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Where the girls aren't: How firms, families, and educational specialization affect the gender gap in workplace authority

by

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Committee in charge:
Professor Heather Haveman, Chair
Professor Trond Petersen
Professor Jonathan Leonard

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ABSTRACT

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This dissertation is written as three separate, but related, papers. Each paper, examines a different aspect of the gender gap in workplace authority by asking where and how women lose out to men in access to management jobs in corporate America. I interrogate common, human capital arguments that women lack the relevant skills and experience to be managers and find that women's qualifications are not holding them back. Gender roles, stereotypes, and decision makers' biases in predominantly smaller American firms keep highly qualified, college-educated women out of management.

In "Where to mind the gap: Variation in gender gaps in management across firms and levels of educational attainment," I examine how higher education affects the differential allocation of men and women into management occupations with different levels of authority across employing organizations of different sizes. Results from logistic regression models using the *Current Population Survey March Annual Demographic Supplement (CPS) 2003-2011* show that although gender gaps in managerial authority are wider among workers with bachelor's and master's degrees compared to workers without college degrees, these gaps are narrower in larger firms compared to smaller ones. The gender gap in authority among those with professional degrees is not statistically significant and the gender gap in authority among PhDs favors women in all but the largest firms, where it disappears. The results imply that gender gaps in managerial authority are not ubiquitous, but are contingent upon both educational attainment and the firms where people work.

In "A matter of degrees: Educational specialization and the gender gap in authority and returns to authority among American college-graduates," I examine whether business and economics degrees and science, technology, engineering, and mathematics (STEM) degrees are more likely to lead to jobs with authority in corporate America than bachelor's degrees in the humanities. After finding that college graduates in the private sector are more likely to be managers and supervisors, and that managers and supervisors have more authority and higher earnings, if they have business, economics, science and engineering degrees, I ask if these authority returns to degrees are equal for men and women seeking access to authority positions and for men and women who are already managers and supervisors. I find that gender

differences in access to authority are mainly confined to business degrees, bachelor's degrees in economics, and bachelor's and master's degrees in engineering. Gender differences in span of control and earnings within the authority hierarchy are mostly confined to supervisors with business, economics, and engineering degrees. These results imply that women's inroads into higher education in these fields will do little to curb the gender gap in authority, if American corporate culture continues to denigrate feminized fields in the humanities, while venerating masculine prowess at managerial activities that require competence in analytical reasoning and mathematics.

In "It's all in the family: How gender differences in working hours, work experience, and family structure explain gender gaps in authority and returns to authority among American college-graduates," I examine why college-educated women are, relative to men, underrepresented in positions of authority in the workplace as managers and supervisors and why they earn less in these positions. Results from the 2003 National Survey of College Graduates (NSCG) show that gender differences in working hours, work experience, and the resources imparted by a spouse's employment status explain most of the gender gap in authority and a large portion of the gender gap in financial returns to authority. Men enjoy an authority bonus from traditional family structures – that is, fathers are more likely to have authority in the workplace than non-fathers and men with less career-committed spouses earn higher salaries than men with wives who work full-time. Although motherhood does not directly affect women's workplace authority or their earnings, children exert an indirect negative effect on women's workplace authority by decreasing women's working hours. The negative effect of children on women's working hours is even larger if she has a husband who works full-time.

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This dissertation is dedicated to Julien Blake, whose laughter and love always remind me of the lighter side of life.

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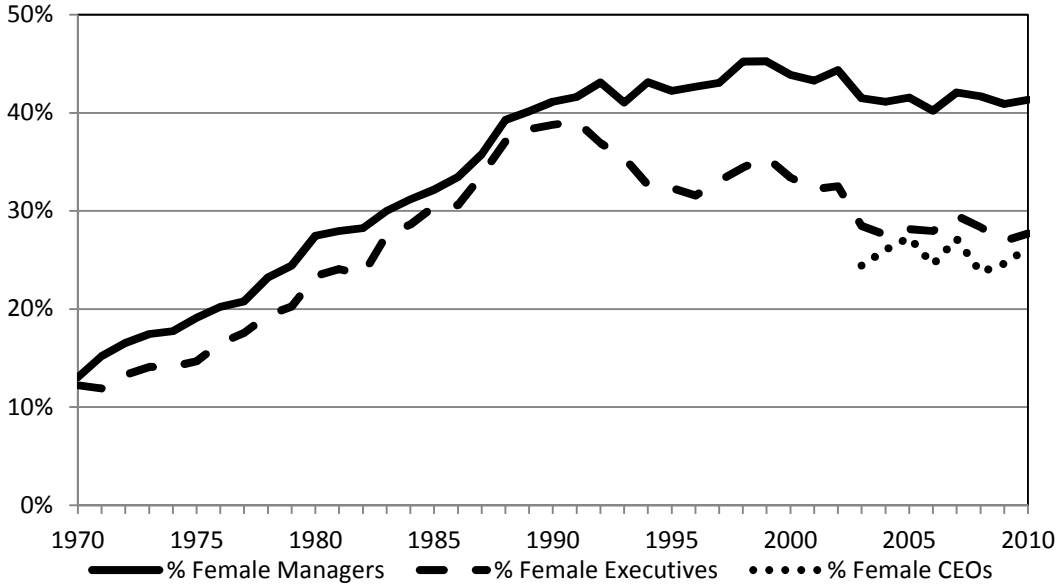
CHAPTER 1: Introduction

Gender still matters if you want to be the boss (Reskin and McBrier, 2000). Although women made significant inroads into management in the 1970s and 1980s, in the 1990s women's progress into the ranks of management "stalled and their gains among top, high-paying management jobs began to wither away" (Cotter, Hermsen, and Vanneman, 2004; Cohen, Huffman, and Knauer, 2009). Figure 1.1 shows that in 1970 only 13 percent of managers in the private sector were women; in 1998 45 percent were women.[1] In 2010, the percentage of female managers in the private sector declined to 41 percent, even though women's share of the civilian labor force rose to 47 percent (U.S. Census Bureau 2011, Table 604).

Figure 1.1: Percent Women Managers in the Private Sector, 1970-2010



Women in top management jobs have fared worse. As Figure 1.1 shows, 12 percent of executives in the private sector were women in 1970; women's representation in executive jobs rose to 39 percent in 1991 and then dropped to 28 percent in 2010.[2] The upward trend in women's representation was weaker for executives (12 to 39 percent) than for managers as a whole (12 to 45 percent), and the recent downward trend was more pronounced for executives (39 to 28 percent women) than for managers as a whole (45 to 41 percent). Among Chief

[1] This figure includes all Census Bureau occupation codes that are relevant to the private sector: occ1990 = 4, 7, 8, 13, 14, 15, 16, 17, 18, 19, 21, and 22. Similar trends are seen when using data from the decennial census and the Equal Employment Opportunity Commission (Cohen, Huffman, and Knauer 2009).

[2] Before 2003, the Current Population Survey had a valid count for executives, but not for CEOs (Mary Bowler, U.S. Census Bureau, personal communication, December 2010). Occupation codes were revised between 2002 and 2003, when a valid code for CEO was created (occ=1, which improved on occ1990=4). Before 2003, figures for executives are based on the occupation code "managers n.e.c." ("not elsewhere classified," occ1990=22); most executive-rank employees are in this category and most employees in this category are executives (Mary Bowler, U.S. Census Bureau, personal communication, December 2010). After 2003, figures for executives include both managers n.e.c. (occ1990=22) and the new CEO code (occ=1/occ1990=4).

Executive Officers (CEOs), the top managerial rank, the percentage of female CEOs was stagnant from 2003 to 2010, ranging between 24 and 27 percent.[3]

Among the largest most powerful firms, women are rarely top corporate managers (Carter and Silva, 2010). From 1992 to 2004, women constituted, on average, 1.3 percent of CEOs in Standard and Poor's 1500 firms (Wolfers, 2006). In 1995, the first year *Fortune* published a combined list for manufacturing and service firms, there were no female CEOs in the Fortune 500 and just two in the Fortune 501-1000; in 2010, 11 Fortune 500 and 14 Fortune 501-1000 companies had female CEOs (Catalyst, 2010). As of January 2014, women constituted a mere 4.6 percent of managers leading the largest, most powerful private-sector firms (Catalyst, 2014).

