

Lasting Effects?
Referrals and Career Mobility of Demographic Groups in Organizations

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Abstract

We examine the effect of referral-based hiring on the number of promotions employees receive and the differences in this effect across demographic groups. Using archival data from a single organization on nearly 16,000 employees over an 11-year period, we investigate the effect of hiring by referrals on subsequent upward mobility in the firm. Drawing on theory on referral-based hiring, inequality, and career mobility, we argue that referral-based hiring provides unique promotion advantages for demographic minorities compared with those hired without a referral. Consistent with this, we find that referrals have a positive effect on promotions for one minority group: blacks. The effect remains after individual differences and regional labor market effects are controlled. We explore possible mechanism for the effect, with initial evidence consistent with referrals providing a signal of quality for black employees. These results suggest refinement to prior research that suggests referral-based hiring in organizations disadvantages racial minorities.

Introduction

Research in labor economics, management, and sociology indicates network-based hiring (referrals) is a widespread organizational practice that leads to advantages for job seekers with social contacts (Granovetter 1981; Fernandez, Castilla, and Moore 2000; Obukhova and Lan 2013; Barbulescu 2015). On the supply-side, networks serve as a main way individuals search and locate employment (Lin, Ensel and Vaughn 1981; Marsden and Hurlbert 1988; Wegner 1991). On the demand-side, social networks affect how organizations select and screen applicants (Fernandez and Weinberg 1997; Petersen, Saporta, and Seidel 2000; Yakubovich and Lup 2006).

To date, research on network-based hiring has focused primarily on initial labor market outcomes, such as interviews, job offers, or starting salaries (Petersen, Saporta, and Seidel 2000; Seidel, Polzer, and Stewart 2000; Torres and Huffman 2002). This makes sense given that the benefits to network-based hiring have been framed around short-term advantages such as minimizing the firm's cost of recruitment or, optimizing the search outcomes for the job seeker. Yet, there are reasons to believe that pre-entry hiring methods – i.e. the “routes” through which individuals join organizations – persist in their effect on individuals' careers post-entry. On one hand, network-based hiring in the form of referrals may lead to positive selection effects, because information is transferred between job-seekers and referring employees allowing individuals to ‘better select’ into jobs (Jovanovic 1979; Montgomery 1991; Lazear 1999; Ioannides and Loury 2004; see Zottoli and Wanous 2001 for review) allowing greater chances for upward mobility. On the other hand, network-based hiring may lead to positive treatment effects, whereby individuals hired through referrals receive social resources

that help them assimilate into their jobs and organizations that could allow for greater opportunities for promotions (Castilla 2005; Fernandez and Sosa 2005; Sterling 2015).

Although such linkages have been previously claimed, few empirical investigations specifically examine these relationships. Additionally, somewhat surprisingly, no studies to our knowledge have explicitly explored pre- and post-entry effects across demographic groups. Generally, pre-entry studies support the notion that referral-based hiring is an inequality-inducing practice (Marx and Leicht 1992; Reskin and Padavic 1994; Korenman and Turner 1996; Reskin, McBrier, and Kmec 1999; Elliott 2001; Moss and Tilly 2001; Smith 2005; Kaley, Dobbin and Kelly 2006; Rubineau and Fernandez 2013). These studies suggest that since networks are often segregated based on gender and race, women and minorities may be less likely to have contacts in organizations and gain referral-based advantages in the hiring process. Nonetheless, there may be reasons to suspect that referral-based hiring as an organizational practice is not universally detrimental to all demographic groups (c.f. Fernandez and Greenberg 2013; Rubineau and Fernandez 2013), particularly when examined in relation to the mobility outcomes of these employees once inside a firm.

In this paper we investigate the relationship between a specific route through which individuals join organizations (referrals) and their subsequent post-entry career mobility (promotions). Building on prior literature that finds beneficial selection (Jovanovic 1979; Montgomery 1991; Lazear 1999; for review, Zottoli and Wanous 2001) and treatment effects associated with organizational advancement (Castilla 2005; Fernandez and Sosa 2005; Sterling 2015), we argue that employees entering via referrals will realize improved upward mobility outcomes compared with those hired without a referral. However, we further consider the possibility that pre-entry networks and post-entry career advancement outcomes may matter

more for members of different demographic groups. Specifically, we argue that women and racial minorities may stand to uniquely benefit from network-based hiring because of the distinct advantages referrals provide, such as access to otherwise blocked networks inside a firm, or, a positive signal of quality from the association with the referee. As such, we expect that referrals will positively and differentially affect the upward mobility of members of traditionally disadvantaged groups versus majority group members.

We examine this question using personnel records from a large U.S.-based sales organization on nearly 16,000 employees hired over an 11-year period, from 2003-2013. This organization (herein, *Sales Co.*), is well suited for our research purposes for a number of reasons. To begin, referrals are a fairly common route through which employees are hired, representing approximately 36% of all hires over the 11-year period; and, all employees in the organization start out in the same entry-level position regardless of the method of hire. Additionally, all employees receive the same training, and are subject to the same incentive structure. Finally, and important to a study on upward mobility, all employees are expected to advance through the same set of hierarchical levels and jobs within the organization. Thus, this setting permits us to investigate how the method of entry affects the upward mobility outcomes of individuals hired into the exact same job within the same organization.

The analysis indicates support consistent with our arguments of referral-based hiring providing a promotion advantage to one traditionally disadvantaged group – black employees. After presenting the results, we explore various alternative explanations for this observed effect, taking advantage of detailed information about the employees, such as education level and performance evaluations that help proxy for individual quality, as well as geographic variance in office locations to test whether referrals are associated with specific regional labor market

advantages. We find the importance of referrals to promotion outcomes of black employees remains. Further, we present initial results from an experimental vignette (cf. Goldberg 1968) that provides insights into why the method of hire may differentially affect black employees' post-entry career prospects. We close with a discussion of the implications of our findings for research on labor markets, networks, and organizational inequality.

Background and Theory

Referral-Based Hiring and Mobility

It is estimated that roughly one-third to one-half of all jobs in the U.S. are found through social contacts (for reviews, Granovetter 1995 and Marsden and Gorman 2001), and studies on other national contexts reveal similar levels of importance of networks (e.g. Yakubovich 2003; Sharone 2014). Despite this, we know little about how employees who enter through a social contact fare with respect to their careers post-entry. To date, most of the theoretical attention on referral-based hiring has focused on outcomes related to the initial entry process (Petersen et al. 2000; Seidel, Polzer, and Stewart 2000; Torres and Huffman 2002). One exception to this has been research linking referral-based hiring with employee turnover, which suggests a link between the pre-entry hiring method and an individual's post-entry experiences in organizations (Mowday, Porter and Steers 1982; Krackhardt and Porter 1985; Castilla 2005; Breugh 2008; Holtom, Mitchell, Lee and Eberly 2008).

