

## **Cracking the Glass Cages? Restructuring and Ascriptive Inequality at Work**

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UNDER REVIEW.

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COMMENTS ARE WELCOME.

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### **ABSTRACT**

Sociologists and feminist scholars have long realized that organizational structures affect ascriptive disadvantage, but stratification research has mostly focused on personnel policies. In this study I show that the organization of work itself, in particular the structure of jobs, can sustain or erode gender and racial disadvantage. Segregated jobs act like “glass cages” that institutionalize ascriptive bias and exclusion. They exacerbate women’s and minorities’ devaluation and limit their access to strategic ties and visible tasks. I argue that re-organizing work toward weaker job boundaries can reduce this disadvantage by increasing workers’ exposure to people and jobs across the organization. Proponents of bureaucratic formalization argue, in contrast, that gender and racial biases are enduring and that relaxing formal rules governing job descriptions and assignments will increase bias in personnel decisions and deepen disadvantage. The re-organization of work over the last two decades provides a test case. Using unique data on the life histories of more than 800 organizations between 1980 and 2002, I examine whether alleviating job segregation leads to better career outcomes for women and minorities. I find that when employers adopt programs that increase cross-functional collaboration – self-directed teams and cross training – the proportion of white women and black women and men among managers increases. Teams and training programs that do not transcend job boundaries, such as problem-solving teams and job training, do not lead to such increases. The implications of these unintended consequences of organizational restructuring for social theory and practice are discussed.

## INTRODUCTION

Despite their significant progress in the labor market, women and minorities continue to be segregated into marginalized and undervalued positions. Early stratification research viewed status attainment as a function of individual characteristics (Blau and Duncan 1967; Featherman and Hauser 1978). The notion that organizational structures also shape disadvantage emerged in the late 1970's in feminist research on gendered organizations and in sociologists' efforts to bring the organization back in to stratification research (Acker 1990; Baron 1984; Baron and Bielby 1980; Ferguson 1984; Kanter 1977). Researchers have looked at how personnel practices channel women and minorities into less desirable jobs (Baron, Mittman and Newman 1991; Reskin and McBrier 2000; Tomaskovic-Devey and Skaggs 1999). But little attention has been paid to the effect that the segregated organization of work has on ascriptive inequality (Kanter 1977; Baron and Bielby 1984; Smith-Doerr 2004). As a result, the structural turn in social stratification research remains incomplete, leaving the segregated of jobs outside researchers' purview. In this study I show that the organization of work can operate to either sustain or erode gender and racial disadvantage.

The division of labor in modern organizations runs along gender and racial lines, with women and minorities typically concentrated in dead end, low level, undervalued jobs. Job segregation obscures the interdependence between tasks and so marginalizes the contributions of workers in lower-level jobs (Ely and Padavic 2007). Research has shown that women's and minorities' segregation at work limits their ability to build strategic social networks and to become visible to managers and others and exacerbates negative stereotypes devaluing their capabilities (Acker 1990; Bell and Nkomo 2001; Blair-Loy 2001; Burt 1998; Kanter 1977; McGuire 2000; Reskin 1993). Segregated jobs thus act as "glass cages" that institutionalize and

reinforce ascription, exclusion and devaluation. Work structures that relax rigid job boundaries can disrupt these processes. Higher levels of integration and collaboration between jobs from different levels and statuses can erode the exclusion and stereotypes that feed off of segregation. This proposition is motivated by an array of social science literatures that link the amelioration of segregated job structures with lower levels of gender and racial disadvantage: sociologists of organizations and stratification (Baron and Bielby 1980; Kanter 1977; Mueller 2001; Reskin 2003); social networks researchers (Ibarra 1992; McGuire 2000); social psychologists (Allport 1954; Dovidio, Gaertner and Kawakami 2003; Kramer 1991; Pettigrew 2006; Ridgeway and Smith-Lovin 1999); management researchers ((Bacharach, Bamberger and Vashdi 2005; Brickson 2000; Chatman et al. 1998) and feminist and post-colonial organizational scholars (Acker 2006; Ely and Padavic 2007; Ferguson 1984; Nkomo 1992).

In contrast, some researchers argue that the marginalization of women and minorities will not be affected by structural changes at work. Stereotypes are enduring (Ollilainen and Rothschild 2001; Planskey Videla 2006; Ridgeway 1997), social exclusion persists regardless of women's and minorities' positions (McGuire 2002), and relaxing rules governing job descriptions and assignments allows gender and racial bias to creep in to personnel decisions (Bielby 2000; Reskin 2000).

The growing popularity of cross-functional work programs – such as self-directed work teams and cross training – provides a unique test case. These programs increase the collaboration and contact between workers and jobs from different levels and departments. Evidence from case studies show that although cross-functional work structures are not free of biases, they provide new opportunities for women and minorities to expand their networks and knowledge of the organization, demonstrate their capabilities, be less demeaned and resist devaluation (Daday and

Burris 2002; Kvande and Rasmussen 1994; Ollilainen and Rothschild 2001; Smith-Doerr 2004; Smith 1996). While all workers can benefit from opportunities like this, they mark a larger break from the typical experiences of women and minorities. Restructuring work in this way can thus have the unintended effect of reducing gender and racial stratification at the workplace. This paper examines if this is indeed the case.

Teams and training programs are more than a passing fad. By 2002, between 40% and 80% of medium and large American work establishments had adopted either, self-directed work teams, problem-solving teams, cross-job training or job training programs (Appelbaum, Bailey and Berg 2000; Black, Lynch and Krivelyova 2004; Kalleberg 2006; Osterman 2000). Using unique data on the life histories of more than 800 organizations between 1980 and 2002, I analyze changes in managerial composition following the introduction of two key aspects of what is often called the “high performance” organization of work: teamwork and skill upgrade programs. Within each of these categories, I examine two types of programs (see Figure 1). One type has the potential to relax narrow job boundaries. These are cross-functional work teams and cross training, both of which increase the exposure of non-managerial workers from different levels to other workers, managers and jobs across the organization. The second type includes two programs that do not undermine job boundaries. Problem-solving teams are usually composed of workers who are already regarded as experts in their job. Job training programs, which were historically promoted as a way to facilitate women’s and minorities’ movement into management, typically train workers in new skills for their own job or the next job up the ladder. As such, neither of these programs increases collaboration between more and less valued jobs and workers.

If the share of white women, black women and black men among managers increases only after the adoption of the two programs that transcend job boundaries – work teams and cross training this will buttress our theoretical understanding of organizational work structures as mechanisms of ascriptive stratification, a largely unexplored area in stratification and organization research. A changing division of labor does not necessarily change stereotypical gender and racial definition of jobs<sup>1</sup> (Ollilainen and Rothschild 2001; Planskey Videla 2006), but providing opportunities for greater collaboration across workers and jobs could reduce the devaluation of some jobs and their incumbents.

### **‘GLASS CAGES’ AND THE RE-ORGANIZATION OF WORK**

The term, ‘glass cages,’ refers to jobs that institutionalize informal barriers for advancement. Several lines of research have shown that segregated job structures – with women and minorities overrepresented in the least valued and least powerful jobs – perpetuate gender and racial disadvantage by reinforcing stereotypes and by limiting opportunities to counter them. These literatures point to two complementary mechanisms whereby cross-functional work programs could reduce disadvantage: 1) lower status workers could gain more visibility with higher status workers through these programs; and 2) stereotypes are less salient in more equalized, collaborative work environments. Building on these literatures I ask whether the adoption of cross-functional work programs leads to a higher representation of women and minorities in management.

In the discussion that follows, I review research that links the amelioration of segregated job structures with lower levels of gender and racial disadvantage and present a dissenting view

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<sup>1</sup> I thank an anonymous reviewer for this point.

that emphasizes the importance of formalized work structures. I then discuss case studies about the work practices at the focus of my study and propose specific hypotheses.

### **Job Segregation as Scaffold of Ascriptive Disadvantage**

Sociologists have pointed to segregation's deleterious effects on women's and minorities' social networks and visibility. Gaining visibility and networking with high status workers can increase women's and minorities' access to career opportunities, increase managers information about women's and minorities' potential and reduce the perception of risk associated with promoting workers from different demographic groups (Bell and Nkomo 2001; Kanter 1977; Thomas and Gabbaro 1999). For the women interviewed by Bell and Nkomo (2001), the opportunity to prove themselves in a prestigious task and build credibility was a key career resource (see also Wellington, Knopf and Gerkovich 2003). "They were surprised that I was smart, competent and capable because they didn't expect that," recalled one black female manager (2001: 145). But due to their low-level positions, women and minorities are less likely to get such a break. Their jobs usually do not involve high profile assignments and their networks are composed of similarly situated workers and so provide limited exposure and less strategic social ties (Burt 1998; Ibarra 1992; Kanter 1977; McGuire 2000; Miller 1986).

Research on intergroup relations illuminates a complementary mechanism of disadvantage perpetuated by job segregation, namely that structural status differentials reinforce stereotypes and biases. According to expectation states theory, women's (and minorities') lower level positions at work perpetuate the stereotype that they are less competent (Ridgeway 1997). When men and women interact within a structurally unequal context, status beliefs are perpetuated, leading them to recreate the gender system in everyday interaction (Ridgeway and Smith-Lovin 1999, p. 191). When structural inequality is less pronounced, interactions among

men and women are less likely to evoke stereotypes (Ridgeway and Smith-Lovin 1999, p. 191). Similarly, research on the “contact hypothesis” (Allport 1954) shows that contact between racial groups is more likely to reduce prejudice when participants have more equal status (Pettigrew and Tropp 2006). Social identity theory (Tajfel and Turner 1979) and small groups research (Sherif 1961) show that demographic group boundaries are less salient when cooperative interdependence fosters a common identity (Gaertner 2000; Gaertner et al. 1990; Kramer 1991; see also Reskin 2000, p. 324). Based on these insights from social psychologists, organizational scholars have found that when organizations emphasize collaboration and common goals rather than individualism and distinctiveness, demographic differences become less salient (Chatman et al. 1998) and supportive intergroup relations develop (Bacharach, Bamberger and Vashdi 2005). Furthermore, because of gender and racial segregation at work, cross-functional integration (rather than collaboration within existing functional divisions) is central for eroding gender and racial boundaries (Brickson 2000; Kanter 1985)<sup>2</sup>. This is likely to result in better career outcomes for women and minorities. To date we have little evidence of the tangible benefits of organizational structures on diversity.

Taken together, sociological, social psychological, and organizational research suggests that organizational structures that create new opportunities for peer-like collaboration between workers from more and less valued jobs can increase visibility and reduce negative stereotypes of women and minorities. Each of these processes could subsequently lead to a greater share of women and minorities in leadership positions. This proposition echoes feminist and postcolonial critiques of organizations, which view the bureaucratic division of labor as reproducing white

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<sup>2</sup> Brickson (2000) criticizes both the contact hypothesis and social identity theory for sharing the same concern with minimizing gender and racial categories. Instead, Brickson promotes an identity orientation theory whereby a relational identity can be promoted in organizations through cross-functional integration and cooperation. Relational identity activates positive cognitive, affect and behavioral responses to diversity (see a summary in Brickson 2000, p. 87).

masculinity (Acker 1990; Britton 2000; Ferguson 1984; Frenkel and Shenhav 2006; Kanter 1977; Nkomo 1992) and emphasizes collaboration and common goals rather than individualism as a means for increasing equity at the workplace (Ely and Meyerson 2000; Ely and Padavic 2007).

A contradicting view heralds the impersonality of bureaucratic rules and employment relations as an effective means for reducing nepotism and ascriptive allocation of resources (Bielby 2000; Reskin 2000; Weber 1968). The guiding assumption here is that formalization curbs the effects of managers' implicit biases and unconscious stereotypes in decision-making processes. Researchers find ascriptive inequality to be lower in formalized contexts (Elvira and Zatzick 2002; Reskin and McBrier 2000) and higher in workplaces where social relations and collegiality are emphasized (Baron et al. 2007; Cook 1998; McIlwee and Robinson 1992). Others argue that gender and racial biases are persistent (Ridgeway 1997) and operate in transformed workplaces as well (Ollilainen and Rothschild 2001), and that women's and minorities' exclusion from networks occurs regardless of their position (McGuire 2002). According to this view, blurring job boundaries and increasing job integration will, at best, have no effect on gender and racial disadvantage, and at worst, deepen it, as the deterioration of formal rules governing jobs and assignments unleashes bias and discrimination.