Why should we care about management jobs and whether or not women are managers? Management jobs are important because they confer authority on their incumbents, from which status, autonomy, and high incomes follow (Reskin and Ross, 1992; England, Herbert, Kilbourne, Reid, and Megdal, 1994; Wright, 1997; Cohen and Huffman, 2007; Choi, Leiter, and Tomaskovic-Devey, 2008). Authority is the "probability that a command with a given specific content will be obeyed by a given group of persons" (Weber, 1968: 53). In modern society, authority legitimately governs relations between super- and sub-ordinates and rests in social positions or roles (Dahrendorf, 1959; Weber, 1968). Authority is different from power in traditional societies, which adheres in the personalities of charismatic individuals. Authority can be measured by ownership, sanctioning (the ability to influence pay or promotions), span of control (number of subordinates under supervision), decision-making or managerial authority over how to organize work, and formal hierarchical authority related to ones position in the organizational structure (Smith, 2002).

Authority is nested in organizational structures formed by the allocation of workers into different functional positions (i.e., occupations and jobs) and the relations among different position-holders. Occupational titles, such as manager and CEO, not only define who has legitimate authority, but also the status of groups of workers occupying similar positions. Women and men are segregated into particular occupations (e.g., female teachers and nurses, male engineers and construction workers) and within occupations into jobs defined by their duties (e.g., female pediatricians and male surgeons) (Acker, 2006). Jobs are markers of status that people use to size others up. Why else would you ask the lonely man or woman at the bar what he or she does for a living?

Jobs with great authority also have lots of autonomy, which allows workers to control their schedules, pace of work, and the conceptual aspects of their work (Wright, 1985; Adler, 1993). Differences in autonomy between men and women are explained partly by occupational segregation, but more so by differences in authority between the positions men and women occupy (Adler, 1993).

Authority also has implications for income inequality. Unequal financial rewards are legitimately allocated by occupation and justified based on the authority of a position (Halaby

[3] Due to lack of valid data before 2003, it is not possible to conduct the same trend analysis for Chief Executive Officers (CEOs).

1979; Wright, Baxter, and Birkelund, 1995). Wage disparities between women and men follow from the under-representation of women in management. Yet occupational disparities do not explain the entire gender wage gap. Indeed, women receive lower incomes than men occupying similar positions of authority, and such disparities are more acute at higher levels of authority and among those who exercise control over monetary resources and personnel (Smith, 2002). This phenomenon of larger wage disparities at higher levels in organizations is referred to the "glass ceiling" effect.

Women's representation in management matters because organizations with more women in management are more equitable organizations. Women's presence in management reduces gender inequality at all organizational levels. For instance, workplaces with more female managers are less segregated by gender (Baron, Mittman, & Newman, 1991; Huffman, Cohen, and Pearlman, 2010), and more likely to hire female managers (Cohen, Broschak, and Haveman, 1998). This has implications for the distribution of wages within and between organizations. Organizations with larger proportions of female managers and supervisors have less wage inequality (Hultin and Szulkin, 2003). Local industrial niches with more or higher-status female managers have smaller gender wage gaps among non-managers (Cohen and Huffman, 2007).

Gender equality may also be good for business. Organizations with more women enjoy higher sales revenues, larger customer-bases, and larger relative profits than male-dominated organizations (Herring, 2009). Although more diverse organizations may encounter more conflict than homogenous ones (Williams and O'Reilly, 1998), diversity is also associated with innovation and creativity as well as improved decision making and problem solving among organizational leaders (Bassett-Jones, 2005).

Organizations are microcosms of society where the occupational class structure of a society is built by decision makers who select workers for jobs, but this structure becomes increasingly unequal if members of all groups are not able to exchange equivalent levels of education and work experience for jobs of equal status and pay (Treiman, 1977). In short, if we care about equalizing conditions among all social groups (e.g., the universal expansion of higher education), we should also care that equality of outcomes will follow suit.

How can we explain why women continue to be under-represented in management? Sociologists and economists often argue that gender disparity in management is due to individual differences between men and women. Economists argue that women lack the requisite human capital to be managers either because they lack work experience or specialized skills and knowledge (e.g., Bertrand, Goldin, and Katz, 2010). It is difficult to argue that women lack the degrees needed to access management positions because women outnumber men as bachelor's and master's degree holders. Women have also reached parity with men among MBAs – degrees that increasingly feed the pipeline into management (Cappelli and Hamori, 2004; National Center for Education Statistics, 2012). Furthermore, gender differences in degree fields of specialization explain little of the gender gap in occupational attainment in general or the gender gap in management in particular (Wienberger, 2011; Abendroth, Maas, and van der Lippe, 2013).

However, women's returns to education, relative to men's, may depend on their employer's propensity to discriminate. Larger organizations are more formalized than smaller ones with written, systematized personnel policies and practices that reduce gender discrimination and increase decision maker's reliance on education in hiring decisions (Stolzenberg, 1978; Reskin and McBrier, 2000). Larger organizations are also more likely than smaller organizations to fall subject to affirmative action and equal opportunity laws that require them to have accountability structures that ensure hiring decisions are meritocratic (DiPrete and Grusky, 1990; Kalev, Dobbin, and Kelly, 2006). Decision makers in larger organizations may evaluate men's and women's education more similarly than decision makers in smaller organizations where lack of formalization opens the door to bias, cronyism, and sex stereotyping in hiring decisions (Reskin and McBrier, 2000).

Gender disparity in workplace authority may also be degree dependent. As bachelor's and master's degrees become more ubiquitous, employers may be looking for more fine-grained distinctions to separate the wheat from the chaff. Employers may doubt women's competence and productivity more if they hold degrees that signal general rather than scarce, specialized knowledge. Women are more likely than men to earn degrees in the humanities, which impart communication and socio-cultural skills, whereas men are more likely to earn degrees that require mathematical skill and analytical reasoning (Gerber and Cheung, 2008, Owen, 2008). Male-dominated degree fields that emphasize strategic management and numeracy such as business and economics degrees as well as degrees in science, technology, engineering, and mathematics (STEM), feed the pipelines into management (Wilson and Smith-Lovin, 1983; Turner and Bowen, 1999; Black et al., 2008).

Yet even if women have the "right" degrees, they may still enjoy less workplace authority than men with the same degrees because organizational decision makers doubt women's competence in these fields due to widely held cultural beliefs about what men and women are good at. Employers subject these women to more competency testing where their performance at male-typed tasks is questioned and more stringently evaluated than men's (Heilman et al., 1995; Oakley, 2000). As a result, women with degrees in male-dominated fields may curb their career ambitions because they know two things:1) they will not be able to exchange their degrees for the same high status jobs as men and 2) even if they earn similar wages to men at the beginning of their careers, they will eventually hit a glass ceiling (Paglin and Rufolo, 1990). Women in male-dominated fields may also abandon their field or leave the corporate world altogether in search of more female-friendly workplaces.

Employers may not only doubt women's competence, but also their commitment. Employers may also expect family obligations to hamper women's dedication to work more so for women who have bachelor's degrees than women who hold degrees that take more time and commitment such as medical degrees and PhDs. Indeed, women may need to earn higher level degrees than men to get access to the same levels of authority to combat employers that doubt their competence and commitment to their careers.

Sociologists and feminist scholars further argue that traditional gender roles are incompatible with the culture of the corporate world that demand managers put work first and family second (e.g., Blair-Loy, 2003). This means that gender differences in work experience

and working hours, which may be used to justify promoting a man to management rather than an equally educated woman, may be the result of gender roles that demand longer hours from men at the office and longer hours from women at home (Spain and Bianchi, 1996; William, 2010. Furthermore, men and women in the corporate world have very different family structures that lend support to their careers – men are more likely to be married to a spouse who spends most or all of her time caring for the couple's home and children, whereas women are more likely to be single or married to a career-driven husband who works full-time (Davidson and Burke, 2000; Kirchmeryer, 2002). Men's family structures support their careers, whereas women's do not.

