning to accept other jobs did not negotiate as much. No one received a worse final offer. Among decliners, the percentage who had an increase in final offer was higher for women than men.

The average increase from initial to final offer, among those receiving an increase, was 4.0%, the same for men and women. Accepters received considerably higher increases between initial and final offer than decliners, on average 4.5% versus 0.7%. Among decliners, the maximum increase was 2.5%, less than the average increase among accepters. It seems that increases in salary offers matter for whether the job is accepted or not. It is thus the case that those who declined received better initial offers,

but these offers were not improved by as much in the process between initial and final offer as among those who accepted.

There is great variation in the salary offers made. In 1994, the lowest and highest offers were \$28,526 and \$128,810 (mean = \$69,527; SD = \$21,996). The worst offer was less than half the average offer and the best almost twice the average, so that the highest offer was more than four times the salary of the lowest.

## RESULTS: MULTIVARIATE ANALYSES

### Referral Method

We start by analyzing the determinants of the referral method, how the applicant got into contact with the organization. The two central methods are through a friend and through having been a previous contractor, especially with respect to getting an offer or not, as shown in table 2. But being recruited by a headhunter is also important with respect to getting an offer. We use a multinomial logit model to analyze the determinants of the referral method, with being recruited through an ad as the reference category. The estimates then give the impacts of the independent variables on the logarithm of the odds of falling into a specific category on the dependent variable rather than into the reference category. A positive coefficient means that the odds increase when the independent variable increases. We comment only on the effects of being referred by a friend, a previous contractor, and by a headhunter, for reasons that will become clear later. We present only the results from the model including sex, race, age, and education, in panel A of table 4.<sup>14</sup>

The effect of being male is numerically very small and not significantly different from zero for any of the six odds. There are hence no differences between men and women in the distribution on the referral method, both before and after controlling for race, age, and education. The results are identical to those found in table 2, where the distributions on referral method were given separately for men and women.

We see that the odds of being referred by a friend are much lower for the ethnic minorities, except for Hispanics. The odds of being referred to the company by virtue of having been a previous contractor are much lower for blacks and Native Americans, but not for Asians and Hispanics. The odds of being referred by a headhunter are much lower for blacks

<sup>14</sup> Using data on the same organization, Seidel, Polzer, and Stewart (2000) analyze the determinants of referral method among hired applicants. We report results for the entire applicant pool.

TABLE 3  
CHARACTERISTICS OF OFFERS MADE TO APPLICANTS WHO RECEIVED AN OFFER

VARIABLE	OFFERED JOB			DECLINED			ACCEPTED		
	All	Men	Women	All	Men	Women	All	Men	Women
%female	24.0			21.2			24.6		
%hired	83.6	83.0	85.6						
Alternative offers (%):*									
0	27.0	27.1	26.1	.9	.9	.8	32.1	32.7	30.4
1	32.6	32.2	33.7	31.1	31.4	30.3	32.9	32.4	34.3
2	32.8	32.9	32.4	33.3	33.4	32.8	32.7	32.7	32.3
3	6.2	6.2	6.4	31.1	30.2	34.5	1.4	1.2	1.7
4	.8	.7	1.2	1.6	1.6	1.7	.7	.6	1.1
5	.5	.6	.1	1.8	2.3	.0	.2	.2	.1
Initial salary offer:†									
Mean	100.0	102.7	91.5	101.0	103.6	90.8	99.8	102.5	91.6
SD	31.7	32.3	28.2	31.4	32.1	26.7	31.8	32.4	28.5
Min	40.8	40.8	41.9	41.8	41.8	44.2	40.8	40.8	41.9
Max	191.4	191.4	186.6	183.4	183.4	177.9	191.4	191.4	186.6
Final salary offer:‡									
Mean	100.0	102.7	91.5	97.7	100.3	87.9	100.5	103.2	92.2
SD	32.3	32.9	28.7	30.5	31.1	26.0	32.6	33.2	29.2
Min	39.5	39.5	40.5	40.3	40.3	42.5	39.5	39.5	40.5
Max	204.3	204.3	187.1	178.8	178.8	172.7	204.3	204.3	187.1

Offer was increased (%) <sup>§</sup> ...	96.3	95.9	97.3	77.9	76.7	82.4	99.9	99.9	99.9
%increase in offer: <sup>  </sup>									
Mean .....	4.0	4.0	4.0	.7	.8	.6	4.5	4.5	4.5
SD .....	3.4	3.4	3.4	.5	.5	.4	3.4	3.4	3.4
Max .....	13.1	13.1	12.7	2.5	2.5	2.1	13.1	13.1	12.7
N .....	3,432	2,608	824	562	443	119	2,870	2,165	705

NOTE.— Data and rounding errors are described in table 2.

\* This gives the number of alternative job offers the applicant had. This variable is not available for those that did not receive an offer. The hiring organization considers this variable quite accurate among those who accepted the offer, but slightly underestimated for those who declined. One man received at least six alternative offers and declined the offer made here.

† To standardize for general wage increases and inflation, each initial salary offer was standardized around the mean initial salary offer in the year it was received (calculated separately for each year). The standardized mean initial salary offer for all who received a job offer was hence 100.0. For the other groups, the standardized mean initial salary offer is expressed relative to the mean for everyone in the year, so that a number of 102.7 among men offered a job indicates that men on average got offers 2.7% above the mean offer in the year. For the unstandardized initial salary offer, in 1985 (1994), mean = \$47,859 (\$64,255); SD = \$15,541 (\$20,810); min = \$19,880 (\$28,064); max = \$89,696 (\$119,280). This spread shows the need for standardization across years.

‡ The final salary offer was standardized according to the same rules governing the initial salary offer. For the unstandardized final salary offer, in 1985 (1994), mean = \$49,773 (\$69,527); SD = \$16,442 (\$21,996); min = \$20,152 (\$28,526); max = \$96,242 (\$128,810).

§ No one received a worse final than initial offer, but 3.7% did not receive one that was better.

|| Computed only for those who received an increase. Across the columns, min = .02%, .02%, .03% (offered a job), .02%, .02%, .03% (declined), and .02%, .02%, .09% (accepted), i.e., about a fifth of a percentage point.

TABLE 4  
EFFECTS OF SEX AND RACE ON REFERRAL METHOD AND PLACE OF FIRST INTERVIEW,  
CONTROLLING FOR AGE AND EDUCATION, FOR ALL APPLICANTS

Category on Dependent Variable	Male (1)	Black (2)	Asian (3)	Hispanic (4)	Native American (5)
Panel A: <sup>a</sup>					
Friend .....	.0628 (.0585)	-5.9267* (.1296)	-3.6232* (.0881)	-.0986 (.3889)	-4.4844* (1.4165)
Cold call .....	.0327 (.0613)	-1.8127* (.1069)	-1.9624* (.0939)	-2.2269* (.3910)	-.0226 (1.0815)
Headhunter .....	-.0021 (.0943)	-2.1535* (.1342)	-3.9514* (.1502)	2.3101* (.3963)	.7696 (1.0731)
Campus recruiter .....	-.0081 (.0606)	-.0549 (.1121)	.3495* (.1021)	3.0575* (.3946)	2.3131* (1.0310)
Previous contractor .....	-.0133 (.0648)	-2.6798* (.1396)	.5551* (.0991)	1.1786* (.4066)	-1.1613 (1.4172)
Other .....	.0411 (.1351)	-3.3074* (.2566)	2.2132* (.1451)	.4955 (.4897)	-.0231 (1.4189)
Panel B: <sup>b</sup>					
Human resources .....	.0240 (.0437)	-2.1875* (.0742)	-2.4141* (.0634)	-1.7093* (.0951)	-2.9927* (.4280)
Placement department .....	.0435 (.0416)	-4.4374* (.0798)	-3.3961* (.0596)	-2.7669* (.0887)	-4.2741* (.3882)
Upper management .....	.1202 <sup>+</sup> (.0655)	-4.7363* (.1698)	-3.6804* (.0783)	-2.7168* (.1330)	-14.7694 (166.2)
Panel C: <sup>c</sup>					
Placement department .....	.0401 (.0432)	-.0737 (.0900)	-.0244 (.0480)	-.1138 (.0869)	-.2920 (.6884)
Upper management .....	.1136 <sup>+</sup> (.0671)	-.0801 (.1866)	.0639 (.0731)	.0044 (.1375)	-11.1785 (199.5)

NOTE.—For description of data, see text. Age and education are used as two continuous variables (in panels A–C); referral method appears as six dummy variables in panel C. Reference categories for sex, race, and referral method are female, white, and ad. nos. in parentheses are SEs.

<sup>a</sup> Dependent variable is referral method. Estimates are from a multinomial logit model.

<sup>b</sup> Dependent variable is place of first interview. Reference category is campus. Estimates are from a multinomial logit model.

<sup>c</sup> Dependent variable is place of first interview, controlling for referral method. Human resources department is the reference category. Campus recruiter referrals are excluded because these applicants have identical interview locations, so there was nothing to predict. Estimates are from a multinomial logit model.

<sup>+</sup>  $P < .10$ .

\*  $P < .05$ .

and Asians, and significantly so, but are higher for Hispanics and Native Americans, also significantly so.