Broadly speaking, two theoretical explanations accounts have been used to link pre-entry hiring method to turnover: selection and treatment. The basic intuition for each account and its effect on turnover is distinct. The selection account attests to the information benefits of network-based hiring through better employer and job-seeker selection (Jovanovic 1979; Montgomery 1991; Lazear 1999; Ioannides and Loury 2004). In labor markets, bilateral

information asymmetry exists, where job applicants know more about their skills, abilities, and motivation than employers. At the same time, employers know more about the organization, the job-demands, and culture than the applicant. In light of this, employees inside organizations can serve as important intermediaries, ‘standing in’ for the lack of knowledge on each side of the labor market. Applicants hired through referrals are then better able to select into jobs than those hired through more formal hiring methods while employers are better able to select candidates when they are referred (Ullman 1966; Williams, Labig, and Stone 1993; Rivera 2015).

Meanwhile the treatment account suggests individuals hired with referrals receive direct help from their referrers post-entry, reducing turnover (Skolnik 1987). For example, Castilla (2005) found that those hired through referrals are less likely to exit, but only when the referrer remains in the organization, suggesting direct interactions between new employees and their referrers are important means of inducing employees to stay. Other research suggests that employers may believe that those hired with friends in the organization have better retention outcomes due to the interactions employees have with the new recruits (Sterling 2014).

Although theory on selection and treatment has previously been directed toward understanding turnover, similar arguments may hold with respect to intra-organizational mobility. Due to the effects of selection, individuals hired through referrals may be ‘better matched’ to the organization or job, and therefore may perform better (Gannon 1971; Montgomery, 1991; Galenianos 2012; 2014; Pallais and Sands 2015). Also, those referred may be higher quality than those hired through other formal methods, due to the greater information received through informal channels compared with formal channels (Williams, Labig and Stone 1993; Fernandez and Greenberg 2013). For example, Burks et. al (2015) find the performance of workers in multiple industries is higher for those hired through networks, citing evidence that

this may be due to higher quality of those referred (as measured by pre-job tests and interview scores).

Further, those hired through referrals may perform better than those without referrals due to treatment effects. Fernandez et. al (2000) find employees referred to the organization are more socialized than those that enter without referrals, and this may have downstream effects on employee performance. Castilla (2005) finds productivity gains for newcomers hired through a referral when the referrer remains in the organization, suggesting interactions with referrers post-entry affect work performance. In her recent study of elite professional service firms, Rivera (2015) details discussions during the hiring process where consulting partners make promises of staffing referees post-entry on their projects, ultimately providing these employees different opportunities and resources once inside the firm. Similarly, Pallais and Sands (2015) found performance benefits to referrals when they directly worked with their referrers.

Overall, existing theory on selection and treatment offer a number of reasons to expect that entering through a referral positively affects an employee's subsequent upward mobility within that firm. Accordingly, we predict:

H1: Employees hired through referrals experience greater upward mobility outcomes post-entry than those hired through formal methods (non-referrals).

Referrals and Career Mobility of Women and Racial Minorities

Although the arguments above posit long-lived benefits of referrals, it is possible that these advantages erode over time and have negligible effects by the time promotions occur (Rosenbaum 1984). In internal labor markets, firms invest in the training and development of employees, with the intent that employees will develop firm-specific human capital (Becker 1975) and social capital within the firm (Burt 2000). All employees – including those hired

without referrals - are expected to receive training and socialization into the firm. Accordingly, the initial benefits of being hired through referrals may dissipate. Consistent with this, there is evidence that selection and treatment-related effects of referral-based hiring may be short-lived (Castilla 2005:1269-1271), as employees catch up over time to those that enter through referrals, or as referrers of these employees leave the company. Whatever initial network advantages referrals provide, these may dissolve as other individuals acclimate and form their own connections and become socialized within the organization.

One exception to this, however, may be the effect of referrals on members of demographically disadvantaged groups. Research indicates that women and racial minorities, particularly in white-collar jobs, are less likely to have social contacts in organizations prior to being hired (Reskin and McBrier 2000; Seidel, Polzer and Stewart 2000; Smith 2005), often resulting in replication of dominant group members inside firms (Beckman and Phillips 2005). Yet, for those that are able to enter with social contacts in place, this may have more lasting effects. Given evidence that all individuals are not treated equally inside organizations (e.g., Lucas 2003; Pager and Shepherd 2008; Gorman and Kmec 2009; Stainback, Tomaskovic-Devey and Skaggs 2010) and that formal hiring methods lead to unequal outcomes for minorities (Bertrand and Mullainathan 2004; Correll, Benard and Paik 2007; Castilla and Benard, 2010; Tilcsik 2011; Kang, Tilcsik, Jun and DeCelles 2015), women and racial minorities may differentially benefit from the informal affiliation with a company insider compared with members of the majority, who may be more able to catch up to their referred peers once inside the firm. Simply stated, faced with unequal access within firms, women and minorities lacking a referral may never be able to access such resources, blocking them from the same upward mobility opportunities.

One way this may occur is by the referral providing crucial signals of quality for minorities from the onset of their employment (Spence 1974), positively influencing outcomes and evaluations of these individuals post-entry. As race and gender provide some of the clearest visible signals that can trigger negative biases of lower quality, commitment, and leadership potential in the workplace that stunts individual advancement opportunities at work (Berger et al. 1980; Tomaskovic-Devey 1993; Bertrand and Hallock 2001; Castilla 2008; Pager and Shepherd 2008; Ridgeway 2014; Rider, Sterling, and Tan, 2016), such signaling could prove highly – and uniquely – beneficial. For women, being linked to a company insider may alleviate concerns about their potential lower commitment to working via the motherhood penalty (Becker 1985; Reskin and Padavic 1994; Budig and England 2001; Correll et al. 2007), or, beliefs that feminine (communal) and leadership (agentic) characteristics are at odds (Eagly and Karau 2002; Cuddy, Fiske and Glick 2004; Heilman and Okimoto 2007). For racial minorities, having an endorser inside the firm may assuage concerns about lower quality and ability relative to whites (Bertrand and Mullainathan 2004; Castilla and Benard 2010) that often lead to fewer promotion considerations (Dreher and Cox 2000; Elliott and Smith 2004).