### **Changes at Work**

The diffusion of self-directed work teams and cross training – two programs that relax rigid job boundaries and increase integration and collaboration between jobs and workers – provides a unique opportunity for examining these conflicting propositions about the relationship between the structure of work and ascriptive disadvantage. The ideas of teams and job enrichment have been around at least since the 1930s in the form of Alton Mayo's Human

Relations theory and, later, Douglas McGregor's Humanistic Management. The contemporary surge of these programs is usually associated with technological changes and accelerating international competition in the early 1980s. Inspired by Japanese and Western European experiences, managers and scholars viewed moving away from the Fordist model of production toward team structures and skill development programs as an effective way to improve quality and competitiveness (Appelbaum and Berg 2001; Piore and Sabel 1984). Research on these transformations has mostly focused on their implications for labor control and firm performance (Barker 1993; Handel and Levine 2004; Osterman 2000; Piore and Sabel 1984). Only a few researchers have looked at the implications of these structures of work for gender and racial inequality (Daday and Burris 2002; Kvande and Rasmussen 1994; Ollilainen and Rothschild 2001; Smith-Doerr 2004; Smith 1996). But given that these programs modify the segregated structure of jobs, and given the documented role of segregation in perpetuating stratification at work and of cross functional collaboration in reducing disadvantage, it is likely that such restructuring will have unintended consequences on women's and minorities' positions. I now turn to discussing these programs in more detail.

### **Team Based Organization of Work**

Few dispute the popularity of team-based work structures in American workplaces. Figure 2 shows the proportion of workplaces with self-directed work teams or problem-solving teams from 1980 to 2002, based on data from a 2002 retrospective survey of a random sample of 810 medium and large establishments. The percents are calculated based on the number of surveyed establishments that existed in each year. The observed trends represent older and more stable work establishments (that survived at least until 2002), but similar figures are found in other national surveys as well (Kalleberg 2006; Kelly and Dobbin 1997; Lawler, Mohrman and

Ledford 1992; Osterman 2000). Self-directed work teams were adopted by about 7 percent of the organizations that existed in the early 1980s, compared to roughly 35 percent of the organizations existing in 2002. In the median organization, 75 percent of core-job workers participated in such teams in 2002 (core-job is defined as the largest job category in the establishment). Problem-solving teams, a more modest transformation of work structures, were adopted by about 11 percent of existing workplaces in the early 1980s compared to 60 percent in 2002, with a median of 50 percent of core-job workers participating.

Self-directed work teams.-- Self-directed work teams are considered the most far-reaching effort to transform the organization of work (Appelbaum and Berg 2001; Cappelli et al. 1997; Osterman 2000). These teams typically bring together workers from different jobs, which hold frequent meetings, assume joint responsibilities on work tasks, share knowledge and participate in decision making. For example, in a high-tech company, engineers, technicians and administrative assistants are members of self-directed work teams. They meet a few times a week in groups to design and create new technologies (Daday and Burris 2002, p.12). In a bank, team members are jointly responsible for phone service and technical tasks (Ollilainen and Rothschild 2001, p.153), and workers in a paper mill plan key activities and tasks collectively, assign and rotate jobs amongst themselves and assume greater responsibility for production, quality and safety (Vallas 2003b, p.230).

Some work teams might do little more than impose production quotas on workers, with no real changes in the work routine (Smith 1997; Taplin 1995). Yet, to the extent that they are more than a sweat method, qualitative researchers point to several ways in which self-directed work teams can enhance women's and minorities' career opportunities: they enable workers to perform tasks beyond their traditional job boundaries and demonstrate hitherto unobserved

capabilities (Berg, Frost and Preuss 2001; Smith-Doerr 2004; Smith 1996); to be treated with more respect by their co-workers (Daday and Burris 2002; Kvande and Rasmussen 1994; Smith-Doerr 2004); and to resist subordination (Ollilainen and Rothschild 2001; Planskey Videla 2006). Below I detail some of this evidence.

Analyzing data on more than two thousands life scientists, Smith-Doerr (2004) finds that women are significantly more likely to be in supervisory positions when they work in bio-tech firms that are organized around project-based teams, compared to hierarchical organizations. The female scientists Smith-Doerr interviewed attributed this difference to the flexibility to collaborate with more people in a peer-like setting and to the higher visibility of their skill and contributions in a team environment. In another context, a similar account was given by a human resources manager at a large auto-manufacturing firm:

I started as a security guard and climbed my way up to being a secretary, and then to a higher secretary, and in the last three years I am in this position in HR, EEO representative, and an administrator of salaried personnel. It wasn't easy... I had to work hard to prove my talent. To make people see my talent. Because my job did not provide such opportunities, joining work teams was the best way for me to do that.... In general, I think that it is a good opportunity to interact with people, and with people in management and to show that you can do things.<sup>3</sup>

The visibility granted by the teaming structure is an important career resource that is very often lacking in segregated jobs.

It would be naïve to assume that gender and racial biases stop at the team's doorstep. Researchers find that men and whites in teams continue to erect boundaries that exclude women and minorities (Daday and Burris 2002; Ollilainen and Rothschild 2001; Sturm 2001; Vallas

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<sup>3</sup> Communication with the author. June 15<sup>th</sup>, 2001.

2003b, p.235). But because job boundaries and status differences are more lax, stereotypes are less likely to be reinforced by the team context (Pettigrew 2006; Ridgeway and Smith-Lovin 1999). Researchers find that status differences are less pronounced when work is structured in cross-functional teams (Smith-Doerr 2004; Kvande and Rasmussen 1994). Studying a high tech company for example, Daday and Burriss (2002) argue that the teaming environment mitigates the exempt/non-exempt divide (which for the most part is also a gender and racial divide). As one of their interviewees, an administrative assistant, attests, “non-exempt can now feel like they are not demeaned; they are treated as an equal part of the team” (Daday and Burriss 2002, p. 17).

The adoption of self-directed work teams also provides new avenues for women and minorities to act against stereotypes and resist exclusion. First, simply by demonstrating their capabilities as previous examples have shown. And second, by using the organizational rhetoric of “the team” to claim their rights. For example, Ollilainen and Rothschild (2001, p.154) report that while men continued to treat the women in their team as secretaries, these women resisted their degradation, and their concerns continued to be openly discussed. Their grievances would have had no legitimacy absent the team context. In another example, Planskey-Videla (2006, p.108) shows how women used the autonomy of self-directed work teams to further their interests (such as favoring mothers in permissions for time off) despite the gender subordination that characterized their teams.

These new opportunities presented by the team structure to network, to become visible in stereotype-negating contexts, to be treated with respect, and to fight devaluation, can translate into better career opportunities for women and minorities (Ollilainen and Rothschild 2001, p.161; Smith 1996 p.178; Smith-Doerr 2004), which could lead to higher shares of women and minorities among managers.

Problem-solving teams.-- An earlier team structure is best known as quality circles, or off-line expert teams, which originated in the 'quality movement' of the early 1980s. These teams are less inclusive. They tend to include experts, who are mostly white and male, who come together to address problems of quality, efficiency or safety (Batt 2004, p. 188; Cappelli et al. 1997, p. 90-92; Smith 1997; Vallas 2003b, p.232). Unlike self-directed work teams, then, problem solving teams have less potential to increase the exposure of women and minorities to new people and work tasks and hence to counteract the negative effects of segregation. And so, if counteracting segregation is the mechanism at work here, we are not likely to observe an increase in managerial diversity following their adoption.

### **Cross-Training and Job Training Programs**

Developing workers' skill is another commonly cited aspect of the re-organization of work (Cappelli et al. 1997, p. 102; Osterman 2000; Piore and Sabel 1984). More and more employers are supplementing pre-labor market education by offering workers cross training and regular job training programs (Appelbaum and Berg 2001; Lynch and Black 1998; Osterman 1994; U.S. Department of Labor 1992). As Figure 3 shows cross training was offered by about 45 percent of the existing workplaces in 1980, and this grew to almost 80 percent in 2002<sup>4</sup>. The figures for job training programs are 35 and 67 percents respectively (see also Kalleberg 2006; Osterman 2000).

Before I discuss these two types of training, it is imperative to clarify that by analyzing the effect of training, I do not examine individual skill level. My research question is whether organizational changes, in the form of the adoption of cross training or job training programs, have been effective in bringing more women and blacks into management in the last twenty

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<sup>4</sup> Figure 3 is based on the same data and generated in the same way as Figure 2.

years. Unlike the case for cross-training, increasing women's and minorities' representation in management was one of the initial goals of job training programs.

Cross training.— Cross training involves multi-skilling programs that provide workers with training and experience in different jobs. The content of these programs varies widely; while some studies report on cross training programs that enrich workers' skills and increase their motivation and job satisfaction (Adler 1992; Campion, Cheraskin and Stevens 1994; Ollilainen and Rothschild 2001), others describe them as “job intensification” methods (Smith 1997, p.322), where workers are pressured to perform more de-skilled work at a higher pace (Handel and Levine 2004, p. 6; Taplin 1995).

Similarly to self-directed work teams, cross training programs can undermine the negative implications of job segregation on women's and minorities' careers. First, through rotating across jobs, women and minorities gain access to new experiences and skills, and get to demonstrate their capabilities and “management potential.” Second, the presence of cross training programs can provide a justification for women and minorities to reach out beyond their typical job boundaries and broaden their skills, ties and experience. Both these processes are exemplified in Ollilainen's and Rothschild's (2001) observations of a cross training program in a bank. Even though the program was compromised by men's refusal to learn women's phone service jobs, women were encouraged -- and took the opportunity -- to gain new skills and learn how to perform multiple functions (p. 155). As a result, the authors conclude, this “could provide a new organizational justification and an opportunity for lower-status women workers to outlearn, and perhaps even move into some of the higher-status tasks formerly reserved for men” (Ollilainen's and Rothschild, p.161. See Vallas 2003b, p. 235, for a similar scenario on a production line). Even Taplin's (1995, p. 35) gloomy description of job rotation in a textile mill

as a ‘sweat method’ suggests that supervisors came to better appreciate the abilities of their low-skill workers after they observed their performance across jobs. If cross training increases the visibility and opportunities of women and minorities, who are usually limited to lower level and under-valued positions, the introduction of these programs may improve their access to managerial jobs.

Job training.-- Job training provides workers with skills required for performing their job or the next job up the ladder. To the extent that, due to pre-labor market processes, women and minorities have lower skill levels than white men, receiving job training from their employer can help them obtain better jobs with better career prospects. Such logic stood behind some of the early adoptions of these programs. Affirmative action regulations, as established in Executive Orders 10925 and 11246, encourage employers to take active steps to promote the ‘full realization of equal opportunity’ of historically disadvantaged groups (Johnson 1965). The adoption of skill training programs has been perceived as an effective means for generating pools of women and minority employees qualified for management jobs (Glass Ceiling Commission 1995, p.47; Holzer and Neumark 1998; Stephanopoulos and Edley Jr. 1995). In 1974, for example, Kaiser Aluminum signed a contract with U.S. Steelworkers to provide new training programs, which would open skilled craft jobs to blacks. These programs became famous when, in 1979, the Supreme Court supported Kaiser in a reverse discrimination suit (Kaiser Aluminum and U.S. Steelworkers v. Brian Weber 443 US 193, 1979), upholding quotas for blacks in recruitment to these training programs.

If job training programs are indeed to fulfill the goal of creating pools of women and minorities eligible for promotion, we could expect the diversity of management rungs to increase after employers adopt such programs.

However, the spread of employer-provided job training has not been motivated solely by the desire to improve women's and minorities' labor market outcomes. During the 1980s and 1990s, facing intensified international competition, employers increased their provision of skill training as means for improving quality and productivity (U.S. Department of Labor 1992; Lynch and Black 1998). Studies indicate that employers view training more as an investment in human capital than as means for equalizing opportunities: employers tend to provide job training to workers they perceive as most likely to return the investment, the more educated workers and those they expect to have continued employment and high productivity. These preferences result in statistical discrimination against women and minorities (Hight 1998; Knoke and Ishio 1998; Lynch and Black 1998). Not surprisingly then, despite its potential to iron out pre-labor market disadvantages, research has shown that employer-provided formal job training exacerbates workplace inequality rather than reducing it (Appelbaum and Berg 2001; Baron and Newman 1990). Accordingly, I do not expect the adoption of job training programs to bring more women and blacks into management.

### **Summary and Hypotheses**

I examine changes in the share of women and minorities in management following the adoption of two types of workplace changes: team work and skill-upgrading programs. Within each type I compare two programs, one that is directed at restructuring the segregated structure of work (self-directed work teams and cross training) and one that does not do so (problem-solving teams and formal job training) (see Figure 1). Building on insights from social science research on job segregation and ascriptive disadvantage and evidence from case studies, I expect those programs that have the potential to undermine the negative effects of job segregation on women and minorities to be followed by a subsequent increase in managerial diversity. To the

extent that whites' and men's higher share of management jobs is a result of sex- or race-based privilege, programs that reduce ascriptive disadvantage may also reduce the advantage of white men (Reskin and McBrier 2000, p. 210). My first hypothesis is thus:

Hypothesis 1: Of the four team and training programs examined here only the adoption of programs that alter job segregation - self-directed work teams and cross training - will be associated with subsequent increases in the proportion of white women, black women and black men among managers and declines in the proportions of white men among managers.