In this dissertation, I address these multiple causes of the gender gap in management through three stand-alone papers. Chapter 2 presents the first paper, where I explore whether gender gaps in management are pervasive across firms of different sizes and among Americans with different levels of education. Chapter 3 delves more deeply into gender-based educational disparities in management by focusing on American college graduates and asking if business, economics, and STEM degrees confer more authority and higher earnings to male than female workers and managers in corporate America. Finally, in Chapter 4 I interrogate how disparities in working hours, work experience, and family structures lead to college-educated women's under-representation in management. Chapter 5 summarizes my findings, discusses the implications of this research, and proposes areas of future research. I conclude that women are under-represented in management not because they are less qualified than men, but because of cultural impediments in the firm, the family, and in our educational institutions that prepare men to rule the boardroom and women, the home.

CHAPTER 2 - Where to mind the gap: Variation in gender gaps in management across firms and levels of educational attainment

Introduction

Jobs with authority are good jobs (Choi, Leiter, and Tomaskovic-Devey, 2008; England et al., 1994; Reskin and Ross, 1992). People who occupy positions of authority in employing organizations – managers – control their own work and the work of others (Wolf and Fligstein, 1979) and reap substantial financial rewards and status from their positions (Wright et al., 1995; Choi, Leiter, and Tomaskovic-Devey, 2008; England et al., 1994; Reskin and Ross, 1992). Workers with authority have the legitimate power to not only control human resources, but also their organizations' physical and financial capital (Kalleberg, 2011).

Higher education has become an increasingly important conduit into management. In 1970, 25 percent of managers in the private sector had at least a bachelor's degree. By 2011, 57 percent of all managers in the private sector held a bachelor's degree or higher (U.S. Census Bureau, 1970-2011). At higher levels of management, higher education is even more important: in 2011, 73 percent of Chief Executive Officers (CEOs) held a bachelor's or advanced degree. In 2003, 62 percent of college-educated executive and mid-level managers, employed full-time in the private sector, held master's degrees in business (U.S. Department of Education, 1993-2003). These numbers suggest that higher education is particularly important for workers who aspire to climb the corporate ladder.

American women earn a large share of the degrees that lead to management jobs. In 2009-2010, women earned 57 percent of all bachelor's degrees and 60 percent of all master's degrees (National Center of Educational Statistics, 2012). These trends are not new; in 1981, women were earning more bachelors and master's degrees than men. In the field of business, the training ground for many managers, women earned 49 percent of business bachelor's degrees in 2009-2010. Women are also reaching parity with men in the attainment of law degrees and master's degrees in business (MBAs), which are associated with higher status management jobs (Useem and Karabel, 1986; Cappelli and Hamori, 2004). In 1989-1990, women earned 42 percent of law degrees and 34 percent of MBAs; in 2009-2010, women earned 47 percent of all law degrees and 46 percent of all MBAs (National Center of Educational Statistics, 2012).

Despite women's high levels of education, women are under-represented in management (Reskin and Ross, 1992; Cohen, Broschak, and Haveman, 1998; Reskin and McBrier, 2000; Carter and Silva, 2010). In 2011, women made up 42 percent of all private sector managers and 23 percent of all CEOs (U.S. Census Bureau, 1970-2011). Women are rarely at the helm of the largest, most powerful organizations. As of May 2013, women held 14.3 percent of all Fortune 500 executive officer positions and only 4 percent of all Fortune 500 CEO positions (Catalyst, 2013).

How can we explain the discrepancy between women's high levels of education and their low levels of authority in American corporations? Many researchers focus on the supply-side of this question arguing that highly-educated women opt out due to family obligations (Black et al.,

2008) or because of actual or anticipated discrimination (Petersen and Saporta, 2004). Women may also garner less authority from higher education than men (Wolf and Fligstein, 1979; Halaby, 1979; McGuire and Reskin, 1993) because they are less likely to earn degrees in fields that lead to management jobs. Women are more likely than men to earn degrees in the arts, humanities, and social sciences and less likely than men to earn degrees in science, technology, engineering, and mathematics (STEM) (Black et al., 2008). Meanwhile, the top ranks of large American corporations are increasingly filled by people with backgrounds in finance (Fligstein, 1987; Zorn, 2004) and in production, and technology (Ocasio and Kim, 1999), which require STEM degrees. Nonetheless, degree fields are desegregating (Morgan, 2008) and gender differences in majors only explain small portions of the gender gap in occupational attainment (Wienberger, 2011). Even when women earn degrees in STEM fields, employers may assume that education is a better predictor of men's productivity than women's because they may believe women are more likely to change their commitment to work if they have children, regardless of their previous investments in education (Correll and In Paik, 2007; Bertrand, Goldin, and Katz, 2010).

Researchers also plumb the mismatch between women's educational attainment and their workplace authority by concentrating on the demand side of the problem. They argue that women's returns to education, relative to men's, may depend on employers' propensity to discriminate, which varies according to the characteristics of the employing organizations where people work. Personnel policies and practices governing recruitment, hiring, promotion, evaluation, and retention affect women's representation in authority positions (Reskin and McBrier, 2000). These policies also affect the degree to which decision makers rely on education to select workers for management jobs. Formalized personnel policies and practices that are written and systematized (i.e., formalization) may increase the relevance of education (Stolzenberg, 1978) and, at the same time, reduce bias, cronyism, subjectivity, and sex stereotyping in personnel decisions (Reskin and McBrier, 2000). This may mean that decision makers evaluate men's and women's education more similarly in organizations with more formalized personnel policies.

Larger organizations are more formalized (Pfeffer, 1977) and formalization may be more effective at depersonalizing personnel decisions in larger than smaller organizations (Reskin and McBrier, 2000). Larger organizations are also more likely to be subject to affirmative action and equal opportunity regulations (DiPrete and Grusky, 1990) and have bureaucratic features such as affirmative action plans, diversity committees or taskforces, and diversity managers or departments that build in accountability to ensure hiring decisions are based on merit rather than gender (Kalev, Dobbin, and Kelly, 2006). Gender differences in authority returns to education may, therefore, be less in larger than smaller organizations.

However, gender differences in authority returns to education may be greater in larger organizations than smaller ones. Larger organizations are more hierarchical, with more elaborate divisions of labor, longer career ladders, and better-developed internal labor markets; characteristics that are associated with fewer women in management (Baron, Davis-Blake, and Bielby, 1986; DiPrete, 1989; Huffman, 1995; Tomaskovic-Devey and Skaggs, 1999). These organizational features may impede women's advancement into management jobs even if they have high levels of education because larger organizations may require more specialized types or

degrees that women are less likely to have (e.g., MBAs in finance) to fill more specialized management jobs.

This study builds on previous research about the relationship between organizational size, education, and occupational attainment in three important ways. First, it challenges the assumption that education has the same positive impact on authority for men and women across firms of different sizes. Second, it builds on earlier findings about differences in the effect of education on occupational attainment across firms of different sizes by examining these effects for management occupations. Finally, this study draws on a large, nationally representative dataset. Previous research has relied on data from small, outdated samples of American workers (e.g., Kalleberg, Wallace, and Althauser, 1981), graduates of a single school (e.g., Bertrand, Goldin, and Katz, 2009), small samples of firms (e.g., Baron, Davis-Blake and Bielby, 1986), or employees in a single industry (e.g., Cohen et al., 1998).

The purpose of this study is to evaluate if the gender gap in management occupations (i.e., managerial authority) varies both across different levels of education and organizations of different sizes. Below, I discuss how education and the features of employing organizations affect the gender gap in managerial authority. I build hypotheses about how the gender gap in management may vary by organizational size and according to workers' educational attainment.