Leveraging informal relationships to signal quality and ability for disadvantaged employees has been observed in a variety of settings (Spence 1974; Ibarra 1997; Burt 1998; Hultin and Szulkin 1999). In a study of managers in a large electronics firm, Burt (1998) found networks with senior ranking men assisted both women and junior-ranking men with earlier promotions. He found that the affiliation with senior-ranking men validated these employees as not only high quality, but also worthy of advancement to an otherwise skeptical set of managers. While this endorsement association has been mostly demonstrated through relationships that originate once inside organizations, it is possible that similar benefits could stem from

relationships formed prior to entry. For example, Sterling (2015) found that pre-entry relationships affect the development of new employees' networks once inside a firm, and importantly, that such pre-entry relationships matter most when quality is uncertain, suggesting that women and racial minorities may benefit from having a referrer alleviate quality concerns that might linger within organizations and dampen promotion chances (Altonji and Perret 2001; Tomaskovic-Devey, Thomas, and Johnson 2005). Moreover, commitment concerns that hamper women should be stymied if a connection to a referrer can signal the employee possesses cultural fit, a strong work ethic or, commitment to the organization (Turco 2010; Briscoe and Kellogg 2011; Rivera 2012; Quintana-Garcia and Elvira 2015). Consistent with this, Elliott and Smith (2004) find that network assistance is as important to women and racial minorities in getting promoted to managerial positions as it is to white men.

Beyond this, having a connection to a referrer may also provide women and racial minorities with a smoother onboarding process into a workplace where they have few other minority colleagues in which to turn to for support. Rivera (2015) discussed how having a 'champion' during recruiting process of professional services firms could help minorities find support and assimilate once inside. Knowing that these stages are a sensitive period of time in individual's careers that may have more lasting effects into an individual's organizational tenure (Stinchcombe 1965; Higgins 2005; Tilcsik 2014; and, see Marquis and Tilcsik 2013 for discussion), having an early endorsement may prove even more critical for a minority employee, signaling positive beliefs about that individual's ability, ultimately setting that individual on a more upwardly mobile path than an employee lacking such a connection.

For these reasons, we predict that women and racial minorities may benefit relatively more from referrals over time, which becomes transparent in their mobility patterns once inside the firm. Accordingly, we predict:

H2. Women and racial minorities hired through referrals experience greater upward mobility outcomes post-entry than those from the same demographic groups hired through formal methods (non-referrals).

Data and Methods

Sample

We test our hypotheses using personnel data from *Sales Co.*, a large private employer with several offices throughout the United States and other regions in the world.² The setting is well suited for our research aims of studying career mobility within organizations. While there are temporary and part-time positions at the firm, the majority of employees at *Sales Co.* start out in the *same* full-time job – an entry-level pre-management full-time position. This entry-level pre-management position has the same set of responsibilities, and employees are subject to the same incentive structure and hierarchical career ladder within the firm. Specifically, the starting position is ‘up or out’ within the firm – i.e. the expectation is that those in the entry-level position will be promoted, or they will be asked to leave the firm. That said, there is not a length of time under which an employee must be promoted to a position with greater responsibilities: promotions from the entry-level onward take place based on how the employee performs compared to his or her peers, making it similar to promotion contests in many internal labor markets (Doeringer and Piore 1985; Bidwell and Mollick 2015).

² The data were received after one of the authors provided a signed copy of a Non-Disclosure Agreement (NDA) to *Sales Co.*

Another benefit is that the organization keeps detailed records of employees. This includes information on employees' status within the organization – i.e. current and previous job titles, promotions, and, if applicable, termination. This allows us to verify, as we have done, that all employees in the personnel files did in fact have the same job-title, and were subject to the same internal labor market in the firm.

The data includes information on employees hired from 2003 to mid-year 2014 that worked in three sales regions in the U.S. *Sales Co.* culls its pre-management employees from two main sources – referrals, which account for approximately 36% of the hires, and formal sources, such as on-campus recruiting and electronic websites, which account for approximately 58% of the hires. The remaining hires were sourced largely through an internship program. Overall records on 16,746 individuals were received. Because we do not have a full year's worth of data on 2014, we do not include those hired that year in our sample. We do not include interns, nor the small number of employees that were left-censored that were included in the data.³ This leaves us with a final data set of 15,382 employees. The personnel records contained an entry for each time a recorded event – a promotion, termination, job-role change – occurred within the firm, and contained 39,750 observations entries for the employees in our sample.

Sales Co. relies upon an internal labor market strategy that follows a “promote from within” HR policy. This means that in addition to all employees starting out in the same pre-management position, they are also always competing for jobs with employees that likewise began in this position – i.e. there are no lateral external hires at this firm. After the pre-management position, individuals can be promoted three more times with a title change. From there, employees may keep the same title but may be promoted to increased job responsibilities.

³ Because we asked the firm for data on those hired beginning in 2003 (the earliest year the full data was available) there are very few observations that are left-censored. These are mainly interns whom we exclude from the analysis.

The largest number of promotions any individual attained in the 11-year period under investigation here is 9; the average number of promotions attained overall was less than one (0.84).

In this sample 38.6% of the employees are women, 55.5% are white, 18.2% are black, 16.2% are Hispanic and 7.5% are Asian American. The remaining individuals (2.6%) belong to a category we call ‘other minority’ to designate that they belong to ethnic or minority groups not included above. The average age at hire is 25 years.

Modeling Strategy and Measures

Our dependent variable is upward mobility within the organization, measured as the number of promotions that employees experienced during their tenure at the firm. In our sample, there is a large left-sided skew in the number of promotions; approximately 61% of employees hired had less than one promotion within the company. Additionally, 71.2% of the employees in the organization experienced turnover during our sampling frame⁴.

To account for this high proportion of 0’s stemming from employee turnover, we use a zero-inflated Poisson model. Important for the nature of our data, this type of model allows the number of promotions to be generated by different processes across two stages. In the first stage we model the likelihood of attaining a negative outcome (i.e. termination prior to first promotion). Our first stage model is a logit model, which indicates the probability of employees attaining zero promotions during their tenure in the company. In the second stage we model the

⁴ The majority of turnovers in our sample are voluntary. In logit models we found employee referrals had a negative and statistically significant impact on turnovers in general, consistent with prior literature. Referrals also had a negative and statistically significant effect on voluntary turnovers, but did not have a statistically significant effect on involuntary turnovers.

number of promotions that an employee attains after accounting for the likelihood that they have a positive number, using the following equation:

$$P_i = \beta_0 + \beta_1 R_i + \gamma X_i + \varepsilon_i$$

P_i is the number of promotions that each employee receives, R_i is the hiring method, while X_i is a vector of demographic variables, covariates and interaction terms and ε_i is the error term. Here we use a Poisson model because the mean and variance in the number of promotions are similar (Greene 2003). The Vuong test indicates that a zero-inflated Poisson fits significantly better than a Poisson ($z = 30.45$, $\Pr > z = 0.000$).⁵ Because there may be differences in the local employment context, employee outcomes within a region may not be independent. To deal with autocorrelation, we cluster by the three general regions where hiring occurred.