The hypothesized positive effect of self-directed work teams and cross training on managerial diversity may not be equal for women and minorities due to the differences between mechanisms shaping gender and racial inequality at work. First, white women are, on average, more educated than blacks and better positioned in organizations (Altonji and Blank 1999, pp. 3151-3155; Bell and Nkomo 1994), and consequently may be more likely to make use of their new career resources and acquire management positions. Second, research shows that racial diversity, more so than gender diversity, can have a negative impact on team processes, such as communication and integration (Baugh and Graen 1997; Townsend and Scott 2001; Vallas 2003a; Williams and O'Reilly 1998, p. 115). These differences lead me to hypothesize that team-based work and cross training are less likely to erode racial boundaries than gender boundaries at work. I thus expect the following:

Hypothesis 1a: The adoption of programs that alter job segregation - self-directed work teams and cross training - will be associated with greater subsequent increases in the proportion of white women among managers than in the proportion of black women and black men among managers.

## **ALTERNATIVE SOURCES OF VARIATION IN MANAGERIAL DIVERSITY**

Some organizational changes that often accompany the adoption of teams and training programs may also explain the gender and racial composition of management. In order to avoid misinterpretation of my results, I include in the analysis measures of those changes. I also include measures of other organizational factors related to management composition, including organizations' structure, labor pools and legal and economic environments. Note that because I use a fixed effects analysis, factors that do not vary with time, such as industry or geographical location, cannot be included in the models, but the variation stemming from them is implicitly accounted for. Before I turn to discussing the modeling strategy, below I detail briefly the motivation for including each of the additional measures in my analysis.

### **Complementary Organizational Changes**

Management training program.-- Firms that adopt autonomous work teams may establish leadership training programs, with the idea of increasing workers' efficacy in these teams (Appelbaum and Berg 2001, p.104). The adoption of these programs can provide women and minorities a formal path and credentials for entering the managerial pipeline, and so their introduction should increase management diversity.

Peer evaluations.-- Peer evaluations, where workers are evaluated by their co-workers, are common among firms with team structures. Researchers have found gender and racial bias in managers' performance evaluations (Elvira and Town 2001; Greenhaus, Parasuraman and Wormley 1990; Williams and O'Reilly 1998). Peer evaluations rely on a broader set of views that may be less biased (Smith-Doerr 2004) and consequently may improve the promotion chances for women and minorities.

Work and family accommodations.-- Employers that adopt 'high performance' programs are also more likely to adopt work/family practices (Berg, Kalleberg and Appelbaum 2003; Osterman 1995). Because the "ideal worker" is expected to be available for work around the clock and because women still bear primary care giving responsibilities, women are expected to benefit disproportionately from employers' work family support (Williams 2000).

Employment reduction.— Downsizing of the establishment's workforce is likely to accompany changes in the organization of work (Black, Lynch and Krivelyova 2004; Osterman 2000) and may affect workforce composition. Studies of downsizing, though not focusing on managerial jobs, suggest that blacks are more likely to be displaced than whites (Elvira and Zatzick 2002; Fairlie and Kletzer 1998), while women seem to be less or equally likely as men to be displaced (Farber 1997). Hence, downsizing may reduce the share of blacks in management.

Availability of managerial jobs.— Growth in managerial ranks has been shown to increase diversity (Blum, Fields and Goodman 1994). Konrad and Linnehan (1995) and Leonard (1990, p. 52) find that managerial growth positively affected white women more than African-Americans. Osterman (2000) finds that establishments with 'high performance work organization' have smaller managerial ranks. In these establishments it may be more difficult to hire managers from disadvantaged groups without hurting opportunities for white men (Baron, Mittman and Newman 1991).

External hiring.— It is plausible that employers that undergo re-organization may increase their external hiring of managers, in a search for managers who fit better with the new organization of work. Increased external hiring may affect managerial diversity, though it is difficult a-priori to ascertain in what direction (the analysis also includes measures of the demographic composition of the external labor pools; see discussion below).

## **Organizational Structures**

Personnel policies.—The presence of formal personnel systems has played prominently in research on organizational stratification. These policies are expected to limit managerial discretion and thereby curtail discrimination (Reskin 2000). Using data from the National Organization Survey, Reskin and McBrier (2000) find that formalization of personnel decisions is associated with a lower share of white men in management. Others contend that formalization exacerbates inequality by creating separate career trajectories for different groups (Baldi and McBrier 1997; Baron and Bielby 1985). Still others studies find that while formalization is not associated with higher demographic diversity, ‘identity conscious’ programs, namely affirmative action and diversity policies, are (Edelman and Petterson 1999; French 2001; Holzer and Neumark 1998; Kalev, Dobbin and Kelly 2006; Konrad and Linnehan 1995). I thus include in the analysis measures for formalization and ‘identity conscious’, affirmative action and diversity, programs, expecting both types of programs to have a positive effect on managerial diversity.

Unionization.— To the extent that union contracts institutionalize seniority-based rules, they tend to favor white, and male, employees (Baron, Mittman and Newman 1991; Blau and Beller 1992; Milkman 1985. But see Leonard 1985). Yet, unions vary in composition and agendas. For example some unions have promoted work-family programs, which may enhance women’s careers (Kelly 2003; Osterman 1995). Their expected effect can go either way.

Change in organizational size.—Organizational growth may be an indication of success, rendering managerial jobs more desirable, and more likely to go to white men than to women and minorities (Reskin and Roos 1990). Research evidence is mixed (Baron, Mittman and Newman 1991; Bielby and Baron 1986; Reskin 1993) and so I do not specify the direction of the expected effect.

## **Workforce Demography**

Diversity of top management ranks.-- Managerial composition is said to be self-reproducing due to homosocial reproduction (Elliott and Smith 2004; Kanter 1977), social closure (Tomaskovic-Devey 1993) and social networks (Burt 1998; Reskin and McBrier 2000). Ely (1995) finds that sex roles are less stereotypical in firms with more women in senior management. Cohen and her colleagues (Cohen, Broschak and Haveman 1998) find that women are more likely to be promoted when some (but not most) of the positions above the focal job were filled by women. Elliott and Smith (2004) find that when they have the opportunity to do so, women and minorities attain power through homosocial reproduction. I thus expect the gender and racial composition of top management to be positively associated with the overall composition of managerial rungs.

Demographic composition of the internal and external labor pools.— Employers that operate in diverse internal and external labor markets have a more diverse pool of managerial candidates to draw from (Cohen, Broschak and Haveman 1998; Reskin and Roos 1990; Shenhav and Habersfeld 1992) and may also face pressures to adopt norms of inclusiveness (Blum, Fields and Goodman 1994, p. 245). Finally, because women and minorities are more likely to supervise workers from the same demographic group (Smith 2002, p. 522), the composition of the non-managerial jobs in the establishment may affect managerial composition.

## **Organizational Environment**

Legal environment.-- Title VII of the Civil Rights Act of 1964 outlawed discrimination based on sex and race, and in 1965, Executive Order 11246 mandated covered employers to take “affirmative action” to end discrimination in employment. Research has established that employers who are more aware of the requirements of anti-discrimination regulations and those

that experience Title VII litigation or affirmative action compliance reviews are more likely to see increases in managerial diversity (Kalev and Dobbin 2006; Leonard 1989; Leonard 1990; Skaggs 2008).

Unemployment .— High unemployment rates are expected to disadvantage women and minorities in the labor queue to managerial jobs (Reskin and Roos 1990). I thus expect lower managerial diversity when unemployment is high.

Industry size.—Growing industries may provide more opportunities for women and minorities but they also indicate increased market success, which renders managerial jobs more attractive and more likely to go to white men (Reskin and Roos 1990). Because I already include measures of growth in the proportion of each group in the industry labor force (see ‘diversity of labor pools’ above), I expect growth in industry employment to be associated with increased presence of white men in management.

## **DATA AND METHODS**

I analyze unique longitudinal data on 810 establishments’ annual workforce composition and employment practices, using fixed-effects models, to estimate changes in the proportion of managers who are white men, white women, black women, and black men following the adoption of teams and training programs between 1980 and 2002.

### **Data**

The dataset employed for this study was assembled from two main sources: establishments’ annual workforce composition reports from 1980 to 2002 and an original survey of these same establishments’ work and personnel structures. The data collection was conducted in collaboration with (identifying information omitted) and was funded by the National Science Foundation and the Russell-Sage Foundation.

The workforce composition data come from annual EEO-1 reports submitted to the Equal Employment Opportunity Commission (EEOC) by all private sector employers with more than 100 employees and government contractors with more than 50 employees and \$50,000 worth of contracts<sup>5</sup>. As required by federal law, these reports detail the sex, racial and ethnic composition of their workforce in nine broad occupational categories. These data were obtained for research purposes from the EEOC under an Intergovernmental Personnel Act (IPA) agreement.<sup>6</sup>

The broad occupational categories used by the EEOC obscure segregation within management, where women and minorities are more likely to be concentrated in lower-level positions. Accordingly, my analysis explores whether, following the re-organization of work, the share of women and minorities increases at least in lower level managerial ranks. But I cannot examine their mobility within management<sup>7</sup>. Still, EEO-1 reports provide the best available data for studying long term change in organizations' workforce composition (see Robinson et al. 2005).

We drew a random sample of establishments from the EEO-1 data for the year 1999 (the latest year of data available at the time of sampling). The sample was stratified by the number of years the establishment appeared in the EEO-1 data to ensure a sufficient longitudinal perspective as well as variation in establishments' age. Half of the establishments had to be in the data at least since 1992 and half since 1980. The sample was also stratified by size, with 35

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<sup>5</sup> Excluded employers, such as state and local governments, schools and colleges provide different reports (EEOC n.d.)

<sup>6</sup> EEO-1 data were obtained for 1971-2002. The 1970s were not included here because cross-functional work arrangements as such began their diffusion in the early to mid-1980s, with high profile cases such as GM, Xerox and Corning transforming their organization of work. The pilot interviews confirm that when employers talk about cross-job training before the 1980s, these were part of executive programs.

<sup>7</sup> Some argue that growth in managerial diversity is an artifact of the reclassification of clerical and lower level supervisory jobs as management jobs (Baron and Bielby 1985; Smith and Welch 1984) Re-classification is most likely to have occurred in the 1970s, the early years of the EEO-1 reporting requirement. Nonetheless, I excluded all organization-year cells in which there was a large change in the number of women or blacks in management (larger than 95% of the cases) and this did not affect the results. This is consistent with evidence that women's and minorities' entrance to management does represent a significant, if small, change in their status (for example, Jacobs 1992).

percent of the establishments having less than 500 employees, and by industry, with food, chemical, computer and transportation equipment manufacturing, wholesale and retail trade, and insurance, business, and health services. The sampling unit was an establishment (that is, a single location of a firm or a firm with a single location), and only one establishment per parent firm was sampled.

Before composing the survey instrument, we examined the wording and findings of other employment surveys conducted in the last decade (in particular Appelbaum, Bailey and Berg 2000; Kelly 2000; Osterman 2000), as well as information about changes in work organization obtained from in-person interviews with human resources managers conducted in collaboration with (identifying information omitted) in 2000-2001. During 2002, trained interviewers at the Princeton University Survey Research Center completed 833 interviews with a response rate of 67%, which is higher than, or comparable to, similar surveys (Kalleberg et al. 1996; Kelly 2000; Osterman 1994; Osterman 2000)<sup>8</sup>. The interviewees were mostly human resources managers with an average tenure of 11 years. Interviewees were asked whether a series of programs related to the organization of work had ever been adopted in their establishment, in what years they were first adopted and whether they were still in place. The survey questions also included information about related personnel practices and other organizational characteristics that are expected to affect managerial composition and so are included as control variables in this analysis. When the respondents did not know the year in which certain programs were adopted, we sent them a list of the unanswered questions at the end of the interview, so they could answer

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<sup>8</sup> Response bias was examined using logistic regression with industry, establishment status (a headquarters, sub-unit or stand-alone organization), size, government contract status and managerial composition (results are available upon request). Responding establishments were larger and had a larger proportion of white men in their managerial ranks than non-responding organizations. Size is included in the models as well as the composition of top management teams. All industries were equally likely to participate in the survey, excluding establishments from the business services industry, which were less likely to participate. The proportion of each industry in the final sample varies little, between 9.66% and 12.80%.

them after consulting their records or colleagues. For three of the four programs examined here 2% or less of the respondents did not know the years of adoption. For self-directed work teams this number was 4%. All missing values were imputed using OLS regression with industry, establishment age and type of establishment as covariates. In the analyses presented below, the coefficients of each of the variables of interests remain robust when no imputed data for each variable are included.

Upon completion of the phone interviews, we matched the survey data for each establishment with the corresponding annual EEO-1 records, and removed all identifying information from the dataset to insure confidentiality. Data on national, state and industry labor market characteristics were added from the Bureau of Labor Statistics' data sources. The final dataset used in this analysis contains 810 cases and 14,693 establishment-years, with a median of 23 years of data for each establishment<sup>9</sup>.

### **Dependent Variable – Managerial Diversity**

The outcome variables are the proportion of white men, white women, black women, and black men among managers in an establishment, as calculated from the EEO-1 data. Between 1980 and 2002 the percent of white men in management declined from 75% to 62%, while white women's share grew from 19% to 26%, black women's from less than 1% to 2% and black men's from 2.4% to 3.1% (see Figure 4). These changes represent the trends in a sample of relatively old and large establishments, which tend to be more stable. These trends are consistent with the trends in the overall EEO-1 dataset and in the data from the Current Population Survey of the Bureau of Labor Statistics, but those other datasets show larger gains for women and

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<sup>9</sup> For 10 cases, useable EEO-1 data exist for less than 4 years. These cases are excluded from the analysis. For an additional 8 interviewed establishments, the survey data were unusable and for 5 cases the EEO-1 data were not useable.

blacks because they include newly founded organizations, nonprofits, and government agencies and because they describe a dynamic population rather than a stable set of firm.