With respect to getting an offer, being referred by a friend is the central referral method, as shown in table 2. For this method, ethnic minorities except Hispanics have much lower odds than whites. This holds also when one controls for age and education.<sup>15</sup>

The estimates from a multinomial logit model have precise interpretations but ones that do not float over with intuition. It is hence useful to convert these into estimated percentages. Panel A of table 5 gives the actual percentages falling into each category of referral method, by sex (from cols. 2–3 of table 2) and by race. Panel B gives the estimated percentages falling into each of the seven categories of the dependent variable referral method from the multinomial logit model in panel A of table 4 after having controlled for sex, race, age, and education. They were computed first for men and women separately (in cols. 1–2), with race equal to white, age equal to its mean (27.0), and education equal to a four-year college degree (16), close to the average education of 16.7. Next it is computed for each ethnic category (in cols. 3–7), with sex set equal to male and education and age as in columns 1–2.

We see here both in panels A and B that there are no differences between men and women, neither in the raw percentages nor in the estimated percentages. The results are not worth further speculation.

There are however dramatic differences between ethnic groups in how they got recruited into the organization. From panel A, we see that 80.3% of whites made the referral through a friend, whereas only 4.9% and 2.4% of blacks and Native Americans did so. As for the actual numbers, 13,854 whites, 123 blacks, and 1 Native American were referred by a friend. Among Asians and Hispanics, this method was used by only 24.8% and 32.8% of applicants, much more often than among blacks but considerably less often than among whites. Only 2.3% of white applicants got referred by a campus recruiter, whereas an entire 36.4% of blacks did so, and 26.3% and 17.5% of Asians and Hispanics. An entire 20.6% of blacks got recruited through an ad. This is in concordance with recent evidence on practices within the industry: “Some blacks and latinos say it’s hard to break into those informal job-referral networks” (Angwin and Castañeda 1998, p. A9).

These differences do not disappear when we control for age and ed-

<sup>15</sup> Note here that having a negative effect on the odds of falling into the category being referred by a friend relative to the reference category does not necessarily imply that the probability of falling into this category decreases when the associated variable increases. What happens to the probability depends on the effects of that variable on the other categories of the dependent variable as well.

TABLE 5  
 DISTRIBUTION (%) AND ESTIMATED PERCENTAGES ON REFERRAL METHOD AND PLACE OF  
 FIRST INTERVIEW FOR ALL APPLICANTS

	Male (1)	Female (2)	White (3)	Black (4)	Asian (5)	Hispanic (6)	Native American (7)
<b>Panel A.*</b>							
Friend .....	51.9	48.3	80.3	4.9	24.8	32.8	2.4
Ad .....	5.8	6.4	.9	20.6	10.3	.4	2.4
Cold call .....	13.4	17.1	8.0	26.8	17.8	32.2	19.5
Headhunter .....	3.9	2.6	4.7	6.1	.5	12.1	19.5
Campus recruiter .....	15.0	14.4	2.3	36.4	26.3	17.5	51.2
Previous contractor .....	9.1	10.2	2.9	4.5	19.1	4.2	2.4
Other .....	1.0	1.0	.9	.8	1.2	.7	2.4
<b>Panel B.†</b>							
Friend .....	85.1	84.5	85.1	5.6	28.2	38.3	3.2
Ad .....	1.0	1.0	1.0	22.7	11.5	.0	3.3
Cold call .....	6.5	6.7	6.5	26.1	11.3	30.0	21.7
Headhunter .....	2.0	2.2	2.0	5.8	.0	10.2	15.0
Campus recruiter .....	1.5	1.6	1.5	34.0	25.7	15.4	50.5
Previous contractor .....	3.0	3.2	3.0	5.1	21.5	4.9	3.2
Other .....	.9	.9	.9	.8	1.3	.8	3.1
<b>Panel C.*</b>							
Campus .....	15.0	14.4	2.3	36.4	26.3	17.5	51.2
Human resources .....	22.8	26.3	16.0	43.0	28.8	31.5	22.0
Placement department ...	56.0	53.8	73.0	19.0	41.3	45.3	26.8
Upper management .....	6.3	5.5	8.7	1.7	3.7	5.6	.0



Panel D. <sup>§</sup>									
Campus .....	1.4	1.4	1.4	32.2	24.5	14.2	42.1		
Human resources .....	17.2	17.6	17.2	45.6	27.7	32.4	26.7		
Placement department ...	72.6	72.8	72.6	20.3	43.8	47.4	31.2		
Upper management .....	8.8	8.2	8.8	1.8	4.0	6.0	.0		
Panel E. <sup>  </sup>									
Campus .....	.0	.0	.0	.0	.0	.0	.0		
Human resources .....	10.1	9.7	10.1	10.4	9.8	10.6	13.9		
Placement department ...	80.4	80.2	80.4	79.6	79.2	78.3	86.1		
Upper management .....	9.5	10.2	9.5	10.0	11.0	11.2	.0		
<i>N</i> .....	26,376	8,853	17,308	2,530	13,645	1,705	41		

NOTE.—For description of data see text. Percentages do not always equal 100.0 due to rounding.

<sup>§</sup> Panel A gives the percentages falling into each category of referral method, by sex (from cols. 2–3 of table 2) and by race.

<sup>||</sup> Panel B gives the estimated percentages falling into each of the seven categories on the dependent variable referral method, from the multinomial logit model used in table 4, panel A, controlling for sex, race, age, and education. The percentages were computed first for men and women separately (in cols. 1–2), with race = white, age = 27 years (mean), and education = 16 (four-year college degree), close to the average education of 16.7 among applicants. Next it is computed for each ethnic category (in cols. 3–7), with sex set equal to male and education and age as in cols. 1–2. Cols. 1 and 3 in panel B are identical because they are computed for the same group of applicants.

<sup>†</sup> Panel C gives the percentages falling into each category on place of first interview, by sex (from cols. 2–3 of table 2) and by race.

<sup>‡</sup> Panel D gives the estimated percentages falling into each of the four categories of the dependent variable place of first interview, from the multinomial logit model used in table 4, panel B, controlling for sex, race, age, and education. The percentages were computed for the same groups on the independent variables as in panel B, above. Cols. 1 and 3 in panel D are identical for the same reason as in panel B.

<sup>¶</sup> Panel E gives the estimated percentages falling into each of the four categories of the dependent variable place of first interview, from the multinomial logit model used in table 4, panel C, controlling for the referral method in addition to sex, race, age, and education. This is computed for the group of applicants referred by a “friend” on the variable referral method. In this group, no one had their first interview on campus. Only those referred by a campus recruiter did so. Hence, the estimated percentages having their first interview on campus equal zero for each group in panel E. See also note *c* to table 4. The other independent variables were given the same values as used in computing the estimated percentages in panels B and D above. Cols. 1 and 3 in panel E are identical for the same reason as in panel B.

ucation in addition to sex and race. Panel B shows major differences between races in estimated percentages falling into each category on referral method after the relevant controls have been made. The contrasts between ethnic groups cannot be reduced to differences in age and education.

#### First Interview

We continue by analyzing the determinants of where the first interview occurred. Also here we use a multinomial logit model, reported in panels B and C of table 4, with campus interview (in panel B) and human resources department (in panel C) as reference categories. Other than sex and race, we control for age and education (in panels B and C) and additionally for referral method (in panel C). Everyone who was referred by a campus recruiter also had their first interview on campus, and no one else did so. In panel C, we thus had to drop everyone in the category campus recruiter on the independent variable, which is equivalent to dropping those in the category campus on the dependent variable. For this group there was no variation to explain and hence nothing to predict.

In both panels B and C, the effect of being male is numerically very small and significantly different from zero in only one of the three odds for which coefficients were estimated. In panel B, there are very strong negative effects of race on each of the three odds. This means that whites are much less likely than the ethnic minorities to fall into the reference category on the dependent variable, having the first interview on a college or university campus.

Adding referral method as an independent variable (in panel C), all race effects disappear, becoming very small and nonsignificant, with the exception of Native American. It has a strong negative but nonsignificant effect on first interview occurring with upper management, meaning that none of the Native Americans had their first interview there.

As above, coefficients from multinomial logit models are not intuitive in their interpretation, and we hence present the estimated percentages falling into each of the four categories on the dependent variable. Panel C of table 5 gives the percentages in the data, whereas panel D gives the estimated percentages from the multinomial logit model in panel B of table 4. From panels C and D of table 5, we see that the differences between men and women are miniscule, both in their marginal distribution on place of first interview and in the estimated distribution, after having taken into account race, age, and education.

But the differences between ethnic groups are again dramatic. The descriptives in panel C of table 5 show that among whites 73.0% had their first interview in the placement department, and 8.7% had their first

interview with upper management. Among blacks, in contrast, only 19.0% and 1.7%, respectively, did so. An entire 36.4% had their first interview on campus, and 43.0% had their first interview in the human resources department. Also Asians, Hispanics, and Native Americans were much less likely than whites, but more likely than blacks, to have their first interview in the placement department. This is the group in the organization with the position to be filled.

Panel D gives the estimated percentages of falling into the four categories on the dependent variable from the multinomial logit model, using the same constellation of independent variables as in panel B. Again, the differences between ethnic groups do not disappear once one controls for age and education; in fact, they change very little.