In this organization two types of promotion outcomes could be achieved. The majority of promotions are obtained when an employee has proven that they are competent to perform the set of tasks required for employees in their position, and the manager deems them ready for increasing responsibility. This dependent variable, the *number of promotions*, is a count of these promotions employees have while at the firm. In addition, in rare instances managers may elect to promote individuals early because they have proven competent to perform at a level faster than expected. This happened for 6.4% of the total promotions over the 11-year period, and so we additionally examine the *number of outstanding promotions* as a dependent variable in the models.

⁵ We also considered hazard rate models but aspects of our study led us to the above modeling approach. Namely, we are interested in understanding attainment in terms of overall promotion outcomes, not promotion rates – which supports the choice of count models. In this firm, while promotions were based on performance, they were also attained based on open positions, which were outside of the employee’s direct control (White, 1970; Sørensen and Tuma, 1981). Thus, hazard models do not map directly onto our stated propositions, nor did they permit us to investigate longer-term mobility. That said, we did run hazard rate models and our findings hold under most model specifications.

The independent variable for the first stage model is the *number of days worked* in the firm. This variable captures the likelihood that the number of promotions an employee receives is zero due to their tenure in the organization. The number of days worked is found for each employee by subtracting their termination day from their start day. For those employees that are right censored (i.e. those still working for the firm after mid-2014), their maximum days worked is found by subtracting their start date from the last day the personnel records were provided (May 1, 2014).

The primary independent variable in the second-stage model is the dichotomous *referral* variable, equal to 1 if an employee was hired through a referral, otherwise 0. For every individual hired through a referral, an indication of such is made in the hiring record. To investigate the relative effect on referral-based hiring on different groups' promotions, we include interaction terms for the method of hire with demographic groups that are disadvantaged in career mobility contests, as indicated in our models. These interaction terms indicate what, if any, within-group effect there is for being routed through a referral at the point of hire versus being hired through other hiring methods.

Covariates. There are a number of covariates included in the models that may affect the number of promotions that employees attain. Because employees all start at the same pre-management position, and are expected to progress through the same career ladder, there is no variance in jobs; thus, job-title controls are necessary. For gender we include a *female* dichotomous variable. We also include the employee race or ethnicity *black*, *Hispanic*, *Asian America*, and *other minority* (*white* is the omitted category). Further, because age may affect advancement we control for the *age* of individuals (a continuous variable based on birth date). We show the full correlation table for all variables in Table 1.

[Insert Table 1 about here.]

Results

We first investigate the effects of hiring on the number of promotions. We run a first stage logit model (where standard errors are clustered by region) in which we regress the days worked on the likelihood of not receiving a promotion and find that the number of days worked has the expected negative and statistically significant relationship ($p < 0.001$). In model 1 of Table 2 we then regress the number of promotions on demographic variables. Consistent with what we might expect based on prior research, women and blacks experience fewer promotions than males and whites (the omitted categories), respectively ($p < 0.01$). There is no disadvantage in the number of promotions for Hispanics, Asian Americans, or other minorities. Additionally, age at the point-of-hire has a negative relationship with the number of promotions, meaning older hires are less likely to be promoted. In Model 2 we include the referral variable and find there is no effect of referrals on the number of promotions. The effect is negative, though not statistically significant. Thus we find no support for H1.

Next we investigate H2 – that there are positive intra-group effects of referrals on post-entry promotions for members of demographically disadvantaged groups. Since only women and blacks have a lower number of promotions, these are the disadvantaged groups that H2 posits referrals affect. We interact these demographic variables with referrals in Models 3 and 4. We find support for the hypothesized relationship of referrals on promotions among black employees. The coefficient on the interaction variable is positive and statistically significant ($p < 0.05$). It indicates that blacks hired through referrals increase their number of promotions by a factor of 1.2 relative to blacks hired through other methods, holding all other factors constant.⁶ In

⁶ When we further reduce the sample to black and white employees only, the effect for blacks remains ($p < 0.06$).

Model 4 we find no support for our hypothesis among women. The interaction between referrals and the female dummy variable is negative and not statistically significant.

[Insert Table 2 about here.]

In Models 1 through 4 in Table 3 we repeat these same regression analyses for outstanding promotions. As with the prior analysis of number of promotions, blacks were less likely to receive outstanding promotions than whites (the omitted category). Hispanics were no different from whites in the number of outstanding promotions; Asian Americans and other minorities received more outstanding promotions than whites. Somewhat counter to expectations and the previous models, the effect of being female on outstanding promotions is positive and statistically significant ($p < 0.05$). While surprising, this may give some indication that women in this firm are not disadvantaged universally, which is contrary to what appears to be the case for blacks. In Model 2 we include the referrals variable. Once again find no support for the direct effect of referrals: there is no significant effect of being routed through this hiring method on the number of outstanding promotions in the firm.

In Models 3 and 4 in Table 3 we investigate the interaction effects. Similar to the prior models, our hypothesis holds for black employees but not for women. We find a positive and statistically significant effect of referrals on the number of outstanding promotions blacks receive ($p < 0.05$). The coefficient on the black-referral interaction indicates that the effect of being black on outstanding promotions can be substantially reduced if one is hired through a referral.

That is, blacks hired through a referral have similar promotion outcomes to whites hired without referrals.⁷

[Insert Table 3 about here.]

In sum, the analyses indicate that blacks sustain disadvantages in post-entry promotions and that the route through which individuals are hired might have persistent effects on reducing this disparity. Black employees receive more promotions when hired through referrals than black employees not routed through informal methods of hiring. This effect is present in both types of promotions; however, the effects of referrals are most pronounced in models of outstanding promotions, where the disadvantages blacks sustain in promotions are almost fully remediated through referrals.

As stated previously, we do not find this effect for women, the other demographic group that appears disadvantaged in mobility outcomes in this firm, at least in terms of overall promotion counts post-entry. One reason for this might be due to the nature of the jobs under study – the firm is in an industry where customer service is important and therefore women may be viewed as of similar quality as men (c.f. Schwepker 2003) because the job role is gender-consistent (Barnett et al. 2000; Barbulescu and Bidwell 2013). To determine whether there was something more systematic occurring for women we further investigated the demographic characteristics of referrers for women versus the characteristics of referrers for men. Specifically, we obtained the pre-hire records – i.e. the applicant files – for one region of *Sales Co.* from 2009 to mid-2011. No employee identifying information appears in the pre-hire data, so these records are not linkable to post-hire records. There were 723 applicants during this period of time. We use these records to examine the degree of gender homophily in referrals –

⁷ We note that we do not have the full set of information available as those making promotion decisions, and thus the effect could be due to unobserved heterogeneity across blacks vs. whites (see Lips, 2013; Olson, 2013) for a discussion.

that is, if female applicants were more likely to be referred by female employees than men. If this is the case, their referrers might be viewed as less legitimate or lack authority in the organization, which might explain the lack of a referral effect for women. We found no evidence that this was the case. Female applicants had a female referrer 41% of the time, while male applicants had a female referrer 38% of the time. Substantively, men and women applicants were both referred by women and men in the organization approximately 40% and 60% of the time, respectively.⁸ Thus, the characteristics of the referrers themselves do not seem to be driving the null effects for women.