Because there are large differences in the absolute magnitude of the change in the outcome variables across groups, I use the log odds of each groups in management as dependent variables (Fox 1997:78).<sup>10</sup> Using log (proportion), rather than log (odds), does not alter the results, but the distribution of log odds is closer to normal.

### **Independent Variables - The Re-Organization of Work**

I use four variables to measure different aspects of the re-organization of work: self-directed work teams, problem-solving teams, cross training and formal job training (the latter is defined as other than ‘on-the-job training’). The variables are based on answers to the survey questions pertaining to adoption of these programs and the years in which they operated in the core job. Core job was defined as the largest job category in the establishment. The questions pertained only to the core job category rather than to the entire establishment to maintain consistency in measuring across establishments and in relation to other programs and policies involved in the analysis (Osterman 1994). The variables are binary, coded as “1” in every establishment-year cell since the year of adoption of each program and “0” before the program is adopted and after it is revoked, if relevant. The median year of adoption for self-directed work teams was 1992, and overall 18% of the establishment-year spells in my data have these teams. For problem solving teams, 1991 is the median year of adoption, and 30% of the establishment-year cells in my data have them. Both cross-job training and job training programs were adopted

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<sup>10</sup> Logit (i)=Log (Pi/1-Pi), where Pi is the proportion of group i among managers. The logit is undefined when Pi=0 or Pi=1. I thus substituted 0 with 1/2Nj, and 1 with 1-1/2Nj, where Nj is the number of managers in establishment j (Hanushek and Jackson 1977; Reskin and McBrier 2000). The results of my analysis are robust to different strategies for substituting zeros. I chose the one that kept the distribution uni-modal and closest to normal. I also included a dummy variable that equals 1 when there were no managers from the focal group. The results are also not sensitive to whether this variable is included.

in the median year 1985. About 57% of the establishment-year spells in my data have cross training programs and 50% have job training programs.

Teams and training programs are common to different types of workplaces in my data. A cross-tabulation (see Appendix Table 1) shows no consistent differences between adopters and non-adopters of these programs in industrial sector, establishment type (headquarters or not), union status, diversity policies, and work family support and size. When differences exist, they are not common to the two cross-functional programs and therefore are not likely to serve as an alternative explanation for the results in this study. For example, adopters of self-directed work teams (as well as problem solving teams) are on average about 150 workers larger than non-adopters, while adopters of cross training are on average smaller by about 150 workers than non-adopters. Adopters of self-directed work teams and problem solving teams had a higher number of diversity programs, but a different pattern is observed for adopters of cross training programs. These differences thus cannot account for the effects of self-directed teams and cross training programs.

### **Independent Variables - Other Factors Affecting Managerial Composition**

All the independent variables in the analysis are measured annually in the year before the dependent variables. Table 1 presents the means, standard deviations, definitions and data sources for all variables employed in the analysis. Organizational characteristics that do not vary with time, such as industry and location, are not included, but are accounted for by organization fixed effects.

Complementary organizational changes--. Management training programs, peer evaluations and employment reduction are based on survey data and are measured as binary

variables. Work-family accommodations counts four work-family factors: paid maternity leave, paid paternity leave, policy allowing flextime, and top management support for work-family programs. The availability of managerial jobs is measured using EEO-1 data on the number of managerial employees. External hiring is measured as the percent of external hires to management in the last two years, and is based on a survey question asked in 10 years intervals (2002, 1992, 1982). Values for intervening years were interpolated using a linear function. This variable is multiplied by 10 for ease of presentation of the coefficients.

Organizational characteristics--. Personnel policies are measured using three variables, based on survey data. First is a count variable of policies formalizing HR decisions: hiring, promotion and discharge guidelines; job descriptions, promotion ladders, performance evaluations, pay grade systems, and internal job posting. Second is a count of diversity programs, including diversity training, diversity evaluations, diversity staff and diversity mentoring and networking. Last is a binary variable denoting the presence of an annual affirmative action plan. Unionization is based on survey data and is measured as a binary variable. Organizational size is measured using EEO-1 data on the total number of employees in the establishment.

Workforce demography--. Diversity of managerial ranks is measured as the percent of women and African-Americans in the top 10 executive positions, based on survey data. We asked about the percent at 10 year intervals and interpolated values for intervening years. Based on data from the EEO-1 reports I include a variable coded as 1 when there are no members of the focal group in management. The diversity of the establishment's internal labor pool is measured as the proportion of the focal group among non-managerial workers, based on the EEO-1 reports. Diversity of the establishment's external labor pool is measured using annual data from the

Current Population Survey on the percent of each demographic group among the industry and state labor forces. Industry employment variables are logged.

Organizational environment--. Legal environment is measured in several ways. A binary variable, based on EEO-1 data, denotes whether the establishment is a government contractor subject to affirmative action regulations. Second, a count variable, based on survey data, counts the establishment's experience with three types of anti-discrimination enforcement: EEOC charges, Title VII lawsuits and affirmative action compliance reviews. Finally a binary variable on the presence of an in-house attorney, based on the survey data, measures managers' awareness to the legal environment. Unemployment is measured with the yearly state unemployment rate, and industry size is measured as total annual industry employment. Both come from the Bureau of Labor Statistics.

## **Method**

The four dependent variables examined in this study are parts of the same whole - the sum of management jobs in an establishment at a certain year - and so their error terms are expected to be correlated. Under these conditions, ordinary least squares would produce unbiased and consistent estimators, but not efficient. I thus use Seemingly Unrelated Regression, a generalized least squares estimation that takes into account this covariance between the errors (Felmlee and Hargens 1988; Zellner 1962)<sup>11</sup>. This estimation also allows me to perform a formal test of Hypothesis 2 that the self-directed work teams and cross training will be more beneficial for eroding gender barriers compared to racial barriers (Kalleberg and Mastekaasa 2001; Zellner 1962).

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<sup>11</sup> Available in Stata using the `sureg` command. The substantive results in this paper are not sensitive to the choice between this GLS estimation and an OLS estimation.

An important concern in the analysis of organizational changes is establishing reliable estimates that are not biased by unobserved heterogeneity. I address this concern by using a fixed-effects specification for both establishment and year (Hicks 1994; Hsiao 1986; Western 2002) and by including a series of control variables that may affect the outcome variable. I also conduct several sensitivity analyses, which I discuss later on.

Establishment fixed-effects capture the influence of unmeasured characteristics of individual establishments that do not change with time and affect both the independent and the outcome variables. For example, a progressive organizational culture may cause organizations to experiment with new work programs and also to promote more women and minorities. This specification increases my confidence that an unobserved factor of that sort does not drive my results. The fixed effects specification is achieved by subtracting the values of each observation from the establishment's mean (Hsiao 1986, p. 31)<sup>12</sup>:

$$y_{it} - E(y_i) = \beta \{ x_{it} - E(x_i) \} + \delta D_{t-2} + \{ u_{it} - E(u_i) \}$$

where  $y$  is a vector of outcome variables,  $x$  is a vector of time varying variables,  $D$  is a vector of dummy variables for  $t-2$  years (the first year, 1980 is omitted and the last year 2002 is included only for calculating the outcome variable),  $E$  denotes a mean,  $i$  denotes an establishment and  $t$  denotes year. This transformation is equivalent to including in the model 810 dummy variables, one for each establishment in the data. By virtue of this definition, fixed effects estimation models only within-establishment variation, hence only variables that change over time are included in the analysis.

Year fixed effects are included to capture unobserved heterogeneity that is associated with the mere passage of time and affects all establishments alike, such as national, cultural, or

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<sup>12</sup> The intercept in these models is not an explanation of the 'between unit' or over-time variance. It is simply a characterization of the variance that attempts to minimize the 'true' explanation, or a measure of the 'specific ignorance', as opposed to the 'general ignorance' captured by the error term (Maddala 1977; Sayrs 1989)

legal changes. Finally, to capture establishment-specific heterogeneity that varies with time, I include in the analysis a series of control variables that measure factors found in the literature to be associated with the restructuring of work and/or with managerial composition. The motivation for inclusion each of these variables is discussed above.

The establishment and year fixed-effects also offer an efficient means of dealing with the non-constant variance of the errors (heteroskedasticity) that stems from the cross-sectional and temporal aspect of the pooled data (Sayrs 1989)<sup>13</sup>. To examine the robustness of my results to within-unit serial correlation, I corrected for AR(1) using the Cochrane-Orcutt method,<sup>14</sup> which multiplies the equation for time  $t-1$  by the auto-correlation coefficient,  $\rho$ , and subtracts it from the equation for time  $t$ :  $y_t - \rho y_{t-1} = (1 - \rho)\beta_0 + (x_t - \rho x_{t-1}) \beta_1 + u_t - \rho u_{t-1}$ . The results of the analysis and the main argument of the paper are robust to this correction.

Additional sources of unobserved heterogeneity can come from the unbalanced nature of the data (30% of the establishments enter the dataset after the first year of data, 1980) if the reason that an establishment is not in the data, for example its size or age, is correlated with the outcome variable. To verify that the results are not driven by the selection of establishments into the data, I replicated the analysis using a balanced sub-sample of establishments; the results were substantially similar to those of the main analysis reported here.

## **FINDINGS**

My analysis provides strong evidence that some – but not all – of the new labor control practices associated with the restructuring of work also increase sex and racial diversity in the management ranks. First, as hypothesized, programs that alleviate the career barriers put forth by segregated job structures – namely, self-directed work teams and cross training - have significant

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<sup>13</sup> Using the Huber-White robust standard errors did not change the results of the analysis.

<sup>14</sup> Available in Stata using the xtregar procedure.

positive effects on the odds that managers are white women, black women and black men and a negative effect on white men's odds in management. In contrast programs that do not offer workers new opportunities to transcend job boundaries— problem-solving teams and job training – do not have these effects. The results also indicate that racial barriers are more resistant to change than are gender barriers. The effect of self-directed teams on black women is significantly smaller than on white women and, problem-solving teams have an adverse effect on black men's and black women's share in management. Below I discuss the findings in greater detail.

Table 2 includes the results of the full model. Exponentiating the coefficients  $\beta$  as follows:  $[\exp(\beta) - 1] * 100$ , yields the average percent change in the odds that managers are from a focal demographic group, associated with a change in an independent variable, net of the variance stemming from the control variables and from each establishment's unique stable characteristics. When the coefficient's absolute value is smaller than 0.1, the percent change can be calculated simply as  $\beta * 100$ . The error of such approximation is about 0.005. The  $R^2$  statistics reported in this table represent the percent of the variance explained by the predictors, when excluding the unique effects of each establishment. The log-likelihood ratio test shows that adding measures of teams and training programs to the baseline model (presented in Appendix Table 2) significantly increases the percent variance explained by the model. The discussion below focuses first on the results pertaining to the main variables of interest.

### **Team-Based Work**

The results presented in Table 2 shows that the adoption of self-directed teams, but not of problem-solving teams, has a significant positive effect on the shares of women and minorities among managers of that establishment. After the adoption of self-directed work teams in an

establishment, the odds that managers are white men decline by an average of 8 percent, the odds for white women increase by an average of 9 percent, and those for black women and black men increase by about 3.5 percent and 5 percent respectively. A  $X^2$  test indicates that the estimated effect of self-directed teams on white women is significantly larger than the estimated effect on black women at a level of 5 percent ( $X^2 = 3.98$ , with 1 *d.f.*,  $p < 0.046$ ), but not significantly larger than the effect on black men ( $X^2 = 1.86$ , with 1 *d.f.*,  $p < 0.173$ ). At least as it pertains to women, racial barriers are less affected by the introduction of autonomous team work. This pattern may be due to sex segregation, where black women and white women compete over the same jobs. And white women are positioned better in this competition.

In contrast to self-directed work teams, the adoption of problem-solving teams is not followed by improvements in the status of women and racial minorities in the workplace. In fact the odds for black women in management are lowered by 3 percent on average and the odds for black men by 6 percent, after the adoption of problem solving teams. The magnitude of these estimates is comparable in absolute value to the positive estimates following the adoption of self-directed work teams. Does this mean that when both programs are adopted, there will be no change in the proportion of black men and women in management, or is there an added value of having both programs in place? To examine this question, in a separate model, I included an interaction term for self-directed work teams and problem solving teams. Having both these programs at the same time has a weak positive effect on black women, significant only at the 10 percent level of confidence ( $\beta = .053$   $SE = .029$ ) and no effect on black men ( $\beta = .024$   $SE = .031$ ). In other words, there is no added value for having both types of programs at the same time<sup>15</sup>.

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<sup>15</sup> Coefficients of the interaction analysis for white men and women show no significant effects as well. Full results are available upon request.