Panel E of table 5 gives the same set of estimated percentages, but now from the model that also controls for referral method, from panel C of table 4. The values on the other independent variables are the same as in panels B and D in table 5, and referral method is set equal to being referred by a friend, the method used by about 51.0% of applicants. Once one takes into account the referral method, the race differences disappear entirely. The contrasts between ethnic groups in place of first interview are almost entirely due to how they got referred to the organization, not to age differences and education.

### Rating

At the time of first interview, each applicant gets rated on a scale of 0–100. Panel A of table 6 gives the estimates of coefficients from a linear regression equation with rating as the dependent variable, where variables are sequentially added to the model.

Before discussing the numbers, a guide for how to read this and subsequent tables is needed. Each column gives the effect of being male, black, Asian, Hispanic, and Native American. Each panel corresponds to a specific dependent variable. In table 6, panels A and B give the results for the dependent variables “Rating at First Interview” and “Getting a Second Interview.” Within each panel, the first line gives the effect of being male on the dependent variable from a regression controlling only for sex (male = 1, female = 0). The second line adds controls for race. It then gives the effects of being male, black, Asian, Hispanic, and Native American from a regression controlling for sex and race. The third line adds controls for age and education. It then gives the effects of sex and race from a regression controlling for sex, race, age, and education. And so it continues, where control variables are sequentially added to the variables in the previous line, but where only the effects of sex and race are presented. This saves space and allows us to see the evolution of the

TABLE 6  
EFFECTS OF SEX AND RACE ON INTERVIEW AND SUBSEQUENT JOB OFFER

Variables Sequentially Added	Male (1)	Black (2)	Asian (3)	Hispanic (4)	Native American (5)
Panel A. <sup>a</sup>					
Sex .....	.2042 (.2248)				
Race .....	.2082 (.2250)	.3081 (.3896)	.0727 (.2097)	-.1063 (.4646)	.5461 (2.8616)
Age, education .....	.2292 (.2298)	.2760 (.3936)	.0470 (.2168)	-.1325 (.4671)	.5355 (2.8616)
Referral method .....	.2330 (.2298)	.2459 (.4441)	.0160 (.2666)	-.1176 (.4826)	.4788 (2.8696)
Place of first interview .....	.2333 (.2299)	.2437 (.4441)	.0146 (.2666)	-.1217 (.4827)	.4785 (2.8697)
Panel B. <sup>b</sup>					
Sex .....	.0799* (.0247)				
Race .....	.0307 (.0257)	-1.6388* (.0462)	-1.0146* (.0239)	-.8287* (.0512)	-1.7096* (.3436)
Age, education .....	.0089 (.0262)	-1.6182* (.0466)	-.9896* (.0246)	-.8092* (.0515)	-1.7122* (.3438)
Rating .....	.0088 (.0262)	-1.6184* (.0466)	-.9897* (.0246)	-.8092* (.0515)	-1.7127* (.3438)
Referral method .....	.0064 (.0298)	.1011* (.0586)	-.0241 (.0342)	.0268 (.0737)	-.4126 (.4004)
Place of first interview .....	-.0076 (.0348)	.1659* (.0674)	-.0133 (.0405)	.1039 (.0737)	-.4415 (.4466)
Panel C. <sup>a,c</sup>					
Sex .....	.0669 (.0420)				
Race .....	.0433 (.0421)	-.7343* (.0864)	-.4587* (.0396)	-.4043* (.0910)	-.9714 (.7254)
Age, education .....	.0323 (.0431)	-.7294* (.0870)	-.4473* (.0408)	-.3982* (.0914)	-.9772 (.7254)
Rating .....	.0214 (.0469)	-.8591* (.0923)	-.5300* (.0443)	-.4643* (.0986)	-1.0267 (.7561)
Referral method .....	.0260 (.0480)	.2407* (.1053)	-.0060 (.0538)	.0434 (.1039)	-.1767 (.7604)
Place of first interview .....	.0175 (.0492)	.2853* (.1087)	-.0182 (.0550)	-.0243 (.1066)	-.0511 (.7723)

Panel D:<sup>d</sup>

Sex .....	.0304	(.0439)	.1797 <sup>+</sup>	(.0932)	.0181	(.0414)	-.3090*	(.0953)	-.0349	(.7750)
Race .....	.0314	(.0439)	.1741 <sup>+</sup>	(.0938)	.0190	(.0427)	-.0438	(.0958)	-.0449	(.7751)
Age, education .....	.0298	(.0449)	.1313	(.1126)	-.0188	(.0504)	-.1135	(.1113)	.5320	(.8375)
Rating .....	.0083	(.0529)	.1528	(.1231)	-.0198	(.0587)	-.0991	(.1137)	.5779	(.8377)
Referral method .....	.0079	(.0529)	.1541	(.1232)	-.0195	(.0587)	-.1004	(.1138)	.5830	(.8375)
Place of first interview ....	.0070	(.0529)								

NOTE.—For description of data, see sections on “data” and “results; descriptive statistics,” above. Row 1 includes only the dummy variable for sex, with female being the reference category. In panels B–D, rows 2–6 sequentially add the following variables: race as four dummy variables (row 2), age and education as two continuous variables (row 3), rating at application as one continuous variable (row 4), referral method as six dummy variables (row 5), place of first interview as two dummy variables (row 6). In panel A, there is no row with rating as an independent variable, so that rows 2–5 in panel A correspond to rows 2–3 and 5–6 in panels B–D. SEs are given in parentheses.

<sup>a</sup> Dependent variable is the rating received at first interview, which runs from a low of 0 to a high of 100. The estimates are from a linear regression model.

<sup>b</sup> Dependent variable is whether the applicant got a second interview (= 1) or not (= 0). The estimates are from a binary logit model.

<sup>c</sup> Dependent variable is whether the applicant received a job offer (= 1) or not (= 0). The estimates are from a binary logit model.

<sup>d</sup> Dependent variable is whether the applicant received a job offer (= 1) or not (= 0), among the subset of applicants that received a second interview. The estimates are from a binary logit model.

<sup>+</sup>  $P < .10$ .

\*  $P < .05$ .

effect coefficients for sex and race as additional variables are controlled. This is essential for our findings.

There is absolutely no sex effect on the rating. It is for all practical purposes equal to zero and is nonsignificant in all specifications. The race effects are also very small and none is significant. On a scale of 0–100 (mean = 70.8; SD = 18.3), the difference between men and women and between ethnic groups is usually a quarter of a point or less. Thus, in terms of the rating received at first interview, there are no differences between men and women or between whites and ethnic minorities. The rating scheme (from a test) is simply entirely gender and race neutral. This is quite common in preemployment screening devices used by mid-sized and large organizations. Some states, like California, even require by law that a test have no adverse racial or gender impact.

#### Second Interview

The next stage in the hiring process is whether the applicant gets invited to a second interview or not. No one received an offer after only one interview, but not everyone received a second interview. Panel B of table 6 gives logit coefficients for whether this occurred or not. There is a trivial positive and significant effect of being male in line 1, but once one controls for race, age, and education, this effect becomes close to zero and nonsignificant.

There are strong effects for the ethnic groups, each of them being less likely than whites to receive a second interview. These effects withstand controls for age, education, and rating (line 4) and remain quite strong. The meritocratic variables can thus not account for the race differences. To illustrate the magnitude of the race effects, when, after controlling for the other variables, 60% of whites get a second interview, then, according to line 4 in panel B, 22.9% of blacks, 35.8% of Asians, and 40% of Hispanics do so (using the formula in Petersen [1985]). However, when referral method is added, the race effects disappear and become nonsignificant. It is thus how one got into contact with the organization that matters, and it explains a large part of the differences between whites and ethnic minorities in success in getting a second interview.

#### Getting an Offer

The crucial node is whether one gets an offer or not. The corresponding logit coefficients are given in panels C (all applicants) and D (second-interview applicants) of table 6.

Starting with panel C, there is a small positive but nonsignificant effect of being male in all models. But once one controls for age, education, and

rating, this effect is for all practical purposes equal to zero, of 0.02 on a logit scale, implying that the probability of receiving an offer is independent of one's sex.

For the race groups, the situation is different. There are reasonably strong negative effects on the probability of receiving an offer for each of the ethnic minorities. These are significant except among Native Americans, a small group for whom significant effects thus are difficult to obtain. The effects do not disappear when one controls for age, education, and rating. Again to illustrate the magnitude of the effects, when, after controlling for the other variables, 10% of whites receive an offer, then, according to line 4 in panel C, 4.5% of blacks, 6.1% of Asians, and 6.5% of Hispanics do so (using the formula in Petersen [1985]).

However, in line 5, where controls are added for referral method, three of the four race coefficients are small and insignificant and the effect of being black turns positive and significant, blacks now being more likely to receive an offer. The same is the case when place of first interview gets added as an independent variable (line 6). Again, the qualitative evidence supports this finding. As Stephan Adams, a black entrepreneur in Oakland expressed it: "To get to the next level, you have to associate with people of power—and those are usually white males" (Angwin and Castañeda 1998, p. A9).