Robustness Checks

We undertake a number of robustness checks to verify the validity of our findings that referrals have a positive effect on the post-entry outcomes of black employees. First, it is possible that there is unobserved heterogeneity in the quality of employees hired through referrals versus non-referrals. If this is the case for blacks, then the results that we observed on the positive effect of referrals could be due to higher quality for blacks sourced into the firm in this manner versus blacks hired through formal means.

To examine this, we obtained information on the education level for the majority of employees in our sample.⁹ Most employees in the sample, 92%, had a college degree while 2% had a two-year degree, another approximately 2% had some college, and less than 1% attained a high school degree or did not finish high school. The remaining had some graduate school education or an advanced degree. We include the education level variables – “not high school”,

⁸ Additionally, we qualitatively examined the names of referrers to see if some groups had a more concentrated set of referrers (perhaps designated “advocates”) and found no evidence that this is the case.

⁹ Note that because we could not be provided education information on all employees in the sample and there is no verification that the data is missing-at-random (Allison, 2002), we include education controls as robustness checks rather than in the main models. The same is true for the performance data.

“high school”, “some college”, “technical school” and “two-year” degree in the Model 1 of Table 4 (“college degree or above” is the omitted group).

Additionally, we obtained performance evaluations for employees at the firm. The number of performance evaluations in personnel files varied across employees, and in interviews *Sales Co.* indicated that performance evaluations were not required to be recorded in the electronic database. Nonetheless, they were available for more than 13,000 employees in our sample. We include the employee’s mean rating (on a five-point scale) if they had more than one rating. There were 10.7% of employees that had a mean rating of 2 or less, 73.9% had a mean rating between 2 and 3, while the remaining had mean ratings more than 3.

In Table 4 in Model 1 and 4, we show the demographic variables with these additional proxies for quality. In terms of education level the variables (not shown) have the expected sign and most are significant. Not obtaining a high school degree or having only a high school degree has a negative and significant effect on the number of promotions and outstanding promotions ($p < 0.01$). Having some college or a technical degree does not affect promotions. The sign on a two-year degree is positive and statistically significant ($p < 0.05$). Perhaps due to its lack of variation, the mean performance evaluations did not have an effect on the number of promotions or outstanding promotions. With these additional variables in the models, the positive and statistically significant interaction for black and referral remains.¹⁰ Consistent with the prior models, there is no such interaction effect for women.

[Insert Table 4 about here.]

¹⁰ We are careful to note that other aspects of unobserved heterogeneity may be left unaccounted for, and that the education and ratings variables are an imperfect proxy for other factors the organization may use in promotion decisions.

Next, we consider the possibility that clustering at the three-region level leaves aspects of non-independence unaccounted for in the models. Namely, there are 692 offices represented in the sample. To account for potential non-independence at the office level, we cluster by individual offices in Model 2 and 5 for promotions and outstanding promotions, respectively. Clustering at the office level impacts the standard errors but not the coefficients, and does not alter the conclusions drawn about the influence of referrals for blacks on promotions. Finally, in Models 3 and 6 we add year fixed effects for each cohort, and our findings remain.¹¹

Exploratory Analyses: Mechanisms Leading to the Referral Effect

Overall, our results suggest that referrals have a positive outcome on post-entry promotions for one traditionally disadvantaged demographic group – blacks – the only group that sustained negative effects from both types of promotions studied. Pinpointing the mechanisms behind this effect is beyond the scope of this present study. However, we do some exploratory analyses toward this end in an experimental vignette (cf. Goldberg 1968), designed to replicate aspects of the archival study. In the experiment, fictionalized employee files are randomly assigned to participants, who are asked to evaluate the employee for a first promotion or, alternatively recommend termination and provide reasons for making the decision. While the results are only preliminary based on sample size (20 per condition, four conditions), they prove informative in suggesting possible mechanisms related to our archival data findings.

We conducted the IRB-approved experimental survey in graduate business school classes of a U.S. university that targeted two cohorts of 62 executive MBA graduate students and one cohort of 37 part-time MBA graduate students. The sample comprised individuals representative of students enrolled in the programs and school. We purposefully sampled graduate students as

¹¹ In analyses not shown, we also ran regressions with outliers removed – i.e. the top 1% and 3% of the number of promotions among blacks. Doing so did not impact the results.

it allowed us to capture a range of respondents with prior managerial experience representative of those familiar with making promotion and termination decisions. The response rate was high – with 52 executive MBA respondents of the 54 attending classes those days (96%) and 37 of the 44 (84%) part-time MBA students (sample = 89).

We asked participants to complete a seven-page, hard-copy survey booklet in class, where they read a vignette about a fictional Fortune-500 U.S. firm, *ABC Co.* that was modeled on *Sales Co.* in our field data (materials not shown, but available). Participants were told to picture themselves as the manager responsible for all promotion and termination decisions for employees at a branch of *ABC Co.* The survey then provided information on a fictional employee, who had worked at *ABC Co.* for one year, including a hiring report that consisted of a few sentences (i.e., either that the employee was “referred to us by an employee in the company” or, “came to us through an on-campus recruiter”) along with a one-page resume of this employee submitted at the time that he initially applied for the job. In addition to the hiring method manipulation, we also manipulated employee race. Akin to prior research (Bertrand and Mullainathan 2004) we changed the employee’s name (Calvin vs. Connor, same surname Johnson, for the black and white employees, respectively). We selected these based on public census data indicating these names were most commonly associated with black and white racial identities (Johnson was neutral). Following Tilcsik (2011), we also altered one line on the resume to indicate race: under leadership experience we listed membership in the National Association of Black Accountants (NABA) for the black employee, whereas for the white employee, we listed Institute of Management Accountants¹².

¹² We confirmed manipulations worked using a series of inference questions at the end of the survey. Post-survey analysis confirmed that participants were more likely ($p < .001$) to infer that Calvin was black and that Connor was white and the hiring condition through a referral/other method correctly ($p < .001$).

We held employee quality constant (low) in all conditions, describing the employee as ranking in the 25th percentile compared to other employees at the same job rank, and having a 2.95/4.0 college GPA. Statistics were provided that showed that employees that ranked in this percentile were promoted 50% of the time and terminated 50% of the time so that participants could equally argue to promote or terminate in their responses. The survey concluded with questions on participant, such as demographic background and work experience. Beyond the hiring method and race manipulations, all materials were identical.