The results provide strong support to the notion that work teams that give workers opportunities to transcend job boundaries alleviate career barriers that women and minorities face. As discussed above, problem-solving teams do not counteract the negative effects of job segregation. They are more likely to include experts and higher-ranking workers, who are usually white and male. In this sense, problem-solving teams are likely to improve the chances of other workers (white men or women) to expand their networks and move into management, deepening the disadvantage of black workers. Note that the coefficients for white women and men are positive though not significant.

### **Cross Training and Job Training**

According to the analysis presented in Table 2, the introduction of cross training programs has positive effects on the share of white women, black women and black men in management and a negative effect on the share of white men in management. On average, the introduction of cross-job training significantly reduces the odds that managers are white men by about 7.5%, and increases the odds for women and blacks in management by about 4%. These results suggest that cross-functional training programs may indeed translate into new mobility opportunities for women and minorities as others have suggested (Ollilainen and Rothschild 2001; Smith 1996).

The analysis shows that the share of women and blacks in management does not change following employers' adoption of job-training programs (Knoke and Ishio 1998; Lynch and Black 1998). None of the coefficients for job training are significant. Despite the historical intent to use job training as a means for helping women and minorities advance, employers' adoption of these programs does not undermine sources of ascriptive disadvantage probably because women and minorities are less likely to be eligible for these training (Knoke and Ishio 1998).

What do these coefficients mean in relation to changes in the proportion of women and minorities in management between 1980 and 2002? Because the log odds transformation is not a linear transformation, the magnitude of changes in managerial composition associated with each program will vary according to the starting point, the baseline proportion (Fox 1997:78). Figure 5 illustrates the percent change in the proportion of each group among managers following the adoption of teams and training programs when the sample means of the proportion of each group among managers are the baseline. Figure 5 is based on Appendix Table 3, which summarizes the percent and percentage point differences between the sample means and the predicted means following adoption for each group. These magnitudes are calculated using the coefficients in Table 2 and are associated solely with the adoption of a program<sup>16</sup>. For example, the mean proportion of white men in management in the sample is 67.9 percent. Adopting self-directed work teams is estimated to reduce this mean to 66.2 percent, net of all the other variables included in the analysis and the establishment and year fixed effects. This means, as Figure 5 shows, a decline of 2.5 percent in their proportion in management that is associated solely with the adoption of these teams. To evaluate this change in context we need to remember that during the entire period under study the proportion of white men in management declined by 17 percent: from 75 percent in 1980 to 62 percent in 2002. For white women, Figure 5 shows, the estimated percent increase in their share among managers following the adoption of self-directed work teams in the average organization is 5.6 percent. During the entire period under study, their proportion of managers increases by 37 percent, from 19.3 percent to 26.4 percent.

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<sup>16</sup> To evaluate the magnitude of the effect as a percent change in the proportion of a focal group in management I use the following calculation:  $\Delta P_{ij}/P_{ij} = [\exp(L_{1ji}) / (1 + \exp(L_{1ji})) - (\exp(L_{0ji}) / (1 + \exp(L_{0ji})))] / (\exp(L_{0ji}) / (1 + \exp(L_{0ji})))$ , where  $j$  denotes the focal demographic group and  $i$  is the focal program.  $L_{0ji}$  is the log-odds of group  $j$  in management before the unit change in  $D_i$  (that is, before the adoption of program  $i$ ) and  $L_{1ji} = L_{0ji} + B_{ij}$ , and is the log-odds of group  $j$  in management after the unit change in  $D_i$  (after adoption), with  $B_{ij}$  being the regression coefficient, estimating the percent change in odds associated with adoption of program  $i$  in the model for the  $j$  group (Petersen 1985).

### **Accompanying Changes and Other Factors Affecting Managerial Composition**

The analysis includes variables measuring additional organizational changes that may affect managerial composition. Coefficients for these variables, presented in Table 2, are generally consistent with expectations based on theory and previous research. The motivation for their inclusion in the analysis is to isolate the effects of the work restructuring programs at the focus of this paper, but their coefficients contribute to our understanding of ascriptive inequality at work and may suggest directions for further research. I briefly discuss here some of these results.

Management training has the expected positive effect on the share of white women in management, but not on black men and women. This supports the notion that formalizing access to management can reduce white men's advantage in management (Reskin and McBrier 2000) and may also indicate that white women are better positioned to take advantage of these programs (Bell and Nkomo 1994). Peer review evaluations show no significant effect on managerial diversity. This result is somewhat in contrast to Smith-Doerr's (2004) argument that being evaluated by a wider range of people helped women's careers. It appears that the informal exposure and visibility granted by cross functional programs are more effective means for reducing career barriers. Work family accommodations have the expected effect of increasing the managerial chances of women, the most likely beneficiaries of these programs. And as women's disadvantages are alleviated by these programs, men's (especially white men's) advantage in management declines. Downsizing shows a positive effect on white and black women in management and no effect on black men. These results are inconsistent with what we know from individual level data about minorities' higher vulnerability to downsizing (Fairlie and Kletzer 1998; Farber 1997) and may indicate that intervening organizational factors shape

downsizing results. Increased availability of managerial jobs has a positive effect on white women in management, at the expense of all other groups. Increased external hiring to management has a negative effect on the share of black men in management, suggesting that black men are more likely to be promoted to a managerial job than to be hired from outside. This is in contrast to the result of Baldi's and McBrier's findings (1997), that black men do not benefit from internal labor markers. Formalization of human resources does not seem to increase managerial diversity. This result is anticipated by mixed evidence from past research regarding different aspects of formalization (Baldi and McBrier 1997; Reskin and McBrier 2000). Consistent with previous studies, affirmative action and diversity programs have positive effects on managerial diversity, as well as legal anti-discrimination enforcement and the presence of an in-house legal counsel (Kalev, Dobbin and Kelly 2006; Skaggs 2008). Some may argue that the negative effects of diversity programs and anti-discrimination enforcement on white men reflect a quota system or a reverse discrimination.<sup>17</sup> Several studies provide evidence against reverse discrimination or quotas. Holzer and Neumark (1998) find that when affirmative action is used in recruiting it does not lower the credentials or performance of women and minorities hired. Wilson (1995) finds that only 100 of 3000 discrimination cases filed involve reverse discrimination, of which only 6% had a claim that could be substantiated (Wilson 1995, cited in Bond and Pyle 1998:260).

An increase in the proportion of women in top management has a positive effect on the share of white women in management but not of black women. Both black women and black men benefit from an increase in the proportion of minorities in top management. Black women do not seem to benefit from an intersectional 'double (dis)advantage' of being both women and

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<sup>17</sup> This criticism is usually directed at affirmative action plans and is less relevant for the focal programs in this study, self-directed work teams and cross training, which are not adopted as part of employers' diversity management programs or antidiscrimination compliance.

black (Nkomo and Cox 1989). This finding emphasizes the importance of intersectionality of gender and race (Browne and Misra 2003; Elliott and Smith 2001). Studies that look at women as a single category cannot tap this pattern (e.g. Cohen, Broschak and Haveman 1998). White men's share in management also declines when the share of women in top management increases, showing that ascriptive processes such as homophily can disadvantage white men depending on the demographic composition of management jobs (see also Elliot and Smith 2004). It may also reflect the ability of top women managers to serve as role models and mentors that aspiring women often lack (Bell and Nkomo 2001; Ely 1995). It is also notable for researchers of organizational demography that the share of the focal group among non-managerial jobs has a positive effect on the share of that group in management. This pattern suggests that higher numbers of women and minorities – be it in top management or in non-managerial jobs – can influence the entrance of women or minorities to management.

Among industry and state labor force composition variables, it is noteworthy that a higher presence of black men in industry has a negative effect on white men in management, and there is weak evidence that white women, not black men, may be increasing their share in management. Higher shares of black men in the state labor force have a negative effect on their representation in management, suggesting support for the threat hypothesis (Blalock 1982). Finally, a rise in unemployment hurts the odds of women in management, lending support to queuing theory (Reskin and Roos 1990).

### **Confounding Factors and Reverse Causality**

The model specification, with fixed effects for each establishment and year, accounts for two possible sources of bias. First, the establishment fixed effects accounts for stable unobserved heterogeneity that might affect the outcomes (for example adopters have a change-oriented

organizational culture, or may be concentrated in progressive industries or states, and so may be more likely to both adopt new programs and be diversity-friendly). Second, the inclusion of a dummy variable for each year accounts for unmeasured heterogeneity that is correlated with time and affects all organizations alike (such as changes in societal attitudes, legal environment or managerial fads).

Organization-specific exogenous changes.-- The fixed effects specification by itself does not rule out the possibility that organization specific exogenous changes – for example, change in organizational leadership or decline in profits – may lead to changes in the organization of work as well as changes in the access of women and blacks to management. I try to rule out spuriousness due to such unobserved heterogeneity in three ways. First the research design: all four programs I examine are often adopted as part of what is often called ‘high performance re-organization’ (Cappelli et al. 1997). That only two of the four innovations examined here show effects on managerial diversity increases my confidence that these effects are not caused by a latent factor. For example, if the ‘real’ factor that affected management diversity was the arrival of a new CEO infatuated with new progressive management, we would expect to see positive effects for all the four programs. Second, the effects of cross functional team and training programs are observed despite the inclusion in the analysis of many other related organizational features that may have an independent effect on managerial diversity, such as management training, peer reviews, work family accommodations, diversity efforts and so forth (see Table 2 for the full list of the control variables), indicating that my findings are not conflated with the effects of these other organizational characteristics. Third, the models may still be subject to omitted variable bias, where an unmeasured factor led both to the adoption of cross-functional programs and to changes in management diversity. I therefore performed an additional analysis

(results are available upon request) where I added binary variables as proxies for the occurrence of an unmeasured event (such as unmeasured financial or technological change) before the adoption of each program. I performed this sensitivity analysis with proxy events assumed as occurring at two and three years prior to the adoption of each of the four teams and training programs examined here, in models parallel to those in Table 2. If the results in Table 2 are spurious, adding a proxy variable for an event occurring before, say, the adoption of self-directed work teams, should cause the coefficients for these teams to decline in size and/or become non-significant, and the proxy variable should show significant effects in the same direction as the original coefficients (Bennear 2007). As expected, the coefficients of interest and the standard errors remained robust to the inclusion of these proxy variables, and neither of the proxy variables had significant coefficients. These analyses too suggest that the observed relationship between the re-organization of work and managerial diversity is not spurious.

Are adopters different than non-adopters?-- Adopters might be different than non-adopters in ways that are not captured by the stable fixed effects or the control and proxy variables discussed above. This would be the case if for example, adopters are faster changing companies. To examine whether the results in Table 2 are merely a reflection of differences between adopters and non adopters I repeated the analysis four times (once for each program) using subsamples of the data that include only adopters of the focal program. Because non-adopters are excluded from these analyses any, differences between adopters and non-adopters cannot affect the results. The results remained substantively similar to those reported in Table 2.

Reverse Causality.-- Finally, there is a possibility of reverse causality where the observed differences in management diversity reflect higher initial levels of diversity among adopters rather than the effect of the programs. Appendix Figure 1 shows the presence of the four teams

and training programs in organizations in different quartiles of percent women and blacks in the workforce. Appendix Figure 1 shows that adopters are not concentrated in more diverse firms and that the four teams and training programs display a heterogeneous pattern with respect to the diversity of the organization when they were adopted. For example self-directed work teams and problem solving teams are about equally present in organizations in the first and fourth quartile of percent women and minority at their workforces, while cross training programs are more highly concentrated in workplaces with the lowest share of women in their workforces. These different patterns suggest that effects of self-directed work teams and cross training programs are unlikely to be a reflection of their concentration in firms that have higher shares of women and minority workers in the first place.

I also repeated the analysis, this time including the proportion of each group in management in the prior year as an independent variable. These lagged dependent variables will absorb the variance in the outcome variable that comes from earlier levels of diversity. The results of that analysis do not change any of the results reported here.<sup>18</sup>

Taken together, the fixed effects specifications, the research design, the range of control variables and the various additional analyses reported here strengthen my confidence in making claims about the effects of cross-functional team and training programs on the share of women and minorities in management, based on Table 2. Results of all the additional analysis can be obtained from the author upon request.

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<sup>18</sup> The final models in this paper do not include the lagged dependent variable because adding the lagged dependent variable to fixed effects models introduces a downward bias to the standard errors (Hsaio 1985, p. 75).

## DISCUSSION AND CONCLUSION

The modern workplace has long been structured around a rigid division of labor and narrow job definitions, themselves the products of early management ideologies, job control unionism and government intervention in labor markets during World War II (Baron, Dobbin and Jennings 1986; Shenhav 1995). As early as 1980, Baron and Bielby used the term ‘new-structuralism’ in stratification research to put forth a research agenda based on the understanding that “the relationship between structure and attainment is intimately tied to the organization of work” (1980, p. 738). More than just a system of labor control (Edwards 1979), feminist scholarship illuminates the gendered and racialized aspects of job segregation as women and minorities are relegated to low-level and undervalued positions (Acker 1990; Nkomo 1992) with limited opportunities to gain visibility, be evaluated for their management capabilities and build strategic networks (Baron and Bielby 1985; Kanter 1977). While scholars and practitioners search for ways to limit the devaluation of these jobs and the channeling of women and minorities into them, I focus on what happens when the segregated structure of jobs is ameliorated. If gender and racial disadvantage is partially rooted in the structure of work, then a re-organization of work would reduce this disadvantage.