Theory and Hypotheses

To understand the relationship between education, organizational size, and women's representation in management it is first necessary to understand how decision makers in different types of organizations select men and women for management jobs. In general, decision makers in organizations select workers for jobs based on beliefs about workers' future productivity (Baron and Bielby, 1980). In the absence of perfect information about workers' productivity, decision makers rely on observable, merit-based indicators of workers' skills and abilities; such as, education and work experience (Spence, 1973). But organizational decision makers may also rely on ascribed characteristics, including gender, to make assumptions about workers' productivity (Reskin and McBrier, 2000). Decision makers in organizations, who are predominately men, may believe women are not as well-suited as men for management jobs because they believe managers should exhibit more masculine traits and women are too "emotional" to be managers (Kanter, 1977; Eagly and Carli, 2007). Also, because there are more men in management jobs, decision makers are more familiar with male managers so they reduce the risk of inaccurately predicting performance by selecting male managers, who also happen to be similar to themselves (Reskin and McBrier, 2000). Decision makers may also believe that even highly qualified women will be less productive than comparable men because of actual or perceived competing family responsibilities (Correll, Bernard, and In Paik, 2007).

Organizational size affects the extent to which decision makers rely more on ascribed characteristics or meritocratic criteria when selecting workers for jobs because firm size affects personnel practices, specifically the level of formalization and use of written rules (Stolzenberg, 1978; Pfeffer and Cohen, 1984; Reskin and McBrier, 2000). Decision makers in larger organizations are less likely to use ascribed criteria and more likely to use meritocratic criteria

for selecting managers than decision makers in smaller organizations because larger organizations are more formalized and rely more on written, systematized rules and procedures governing recruiting, hiring, and promotion than smaller organizations (Pfeffer, 1977). Formal rules limit decision makers' discretion, making it more difficult to select managers on the basis of personal preferences and tastes (Pfeffer, 1983; Anderson and Tomaskovic-Devey, 1995; Reskin et al., 1999). Structures found mostly in larger organizations, including affirmative action plans, diversity committees or taskforces, and diversity managers or departments, also hold decision makers accountable and reinforce meritocratic hiring criteria (Peterson and Saporta, 2004; Kalev, Dobbin, and Kelly, 2006; Baron et al., 2007). Indeed, Max Weber celebrated the formalized, meritocratic basis of hiring decisions as a hallmark of bureaucracy that would stamp out hiring practices based on personal ties, preferences, or ascribed characteristics (Weber, 1968). Therefore, other relevant variables being equal:

> Hypothesis 1: The gender gap in management will decrease with organizational size.

At the same time that formalization may reduce the use of gender as a proxy for productivity, it may also increase reliance on education as a signal of productivity. The standardized personnel policies found in larger organizations cause decision makers to rely more on education because larger organizations must base personnel decisions on widely accepted measurements of cognitive ability that implicate future productivity (Stolzenberg, 1978). One study showed that the effect of education on occupational attainment and earnings increased with organizational size (Stolzenberg, 1978). These findings may apply to workers' attainment of managerial occupations because managers occupy positions with high pay, status, and control over the means of production (Smith, 2002). Therefore, other relevant variables being equal:

> Hypothesis 2: The impact of education on the likelihood that a worker is a manager will increase with organizational size.

The magnitude of the gender gap in management may also depend on educational attainment. Although highly educated women are more attached to the labor force than their lesser educated counterparts (i.e., they are less likely to reduce their working hours or leave the labor force once they have children), highly educated women are more likely to be penalized for real or perceived competing family obligations than equally educated men (Correll and In Paik, 2007; Bertrand, Goldin, and Katz, 2010). Furthermore, there is reason to believe that women and men may not enjoy equal returns to education not simply because men are more likely than women to earn advanced degrees in the fields that are connected with the pipeline into management – that is, business and STEM fields – but because employers are far more likely to doubt women's competence in specialized fields (Fligstein, 1987; Ocasio and Kim, 1999; Black et al., 2008; Benard and Correll, 2010). Therefore, other relevant variables being equal:

> Hypothesis 3a: The gender gap in management will be larger among more highly educated workers.

There is also reason to believe that the gender gap in management may be narrower among workers with advanced degrees (Morgan, 2008). Discrimination against women with

well-defined, advanced degrees may be more costly than against less educated women because such discrimination is more visible to highly educated women who may pursue litigation and it is more visible to other internal and external constituents that organizations depend on for legitimacy (e.g., regulatory bodies, customers, professional groups and unions) (Petersen and Saporta, 2004). Women's higher level degrees (e.g., professional degrees in law and medicine) may also help employers overcome gender bias because they provide objective information about workers' productivity (especially because of the universality of high school degrees and increasing ubiquity of college degrees that are usually required to access good jobs) (Reskin, 2000; Morgan, 2008). Those with higher levels of education are presumed to have better defined career plans because their degrees are more intimately connected to well-defined jobs. Therefore, other relevant variables being equal:

> Hypothesis 3b: The gender gap in management will be smaller among more highly educated workers.

The attenuating effect of education on the gender gap in management may also vary by firm size. There are two possibilities. On the one hand, if women are indeed better off in larger firms, and if education and authority are more positively correlated in larger firms, then women may benefit just as much as men from their education in large firms. The formal personnel policies found in larger firms should reduce biases among decision makers that keep women, compared to similarly educated men, out of the ranks of management. Furthermore, discrimination against highly-educated workers is less likely to occur in larger firms compared to smaller ones because larger firms are more likely to have to answer complaints from larger, more powerful external and internal constituents (e.g., EEOC, class action lawsuits) that are more likely to pursue punitive litigation on behalf of savvy employees that know how to navigate the legal system. In contrast , accusations of discrimination in smaller firms usually come from individuals, who are more likely to settle discrimination disputes out of court, even if they have a keen understanding of the legal bureaucracy. Therefore, other relevant variables being equal:

> Hypothesis 4a: The attenuating effect of education on the gender gap in management will increase with organizational size (i.e., the gender gap in management will be narrower or non-existent in larger firms at higher levels of education.)

On the other hand, the gender gap in management may be larger at higher levels of education in larger organizations compared to smaller ones. One study showed that education improves men's incomes more than women's in larger establishments, but in smaller establishments, education pays off more for women (Kalleberg, Wallace, and Althauser, 1981). Another study showed that men secured greater returns to education in larger firms than smaller firms, but women's returns to education did not vary by firm size (Villemez and Bridges, 1988). Although these studies analyze earnings rather than authority, they provide evidence that men may accrue higher occupational benefits from education than women in larger firms. This might happen because decision makers in larger organizations may be more likely to associate men's education with productive attributes than women's because they presume women's productivity will be hampered by family responsibilities that cause women to acquire fewer firm-specific skills. Education may therefore provide a weaker signal of women's productivity relative to

men's in larger firms where managerial responsibilities are greater and require more firm-specific experience and knowledge given that managers in larger firms supervise the work of more people, make decisions that affect larger amounts of financial capital, and manage relationships with more powerful exchange partners. Therefore, controlling for other relevant variables:

> Hypothesis 4b: The attenuating effect of education on the gender gap in management will decrease with organizational size (i.e., the gender gap in management will be wider in larger firms at higher levels of education.)

Data and Measures

To test my hypotheses, I analyze the *Current Population Survey March Annual Demographic Supplement (CPS) 2003-2011*, which is distributed by Integrated Public Use Microdata Series (King et al., 2010). The CPS is conducted by the U.S. Census Bureau and the Bureau of Labor Statistics; it is a nationally representative sample of the civilian, non-institutionalized population. From 2003-2011, the CPS includes demographic, occupational, and educational information for over 1 million persons. Detailed occupation codes for managers in the CPS permit the analysis of CEOs. I chose the years 2003-2011 because valid data for CEOs were not collected by the CPS until 2003. Prior to 2003, most CEOs were lumped into the occupational category "managers and administrators not elsewhere classified." I use data up to 2011 because this was the latest year of data available when I conducted the analysis.

I restrict my analysis to workers ages 30 to 65 with at least a high-school education who worked full-time (35 hours or more per week) and full year (50-52 weeks per year) in the private sector for a single U.S. employer in the previous year and remain employed in the private sector as of March in the survey year. These restrictions ensure that the sample includes private sector workers who are highly attached to the American labor market. The sample includes 291,833 workers, of which 41,561 are managers and 5,067 are CEOs.

My primary motivation for using the CPS is its large sample of managers and CEOs coupled with measures of firm size and education. Although other nationally representative data sources (e.g., National Longitudinal Survey of Youth 1979; Panel Study of Income Dynamics; National Survey of College Graduates) have similar measures, they have far fewer observations for managers and even fewer observations for top-level managers.