In all, we had four condition assignments (2x2 design): black male hired by referral (n=20), black male hired by on campus interview (n=23), white male hired by referral (n=23), white male hired by on campus interview (n=23). Each participant was randomly assigned to one of the four conditions. One author administered all surveys in person in the classrooms¹³.

The survey captured promotion or termination decisions through a few questions, including asking the participant to use a 5-point Likert scale to indicate the likelihood to promote the employee, the likelihood to terminate the employee, assessment of the employee's suitability for promotion and also, asked the participant to make an overall recommendation to promote or terminate the employee to replicate an "up or out" HR policy akin to our field study.

Figures 1a and 1b show participant's mean ratings across condition assignment. Figure 1a shows the distribution of recommendations to promote versus terminate the employee by condition assignment. The pattern is consistent directionally with our results from the archival study. Namely, it shows that participants assigned to the Black-Referral condition had the highest distribution of promotion recommendations (70% promote versus 30% terminate). Next, was Black-Non-Referral, which was 65%-35% in favor of promotion (not statistically different

¹³ To validate random survey assignment, we ran a logistic regression predicting the likelihood of being assigned to each of the conditions based on participant characteristics (e.g., age, gender, race, marital status, work experience). No characteristic predicted the likelihood of completing a survey for any of the four conditions.

than Black Referral, $\chi^2(1) = 0.11, p=0.74$). Those assigned to White-Referral condition had a 45%-55% split in favor of termination (marginally significant different than Black-Referral condition, $\chi^2(1) = 2.58, p=0.11$). Without a referral, the split was 22%-78% in favor of termination for white employees (statistically different than Black Referral, $\chi^2(1) = 10.10, p=0.001$).

Figure 1b next compares participant mean ratings (+/- one standard deviation) of likelihood to terminate the employee. The lowest mean rating of likelihood to terminate was for Black-Referral ($M=2.70, SD=0.98$). Participants assigned to the Black-Referral condition also statistically differed from those assigned to White-Non-Referral in mean promotion likelihood ($t=3.76, p=.001$) and termination likelihood ($t=3.03, p=.004$)¹⁴. Interestingly, no condition statistically differed from another in the mean rating of suitability for promotion. Thus, participants deemed all candidates equally suitable, yet, still differed in their recommendations to promote or terminate across conditions.

[Insert Figures 1a and 1b about here.]

To qualitatively explore if participants used different logics in their explanations across conditions, we examined the participants' explanations for their evaluations. Reading through these, we observed differences in participant's explanations. One recurring theme we observed was that in some cases, participants relied directly on the hard data about the employee, such as the percentile ranking to justify their recommendation (such as "Because 25th percentile is not sufficient to be promoted" or, "Low percentile ranking, low GPA..."). We also qualitatively observed evidence that having a referral might matter for the salience or weighting of hard data

¹⁴ Notably, Black-Non-Referral also differed in mean ratings with White-Non-Referral in promotion likelihood ($t=1.97, p=.06$) and termination likelihood ($t=-2.54, p=.02$). Black-Referral and Black-Non-Referral did not statistically differ from each other in promotion likelihood ($t=-0.58, p=0.57$) or termination likelihood ($t=-0.40, p=0.69$). We were somewhat surprised at the pro-black effect we uncovered suggesting a potential social desirability bias among the business school graduates we surveyed.

by the participant. As one participant in non-referral condition explained: “If he is performing in the 25%, I would want to see a lot of information or knew him personally (or through a trusted source recommendation) to bring him on.”

To assess this systematically, we had one author and two independent raters (one male, one female, both native English speakers with work experience, unaware of our hypotheses) evaluate the text responses¹⁵. From this, we first created an indicator variable that captured if the participant “mentioned the 25th percentile” in their explanation, which equaled “1” if two out of the three raters agreed on this, “0” otherwise (36% of the responses were coded as mentioning percentile ranking). We found that participants evaluating black employees were statistically more likely ($\chi^2(1) = 4.70, p=0.03$) to mention “percentile ranking” in their explanations ($M=0.48, SD=0.51$) than those evaluating white employees ($M=0.24, SD=0.43$). Further, participants assigned to the referral hiring method condition were statistically less likely ($\chi^2(1) = 4.01, p=0.05$) to mention “percentile ranking” in their explanations ($M=0.25, SD=0.44$) than those evaluating employees not hired with a referral ($M=0.46, SD=0.50$). Comparing those assigned to Black-Referral versus Black-Non-Referral further revealed that those assigned to Black-Non-Referral were statistically more likely to use “percentile ranking” in their explanations ($M=0.67, SD=0.48$ vs. Black-Referral: $M=0.26, SD=0.45, \chi^2(1) = 6.51, p=0.01$)¹⁶. Thus, even though the distribution of the recommendations to promote or terminate did not statistically differ from one

¹⁵ A kappa statistic showed “in substantial agreement” across the dimensions for all raters (mean across rating=0.72, $p<.001$), (Viera and Garrett 2005; see, Barbulescu and Bidwell, 2013 for similar approach). 81 text explanations were evaluated in all, as 8 participants did not provide a written explanation (BM-Referral $n=19$; BM-Non-Referral $n=21$; WM-Referral $n=21$; WM-Non-Referral $n=20$).

¹⁶ Running a logistic regression on the odds of using “percentile ranking” in the explanation revealed that participants were 2.9 times more likely to use this when evaluating black employee versus white employee; participants were 2.6 times more likely to use it when evaluating employees without a referral versus with a referral; and participants were 6.6 times more likely to use it when evaluating Black-Non-Referral versus a White employee which reduced to 1.1 times more likely when evaluating Black-Referral versus a White employee. Similar analyses were performed comparing on participant’s citing low GPA in explanation, showing marginally statistical differences between Black-Referral and Black-Non-Referral ($p=0.15$).

another, the reasons for making these recommendations did, with participants less apt to weight hard data such as “percentile rankings” when the black employee had a referral to vouch for their quality or ability.

While more robust analysis is needed to conclusively pinpoint the precise mechanism, the experiment was informative in showing different logics were used to justify mobility decisions on the first job move of identically qualified employees who varied only by race and hiring method. Specifically, we found participants more apt to use hard data to assess employee quality when evaluating black employees compared to white employees, but were less likely to do so for employees that were hired by a referral versus formal methods. This difference in the use of hard data further appeared between explanations of participants evaluating black employees with and without a referral. This is consistent with aforementioned explanations of signaling as a source of advantage referrals may provide where referrals may vouch for traditionally disadvantaged employee by minimizing attention to perceived lower quality (i.e., low percentile ranking), pushing them forward along the career path inside a firm. The fact that this emerged with minor manipulations is encouraging for continued research on the topic.