Analyzing data on the organization of work and managerial composition over the last 20 years from a national sample of more than 800 workplaces, I find that moving away from a segregated job structure towards greater cross-functional collaboration – by adopting self-directed work teams and cross training programs – is followed by increases in the gender and racial diversity of management. These results are not merely due to adoption of “high performance” programs or the churning of managerial positions associated with organizational change: other teams and training programs that do not allow women and minorities to transcend

job boundaries do not have these effects. While it would be naïve to assume that gender and racial biases cease to exist in a restructured work setting, or to ignore the possibility that teams and cross-training programs constitute intensified means of labor control, my findings support the notion that relaxing narrow job boundaries provides women and minorities with new career opportunities (Smith 1996; Ollilainen and Rothschild 2001; Smith-Doerr 2004).

These unintended consequences of organizational change have significant contributions for theory and practice. First, they lend strong support to structural stratification theory and call attention to the structure of work, not only personnel policies, as sources of ascriptive advantage and disadvantage (Acker 1990; Baron and Bielby 1980; Kanter 1977). Similarly, research on labor control mostly focuses on class inequalities, largely overlooking the distinct effects of work structures on women and minorities (Barker 1993; Edwards 1979; Handel 2005; Osterman 2000). That mitigating job segregation undermines ascriptive inequality confirms expectations derived from case studies showing that self-directed teams and cross training provide workers with greater exposure in stereotype-negating contexts, voice and respect at the workplace (e.g. Ollilainen and Rothschild 2001; Smith-Doerr 2004; Smith 1996). While all workers can benefit from such career resources, for women and minorities they mark a larger break from their previous experience and opportunities. One plausible path to promotion in this context could be that women and minorities use their new networks to learn about, and obtain, lateral moves to jobs with better career ladders than their own (DiPrete and Soule 1988). Another - and complementary - plausible mechanism is that managers and others become more aware of women's and minorities' talent and leadership capabilities and reduce their reliance on stereotypes in decision making.

Second, my research contributes to the dialogue between macro and micro theories of inequality. In 1994, Baron and Pfeffer noted that the new structuralism in organization research has neglected the social psychological processes that perpetuate ascriptive inequality at work. This insight was echoed later on by Barbara Reskin's observation that "the proximate causes of discrimination are the contextual factors that permit or counter the effects of the [...] habits of the brain" (Reskin 2000, p. 323; see also Bielby 2000). Social psychologists study how structural contexts affect intergroup bias and relations (for example, Allport 1954; Ridgeway 1997). Researchers in organizational behavior and diversity management have relied on this social psychology literature for studying how organizational contexts can reduce intergroup bias and foster supportive relations (Bacharach, Bamberger and Vashdi 2005; Brickson 2000; Chatman et al. 1998; Kramer 1991). I show that work structures that, according to social psychological and management research, should reduce gender and racial bias and enhance supportive intergroup relations, indeed lead to lower levels of ascriptive inequality. In this sense my research also furthers the dialogue between sociological and management research on inequality on the relations between structures and intergroup relations.

Third, it is also significant that the adoption of typical job training programs does not undermine gender and racial inequality. At first glance, this finding appears somewhat unexpected. According to human capital theory, women's and minorities' lower positions at work reflect their lower skill levels. Consistent with this reasoning, proponents of affirmative action have promoted employers' training programs as a means for improving the career chances of women and minorities (Glass Ceiling Commission 1994). Yet, research has shown that women are less likely to receive such training, exactly because of their segregation in positions that are not eligible for training (Knoke and Ishio 1998). It is hardly surprising, then, that job

training programs do not lead to higher managerial diversity in my analyses. This does not mean that women and minorities are not in need of training. They may very well be. Rather, in line with structural stratification theory, my findings suggests that organizational endeavors to reduce ascriptive disadvantage should aim at altering the structure of work that locks women and minorities in jobs that are ineligible for training and job experience opportunities.

Fourth, by analyzing white women, black women and black men separately, I show that organizational structures have different effects across the intersection of gender and race (Bell and Nkomo 2001; Browne and Misra 2003; Nkomo and Cox 1989; Vallas 2003a). First, black women's, but not black men's, gains from the transition to team-based work are significantly smaller than white women's. Perhaps this is indicative of sex segregation, whereby white and black women compete for the same managerial jobs, and so the gains of white women in management come at the expense of black women. Second, black men and black women, but not white women, experience adverse effects from the introduction of problem-solving teams. This probably reflects a pattern where highly valued employees – usually white and male – are more likely to participate in these expert teams (Batt 2004; Vallas 2003b) and to benefit from the enhanced promotion opportunities that participation in these teams may convey, a process which seems to deepen the disadvantage of black women and men in access to management. Another possible explanation of these adverse effects is suggested by evidence that problem-solving teams (but not self-directed work teams) are accompanied by increased tension at the workplace (Applebaum et al. 2000, p.177; Vallas 2003b). It is plausible then that racial boundaries, more than gender boundaries, are redrawn in such a context (Vallas 2003a). These findings illustrate the need to embed studies of gender and racial disadvantage at work in the wider economic, political and cultural context of group relations (Nkomo 1992).

Fifth, organizational and industrial relations research look at “high performance” practices as a modern system of labor control (for example, Osterman 2000; Handel 2005) . My study shows that the labor process is not gender- and race- neutral<sup>19</sup>. Regardless of whether these programs enhance what Barker (1993) terms “concretive control” over workers, my research shows that class, gender and race relations operate in interlocking ways, sometimes producing divergent effects. Structures that may reproduce oppressive class relations may at the same time disrupt gender and racial systems of oppression.

Sociologists studying stratification at work rarely discuss the decline in white’s and men’s share in management jobs that often accompanies the improvements in women’s and minorities’ access to those jobs. In my analysis, the odds of managers being white men decline following the adoption of cross-functional team and training programs, as well as after the adoption of work family accommodations, affirmative action programs, diversity measures, the hiring of legal counsel and experiencing legal antidiscrimination enforcement. These results illustrate that women’s and minorities’ disadvantage is inherently linked to white male’s advantages. If certain policies and programs erode sex- and race-based ascription in organizational processes, this should affect all groups: those that benefit and those that are harmed by the ascriptive system of rewards. And so at the same time that women and minorities are disadvantaged by job segregation, white men benefit from it, for example because they are more likely to be concentrated in those visible high profile jobs, or because they face lower competition over good career opportunities. Hence, altering segregation and increasing other groups’ access to the same benefits (visibility, information about career opportunities) will reduce white men’s advantage. Or if white men’s advantage in management is, at least partially,

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<sup>19</sup> Researchers have noted the negative effect of outsourcing and downsizing restructuring on women and minorities (Smith 1997; Kalleberg et all 2000).

due to discriminatory managerial decisions, and a legal counsel or a recent lawsuit encourages employers to check managerial decisions more rigidly, white men's advantage may decline. Similarly if part of men's advantage in management is due to fact that conflicting work and family demands hold back some of their female coworkers, improved work family accommodation will reduce this advantage. At minimum, if more women and minorities are considered for managerial positions because ascriptive barriers have been eroded, the managerial pipeline may become more diverse and, *ceteris paribus*, the chances of white men becoming managers will decline.

If a given program helps one group but clearly harms another it is likely to evoke backlash, be it due to sexism, racism, aversion to change, or the feeling that one's interests, status, social identity, or rights are being undermined (Cockburn 1991; Linnehan and Konrad 1999; Lowery, Knowles and Unzueta 2007; Tomaskovic-Devey 1993; Tsui, Egan and O'Reilly 1992).<sup>20</sup> Such reactions are the symptom of the current organization of work that accords power advantage based, at least partially, on ascriptive characteristics (Linnehan and Konrad 1999, p. 409). Leonard (1989, p. 71) finds that employers often promise more managerial jobs for everyone, men and women, whites and minorities, in the hope of reducing resistance to diversity efforts. Social psychologists provide useful insights for minimizing such backlash. For example, Lowery et al. (2007) suggest that framing diversity programs as addressing the unearned advantage of the dominant group may increase whites' acceptance because the perception of an unearned disadvantage undermines their positive sense of self (Lowery et al. 2007, p. 1246). It is plausible that backlash against women's and minorities' success will be lower in the contexts of cross-functional programs, because it is less likely to be attributed to reverse discrimination or

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<sup>20</sup> I thank an anonymous reviewer for this point.

rights violation, compared to when diversity is achieved through affirmative action or diversity programs. Kvande and Rasmussen (1994, p. 172) observed more alliances between men and women in dynamic network organizations, arguing that these structures provide more opportunities for everyone, thus lowering the sense of intergroup threat and competition. Along similar lines, categorization theory suggests that what constitutes individual's self-interest depends on the nature of the social and organizational categories that are salient to them (Kramer 1991, p. 219; Tsui et al 1992) and that common goals and intergroup collaborations can reduce the salience of gender and racial group boundaries (Brickson 2000; Tajfel and Turner 1979). It is plausible, then, that in cross-functional structures, the greater sense of opportunity and the salience of common goals will weaken backlash against women and minorities' progress.

It is noteworthy that despite the significant negative effects of some programs on the odds of white men in management, women's and minorities' career progress has not eliminated white men's advantage in the higher rungs, and so the results of this study should be interpreted with care. Whites and men continue to hold high level, powerful jobs (Elliot and Smith 2004). And while the share of white men among managers declined in the last 30 years, census data show that the percent of white men who are managers continued to increase, alongside the growth in the share of white women, black women and black men who are managers (Padavic and Reskin, 2002, p. 102). Furthermore, women's and minorities' labor market gains seem unstable. Data from the Panel Study of Income Dynamics indicate that relative to white workers, blacks suffered higher incidences of downward mobility from managerial occupations during the 1990s (McBrier and Wilson 2004) and data from the Current Population Survey show that white men are more likely to find jobs after layoffs compared to other groups (Spalter-Roth and Deitch 1999).

Ever since the passage of the Civil Rights Act and affirmative action Executive Orders in the 1960s, employers have been experimenting with ways to increase the representation of women and minorities in the workforce and in management. The formalization of human resources policies is one prominent means for curbing bias by procedural fairness (Reskin 2000); but researchers (Baldi and McBrier 1997; Elvira and Town 2001), as well as the Supreme Court (Griggs v. Duke Power Co., 401 US 424, 431-2, 1971), have found formalization to be far from a panacea. Employers have devised special networking and mentoring programs for women and minorities to reduce their social isolation. Research has shown that these programs have weak, and often negative, effects on diversity outcomes (Carter 2003; Friedman and Craig 2004; Kalev, Dobbin and Kelly 2006). I show that altering the segregated structures of work within which gender and racial bias and isolation are reproduced, leads to significant increases in managerial diversity. Job segregation is one of the unquestioned work practices that support and reify entrenched ascriptive disparities between men and women (Ely and Meyerson 2000: 107). But focusing on structural sources of inequality should not lead us to an agentless view of stratification. As this study demonstrates, employers and managers can alter the organization of work and jobs in ways that will reduce ascriptive disadvantage.