Some of the disadvantage to ethnic minorities likely is due to their educational backgrounds, on which we have no information, other than its length. But the national statistics are irrefutable. In 1985, the first year in our data, of those receiving bachelor's degrees in mathematics, engineering, and computer science, the racial composition was 80.3% white, 4.0% black, 6.0% Asian, and 2.3% Hispanic, numbers that by 1995 were 69.2% white, 6.3% black, 10.1% Asian, and 4.2% Hispanic (Angwin and Castañeda 1998, p. A8). These are important educational backgrounds in high-technology companies, and minorities are underrepresented in them. This shows up in managerial comments on experiences in recruiting: "Many managers say they don't have much luck at minority colleges and job fairs because there are too many employers chasing too few qualified applicants" (Angwin and Castañeda 1998, p. A9). A staffing director for one company supplemented this with the observation on the competitive situation in recruiting minorities: "Everyone has these same regulations that they are trying to meet."

Turning to panel D of table 6, where the focus is on employees who received a second interview, there are no sex or race effects on the probability of receiving an offer, even with no control for age and education. Thus, after the second interview has occurred, there are no race effects on whether an offer is extended or not. An entire 56.4% of applicants got invited to a second interview, and 16% of those received an offer.

The strong race effects we observe on getting an offer before taking into account the referral method mostly reflect that whites are more likely to get a second interview. The likelihood of getting a second interview depends strongly on referral method, which once controlled, makes all the negative race effects disappear. For those with a second interview, there are no race effects, with or without control for referral method. We here have a classic disparate-impact situation. The recruitment procedure relying heavily on social networks puts minorities at a disadvantage. But once recruitment procedure is controlled, there is no disparate treatment of minorities.<sup>16</sup>

#### Initial Salary Offer

The issue is of course not only to get an offer but also its quality. Panel A of table 7 gives regression coefficients for the impact of the independent variables on the natural logarithm of the initial salary offer among those who received an offer.<sup>17</sup>

In line 1, controlling only for sex, men on average earned about 11% more than women, with the same effect in line 2 where race is controlled. Note that this is the first place where there is a sizeable difference between men and women in their values on the dependent variable. But as soon as age and education are added in line 3, the effect of being male drops to zero, to less than half of a percentage point, not significantly different from zero. With additional controls, the sex effect remains equal to zero and nonsignificant. Thus, in terms of the initial salary offer, there is a

<sup>16</sup> There are some interaction effects between sex and race on getting an offer, not explored here. Among whites, there is total equality between men and women and, for all practical purposes, also among Asians. However, among Hispanics, men are at a disadvantage relative to women, while among blacks, men are at an advantage relative to women, the two effects being moderate, of equal size but opposite signs. Controlling for referral method, these interaction effects mostly disappear, with black men and Hispanic women coming out better than white men and women. So for whites and Asians, 87.8% of the applicants, there are no interaction effects. For blacks and Hispanics, 7.2% and 4.8% of the applicants, there are interaction effects of numerically almost the opposite sizes. Thus, in the regressions not including interaction effects, the two opposite effects for 12.0% of the applicants cancel each other out.

<sup>17</sup> Analyzing the same organization, Seidel, Polzer, and Stewart (2000) elaborate on aspects of the initial and final salary offers among hired applicants. We note here the similarities and differences between theirs and the present analysis. For initial salary offer, they report effects for hired applicants (table 6), about 84% of those with offers. We report effects for all applicants with an offer (table 7, panel A; table 10, panel A). They report effects on the percentage increase between initial and starting salary among hired applicants (tables 3 and 7). We do the same in a subset of the analyses below (table 8, panel B; table 10, panel F). They include applicants up to 1995; we include applicants only up to 1994.



clear overall difference between men and women, but after controlling for age and education, it drops to zero: nothing but pure meritocracy.

Note here that there are no controls for occupation, job title, or level within organization. Even so, age and education account for all salary differences. On average, the salary of women is 11% lower than among men, indicating that they are placed in somewhat different lines of work or at different levels. But these differences disappear entirely in the regression. For men and women with same age and education, they must be placed about the same in terms of types of work and level, otherwise we would have gotten a salary differential higher than a quarter of a percent.

There are small, negative, and nonsignificant effects of being black and Hispanic, of about 3.6% and 1.2% respectively, a strong negative and significant effect of being Asian of about 13.6%, and a big positive but nonsignificant effect of being Native American. All these effects disappear once one controls for age and education, then becoming practically equal to zero. For the initial salary offer, the process is entirely meritocratic also for race.

#### Final Salary Offer

We use a logit model to determine whether the final salary offer was increased relative to the initial offer (for results see table 7, panel B). There is a moderate negative effect of being male on the probability of receiving an increase in the final offer. This is the case also when controlling for age and education, as well as the other covariates. Men are somewhat less likely to receive an increase in their final offer, even though men and women on average received equal initial salary offers once age and education were taken into account.

There are no effects of race on whether an increase was received or not. The effects are mostly small and nonsignificant, except among Native Americans, where there is a big positive but nonsignificant effect.

To determine the amount of increase between initial and final offers, panel C of table 7 gives the estimates with the dependent variable being the difference in natural logarithms of final and initial salary offers. Coefficients, when multiplied by 100, can be interpreted roughly as the number of percentage points the final offer was changed, relative to the initial, when the associated independent variable was increased with one unit, where the reference group is white and female. A coefficient of  $-.03$  for blacks means their increases on average were 3% less than those received by whites.

There is absolutely no sex effect in any of the models. Men and women

TABLE 7  
EFFECTS OF SEX AND RACE ON SALARY OFFERS

Variables Sequentially Added	Male (1)	Black (2)	Asian (3)	Hispanic (4)	Native American (5)
Panel A: <sup>a</sup>					
Sex .....	.1111*				
Race .....	.1099*	-.0359	-.1357*	-.0118	.3197
Age, education .....	.0042	.0123	-.0051	-.0010	-.0310
Rating .....	.0048	.0069	-.0017	-.0082	-.0122
Referral method .....	.0048	.0068	-.0017	-.0081	-.0123
Place of first interview .....	.0049	.0068	-.0017	-.0081	-.0120
Panel B: <sup>b</sup>					
Sex .....	-.4346 <sup>+</sup>				
Race .....	-.4382 <sup>+</sup>	.0414	.2313	-.1219	7.4140
Age, education .....	-.4437 <sup>+</sup>	.0535	.2387	-.1115	7.3918
Rating .....	-.4440 <sup>+</sup>	.0587	.2337	-.1183	7.3956
Referral method .....	-.4420 <sup>+</sup>	.1858	.2787	-.0696	7.4821
Place of first interview .....	-.4392 <sup>+</sup>	.1984	.2754	-.0682	7.4555
Panel C: <sup>c</sup>					
Sex .....	.0001*				
Race .....	-.0000	-.0305*	-.0223*	-.0121*	-.0202
Age, education .....	-.0010	-.0300*	-.0210*	-.0117*	-.0231
Rating .....	-.0010	-.0300*	-.0211*	-.0117*	-.0230
Referral method .....	-.0006	-.0002	-.0015	.0018	-.0059
Place of first interview .....	-.0006	-.0002	-.0015	.0018	-.0059



are treated equally in terms of the size of increase between initial and final salary offers.

Ethnic minorities receive smaller percentage increases than whites, of 1%–3%, significantly so except for Native Americans (in line 2). This is the case also when one controls for age and education, as well as rating (in line 4): when whites on average increase their offers by 10%, blacks and Hispanics increase them only by 7.0% and 8.8%. But again, when one controls for referral method, the race effects disappear totally.

Finally, in panel D of table 7, we have the analysis of the size of the final offer. The effect of sex is the same as for the initial offer in panel A of table 7. This is not surprising given that women and men got about the same percentage increases in salaries, even though women had a higher probability of receiving an increase. As with the initial offer, the raw difference between men and women disappears once controls for age and education are introduced. There are, however, strong race effects, stronger than in the initial offer, with blacks and Asians making about 6.3% and 14.5% less than whites, respectively ( $P < .05$ ). This is also not surprising since ethnic minorities had smaller salary increases between initial and final salary offer. Once one controls for age and education, the race effects become quite small at 1%–2%, significant only for Asians, and then drop to zero and nonsignificance after controlling for referral method.

So again, for sex, it is exclusively meritocracy at work. For race, it is a good portion of meritocracy plus a bit of drawing on social networks that explains the differences in final salary offer. Ethnic minorities lose some ground between initial and final salary offer, receiving lower increases. There are no race effects on initial offer once age and education are taken into account. In final offer, there are differences of 1%–2% after controlling for age and education, only significant for Asians, but these drop to zero once referral method is taken into account. It seems that whites benefit in the negotiation process between initial and final salary offer from having considerably more often been referred by a friend.

#### Accepting an Offer

Having received a final offer, the applicant must decide whether to accept or decline. Panel A of table 8 provides the relevant estimates from a logit model. There is a relatively small negative and significant effect at the 10% level of being male, an effect that remains as variables are added. Men are somewhat less likely to accept than women.

The effects for blacks, Asians, and Hispanics are small and nonsignif-

icant. For Native Americans there are big positive effects, nonsignificant though. Everyone in this group accepted the offer.<sup>18</sup>

#### Starting Salary

We now turn to the starting salary among those that accepted the job offer. Panels B and C of table 8 give regression coefficients for the impact of the independent variables first on the difference in natural logarithms between starting and initial salary (in B) and then on the natural logarithm of the starting salary (in C). The results are about identical to those found for final salary offer. No additional comments are needed. Again, for gender, the process is entirely meritocratic, but for race one also needs to control for the referral method.