Concluding Remarks

This study is the first to our knowledge to investigate the effect of hiring method on upward mobility outcomes within organizations and how this differs across demographic groups. Results of a field study of a single organization over an 11-year period indicate that referral-based hiring positively affects upward mobility within organizations, but that these effects are limited to certain demographic groups. Specifically, we do not find evidence that there is a positive, main effect of referrals on upward mobility for all individuals. Rather, we find that for one demographic group – black employees – referrals lead to improved upward mobility

outcomes. Some exploratory evidence indicates this may stem from positive signaling that blacks receive when hired through referrals that may persist after they enter the firm.

Notably, we did not find the same referral effect for promotions for women. While this study cannot precisely determine the reason behind this observed non-effect, we did ascertain that women did not sustain disadvantages in all promotion pursuits, nor were there systematic difference in the referrals that women received compared to male employees, such as characteristics of the referrer. It could be that in the context we studied – a sales organization in a customer service role – women are not perceived as inconsistent or, less able compared to men. Certainly studies have shown professions and job functions to be gendered or, perceived as such (e.g., England 1992; Barnett Baron and Stuart 2000; Cohen and Huffman 2003; Barbulescu and Bidwell 2013). It may also be the case that the referral is more critical to occur for women once inside the firm compared to a pre-entry affiliation. Knowing that the source of blocked upward mobility differs for women (i.e., work commitment, leadership potential) compared to blacks (quality), it may be the case that for women, a pre-entry benefit of a referral is poorly timed and more relevant after the women enters the firm and reaches an age where work-life balance becomes salient. Thus, the advocate may be able to attest to the woman's commitment or leadership ability based on observed work in the firm at that time. In comparison, when faced with a constant bias of inferior quality, black employees may benefit much more from a pre-entry affiliation by signaling quality and ability from the start. Thus, the pre-entry timing of the affiliation through a referral may be more advantageous when the bias is constantly there (i.e., quality) rather than a bias that is triggered by an event (i.e., getting married or, having children). Regardless, this makes analyses of other contexts, affiliations, and the timing of such affiliations important for future research.

This study makes a number of contributions to research on inequality within organizations, labor markets, and networks as well as policies in reducing such inequality. Prior studies largely point to the inequality-inducing aspects of referral-based hiring within organizations (Korenman and Turner, 1996; Reskin, McBrier, and Kmec 1999; Fernandez and Fernandez-Mateo 2006; Rubineau and Fernandez 2013). Our study suggests refinements to this thesis, given the disproportionate effects referrals have on the outcomes of group members that might otherwise sustain disadvantages in upward mobility pursuits. More pointedly, while prior studies largely lead to the conclusion that referral-based hiring should be *reduced* to address inequality between groups, we find evidence counter to this claim especially when considering post-entry career outcomes for some demographic groups (c.f. Fernandez and Greenberg, 2013).

Our finding is also particularly important in light of the fact that careers are multifaceted. Primary attention to the influence of referrals on the initial, hiring stage misses its effects on upward mobility within organizations that affect the economic and social rewards that employees receive after entering the firm. Additionally, prior studies on upward mobility in organizations almost unilaterally view networks formed within organizations as primary social structures affecting upward mobility (Burt 2000; Brass et al. 2004). This study sheds light on the importance of networks that exist between individuals prior to entry, and adds insights into why such networks have persistent effects.

Finally, this study has implications for HR professionals and other practitioners. On the one hand, practitioners may be motivated to reduce network-based hiring due to the possibility it reduces the probability of members of certain demographic groups to be hired. On the other hand, this study suggests this policy of avoiding network-based hiring policies would have downsides, given the importance of networks for some groups post-entry. This may be especially

true in light of the fact naturally occurring relationships in the form of referrals may not be easily replicated through other means such as mentors (e.g. Kalev, Dobbin, and Kelly 2006; Sterling 2015).

In closing, it has long been stated that organizations play a fundamental role in generating inequality in industrialized countries (Baron 1984; Sørensen 2007; Stainback, Tomaskovic-Devey and Skaggs 2010). Here our findings are consistent with the idea that organizations may utilize leveling practices at the point-of-hire that have disproportionate effects on members of demographic groups. That is, it appears networks at entry “cast a long shadow” post-entry. Future research should continue to examine how networks at the point-of-hire generate or reduce inequality within organizations.

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Table 1. Descriptive Statistics

	Mean	Std Dev.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) No. of Promotions	0.84	1.25	1.000									
(2) No. of Outstanding Promotions	0.06	0.32	0.275 *	1.000								
(3) Employee Referral	0.35	0.48	-0.025 *	-0.014	1.000							
(4) Female	0.39	0.49	-0.038 *	0.006	-0.037 *	1.000						
(5) Black	0.18	0.39	-0.069 *	-0.034 *	0.036 *	0.058 *	1.000					
(6) Hispanic	0.16	0.37	0.009	0.016	0.007	-0.018 *	-0.208 *	1.000				
(7) Asian American	0.08	0.26	0.014	0.051 *	-0.050 *	0.009	-0.135 *	-0.126 *	1.000			
(8) Other Minority	0.02	0.16	-0.037 *	0.011	0.025 *	0.019 *	-0.075 *	-0.070 *	-0.045 *	1.000		
(9) Age	25.0	3.6	-0.063 *	-0.022 *	0.007	-0.131 *	0.104 *	0.048 *	-0.022 *	-0.002	1.000	
(10) Max Days Worked	2329.8	1147.9	0.265 *	0.041 *	-0.090 *	-0.005	-0.035 *	-0.005	0.059 *	-0.156 *	-0.034 *	1.000

N = 15,382

*p < 0.05

Table 2. Effect of Referrals on Number of Post-Entry Promotions

	(1)	(2)	(3)	(4)
Female	-0.101 ** (0.020)	-0.102 ** (0.019)	-0.102 ** (0.020)	-0.101 ** (0.024)
Black	-0.164 ** (0.018)	-0.163 ** (0.019)	-0.209 ** (0.033)	-0.163 ** (0.019)
Hispanic	0.037 (0.044)	0.037 (0.044)	0.038 (0.044)	0.037 (0.044)
Asian	-0.001 (0.035)	-0.002 (0.034)	-0.004 (0.034)	-0.002 (0.034)
Other Minority	-0.075 (0.099)	-0.075 (0.098)	-0.074 (0.098)	-0.074 (0.098)
Age	-0.020 ** (0.005)	-0.020 ** (0.005)	-0.0195 ** (0.005)	-0.020 ** (0.005)
Employee Referral		-0.015 (0.026)	-0.032 (0.026)	-0.014 (0.035)
Black x Referral			0.116 * (0.047)	
Female x Referral				-0.004 (0.033)
Constant	1.080 ** (0.211)	1.083 ** (0.216)	1.089 ** (0.217)	1.083 ** (0.218)
Log pseudolikelihood	-18310.4	-18310.1	-18308.3	-18310.1
N	15382	15382	15382	15382

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$; two-tailed tests.