Dependent Variables

I predict authority attainment with two dependent variables. The first, which is measured for all workers in the sample, is coded "1" if a worker is a manager and "0" otherwise. Following previous researchers (Cohen, Huffmann, and Knauer, 2009), I defined workers as managers if they are in Census occupation codes 1 through 43. These detailed Census codes categorize managers according to the type of work they perform. For example, my definition for manager includes financial managers and construction managers who may have different types of industry knowledge, but serve similar functions and have authority over other workers in their

organizations. According to the U.S. Census Bureau, workers categorized as managers are primarily engaged in planning and directing, as well as supervision (U.S. Bureau of Labor Statistics, 2010). I rely on self-reported occupation last year, rather than the reported occupation in the survey year, because firm size measurements pertain to the occupation the respondent held in the previous year, and not during March of the survey year.

The second dependent variable, which is measured for managers only, is coded "1" if the manager is a Chief Executive Officer (CEO) and "0" otherwise. Managers are CEOs if they are in the Census occupation code for Chief Executives (code 1). Managers that are CEOs should have more similar skill levels, perform more similar activities, and have jobs that require more comparable levels of education than managers as a whole (U.S. Bureau of Labor Statistics, 2010). Chief executives also represent a higher level of authority because they control the work of more workers and have greater influence over decisions regarding the working conditions in their organizations.

Independent Variables

The key independent variables are gender, education, and firm size. I measure gender with a dummy variable equal to "1" if the respondent is female and "0" if the respondent is a male. Table 2.1, which reports descriptive statistics (discussed below), shows that women make up 43 percent of workers in the sample. Women are under-represented among managers and CEOs: they make up 38 percent of all managers and 25 percent of CEOs.

The CPS measures education according to respondents' highest degree attained. Respondents with at least a high school education fall into seven categories: high school diploma or equivalent, some college but no degree, associate's degree, bachelor's degree, master's degree, professional degree, and doctoral degree. I collapse the categories for high school, some college, and associate's degree into a single category that represents workers in the sample without bachelor's degrees. I focus on the difference having a bachelor's degree or higher makes on the attainment of a management job because higher education is positively related to the attainment of a management job (Useem and Karabel, 1986). The omitted category is, therefore, workers without bachelor's degrees. Approximately 65 percent of the workers in the sample do not have a bachelor's degree, 23 percent have at least a bachelor's degree, 8 percent have master's degrees, 2 percent have professional degrees, and 2 percent have doctorates. Professional degrees are classified according to the same degree scheme implemented by the *Digest of Educational Statistics* and primarily include medical, health-related degrees (e.g., pharmacy and dentistry degrees), and law degrees (U.S. Department of Education, 2010).

Unfortunately, it is impossible to distinguish between the effects of degrees in different fields because the CPS does not ask respondents about their field of study. Although there is a great deal of variation in fields of study for bachelor's degrees, masters and professional degrees are earned in fewer fields than bachelor's degrees (U.S. Department of Education, 2010). Of those with master's degrees working full-time in the private sector in 2003, 50 percent held masters' degrees in business and management and 28 percent held master's degrees in STEM fields (U.S. Department of Education, 1993-2003). Therefore, the effect of having a master's

degree should largely reflect the positive effects of expertise in these fields.[4]

The CPS measures organizational size as the total number of people working at *all* locations for the respondent's employer last year. This measure of organizational size captures firm size rather than establishment size, meaning the location where the respondent works. Firm size is positively correlated with establishment size (Mellow, 1982) and should convey part of the effect of establishment size (Hollister, 2004). Firm size, nonetheless, may better capture formalization than establishment size because formalization is likely to be greater in smaller establishments that belong to larger firms than in smaller establishments of smaller firms.

The CPS variable for firm size is based on six categories: 1) less than ten, 2) 10 to 24, 3) 25 to 99, 4) 100 to 499, 5) 500 to 999, and 6) 1000 or more employees. I converted this categorical measure into a continuous measure of firm size by plotting the cumulative distribution at the maximum value of each category and then fitting a logarithmic line to this distribution (Hollister, 2004). Using the equation for this line, I calculated the median firm size for each category. I recoded each categorical value of firm size to take on this median value and finally took the natural log of the continuous firm size measure. Earlier analyses with dummy variables for firm size produced similar results, but a continuous measure of firm size simplified modeling procedures, while allowing me to include all firm size categories.

Controls

Management jobs are time-intensive (Jacobs and Gerson, 2004; Collinson and Collinson, 2004). Table 2.1 shows that the mean number of hours worked per week are greater for managers than all workers. One explanation for women's under-representation in management is that women work fewer hours than men due to familial obligations (Bertrand et al., 2010). I, therefore, control for working hours with a continuous variable equal to the number of usual hours worked per week. I also control for marriage with a dummy equal to "1" if the respondent is married and living with their spouse and "0" otherwise. I control for children with a continuous variable for the number of own children living with the respondent and a dummy variable equal to "1" if the respondent has a child under age five and "0" otherwise.

I also include a set of control variables for year, race, foreign-born status, age, region, and industry. Year is included as a linear measure equal to "0" in 2003 and increasing by one thereafter. I control for race with a set of dummy variables including white, black, Asian, and other. The omitted category is white. I control for foreign-born status with a dummy variable equal to "1" if the respondent was born outside the U.S. and "0" otherwise. I include controls for age and age squared because workers' occupational attainment generally increases with age, but the positive effect of age may diminish over time (Powell and Butterfield, 1994). I control for region with a series of dummy variables for northeast, Midwest, south, and west. The omitted category is south. I control for industry with a series of dummy variables based on a recode of private-sector 2000 Census industry codes into ten major industries: 1) agriculture, fishing, forestry, and mining; 2) construction; 3) manufacturing; 4) transportation, communication, and other utilities; 5) wholesale trade; 6) retail trade; 7) finance, insurance, and real estate (FIRE); 8)

[4] Although a large portion of master's degrees are also earned in education, most of these workers are employed in the public sector. Only 6 percent of workers with master's degrees in the sample were teachers.

business and personal services; 9) entertainment; and 10) professional services. The omitted category is manufacturing.

Methods of Analysis

I estimate two sets of logistic regression models: the first predicts whether or not a worker is a manager for the full sample of workers and the second predicts whether or not a manager is a CEO for the subsample of managers. I begin the analysis with the following logistic regression model:

$$P(Y = 1|x_1, \bar{x}_2, x_3, \tilde{x}) = F\left(\beta_1 x_1 + \beta_2 \bar{x}_2 + \beta_3 x_3 + \tilde{x}\tilde{\beta}\right) = F(x\beta)$$

where Y is a binary dependent variable for management occupations, x_1 is a binary variable for gender (female=1), $\bar{x}_2$ is a set of binary variables for education, x_3 is the natural log of firm size, β_j are the associated coefficients, $\tilde{x}\tilde{\beta}$ is the linear combination of all remaining explanatory variables and coefficients (Cornelissen and Sonderhof, 2009), and F is the cumulative density function of the logistic distribution. This model assumes that the effects of education and firm size are the same for men and women. To test hypotheses about gender differences in the effect education across firms of different sizes, I add two-way and three-way interactions to the model. The logistic regression equation is:

$$P(Y = 1|x_1, \bar{x}_2, x_3, \tilde{x}) = F(\beta_1 x_1 + \beta_2 \bar{x}_2 + \beta_3 x_3 + \beta_{12} x_1 \bar{x}_2 + \beta_{13} x_1 x_3 + \beta_{23} \bar{x}_2 x_3 + \beta_{123} x_1 \bar{x}_2 x_3 + \tilde{x}\tilde{\beta})$$

This model includes all lower-order components of the highest-order interaction term and is known as a hierarchically well-formulated model (Jaccard, 2001). In this way, I allow the effect of gender on the probability that workers are managers and managers are CEOs to vary over combinations of firm size and education. A two-way interaction is often referred to as a second difference (Cornelissen and Sonderhof, 2009). The triple interaction is the change of the second difference as firm size increases and all other variables are held constant. Education is the first-order moderator variable because it moderates the impact of gender on managerial representation. Firm size is the second-order moderator variable because it moderates the impact of the first-order moderator on the relationship between gender and managerial representation (Jaccard, 2001). The three-way interaction is therefore used to test the hypothesis that the moderating effect of education on the gender gap in management varies across firms of various sizes.