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Figure 1: Types of Organizational Change

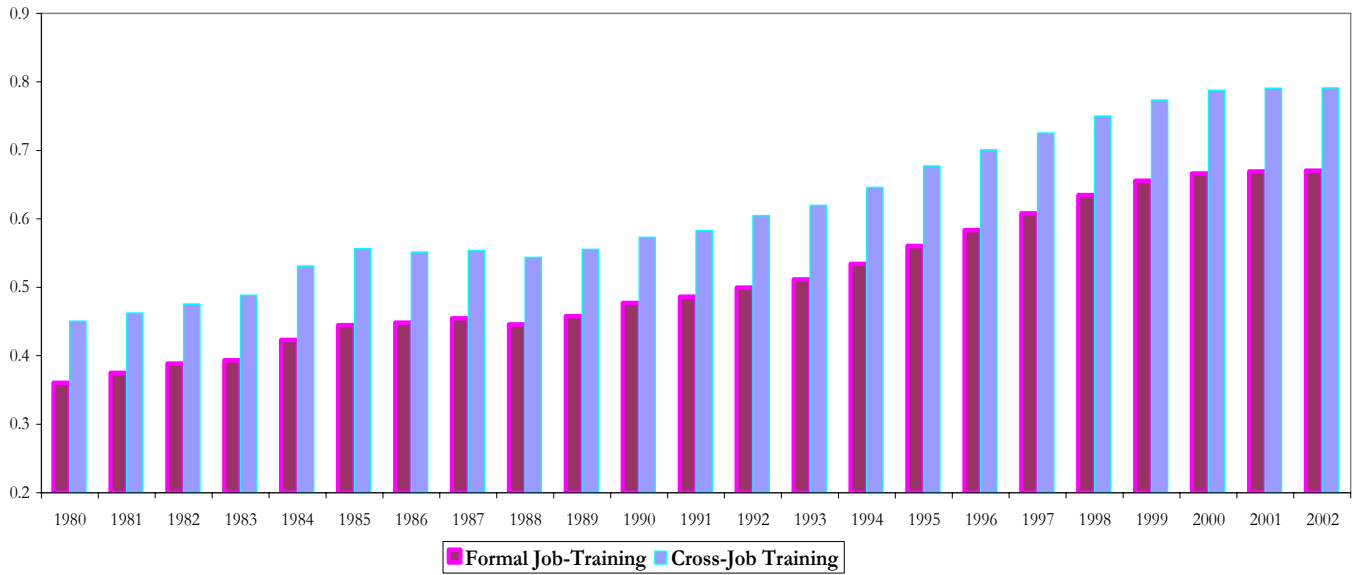
		TEAMS	TRAINING
<b>RE-STRUCTURING OF WORK?</b>	<b>YES</b>	Self-directed work teams	Cross-job training
	<b>NO</b>	Problem-solving teams	Job Training

Figure 2 - Percentage of Workplaces with Self-Directed Work Teams and Problem-Solving Teams , 1980-2002



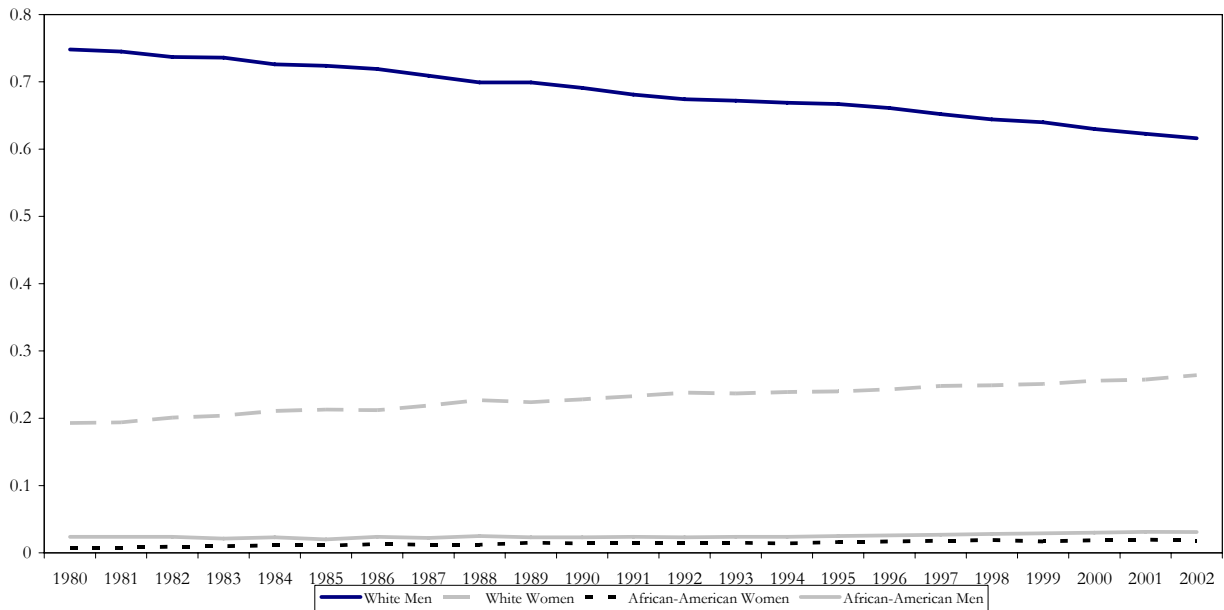
Source: Princeton University Human Resources Survey 2002. Max N=810.

Figure 3 - Percentage of Workplaces with Formal Job Training and Cross-Job Training, 1980-2002



Source: Princeton University Human Resources Survey 2002. Max N=810.

Figure 4 - Proportion of White Men and Women and African-American Men and Women among Managers, 1980-2002



Source: EEO-1 reports for 1980-2002 sampled for the Princeton University HR survey 2002. Maximum N = 810.

**Figure 5 - Estimated Average Changes in Managerial Composition Following the Adoption of Teams and Training Programs.**



Note: Estimates are based on the sample mean proportion of each group in management.

**Table 1 - Means and Standard Deviations of Variables Used in the Analysis of Managerial Workforce Composition.\* N=14,693**

	Mean	S.D.	Min	Max	Type	Data Source
<b>Outcome Variables:</b>						
Proportion of white men among managers	0.684	0.231	0.000	1.000	Continuous	EEO-1
Proportion of white women among managers	0.231	0.210	0.000	1.000	Continuous	EEO-1
Proportion of Black women among managers	0.013	0.038	0.000	0.556	Continuous	EEO-1
Proportion of Black men among managers	0.025	0.055	0.000	1.000	Continuous	EEO-1
<b>Team Structures:</b>						
Self-Directed Work Teams	0.176	0.381	0	1	Binary	Survey
Problem-Solving Teams	0.297	0.457	0	1	Binary	Survey
<b>Skill Upgrade:</b>						
Cross-job training	0.558	0.497	0	1	Binary	Survey
Formal Job-Training	0.501	0.500	0	1	Binary	Survey
<b>Complementary Organizational Changes:</b>						
Management Training	0.444	0.497	0	1	Binary	Survey
Peer Evaluations	0.118	0.322	0	1	Binary	Survey
Work-family accommodations	1.049	0.996	0	4	Count <sup>1</sup>	Survey
Organizational Downsizing	0.225	0.418	0	1	Binary	Survey
Percent managerial jobs in the establishment	0.126	0.092	0	100	Continuous	Survey
Percent management hiring that is external	56.693	29.773	0	100	Continuous	Survey
<b>Organizations' Structures</b>						
Formalized personnel policies	4.454	2.245	0.000	8.000	Count <sup>2</sup>	Survey
Affirmative-action plan	0.503	0.500	0	1	Binary	Survey
Diversity programs	0.358	0.792	0	4	Count <sup>3</sup>	Survey
Union agreement	0.248	0.432	0.000	1.000	Binary	Survey
Establishment size	753.516	972.482	13	14195	Continuous	EEO-1
<b>Workforce Composition</b>						
Percent women in top management	16.933	22.959	0	100	Continuous <sup>4</sup>	Survey
Percent minorities in top management	3.471	9.490	0	100	Continuous <sup>4</sup>	Survey
Prop. of white men among non-managers	0.403	0.247	0	0.982	Continuous	EEO-1
Prop. of white women among non-managers	0.377	0.247	0	1	Continuous	EEO-1
Prop. of Black women among non-managers	0.058	0.095	0	0.886	Continuous	EEO-1
Prop. of Black men among non-managers	0.053	0.089	0	0.940	Continuous	EEO-1
No white men in management	0.005	0.074	0	1	Binary	EEO-1
No white women in management	0.094	0.291	0	1	Binary	EEO-1
No Black women in management	0.686	0.464	0	1	Binary	EEO-1
No Black men in management	0.533	0.499	0	1	Binary	EEO-1
Proportion industry labor force that is white male	0.434	0.147	0.145	0.711	Continuous	CPS
Proportion industry labor force that is white female	0.323	0.140	0.129	0.624	Continuous	CPS
Proportion industry labor force that is black female	0.040	0.018	0.014	0.097	Continuous	CPS
Proportion industry labor force that is black male	0.042	0.023	0.005	0.098	Continuous	CPS
Proportion state labor force that is white male	0.380	0.060	0.116	0.502	Continuous	CPS
Proportion state labor force that is white female	0.358	0.066	0.093	0.496	Continuous	CPS
Proportion state labor force that is black female	0.042	0.029	0.001	0.186	Continuous	CPS
Proportion state labor force that is black male	0.049	0.035	0	0.201	Continuous	CPS
<b>Organizations' Environment</b>						
In-house legal counseling	0.303	0.460	0	1	Binary	Survey
Government contract (Subject to Affirmative Action)	0.486	0.500	0	1	Binary	EEO-1
Legal enforcement of anti-discrimination	0.948	1.019	0	3	Count <sup>5</sup>	Survey
Unemployment rate	6	2	2	18	Continuous	CPS
Industry employment	3961	2904	996	11458	Continuous	BLS
Year	1991	6	1980	2001	Continuous	EEO-1

\* All independent variables, excluding the proportion of managerial jobs, are measures one year before the outcome variables.

<sup>1</sup> Includes paid maternity leave, paid paternity leave, policy allowing flexible working hours and top management support for work family balance.

<sup>2</sup> Includes adoption of formal HR department, written hiring, promotion and discharge guidelines, written job description, written promotion ladder, written performance evaluations, pay grade system and internal posting of jobs.

<sup>3</sup> Includes diversity committee, diversity training, diversity networking, mentoring, diversity evaluation for managers and diversity staff.

<sup>4</sup> Percents were obtained in 10 years intervals from 1982-2002. Values for years in between were interpolated using a linear function.

<sup>5</sup> Includes affirmative action compliance review, EEOC charges and discrimination-law suits.

**Table 2 - Fixed Effects Estimates of the Log Odds that Managers are White Men, White Women, Black Women or Black Men after Adoption of New Forms of Work Organization, 1980-2002.**

Unstandardized coefficients from a seemingly unrelated regression, standard errors in parenthesis.

	<b>White Men</b>	<b>White Women</b>	<b>Black Women</b>	<b>Black Men</b>
<b><u>Team Work</u></b>				
Self-Directed Work Teams	-0.081 ** (0.019)	0.087 ** (0.020)	0.035 * (0.018)	0.048 * (0.019)
Problem-Solving Teams	0.014 (0.014)	0.024 (0.015)	-0.031 * (0.013)	-0.058 ** (0.014)
<b><u>Skill Upgrade</u></b>				
Cross Training	-0.076 ** (0.016)	0.044 * (0.017)	0.033 * (0.016)	0.040 * (0.018)
Job Training	-0.005 (0.016)	0.007 (0.017)	0.017 (0.015)	-0.002 (0.017)
<b><u>Complementary Organizational Changes</u></b>				
Management Training	0.002 (0.015)	0.040 ** (0.015)	0.003 (0.014)	-0.017 (0.015)
Peer Review Evaluations	0.007 (0.018)	0.013 (0.019)	0.011 (0.018)	0.032 (0.018)
Work-family accommodations	-0.036 ** (0.008)	0.029 ** (0.008)	0.018 * (0.007)	-0.005 (0.008)
Organizational Downsizing	-0.025 (0.016)	0.070 ** (0.022)	0.080 ** (0.015)	0.024 (0.016)
Percent managers in establishments	-1.357 ** (0.103)	0.823 ** (0.110)	-2.919 ** (0.098)	-2.191 ** (0.101)
Percent management hiring that is external (*10)	0.007 (0.004)	-0.002 (0.004)	-0.002 (0.004)	-0.013 ** (0.004)

**Table 2 continues on next page**

\*\* p<0.01; \* p<0.05; (two tailed test)

Table 2 (Continued)

	White Men	White Women	Black Women	Black Men
<b><u>Organizations' Structures</u></b>				
Formalization of personnel decisions	0.002 (0.004)	-0.007 (0.004)	-0.012 ** (0.004)	-0.007 (0.004)
Affirmative-action plan	-0.045 ** (0.017)	0.029 (0.018)	-0.003 (0.016)	0.040 * (0.017)
Diversity programs	-0.046 ** (0.009)	0.059 ** (0.009)	0.043 ** (0.008)	0.015 (0.009)
Union agreement	-0.086 * (0.035)	-0.019 (0.038)	-0.019 (0.034)	0.037 (0.036)
Establishment size (log)	-0.096 ** (0.012)	0.041 ** (0.013)	-0.549 ** (0.012)	-0.342 ** (0.013)
<b><u>Workforce Composition</u></b>				
Percent women in top management	-0.002 ** (0.000)	0.004 ** (0.001)	0.001 (0.001)	-0.003 ** (0.001)
Percent minorities in top management	-0.001 (0.001)	-0.003 (0.002)	0.008 ** (0.001)	0.013 ** (0.002)
Proportion of focal group in non-managerial jobs	1.058 ** (0.048)	1.217 ** (0.054)	0.475 ** (0.116)	1.533 ** (0.136)
Flag: no focal group in mgmt	-0.360 ** (0.046)	-0.221 ** (0.013)	-0.579 ** (0.012)	-0.156 ** (0.007)