#### Departures

We end by analyzing turnover and addressing the extent to which women in this company should be considered less stable employees than men. Panel D of table 8 gives the estimates of effects on the rate of departure from the company from several so-called Weibull models, which belong to the class of proportional-hazards models. A coefficient can be interpreted roughly as the proportional change in the probability of leaving the organization in the next month, given no departure prior to entry into the month, resulting from a one-unit increase in the associated independent variable.

There is a small positive but nonsignificant effect of being male in all five models. Careerwise, women are not less stable than men in this organization. There are strong positive and significant effects of being black, Hispanic, and Asian on the departure rate, even when controlling for age, education, and rating. These ethnic minorities leave at substantially higher rates than whites. However, when referral method is controlled, the effects of being black and Hispanic turn negative of moderate size, significant only for blacks, while the effect of being Asian drops to zero. There is a strong negative but nonsignificant effect of being Native American in all models. To illustrate the magnitude of the race effects, after controlling for the other variables, if 10% of newly hired whites leave within the first year, then, according to line 4 in panel D, 58.5% of blacks, 31.8% of

<sup>18</sup> When controls are added for whether one has alternative offers or not, blacks become more likely to accept. And after adding controls for the number of alternative offers, both blacks and Hispanics are much more likely to accept, significantly so. The probability of acceptance decreases strongly with whether one has alternative offers or not and increases strongly with whether one received a salary increase or not and with the size of the increase. None of these additional effects are reported in the table.

TABLE 8  
EFFECTS OF SEX AND RACE ON OFFER ACCEPTANCE, SALARY, AND DEPARTURE

Variables Sequentially Added	Male (1)	Black (2)	Asian (3)	Hispanic (4)	Native American (5)
Panel A: <sup>a</sup>					
Sex .....	-.1925 <sup>+</sup> (.1120)				
Race .....	-.1929 <sup>+</sup> (.1120)	.1932 (.2379)	.0250 (.1016)	.1108 (.2443)	15.3524 (3,335.4)
Age, education .....	-.1633 (.1144)	.1416 (.2401)	-.0140 (.1056)	.0689 (.2458)	15.4575 (3,335.2)
Rating .....	-.1633 (.1144)	.1433 (.2402)	-.0161 (.1056)	.0669 (.2459)	15.4620 (3,335.3)
Referral method .....	-.1650 (.1145)	.0964 (.2636)	-.0680 (.1230)	.0558 (.2516)	15.5122 (3,335.3)
Place of first interview ....	-.1652 (.1145)	.0971 (.2637)	-.0677 (.1230)	.0540 (.2517)	15.5163 (3,335.2)
Panel B: <sup>b</sup>					
Sex .....	.0004 (.0014)				
Race .....	.0004 (.0013)	-.0356 <sup>*</sup> (.0027)	-.0254 <sup>*</sup> (.0012)	-.0146 <sup>*</sup> (.0028)	-.0265 (.0210)
Age, education .....	-.0007 (.0013)	-.0349 <sup>*</sup> (.0027)	-.0240 <sup>*</sup> (.0013)	-.0142 <sup>*</sup> (.0028)	-.0298 (.0210)
Rating .....	-.0008 (.0013)	-.0349 <sup>*</sup> (.0027)	-.0240 <sup>*</sup> (.0013)	-.0142 <sup>*</sup> (.0028)	-.0297 (.0210)
Referral method .....	-.0003 (.0010)	-.0004 (.0024)	-.0008 (.0012)	-.0003 (.0023)	-.0102 (.0168)
Place of first interview ....	-.0004 (.0010)	-.0004 (.0024)	-.0008 (.0012)	-.0004 (.0023)	-.0103 (.0168)
Panel C: <sup>c</sup>					
Sex .....	.1093 <sup>*</sup> (.0141)				
Race .....	.1083 <sup>*</sup> (.0138)	-.0691 <sup>*</sup> (.0286)	-.1638 <sup>*</sup> (.0130)	-.0296 (.0300)	.2927 (.2241)
Age, education .....	.0041 (.0061)	-.0253 <sup>*</sup> (.0125)	-.0282 <sup>*</sup> (.0059)	-.0162 (.0130)	-.0012 (.0970)
Rating .....	.0041 (.0061)	-.0254 <sup>*</sup> (.0125)	-.0282 <sup>*</sup> (.0059)	-.0162 (.0130)	-.0014 (.0970)
Referral method .....	.0052 (.0060)	.0037 (.0137)	-.0023 (.0068)	-.0082 (.0132)	-.0237 (.0966)
Place of first interview ....	.0052 (.0060)	.0037 (.0137)	-.0023 (.0068)	-.0081 (.0132)	-.0240 (.0966)

Panel D:<sup>d</sup>

Sex .....	.1897	(.1419)								
Race .....	.2094	(.1402)	2.0919*	(.1794)	1.2357*	(.1336)	.8019*	(.3032)	-6.3027	(9,213.0)
Age, education .....	.1710	(.1415)	2.1096*	(.1849)	1.2928*	(.1373)	.8159*	(.3074)	-8.1170	(49,640.0)
Rating .....	.1638	(.1414)	2.1211*	(.1853)	1.2918*	(.1377)	.8182*	(.3071)	-7.9294	(41,870.0)
Referral method .....	.1231	(.1311)	-4434*	(.1979)	.0301	(.1560)	-4192	(.2781)	-7.5901	(35,080.0)
Place of first interview .....	.1239	(.1309)	-4476*	(.1981)	.0307	(.1560)	-4283	(.2783)	-5.0077	(2,715.0)

NOTE.—For description of data see text. Row 1 includes only the dummy variable for sex, female = 0. Rows 2–6 sequentially add the following variables: Race as four dummy variables (row 2); age and education as two continuous variables (row 3); rating at application as one continuous variable (row 4); referral method as six dummy variables (row 5); place of first interview as two dummy variables (row 6). In Panels B and C we also control for the calendar year with 1985–1994 coded 0–10. This controls for upward movement of salaries with time, yielding coefficients for year of about .036, implying that salaries on average increased with 3.6% per year. SEs are given in parentheses.

<sup>a</sup> Dependent variable is whether the offer was accepted (= 1) or not (= 0). The estimates are from a binary logit model.

<sup>b</sup> Dependent variable is the natural logarithm of starting salary minus the natural logarithm of initial salary offer. The coefficients can roughly be interpreted as giving the percentage (after being multiplied by 100) by which the starting salary was bigger than the initial salary offer. The estimates are from a linear regression model.

<sup>c</sup> Dependent variable is the natural logarithm of the starting salary. The estimates are from a linear regression model.

<sup>d</sup> Dependent variable is the amount of time elapsed between the employee's starting to work for the company and either his or her departure or when last observed working there (December 1995). The estimates are hazard-rate coefficients from a Weibull model, belonging to the class of proportional hazards models. A positive coefficient means that the rate of departure goes up when the associated variable increases, while a negative means that it goes down.

+  $P < .10$ .

\*  $P < .05$ .

Asians, and 21.2% of Hispanics do so (using equation [9.35] in Petersen [1995, p. 467]). Even with the same hiring rates for all races, the racial composition of the employees would eventually become more white due to differential attrition by race.

Thus, even on the departure rate, the referral method exerts its influence. Once taken into account, differences between ethnic groups diminish strongly and for some change direction.

#### Impact of Referral Method

Although our focus has not been on the referral method itself, it turned out to be crucial for the processes, making all race effects disappear. We thus end the analyses by presenting its effects on all the dependent variables studied above, except on referral method itself.

Table 9 gives the estimated effects of referral method on the five dependent variables in tables 4 and 6, covering the process up to and including whether an offer is given. Three models are presented: the first controls only for the referral method, the second adds controls for sex, race, age, education, and rating at first interview (not in panels A and B), and the third adds controls for place of first interview (not in panel A). These estimates are from the same models from which estimates of sex and race effects were presented above in tables 4 and 6. Lines 2 and 3 for each dependent variable in table 9 correspond to lines 5 and 6 for each dependent variable in table 6 (panels B–D). The reference category for referral method is being recruited by an ad. A coefficient thus gives the contrast between the reference group and the group to which the coefficient pertains. The referral method “other” applied to only 1% of applicants and to 1% of those with offers. We do not know what hides behind this label. The effects of the category are presented but not commented upon.

As table 9 shows, there is no question that referral method itself has strong effects on several stages of the hiring process, beyond making race effects disappear as documented in tables 4 and 6–8. In panel A, we see that referral method has a tremendously strong impact on the place of first interview, even with controls for sex, race, age, and education. Being referred by a friend, through a headhunter, or as a previous contractor all strongly decrease the odds of having the first interview in the human resources department. As pointed out earlier, all of those being referred by a campus recruiter had their first interview on campus, and no one else did so. Therefore, applicants in the category campus recruiter on the independent variable, and campus on the dependent variable, were dropped from this analysis. In panel B, we see that referral method has



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no impact whatsoever on the rating given in the first interview, neither in magnitude nor statistical significance.