My models are estimated using survey weights to generate accurate standard errors. I use replicate weights, which allow a single sample to simulate multiple samples (IPUMS, 2012). The use of replicate weights is recommended by IPUMS because people with some characteristics are over-represented and others are under-represented in the CPS sample.

Results

Table 2.1 presents descriptive statistics for the full sample of workers and the subsamples of managers and CEOs. The first row of Table 2.1 shows that very few workers are managers; approximately 14 percent of all workers are managers. Even fewer, approximately 2 percent, are CEOs. Table 2.1 also shows that managers and CEOs are mostly male (62 and 75 percent, respectively)

Table 2.1: Descriptive Statistics for the CPS 2003-2011

2003-2011 CPS Sample Statistics			All Workers		Managers		Female Managers		Male Managers		CEOs		Female CEOs		Male CEOs	
			N = 291,833		N = 41,561		N=15,485		N=26,076		N=5,067		N=1,235		N=3,832	
Variables	min	max	mean	s.d.	mean	s.d.	mean	s.d.	mean	s.d.	mean	s.d.	mean	s.d.	mean	s.d.
manager	0	1	0.143	*0.358*	1	*0*	1	*0*	1	*0*	1	*0*	1	*0*	1	*0*
CEO	0	1	0.018	*0.134*	0.123	*0.335*	0.083	*0.280*	0.147	*0.363*	1	*0*	1	*0*	1	*0*
gender (female=1)	0	1	0.431	*0.507*	0.377	*0.495*	1	*0.000*	1	*0*	0.254	*0.443*	1	*0*	1	*0*
less than bachelor's	0	1	0.654	*0.487*	0.428	*0.505*	0.481	*0.507*	0.397	*0.501*	0.242	*0.436*	0.353	*0.477*	0.204	*0.413*
bachelor's degree	0	1	0.234	*0.433*	0.371	*0.494*	0.342	*0.482*	0.389	*0.500*	0.459	*0.507*	0.396	*0.488*	0.480	*0.512*
master's degree	0	1	0.079	*0.276*	0.172	*0.386*	0.154	*0.367*	0.183	*0.397*	0.244	*0.437*	0.207	*0.405*	0.256	*0.447*
professional degree	0	1	0.018	*0.137*	0.013	*0.115*	0.011	*0.105*	0.014	*0.121*	0.030	*0.174*	0.019	*0.137*	0.034	*0.185*
doctorate	0	1	0.015	*0.123*	0.015	*0.124*	0.013	*0.114*	0.017	*0.131*	0.025	*0.160*	0.024	*0.154*	0.025	*0.162*
firm size (logged)	1.609	8.743	5.938	*2.726*	6.013	*2.657*	6.019	*2.646*	6.010	*2.664*	5.427	*2.615*	5.337	*2.616*	5.457	*2.612*
time	0	8	4.034	*2.619*	4.067	*2.628*	4.089	*2.611*	4.054	*2.638*	4.044	*2.606*	3.963	*2.514*	4.071	*2.636*
age	30	65	45.040	*9.340*	45.598	*9.123*	45.315	*9.069*	45.769	*9.151*	48.403	*8.591*	47.835	*8.173*	48.597	*8.724*
age squared	900	4225	2112.015	*860.240*	2158.912	*846.589*	2133.164	*835.679*	2174.486	*852.790*	2414.071	*827.317*	2355.276	*780.057*	2434.071	*842.352*
white	0	1	0.821	*0.392*	0.887	*0.323*	0.866	*0.346*	0.900	*0.308*	0.939	*0.244*	0.918	*0.274*	0.946	*0.232*
black	0	1	0.108	*0.317*	0.056	*0.235*	0.079	*0.274*	0.043	*0.207*	0.021	*0.145*	0.037	*0.189*	0.015	*0.126*
asian	0	1	0.056	*0.236*	0.045	*0.213*	0.043	*0.206*	0.047	*0.217*	0.033	*0.183*	0.036	*0.185*	0.033	*0.182*
other	0	1	0.015	*0.125*	0.011	*0.108*	0.012	*0.112*	0.011	*0.106*	0.007	*0.085*	0.009	*0.095*	0.006	*0.082*
foreign born	0	1	0.151	*0.366*	0.114	*0.324*	0.103	*0.308*	0.121	*0.334*	0.096	*0.300*	0.098	*0.296*	0.096	*0.301*
south	0	1	0.354	*0.489*	0.341	*0.484*	0.349	*0.484*	0.336	*0.484*	0.332	*0.479*	0.369	*0.481*	0.319	*0.478*
north	0	1	0.197	*0.407*	0.206	*0.413*	0.201	*0.407*	0.209	*0.417*	0.219	*0.421*	0.202	*0.401*	0.224	*0.427*
midwest	0	1	0.242	*0.438*	0.227	*0.428*	0.222	*0.422*	0.230	*0.431*	0.224	*0.425*	0.205	*0.403*	0.230	*0.432*
west	0	1	0.207	*0.414*	0.226	*0.427*	0.228	*0.426*	0.225	*0.428*	0.226	*0.426*	0.223	*0.416*	0.226	*0.429*
manufacturing	0	1	0.186	*0.398*	0.194	*0.404*	0.118	*0.327*	0.240	*0.438*	0.163	*0.376*	0.061	*0.239*	0.198	*0.408*
agriculture, forestry, fishing, mining	0	1	0.013	*0.116*	0.014	*0.121*	0.006	*0.076*	0.020	*0.142*	0.014	*0.121*	0.009	*0.092*	0.016	*0.130*
construction	0	1	0.057	*0.236*	0.066	*0.254*	0.022	*0.148*	0.093	*0.298*	0.055	*0.231*	0.024	*0.153*	0.065	*0.252*
utilities, transportation, communications	0	1	0.096	*0.302*	0.095	*0.300*	0.074	*0.267*	0.108	*0.318*	0.077	*0.271*	0.058	*0.232*	0.084	*0.284*
wholesale trade	0	1	0.045	*0.213*	0.037	*0.193*	0.025	*0.158*	0.044	*0.211*	0.064	*0.249*	0.038	*0.191*	0.073	*0.266*
retail trade	0	1	0.115	*0.326*	0.051	*0.225*	0.048	*0.217*	0.054	*0.231*	0.056	*0.234*	0.058	*0.234*	0.055	*0.234*
finance, insurance, and real estate	0	1	0.106	*0.314*	0.161	*0.375*	0.214	*0.417*	0.129	*0.344*	0.274	*0.454*	0.383	*0.485*	0.237	*0.436*
business and personal services	0	1	0.066	*0.253*	0.058	*0.239*	0.059	*0.239*	0.058	*0.239*	0.069	*0.259*	0.079	*0.270*	0.066	*0.254*
entertainment	0	1	0.052	*0.227*	0.080	*0.277*	0.089	*0.289*	0.075	*0.269*	0.027	*0.164*	0.013	*0.115*	0.031	*0.178*
professional services	0	1	0.264	*0.451*	0.243	*0.438*	0.346	*0.483*	0.181	*0.395*	0.202	*0.409*	0.277	*0.446*	0.176	*0.390*
usual hours worked	35	99	43.378	*7.366*	46.356	*8.473*	44.372	*7.284*	47.556	*8.906*	49.371	*9.504*	46.849	*8.386*	50.229	*9.716*
married with present spouse	0	1	0.661	*0.484*	0.743	*0.447*	0.647	*0.485*	0.801	*0.410*	0.844	*0.369*	0.746	*0.434*	0.878	*0.336*
number of children	0	9	0.976	*1.165*	1.054	*1.170*	0.878	*1.051*	1.161	*1.225*	1.153	*1.223*	0.844	*1.047*	1.258	*1.261*
child under 5	0	1	0.124	*0.337*	0.144	*0.359*	0.102	*0.307*	0.170	*0.385*	0.128	*0.340*	0.084	*0.277*	0.143	*0.358*

and have higher levels of education compared to non-managers. Fifty-seven percent of managers and 76 percent of CEOs have a bachelor's degree or higher, whereas approximately 35 percent of workers in the sample have a bachelor's degree or higher. However, female managers and CEOs are less likely to have advanced degrees than their male counterparts (52 percent of female managers and 65 percent of female CEOs hold a bachelor's degree or higher, in comparison to 60 percent of male managers and 80 percent of male CEOs).