Table 2 continues on next page

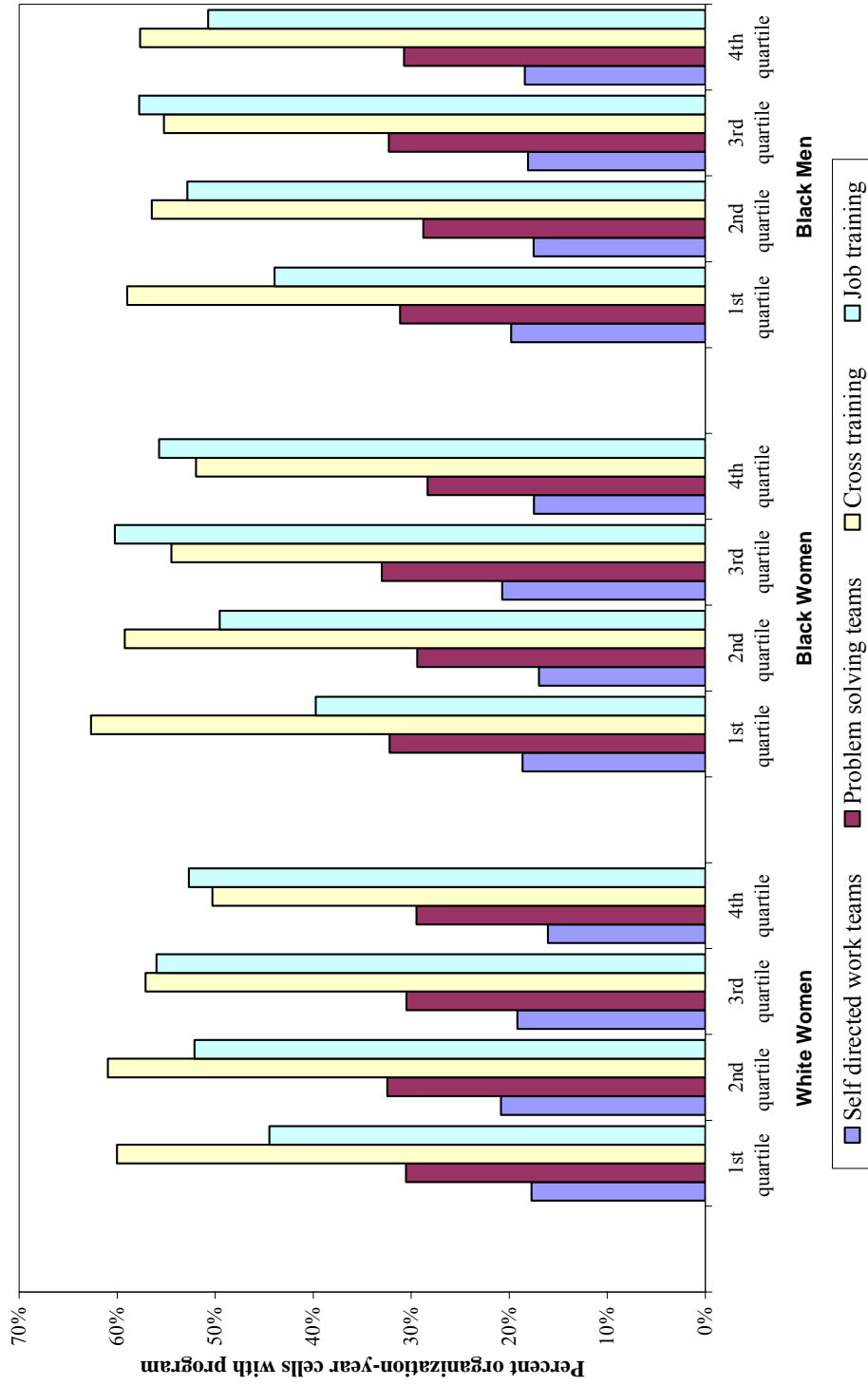
Table 2 (Continued)

	White Men	White Women	Black Women	Black Men
White men in industry labor force (log)	0.400 ** (0.086)	-0.240 ** (0.090)	0.123 (0.082)	0.151 (0.088)
White women in industry labor force (log)	-0.037 (0.059)	0.235 ** (0.063)	0.151 * (0.056)	-0.084 (0.061)
Black women in industry labor force (log)	-0.042 (0.022)	0.037 (0.024)	-0.023 (0.021)	0.051 * (0.023)
Black men in industry labor force (log)	-0.058 * (0.025)	0.048 (0.026)	0.030 (0.024)	0.008 (0.025)
White men in state labor force	0.192 (0.350)	-0.097 (0.370)	-1.349 ** (0.333)	-0.020 (0.359)
White women in state labor force	-0.493 (0.294)	1.070 ** (0.312)	-0.439 (0.280)	0.056 (0.302)
Black men in state labor force	1.080 (0.720)	-0.378 (0.761)	-1.049 (0.687)	-1.614 * (0.740)
Black women in state labor force	-0.943 (0.604)	2.638 ** (0.639)	1.200 * (0.580)	0.245 (0.620)
<b><u>Organizations' environment</u></b>				
In-house legal counseling	-0.059 * (0.024)	0.104 ** (0.025)	0.023 (0.023)	0.074 ** (0.024)
Government contract	-0.013 (0.019)	0.039 * (0.020)	-0.036 * (0.018)	0.040 * (0.019)
Legal enforcement of anti-discrimination	-0.034 ** (0.008)	0.050 ** (0.008)	0.002 (0.007)	0.015 (0.008)
Unemployment rate	0.023 ** (0.004)	-0.026 ** (0.004)	-0.011 ** (0.004)	-0.002 (0.004)
Industry employment	0.023 ** (0.005)	-0.053 ** (0.005)	-0.007 (0.005)	-0.014 ** (0.005)
R-sq	0.2215	0.1936	0.2362	0.1305
N	14693	14693	14693	14693
Chi-sq	4464	3661	4635	1970
Number of parameters	53	53	53	53
Log Likelihood Ratio test	Chi-sq (16)=84.01 Probability >Chi=0.000			

Note: All independent variables are lagged by one year, excluding the proportion of managerial jobs. The analysis includes 20 variables for the years 1981-2001 (1980 is the omitted year and 2002 is included in the analysis only for calculating the outcome variable).

\*\* p<0.01; \* p<0.05; (two tailed test)

**Appendix Figure 1: The Presence of Teams and Training Programs by Workforce Composition**



## Appendix Table 1: Presence of Teams and Training Programs across Organizational Characteristics

	Self-Directed Work Teams	Problem Solving Teams	Cross Training	Job Training
<b>Industrial Sector</b>				
Manufacturing	32%	52%	82%	63%
Service	29%	45%	68%	73%
<b>Establishment Type</b>				
Headquarters	17%	27%	52%	55%
Branch	21%	34%	62%	53%
Single Location Firm	15%	29%	53%	46%
<b>Union</b>				
Non union	18%	29%	56%	54%
Union	18%	35%	59%	46%
<b># of Diversity Programs</b>				
0	15%	26%	53%	44%
1	28%	42%	70%	70%
2	29%	50%	67%	82%
3 or more	38%	54%	69%	80%
<b># of Work Family Programs</b>				
0	8%	16%	44%	35%
1	19%	29%	57%	50%
2	27%	47%	70%	65%
3 or more	32%	45%	72%	82%
<b>Size</b>				
Adopters Mean	843	790	705	780
Non Adopters Mean	692	673	884	659

Note: Percents are calculated from on all organization-year.

**Appendix Table 2 - Fixed Effects Estimates of the Log Odds that Managers are White Men, White Women, Black Women or Black Men, 1980-2002. Baseline Model.**

Unstandardized coefficients from a seemingly unrelated regression, standard errors in parenthesis.

	White Men	White Women	Black Women	Black Men
<b><u>Complementary Organizational Changes</u></b>				
Management Training Program	0.002 (0.015)	0.043 ** (0.015)	0.002 (0.014)	-0.020 (0.015)
Peer Review Evaluations	-0.002 (0.018)	0.025 (0.019)	0.014 (0.017)	0.034 (0.018)
Work-family accommodations	-0.041 ** (0.008)	0.034 ** (0.008)	0.021 ** (0.007)	-0.003 (0.008)
Organizational Downsizing	-0.032 * (0.016)	0.062 ** (0.017)	0.082 ** (0.015)	0.024 (0.016)
Percent managers in establishments	-1.339 ** (0.104)	0.795 ** (0.110)	-2.920 ** (0.098)	-2.186 ** (0.101)
Percent management hiring that is external (*10)	0.007 * (0.004)	-0.003 (0.004)	-0.003 (0.004)	-0.014 ** (0.004)
<b><u>Organizations' Structures</u></b>				
Formalization of personnel decisions	-0.001 (0.004)	-0.005 (0.004)	-0.010 ** (0.004)	-0.006 (0.004)
Affirmative-action plan	-0.053 ** (0.017)	0.037 * (0.018)	0.001 (0.016)	0.043 * (0.017)
Diversity programs	-0.046 ** (0.008)	0.059 ** (0.009)	0.043 ** (0.008)	0.015 (0.008)
Union agreement	-0.079 * (0.035)	0.027 (0.038)	-0.022 (0.034)	0.034 (0.036)
Establishment size (log)	-0.096 ** (0.012)	0.042 ** (0.013)	-0.549 ** (0.012)	-0.343 ** (0.012)
<b><u>Workforce Composition</u></b>				
Percent women in top management	-0.002 ** (0.001)	0.004 ** (0.001)	0.001 (0.001)	-0.003 ** (0.001)
Percent minorities in top management	-0.001 (0.001)	-0.002 (0.002)	0.008 ** (0.001)	0.013 ** (0.002)
Proportion of focal group in non-managerial jobs	1.060 ** (0.048)	1.226 ** (0.054)	0.469 ** (0.116)	1.539 ** (0.136)
No focal group in mgmt	-0.362 ** (0.046)	-0.223 ** (0.013)	-0.579 ** (0.012)	-0.156 ** (0.007)

Appendix Table 2 continues on next page

Appendix Table 2 (Continued)

	White Men	White Women	Black Women	Black Men
White men in industry labor force (log)	0.402 ** (0.086)	-0.246 ** (0.090)	0.126 (0.082)	0.155 (0.088)
White women in industry labor force (log)	-0.039 (0.059)	0.236 ** (0.063)	0.153 * (0.056)	-0.083 (0.061)
Black women in industry labor force (log)	-0.039 (0.022)	0.034 (0.024)	-0.024 (0.021)	0.050 * (0.023)
Black men in industry labor force (log)	-0.056 * (0.025)	0.045 (0.026)	0.031 (0.024)	0.010 (0.025)
White men in state labor force	0.189 (0.350)	-0.133 (0.370)	-1.327 ** (0.332)	0.032 (0.359)
White women in state labor force	-0.557 (0.295)	1.143 ** (0.311)	-0.424 (0.280)	0.080 (0.302)
Black men in state labor force	0.957 (0.720)	-0.266 (0.761)	-0.995 (0.687)	-1.553 * (0.740)
Black women in state labor force	-0.992 (0.605)	2.678 ** (0.639)	1.233 * (0.576)	0.286 (0.620)
<b><u>Organizations' environment</u></b>				
In-house legal counseling	-0.058 * (0.024)	0.104 ** (0.025)	0.023 (0.023)	0.074 ** (0.024)
Government contract	-0.011 (0.019)	0.035 (0.020)	-0.036 * (0.018)	0.041 * (0.019)
Legal enforcement of anti-discrimination	-0.035 ** (0.008)	0.052 ** (0.008)	0.001 (0.007)	0.012 (0.008)
Unemployment rate	0.024 ** (0.004)	-0.028 ** (0.004)	-0.011 ** (0.004)	-0.002 (0.004)
Industry employment	0.023 ** (0.005)	-0.051 ** (0.005)	-0.007 (0.005)	-0.015 ** (0.005)
R-sq	0.2191	0.1917	0.2355	0.1290
N	14693	14693	14693	14693
Chi-sq	4415	3616	4615	1940
Number of parameters	49	49	49	49

Note: All independent variables are lagged by one year, excluding the proportion of managerial jobs. The analysis includes 20 variables for the years 1981-2001 (1980 is the omitted year and 2002 is included in the analysis only for calculating the outcome variable).

\*\* p<0.01; \* p<0.05; (two tailed test)

**Appendix Table 3 - Estimated Average Differences in Managerial Composition Following the Adoption of Teams and Training Programs (Based on the Sample Mean Proportion of Each Group in Management).**

	<b>White Men</b>	<b>White Women</b>	<b>Black Women</b>	<b>Black Men</b>
<b>Baseline - mean proportion in management</b>	<b>0.679</b>	<b>0.233</b>	<b>0.0146</b>	<b>0.0253</b>
<b>Self-directed work teams</b>				
Estimated proportion with the program	0.662 **	0.246 **	0.0151 *	0.026 *
Percent difference due to the program	-2.5%	5.6%	3.4%	3.6%
Percentage point difference due to the program	-1.70	1.30	0.05	0.09
<b>Problem Solving Teams</b>				
Estimated proportion with the program	0.683	0.234	0.0136 *	0.024 **
Percent difference due to the program	0.6%	0.4%	-6.8%	-6.7%
Percentage point difference due to the program	0.40	0.10	-0.10	-0.17
<b>Cross-job training</b>				
Estimated proportion with the program	0.663 **	0.241 *	0.0151 *	0.026 *
Percent difference due to the program	-2.4%	3.4%	3.4%	2.8%
Percentage point difference due to the program	-1.60	0.80	0.05	0.07
<b>Job training</b>				
Estimated proportion with the program	0.680	0.231	0.0148	0.025
Percent difference due to the program	0.1%	-0.9%	1.4%	-1.2%
Percentage point difference due to the program	0.10	-0.20	0.02	-0.03

\* p<.05; \*\* p<.01