In Panel C, the effects on who gets a second interview are especially strong for having made the referral through a friend, having been a previous contractor, or by a headhunter. Of these, being referred by a friend or as a previous contractor are by far the most important initial avenues into the organization. Both are through social networks, personal and professional, respectively. However, once one adds controls for place of first interview (in line 3), the effect of referral method becomes very small and nonsignificant, except for being referred by a campus recruiter. Thus in terms of getting a second interview, referral method has a strong direct impact on the place of first interview, which in turn has a strong impact on getting a second interview, but referral method has no direct impact on getting a second interview once place of first interview is controlled.<sup>19</sup>

In panel D, considering all applicants, being referred by a friend, having been a previous contractor, or by a headhunter have strong positive effects on the probability of receiving an offer, also after controlling for sex, race, age, education, and rating. However, once one adds controls for place of first interview (in line 3), the effect of referral method becomes very small and nonsignificant, except for being referred by a campus recruiter. Thus, in terms of getting an offer, referral method has a strong direct impact on the place of first interview, which in turn has a strong impact on getting an offer; but referral method has no direct impact on getting an offer once place of first interview is controlled.<sup>20</sup>

In panel E, narrowing the set of applicants to those with a second interview, referral method no longer has an effect on getting an offer or not. So its effect here is really in terms of who gets a second interview. Among those that got one, 16% received an offer.

Summing up the results in panels A, C, D, and E, the “causal chain” is the following: Referral method has a very strong impact on place of first interview (from panel A), which in turn has a strong impact on whether one gets a second interview or not (from panel C, comparing lines 2 and 3), which finally has a strong impact on whether one gets an offer or not (from panels D and E). Referral method itself has no direct effect on getting a second interview once one controls for place of first

<sup>19</sup> The effects of the two dummy variables for place of first interview, not reported in the table, were 3.8880 and 2.8130 for placement department and upper management, respectively, both significantly different from zero, and both being very strong effects. Human resources department was the reference category.

<sup>20</sup> The effects of the two dummy variables for place of first interview, not reported in the table, were 2.5773 and 2.2948 for placement department and upper management respectively, both significantly different from zero, and both being very strong effects. Human resources department was the reference category.

TABLE 9  
EFFECTS OF REFERRAL METHOD ON FIVE DEPENDENT VARIABLES CONSIDERED IN TABLES 4 AND 6

Variables Sequentially Added	Friend (1)	Cold Call (2)	Headhunter (3)	Campus Recruiter (4)	Previous Contractor (5)	Other (6)
<b>Panel A:<sup>a</sup></b>						
Placement vs. HR:						
Referral method .....	5.3073* (.1168)	1.7946* (.1195)	5.9895* (.1721)		5.3768* (.1280)	3.9077* (.1614)
Age, education .....	5.2879* (.1219)	1.7782* (.1214)	6.0143* (.1761)		5.3664* (.1292)	3.8971* (.1629)
<b>Upper management vs. HR:</b>						
Referral method .....	5.0510* (.2802)	-.0127 (.3408)	5.9708* (.3149)		4.0602* (.2975)	2.3705* (.4595)
Age, education .....	5.0738* (.2861)	-.0510 (.3425)	6.0731* (.3205)		4.0350* (.2996)	2.3813* (.4610)
<b>Panel B:<sup>b</sup></b>						
Referral method .....	-.5784 (.4226)	-.8263* (.4757)	.2572 (.6543)	-.6178 (.4735)	-.2201 (.5113)	.3864 (1.0542)
Age, education .....	-.4813 (.4648)	-.8068* (.4900)	.3834 (.6856)	-.5783 (.4774)	-.1630 (.5185)	.4508 (1.0607)
Place of first interview ....	-.2558 (.5475)	-.7628 (.4928)	.6176 (.7514)	-.4960 (.6928)	.0752 (.5939)	.6267 (1.0819)
<b>Panel C:<sup>c</sup></b>						
Referral method .....	3.0373* (.0676)	.8017* (.0730)	3.1556* (.0942)	.5722* (.0737)	3.0767* (.0770)	2.3647* (.1273)
Rating .....	3.0545* (.0722)	.7930* (.0746)	3.1755* (.0979)	.5900* (.0742)	3.1012* (.0780)	2.3832* (.1283)
Place of first interview ....	.0994 (.0949)	.0413 (.0880)	.0223 (.1204)	-1.9032* (.1062)	.0657 (.1011)	.1866 (.1777)

Panel D: <sup>d</sup>													
Referral method	.....	1.8448*	(.1447)	.6186*	(.1621)	1.8971*	(.1678)	.4654*	(.1638)	1.9164*	(.1545)	1.6695*	(.2240)
Rating	.....	2.1625*	(.1572)	.7609*	(.1680)	2.1502*	(.1808)	.5721*	(.1684)	2.2032*	(.1616)	1.8634*	(.2409)
Place of first interview	....	.0632	(.1832)	.0682	(.1809)	-.0257	(.2053)	-1.4315*	(.2073)	.0723	(.1878)	.0740	(.2641)
Panel E: <sup>e</sup>													
Referral method	.....	-.0491	(.1609)	-.0672	(.1762)	-.0278	(.1803)	-.0312	(.1783)	.0146	(.1675)	.0200	(.2381)
Rating	.....	-.0374	(.1971)	-.0309	(.2113)	-.1221	(.2187)	-.0926	(.2124)	-.0237	(.2013)	-.0562	(.2843)
Place of first interview	....	-.0743	(.2174)	-.0451	(.2173)	-.1617	(.2378)	-.2360	(.2455)	-.0538	(.2216)	-.0839	(.2968)

NOTE.— For description of data see text. In the first row of each panel, “referral method” includes only the dummy variables for referral method. In the second row of panels A and B, “age, education,” adds to the referral method controls for sex, race, age, and education. In B, “place of first interview” adds controls for place of first interview to the previous variables. In C–E, “rating” adds to the referral method controls for sex, race, age, education, and rating. In C–E, “place of first interview” adds to the variables in the previous row controls for place of first interview. In each row in panels B–E, the variables are entered in the same manner as in table 6, panels A–D. In panel A, “age, education” estimates come from the same model as table 4, panel C. In panel B, “age, education” and “place of first interview” estimates come from the same models as in table 6, panel A, lines 4 and 5. In panels C–E, the estimates in “rating” and “place of first interview” come from the same models as in table 6, panels B–D, lines 5 and 6. SEs are given in parentheses.

<sup>a</sup> Dependent variable is place of first interview. See table 4, note c. “Placement vs. HR” indicates odds of first interview occurring in placement department as opposed to human resources department; “upper management vs. HR” indicates odds of first interview occurring in upper management as opposed to human resources department.

<sup>b</sup> Dependent variable is the rating received at first interview, which runs from a low of 0 to a high of 100. The estimates are from a linear regression model.

<sup>c</sup> Dependent variable is whether the applicant got a second interview (= 1) or not (= 0). The estimates are from a binary logit model.

<sup>d</sup> Dependent variable is whether the applicant received a job offer (= 1) or not (= 0). The estimates are from a binary logit model.

<sup>e</sup> Dependent variable is whether the applicant received a job offer (= 1) or not (= 0), among the subset of applicants that received a second interview. The estimates are from a binary logit model.

+  $P < .10$ .

\*  $P < .05$ .

TABLE 10  
EFFECTS OF REFERRAL METHOD ON EIGHT DEPENDENT VARIABLES CONSIDERED IN TABLES 7 AND 8

Variables Sequentially Added	Friend (1)	Cold Call (2)	Headhunter (3)	Campus Recruiter (4)	Previous Contractor (5)	Other (6)
Panel A: <sup>a</sup>						
Referral method .....	.0527 (.0448)	-.2003* (.0492)	.3355* (.0503)	.1170* (.0497)	-.0462 (.0467)	.0205 (.0663)
Rating .....	-.0210 (.0200)	-.0325 (.0215)	.0270 (.0224)	-.0105 (.0217)	-.0318 (.0205)	-.0286 (.0290)
Place of first interview ...	-.0176 (.0217)	-.0309 (.0219)	.0304 (.0240)	-.0058 (.0247)	-.0285 (.0222)	-.0255 (.0301)
Panel B: <sup>b</sup>						
Referral method .....	.0556 (.7295)	.0211 (.7981)	-.1894 (.7988)	.1752 (.8181)	.2081 (.7655)	.5318 (1.2430)
Rating .....	.2770 (.7531)	.0467 (.8042)	.1793 (.8407)	.1388 (.8210)	.2279 (.7771)	.5876 (1.2524)
Place of first interview ...	-.2006 (.8237)	-.1811 (.8176)	-.3167 (.9082)	-.1191 (.9361)	-.2766 (.8429)	.1213 (1.2891)
Panel C: <sup>c</sup>						
Referral method .....	.0426* (.0039)	-.0019 (.0043)	.0227* (.0044)	.0016 (.0044)	-.0004 (.0041)	-.0003 (.0058)
Rating .....	.0413* (.0040)	-.0010 (.0040)	.0192* (.0045)	.0007 (.0044)	-.0001 (.0041)	-.0011 (.0058)
Place of first interview ...	.0412* (.0043)	-.0011 (.0044)	.0191* (.0048)	.0005 (.0050)	-.0003 (.0045)	.0013 (.0060)
Panel D: <sup>d</sup>						
Referral method .....	.0938* (.0452)	-.2022* (.0496)	.3573* (.0507)	.1186* (.0501)	-.0466 (.0471)	.0203 (.0668)
Rating .....	.0190 (.0204)	-.0334 (.0219)	.0457* (.0228)	-.0098 (.0220)	-.0138 (.0208)	-.0295 (.0295)
Place of first interview ...	.0214 (.0221)	-.0323 (.0223)	.0481* (.0244)	.0058 (.0251)	-.0296 (.0226)	-.0274 (.0306)
Panel E: <sup>e</sup>						
Referral method .....	-.3452 (.4400)	-.1869 (.4478)	-.3716 (.4818)	-.3618 (.4776)	-.2268 (.4556)	-.0290 (.6480)
Rating .....	-.3219 (.4492)	-.1787 (.4802)	-.3732 (.4915)	-.3603 (.4788)	-.1884 (.4592)	-.0150 (.6516)
Place of first interview ...	-.3505 (.4820)	-.1901 (.4878)	-.4021 (.5232)	-.4349 (.5380)	-.2137 (.4922)	-.0369 (.6716)
Panel F: <sup>f</sup>						
Referral method .....	.0497* (.0037)	-.0016 (.0041)	.0263* (.0042)	.0022 (.0041)	-.0001 (.0038)	-.0003 (.0055)
Rating .....	.0485* (.0038)	-.0004 (.0041)	.0231 (.0043)	.0012 (.0041)	.0001 (.0039)	-.0008 (.0055)
Place of first interview ...	.0473* (.0041)	-.0011 (.0041)	.0218 (.0046)	.0008 (.0047)	-.0012 (.0042)	-.0020 (.0057)