The majority of management jobs are concentrated in manufacturing, FIRE, and professional services. Male managers and CEOs are overrepresented in manufacturing, while female managers and CEOs are largely concentrated in FIRE and professional services.

Table 2.1 also shows that managers as a whole, but not CEOs, work in somewhat larger firms. Approximately 42 percent of managers in the sample are concentrated in the largest firms with over 1,000 workers, whereas 9 percent work in firms with less than 10 workers, 10 percent work in firms with 10 to 24 workers, 15 percent work in firms with 25 to 99 workers, 18 percent work in firms with 100 to 499 workers, and 6 percent work in firms with 500-999 workers. The distribution of male and female managers and CEOs across firms of different sizes is approximately equivalent.

Tables 2.2 and 2.4 present results from the estimated logistic regression models for all workers and managers, respectively. The models are built incrementally: model 1 includes controls only; model 2 adds gender; model 3 adds education; model 4 adds firm size; models 5 through 7 add interactions between gender and firm size, education and firm size, and education and gender one at a time; model 8 contains all two-way interactions; and model 9 adds three-way interactions between education, gender, and firm size.

The interaction effects cannot be evaluated by merely looking at the sign, magnitude, and statistical significance of the coefficients of the interaction terms (Ai and Norton, 2003). Therefore, I calculate the predicted probability of being a manager and CEO for men and women at the median values of each firm size category (Karaca-Mandic et al., 2012). Table 2.3 presents the predicted probabilities of being a manager for men and women and gender differences in predicted probabilities at each level of education across firms of different sizes. Figure 2.1 graphically presents these results for all managerial occupations. Table 2.5 presents the predicted probabilities of being a CEO among male and female managers and gender differences in these probabilities by degree level and firm size. Figure 2.2 depicts these results for CEOs. The predicted probabilities are calculated by setting all binary control variables equal to zero and all continuous variables at their means. Calculations for the predicted probabilities and differences in predicted probabilities are based on results from model 9.

In what follows, I first present results for all management occupations, then results for CEOs. For each dependent variable, I briefly discuss the effects of the control variables from the estimated models, followed by discussions of the main effects and the two-way interactions effects. Finally, I present results from the analysis of the three-way interactions.

Results for Management Occupations

Table 2.2 shows that age increases the likelihood of being a manager, although this relationship dampens among older workers. Being a minority or foreign-born worker decreases the likelihood workers are managers. Workers in the northeast and west are more likely to be managers than workers in the south, but the effect of working in the northeast is mediated by education in model 3. Workers in the construction, FIRE, and entertainment industries are more likely to be managers than manufacturing workers, but workers in utilities, wholesale, retail, and professional services are less likely to be managers than manufacturing workers. Working hours, marriage, and children are all positively related to being a manager. Results from separate regression models for men and women (not shown) do not indicate any gender differences in the effects of marital status and children. This is likely because children and family have an indirect effect on women's careers through their reduction in working hours and full-year employment. This issue will be explored in greater detail in chapter 4 of this dissertation.

Table 2.2: Coefficients from Logistic Regressions of Management Occupations on Individual and Firm Characteristics

Coefficients from Logistic Regressions of Managment Occupations on Individual and Firm Characteristics									
Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
time	0.008	0.008	0.002	0.002	0.002	0.002	0.002	0.002	0.002
age	0.071***	0.072***	0.077***	0.077***	0.077***	0.077***	0.077***	0.077***	0.077***
age squared	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
black	-0.636***	-0.632***	-0.531***	-0.527***	-0.528***	-0.526***	-0.525***	-0.525***	-0.525***
asian	-0.126**	-0.125**	-0.319***	-0.317***	-0.317***	-0.323***	-0.315***	-0.321***	-0.320***
other	-0.384***	-0.382***	-0.262***	-0.260***	-0.260***	-0.260***	-0.257***	-0.257***	-0.257***
foreign born	-0.388***	-0.391***	-0.430***	-0.434***	-0.434***	-0.438***	-0.432***	-0.436***	-0.437***
north	0.070**	0.068*	0.013	0.013	0.013	0.01	0.014	0.011	0.011
midwest	-0.107***	-0.106***	-0.097***	-0.096***	-0.096***	-0.096***	-0.095***	-0.096***	-0.096***
west	0.158***	0.156***	0.129***	0.130***	0.129***	0.129***	0.130***	0.129***	0.129***
agriculture, forestry, fishing, mining	-0.331***	-0.335***	-0.118	-0.131	-0.133	-0.136	-0.119	-0.126	-0.128
construction	0.145***	0.134***	0.350***	0.324***	0.320***	0.312***	0.338***	0.319***	0.314***
utilities, transportation, communications	-0.122***	-0.122***	-0.106**	-0.105**	-0.105**	-0.099**	-0.101**	-0.095**	-0.094**
wholesale trade	-0.383***	-0.382***	-0.395***	-0.407***	-0.408***	-0.407***	-0.410***	-0.412***	-0.412***
retail trade	-0.938***	-0.927***	-0.842***	-0.848***	-0.849***	-0.843***	-0.852***	-0.850***	-0.851***
finance, insurance, and real estate	0.495***	0.518***	0.330***	0.325***	0.324***	0.328***	0.316***	0.317***	0.317***
business and personal services	-0.098**	-0.089*	-0.008	-0.029	-0.029	-0.034	-0.028	-0.034	-0.035
entertainment	0.612***	0.625***	0.740***	0.729***	0.729***	0.735***	0.725***	0.729***	0.729***
professional services	-0.103***	-0.076**	-0.285***	-0.297***	-0.298***	-0.286***	-0.299***	-0.288***	-0.287***
usual hours worked	0.051***	0.050***	0.046***	0.046***	0.046***	0.046***	0.046***	0.046***	0.046***
married with present spouse	0.338***	0.331***	0.294***	0.294***	0.295***	0.294***	0.295***	0.295***	0.296***
number of children	0.008	0.008	0.019*	0.019*	0.020*	0.020*	0.018*	0.019*	0.018*
child under 5	0.182***	0.174***	0.051*	0.052*	0.052*	0.051*	0.050*	0.048	0.048
gender (female=1)		-0.080***	0.014	0.015	-0.02	0.013	0.106***	0.037	-0.048
bachelor's degree			1.001***	1.006***	1.007***	0.977***	1.096***	1.067***	1.025***
master's degree			1.431***	1.438***	1.438***	1.011***	1.489***	1.056***	0.940***
professional degree			-0.135	-0.132	-0.133	-0.534**	-0.147	-0.538**	-0.721***
doctorate			0.418***	0.427***	0.426***	0.296	0.363***	0.257	0.003
firm size (logged)				-0.011***	-0.013**	-0.023***	-0.011***	-0.028***	-0.035***
gender*firm size					0.006			0.012	0.027**
bachelor's degree*firm size						0.006		0.006	0.014
master's degree*firm size						0.067***		0.068***	0.086***
professional degree*firm size						0.068**		0.067*	0.098***
doctorate*firm size						0.021		0.017	0.058*
bachelor's degree*gender							-0.224***	-0.230***	-0.13
master's degree*gender							-0.121*	-0.120*	0.184
professional degree*gender							0.083	0.055	0.617
doctorate*gender							0.262	0.252	1.130**
bachelor's degree*gender*firm size									-0.017
master's degree*gender*firm size									-0.049*
professional degree*gender*firm size									-0.093
doctorate*gender*firm size									-0.136*
constant	-6.009***	-5.955***	-6.277***	-6.217***	-6.203***	-6.147***	-6.252***	-6.153***	-6.120***
chi2	7316.692	7455.065	10833.62	10803.62	10987.97	11297.75	11696.6	12450.51	13156.65

Notes: * p<0.05; ** p<0.01; *** p<0.001

Model 2 in Table 2.2 shows that being female exerts a negative effect on the likelihood workers are managers. The odds of being a manager decrease by 8 percent if a worker is a woman. The negative effect of being female, however, is mediated by education. This means that gender differences in education and the control variables explain the gender gap in management.