Table 3. Effect of Referrals on Number of Outstanding Post-Entry Promotions

	(1)	(2)	(3)	(4)
Female	0.076 ** (0.027)	0.072 * (0.032)	0.066 * (0.032)	0.104 (0.062)
Black	-0.329 ** (0.032)	-0.323 ** (0.034)	-0.543 ** (0.057)	-0.320 ** (0.026)
Hispanic	0.277 (0.169)	0.273 (0.171)	0.270 (0.173)	0.275 (0.171)
Asian	0.573 ** (0.063)	0.567 ** (0.063)	0.563 ** (0.060)	0.566 ** (0.065)
Other Minority	0.525 ** (0.169)	0.518 ** (0.173)	0.512 ** (0.174)	0.523 ** (0.160)
Age	-0.026 (0.019)	-0.026 (0.019)	-0.026 (0.018)	-0.026 (0.019)
Employee Referral		-0.067 (0.046)	-0.141 (0.079)	-0.029 (0.086)
Black x Referral			0.504 ** (0.159)	
Female x Referral				-0.105 (0.227)
Constant	0.180 (0.429)	0.203 (0.442)	0.209 (0.441)	0.181 (0.442)
Log pseudolikelihood	-3372.4	-3372.0	-3369.8	-3371.9
N	15382	15382	15382	15382

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$; two-tailed tests.

Table 4. Robustness Checks on the Effect of Referrals

	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Number of Promotions</i>			<i>Number of Outstanding Promotions</i>		
Female	-0.087 ** (0.024)	-0.087 ** (0.026)	-0.105 ** (0.025)	0.111 * (0.055)	0.111 (0.079)	0.115 (0.080)
Black	-0.206 ** (0.034)	-0.206 ** (0.046)	-0.218 ** (0.045)	-0.555 ** (0.027)	-0.555 ** (0.149)	-0.521 ** (0.143)
Hispanic	0.047 (0.047)	0.047 † (0.028)	0.033 (0.028)	0.344 * (0.149)	0.344 ** (0.112)	0.332 ** (0.121)
Asian	-0.001 (0.035)	-0.001 (0.036)	-0.0350 (0.036)	0.562 ** (0.065)	0.562 ** (0.120)	0.572 ** (0.111)
Other Minority	-0.080 (0.087)	-0.080 (0.081)	0.061 (0.079)	0.511 ** (0.118)	0.511 ** (0.182)	0.510 ** (0.158)
Age	-0.017 ** (0.005)	-0.017 ** (0.003)	-0.019 ** (0.003)	-0.018 (0.017)	-0.018 (0.012)	-0.025 * (0.011)
Employee Referral	-0.026 (0.034)	-0.026 (0.028)	-0.037 (0.027)	-0.051 (0.102)	-0.051 (0.115)	-0.121 (0.111)
Black x Referral	0.109 * (0.043)	0.109 † (0.061)	0.118 * (0.060)	0.563 ** (0.115)	0.563 * (0.227)	0.516 * (0.224)
Female x Referral	-0.022 (0.040)	-0.022 (0.044)	0.015 (0.043)	-0.171 (0.201)	-0.171 (0.142)	-0.131 (0.135)
Constant	1.091 ** (0.319)	1.091 ** (0.104)	-1.278 ** (0.151)	-0.562 (0.792)	-0.562 (0.434)	-1.321 ** (0.413)
Mean Rating	Yes	Yes	No	Yes	Yes	No
Educational Level	Yes	Yes	No	Yes	Yes	No
Cohort Year Intervals	No	No	Yes	No	No	Yes
Clustering	Region	Office	Office	Region	Office	Office
N	13381	13381	15382	13381	13381	15382
Log pseudolikelihood	-17266.7	-17266.7	-17930.1	-3205.1	-3205.1	-3342.9

Standard errors in parentheses,

**p< 0.01; * p<0.05; † p<0.10; two-tailed tests.

Figure 1a. Distribution of Participant Recommendation to Promote or Terminate Employee by Condition Assignment

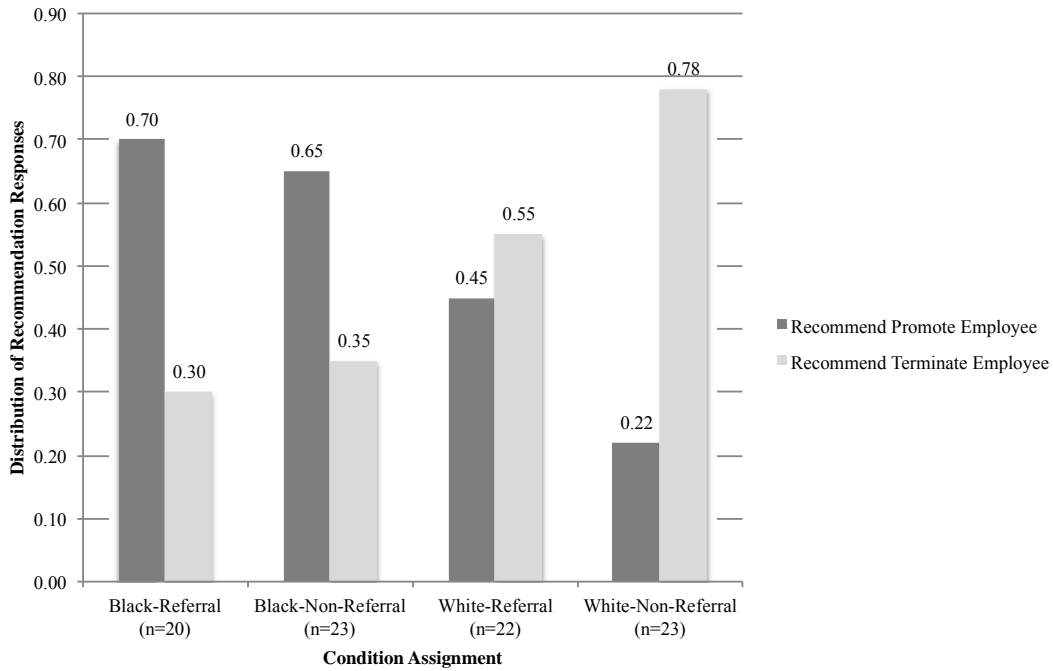


Figure 1b. Mean Participant Rating (+/- SD) of Likelihood to Terminate Employee (1 = 'not at all likely' to 5 = 'highly likely') by Condition Assignment