Panel G: <sup>g</sup>													
Referral method	.....	.0908 <sup>+</sup>	(.0485)	-.2071 <sup>*</sup>	(.0533)	.3544 <sup>*</sup>	(.0547)	.1175 <sup>*</sup>	(.0541)	-.0521	(.0506)	-.0154	(.0718)
Rating	.....	.0305	(.0274)	-.0243	(.0224)	.0516 <sup>*</sup>	(.0245)	-.0075	(.0236)	-.0264	(.0222)	-.0431	(.0346)
Place of first interview	...	.0315	(.0238)	-.0240	(.0239)	.0527 <sup>*</sup>	(.0264)	-.0031	(.0271)	-.0257	(.0243)	-.0425	(.0328)
Panel H: <sup>h</sup>													
Referral method	.....	-2.7406 <sup>*</sup>	(.3039)	-.5022	(.3090)	-2.0996 <sup>*</sup>	(.4682)	1.5120 <sup>*</sup>	(.2802)	-1.3967 <sup>*</sup>	(.3138)	1.6372 <sup>*</sup>	(.3156)
Rating	.....	-2.8227 <sup>*</sup>	(.3158)	-.4812	(.3103)	-2.1056 <sup>*</sup>	(.4800)	1.5659 <sup>*</sup>	(.2781)	-1.4794 <sup>*</sup>	(.3114)	1.6090 <sup>*</sup>	(.3157)
Place of first interview	...	-2.9222 <sup>*</sup>	(.3494)	-.5133	(.3176)	-2.2098 <sup>*</sup>	(.5043)	1.2768 <sup>*</sup>	(.4369)	-1.5628 <sup>*</sup>	(.3463)	1.5325 <sup>*</sup>	(.3488)

NOTE—For description of data see text. In each panel, variables are sequentially added to the regression model. Row 1, “referral method,” includes only the dummy variables for referral method. Row 2, “rating,” adds to the referral method controls for sex, race, age, education, and rating. Row 3, “place of first interview,” adds to the variables in row 2 controls for place of first interview. In each panel the variables are entered in the same manner as in tables 7 and 8. In panels A–D, the estimates in lines 2 and 3 come from the same models as in table 7, panels A–D, lines 5 and 6. In panels E–H, the estimates in lines 2 and 3 come from the same models as in table 8, panels A–D, lines 5 and 6. SEs are given in parentheses.

<sup>a</sup> Dependent variable is the natural logarithm of initial salary offer. The estimates are from a linear regression model.  
<sup>b</sup> Dependent variable is whether the final salary offer was bigger than the initial offer (=1) or not (=0). The estimates are from a binary logit model.  
<sup>c</sup> Dependent variable is the natural logarithm of final salary offer minus the natural logarithm of initial salary offer among those that received an increase. The estimates are from a linear regression model.

<sup>d</sup> Dependent variable is the natural logarithm of final salary offer. The estimates are from a linear regression model.  
<sup>e</sup> Dependent variable is whether the offer was accepted (=1) or not (=0). The estimates are from a binary logit model.

<sup>f</sup> Dependent variable is the natural logarithm of starting salary minus the natural logarithm of initial salary offer. The estimates are from a linear regression model.  
<sup>g</sup> Dependent variable is the natural logarithm of starting salary. The estimates are from a linear regression model.

<sup>h</sup> Dependent variable is the amount of time elapsed between the employee’s starting working for the company and either his or her departure or when last observed working there. The estimates are from a Weibull model.

<sup>+</sup>  $P < .10$ .

\*  $P < .05$ .

interview. It also has no effect on getting an offer once one controls for whether a second interview was received, nor did place of first interview.<sup>21</sup>

Table 10 gives the same kinds of estimates for postoffer outcomes, but now for the eight dependent variables in tables 7 and 8. It is organized in exactly the same way as table 9, where lines 2 and 3 for each dependent variable correspond to lines 5 and 6 for each dependent variable in tables 7 and 8.

In panel A, referral method has strong effects on initial salary offer, when no other variables were controlled. However, controlling for the other variables, referral method has numerically small effects, in the range of 1%–3%, and none is significantly different from zero. In panel B, there is a small impact of referral method on whether an increase was received or not between initial and final offer. The coefficients are numerically small and for the most part not statistically significant from zero. In panel C, those being referred by a friend and by a headhunter, as was the case for 67.7% and 5.0% of those with offers, received salary increases that were 4% and 2% higher than those with other referral methods. In panel D, for final salary offer, it was somewhat higher among those who were referred by a friend or a headhunter. Those two groups had larger salary increases between initial and final offer and also come out better than the other groups in final offer. In panel E, referral method has effects of moderate size but nonsignificant on whether the offer was accepted or not. In panel F, the impact on the amount of increase between initial salary offer and starting salary among those accepting the job offer is the same as on the amount of increase between initial and final salary offer presented in panel B. In panel G, the effects on the starting salary among those accepting the job offer are for all practical purposes the same as on the final salary offer presented in panel D.

In panel H, the effects of referral method on the departure rate are very strong. Those being referred by a friend, a headhunter, or as a previous contractor are all considerably less likely to leave than those referred by other methods, and the effects of the three variables are significant. It is useful to illustrate the magnitude of these effects. If, after controlling for the other variables, 10% of those who were referred by an ad leave within one year, then, according to line 3 in panel H, 0.6% of those referred by a friend, 1.1% of those referred by a headhunter, 31.5% of those referred by a campus recruiter, and 2.2% of those having been

<sup>21</sup> Place of first interview had no impact on any of the other dependent variables reported in panels B and E of table 9 and panels A–H of table 10, its effects being small in size and always insignificant. Controlling for place of first interview also did not change the effects of sex, race, or referral method, except in panels C and D of table 9. This can be seen in the last line for each dependent variable in tables 9 and 10 (or tables 4, 6–8).

a previous contractor do so (using eq. [9.35] in Petersen [1995, p. 467]). These are very strong effects.

In summary, the method of referral starts a “causal chain.” Referral method has a strong impact on place of first interview, with strong effects of personal and professional networks as well as of being referred by a headhunter. Place of first interview in turn has a strong impact on whether a second interview is received, but referral method itself has no direct impact once place of first interview is controlled. Whether a second interview is received has a tremendous impact on whether one gets an offer, and neither referral method nor place of first interview has an effect once whether one got a second interview was controlled. In the subsequent stages of the hiring process, the referral method works mostly by dampening the effects of the race variables. But it also has some effects on the initial salary offer, on the increase between initial and final salary offer, and hence on the final salary offer.

#### DISCUSSION

The hiring process is perhaps the single most important node in the employment relationship for employees and employers alike. It is a complex process with many subnodes or stages. It involves agents that often are physically apart, the employer and hiring officials on one side, the job seeker and his or her families on the other, parties that rarely know each other well, who have limited information about what the other party does and thinks. Even at the simplest level, hiring involves three distinct stages. The recruitment process concerns how applicants are attracted, through ads, personal networks, and so forth. Next comes the offer process, which includes deciding to whom to extend offers—which often requires extensive interviewing—and, when an offer is to be made, some negotiation about its terms. Then follows possible renegotiations to elicit a better, final offer, obtained by 97% of those receiving offers in the company studied here.

We analyzed the hiring process in a midsized high-technology organization, using information on 35,229 applicants in the period 1985–94. For gender, the process is entirely meritocratic: Age and education account for all gender differences. But even without taking into account the two meritocratic variables, there are small if no differences between men and women at most stages in the hiring process. The exception is in the initial and final salary offer, where men on average get 11% higher salaries, a difference that drops to less than half of a percentage point and nonsignificance once age and education are taken into account.

For ethnic minorities the process is partly meritocratic but partly about

social networks, both personal and professional, and to some extent influence by headhunters. When all one controls for is age, education, and rating at first interview, the race effects are strong. This is especially so on likelihood of getting a second interview, which is very important for whether one gets an offer, but also on the amount of increase in salary between initial and final offer. But once referral method is taken into account, all race effects disappear. The extent then to which ethnic minorities are disadvantaged in hiring is in the precontact stage. They lack access to or utilize less well the social networks that lead to high success in getting hired. This is in line with survey evidence showing that some of the gap between blacks and whites can be attributed to differences in access to or efficacy of information networks (see Granovetter 1995, p. 151). We have a clear case of a disparate racial impact as opposed to a disparate-treatment situation.

It is really the social network variables that are important, as only 3.6% of applicants and 5.0% of those with job offers were recruited by a headhunter, whereas the central avenue into the organization through personal and professional networks accounts for 60.4% of applicants and 80.8% of those receiving offers. The role of networks is primarily compositional, not a question of differential impact of networks by race because all race effects disappear once their distribution on networks is taken into account.

This is decidedly not an “old boys network.” What we observe is an overwhelmingly “white young girls and boys network” to which especially blacks but also other minorities have less access, men and women alike. If a dividing line is to be drawn, it is not men against women, but whites on one side and ethnic minorities on the other.

For women then, and also for minorities once network ties are taken into account, the organization corresponds to the perception that “the high-tech industry is one of the world’s purest meritocracies. ‘If you’re good, you get hired,’ says David Ellington, cofounder and CEO of the black Internet service NetNoir, ‘and on the whole that makes Silicon Valley less racist than the rest of society’” (Jacoby 1999, p. 25).

Even though the race effects are clearly discernable and statistically significant when no control is made for referral method, they are substantively small, on most outcomes, except on place of first interview and on getting a second interview. For example, for final salary, the differences are 1%–2%, not 10%–15%. Given the total absence of gender effects, what is remarkable and unfortunate is not the size of race effects, which are small, but that there are any at all.

Why is it that the two network types, personal and professional, and being recruited by a headhunter, have such strong impacts on success in the hiring process? For the social networks, it is unquestionably the quality



of the information they yield that counts.<sup>22</sup> Either someone already in the company can vouch for you, through personal networks, or you have already done a job for the organization, as a previous contractor, a professional network, which also supplies useful information. It is however the personal network that has the more enduring effect. Why is that so? Perhaps because a friend in the organization often also is a professional colleague through common or similar education or experience, thus knowing in more detail one's qualifications and perhaps only encouraging an application when perceiving it could be met with success? Perhaps because a previous job may have been accomplished by varying degrees of success or quality as perceived by the organization and thereby making contact as previous contractor on average less efficacious?

A headhunter's job is to identify especially promising prospective employees. One should expect the average quality of applicants recruited by headhunters to be considerably above that of other applicants. We did not find so for the rating done in first interview. We did however find consistent positive effects of being headhunted on subsequent outcomes in the hiring process.

Beyond the importance of social networks for hiring, and especially how minority groups but not women are disadvantaged in that respect, a final central finding is the importance of the initial screening process. Place of first interview and whether one gets a second interview strongly affect whether one gets an offer. Most racial differences are found here, and this is also where the social networks have their strongest impacts.

How representative is this organization? Perhaps one might have to search for some time to find as fair an employer? This is something which is difficult to know and which at present we cannot know. In all likelihood, this organization is typical of other midsized and large organizations, especially in high-technology and probably many service industries, for example, banking and insurance. We know of only one other study of hiring in contemporary organizations using data on the entire applicant pool with a focus on gender and race (Petersen et al. 2000).<sup>23</sup> It reported

<sup>22</sup> In all likelihood, recruitment through social networks is informationally efficient, but it may lead to less diversity than desirable because one may end up with hires who are socially and professionally too similar. Wanting to represent different viewpoints in an organization, perhaps to challenge the status quo, even to promote creativity, relying less on networks and more on other methods of recruitment may lead to better outcomes.

<sup>23</sup> Additionally, there is the creative study by Goldin and Rouse (2000) of hiring into eight major American symphony orchestras. It covers a long period, late 1950s through 1995, with most of the data from 1970 and later, but it gives little detailed evidence on the situation during the last 10 years, those probably most advantageous to women. This is an unusual labor market. There is also the study of an insurance company in 1981 in Kirnan et al. (1989).

on 6,421 applicants, 80.6% female, and 357 hires in a large female-dominated service organization in the State of California in 1993–94. It also found that there are absolutely no differences between men and women in likelihood of getting hired. To the extent there is a difference, it is to the advantage of women. As in the present organization, especially blacks are at a disadvantage, but no information was available on networks in that study. Fernandez and Weinberg (1997), in a study of the role of social networks in hiring, also report the effects of sex on the probability of getting a job offer. They analyzed hiring into entry-level positions in a large bank in 1993–95 and found small and positive effects of being female on the probability of getting an offer. Also in this organization, there is definitely no disadvantage to being female. Their study, unlike the present one and the one discussed above, focused exclusively on entry-level positions. Across these three studies, the organizations cover the entire spectrum from female- to male-dominated in terms of sex composition of their applicant pools, from 25% female in the present organization, to 50% in Fernandez and Weinberg (1997), to an entire 80% in Petersen et al. (2000).

These three studies provide the bulk of the evidence available on the role of gender in access to positions at the time of hire in modern corporate America. Assuming, probably quite safely, that they are representative of practices in midsized and large U.S. organizations, one may conjecture that women have achieved equality with men in the hiring process, in much the same way as the struggle for equal pay for equal work seems to have been won (Petersen and Morgan 1995). Less well understood is the role of promotion in creating differences between men and women, including possible lack of access to higher positions, known as the glass-ceiling problem. More well documented is the low pay in female-dominated occupations, which has been addressed in studies of comparable worth (e.g., England 1992).

One may object that researchers only get access to data on firms with fair hiring practices. We think this is not the case. First, these firms are never randomly sampled, nor did they spontaneously offer their data to us. We get access usually through a network tie well placed in the firm, with whom we work over a long period to access the relevant data. Second, as we learned from showing our results to employees in the firm, companies rarely know much about what goes on, about the extent to which they are fair or not. Third, the objection, while not racist, definitely reflects a Eurocentric bias. Consider the reasoning behind it: Since we did not find any gender differences, we must have studied a fair employer. But this is not a company free of trouble. It is just free of gender trouble, antisceptically so. It does however have race issues, which are reflective of the social structure of the broader society.

In our theoretical analysis, we discussed how the hiring process is where

one should expect most differential treatment between men and women, for a number of reasons, as also pointed out by other researchers (e.g., Bloch 1994; Epstein 1992). But this is not what we found, and it is time again to heed Sherlock Holmes' admonition: "It is a capital mistake to theorize before one has data. Insensibly one begins to twist facts to suit theories, instead of theories to suit facts" (Doyle 1986, vol. 1, p. 212). And now, having seen the data from three case studies, each with the same unambiguous conclusion, we may also have to accept another of Holmes' dicta: "It is an old maxim of mine that when you have excluded the impossible, whatever remains, however improbable, must be the truth" (Doyle 1986, vol. 1, p. 428). In the present case, this translates into the surprising conclusion: Currently, women probably face no disadvantages in the hiring process in midsized and large U.S. organizations. So now we need to revise our conceptual apparatus. We can start by asking why the hiring process, which on conceptual grounds seems so fraught with and open to subjective assessments, differential treatment, and bigotry, currently, at least in midsized to large organizations, appears to be so overwhelmingly nondiscriminatory against women? Obviously we cannot satisfactorily resolve this question here. But we can speculate whether some of the extensive legal efforts by the Equal Employment and Opportunity Commission (EEOC) have had their desired effects. The EEOC has put forth a number of high-profile cases involving hiring. Perhaps most famous was the 12-year case against Sears, Roebuck and Co., where the trial itself lasted 10 months (e.g., Epstein 1992, pp. 385–91). The EEOC failed in the suit, Sears was acquitted, but the "retailer spent an estimated \$20 million and at one point employed 250 full-time workers merely to respond to document demands" (Olson 1997, p. 226), the case producing a trial record of more than 19,000 pages. This is a legal climate where being charged, even if eventually acquitted, can be exceedingly costly. One conjecture then is that these well-known costs of even being incorrectly charged, make midsized and large employers very careful in their hiring processes.

On the wider significance of these three consistent sets of findings, we can at present nevertheless only speculate. Due to the complexity of the process and the difficulty of assembling the relevant data, one cannot reach the kind of closure in conclusions for hiring as one can for wages, for which Petersen and Morgan (1995) found virtually no wage gap within jobs. Men and women who do the same work for the same employer are paid the same. What is not speculation, however, is that no matter its representativeness or lack thereof, it is only through such focused studies that we will be able to assemble and assess the relevant data for gaining insight into the hiring process. One needs to sample the decisions made by the agents possibly executing the discriminatory acts, and then infor-

mation on the entire set of applicants over which the decisions are taken, sampling both sides of the market. Sample surveys of job seekers and employees cannot accomplish this. They yield no information on all applicants to the same jobs with the same employer, so one cannot compare rejected to accepted applicants. Likewise, studies asking employers about their recruiting practices do no better, because one does not get information about the entire applicant pool they face.

What we found—much to our surprise, contrary to our prior notions, through considerable quantitative toil resembling the detective's methods—is that there is absolutely no disadvantage to being a women in these processes, and once account has been taken of position in network structure, there is no disadvantage for ethnic minorities either. The list of meritocratic factors is short: age and education. The list of network factors is equally short: personal and professional. So in this singularly clean and well-lit case, it can all be reduced to meritocracy and social networks.

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