Model 3 shows that workers with bachelor's, master's, and doctoral degrees are more likely to be managers than workers without bachelor's degrees. The largest effect of education is found for those with master's degrees. Workers with master's degrees increase their odds of being managers by a factor of approximately 4.2 over workers without bachelor's degrees, while workers with bachelor's and doctoral degrees increase their odds of being managers by factors of 2.7 and 1.5, respectively. Workers with professional degrees may be slightly less likely to be managers than those without bachelor's degrees, but the coefficient for professional degrees is only marginally statistically significant (p=.085).

The interaction between gender and firm size in model 5 is not statistically significant. Contrary to hypothesis 1, the gender gap in management does not decrease significantly as organizational size increases. The interactions between master's and professional degrees and firm size are significant and positive in model 6, lending evidence to hypothesis 2 that the impact of education on the likelihood a worker is a manager increases with organizational size. In model 7 the interactions between bachelor's and master's degrees and gender are negative and statistically significant. This means that the gender gap in management is larger for those with bachelors and master's degrees compared to the gender gap in management among workers without bachelor's degrees. These results lend support to hypothesis 3a. However, the gender gap in management among those with professional degrees and doctorates is not significant, lending support to hypothesis 3b. Lastly, the three-way interactions between master's degree, gender, and firm size and between doctorate, gender, and firm size are statistically significant and negative in model 9. The interpretation of the three-way interactions is assessed in Table 2.3 and Figure 2.1.

Table 2.3: Predicted Probabilities and Gender Differences in Predicted Probabilities of being a Manager by Education and Firm Size

		Median Firm Size					
Degree	Gender	5	15	49	222	706	6269
No college degree	Women	0.087***	0.087***	0.086***	0.085***	0.084***	0.083***
	Men	0.088***	0.085***	0.082***	0.078***	0.075***	0.070***
	Difference	-.001	.002	*0.004*	0.007***	0.009***	0.013***
Bachelor's Degree	Women	0.189***	0.187***	0.185***	0.182***	0.180***	0.176***
	Men	0.215***	0.211***	0.207***	0.202***	0.198***	0.191***
	Difference	-0.026*	-0.024**	-0.022***	-0.019***	-0.018***	-0.015*
Master's Degree	Women	0.238***	0.244***	0.251***	0.259***	0.266***	0.279***
	Men	0.221***	0.231***	0.242***	0.256***	0.268***	0.290***
	Difference	0.018	0.014	0.009	0.003	-0.002	-0.011
Professional Degree	Women	0.080***	0.080***	0.080***	0.080***	0.079***	0.079***
	Men	0.052***	0.056***	0.060***	0.065***	0.070***	0.080***
	Difference	0.028	0.024	0.02	0.014	0.009	-0.001
Doctorate	Women	0.208***	0.193***	0.178***	0.159***	0.146***	0.124***
	Men	0.096***	0.098***	0.100***	0.104***	0.106***	0.111***
	Difference	0.112*	0.095**	0.077**	0.055**	0.040*	0.013

Notes: * p<0.05; ** p<0.01; *** p<0.001. Numbers in *italics* are marginally significant (0.05≤p<0.10). Estimates are based on model 9 in Table 2.2.

Figure 2.1: Gender Differences in Predicted Probability of being a Manager by Education and Firm Size

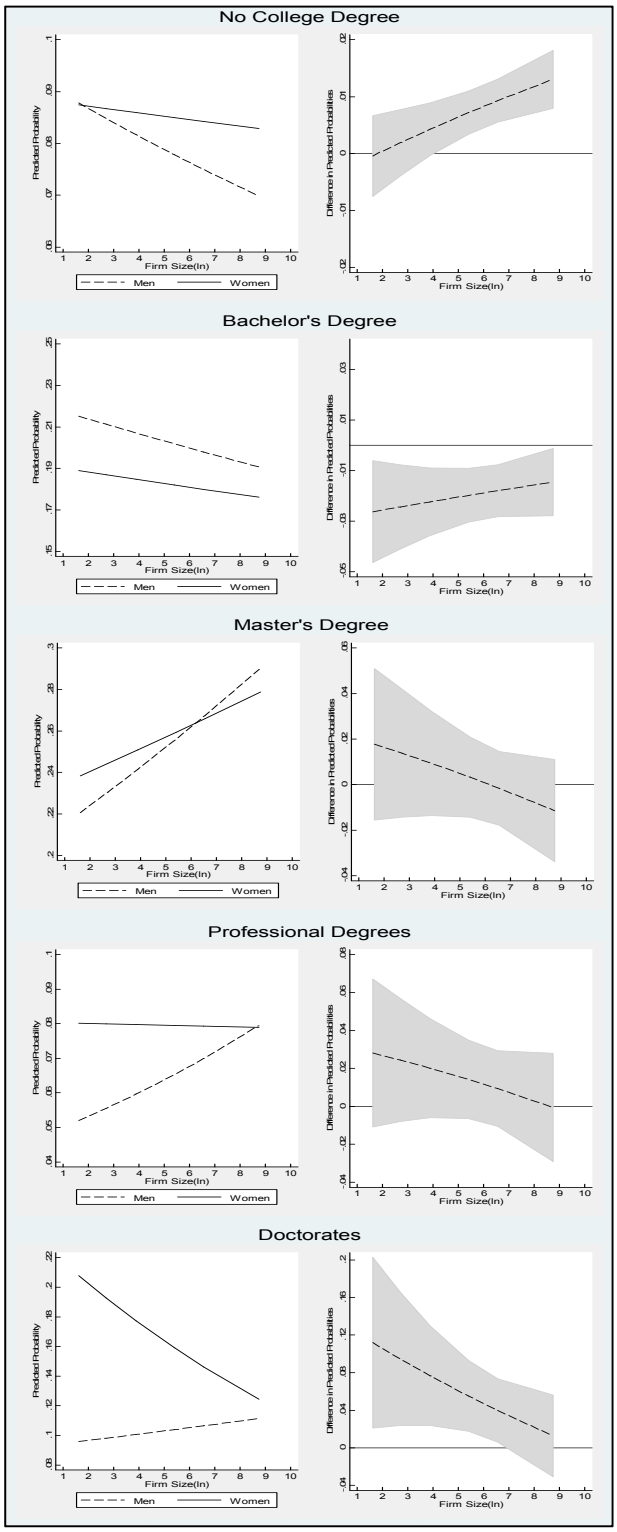


Table 2.3 presents the predicted probabilities of being a manager for men and women with equivalent levels of education at the median value of each firm size category and the gender differences in these predicted probabilities. The graphs in the first column of Figure 2.1 depict the predicted probabilities of being a manager by gender and the graphs in the second column of Figure 2.1 illustrate gender differences in predicted probabilities as well as the upper and lower bounds of the 95% confidence intervals.

The first rows of Table 2.3 and Figure 2.1 show that although men and women without college degrees are both less likely to be managers in larger firms compared to smaller ones, women without college degrees are more likely to be managers than similarly educated men in firms with approximately 50 or more employees. Although this gap favors women, the first graph in Figure 2.1 shows that this advantage is small (approximately 1.3 percent in the largest firms).

The second row of graphs in Figure 2.1, however, shows that female advantage turns into disadvantage among those with bachelor's degrees. This disadvantage is largest in the smallest firms where the gender difference in the predicted probability of being a manager is approximately 2.6 percent. Although the gender gap is small and gets slightly smaller as firm size increases, it is statistically significant across all firm sizes. This result provides partial support for hypothesis 4a because the gender gap in management is slightly smaller among larger firms, however, the relationship between having a bachelor's degree and firm size is not significant (see Table 2.2).

The third row of graphs in Figure 2.1 shows that master's degrees are more positively associated with being a manager as firm size increases and that while the gender gap among those with master's degrees is significantly different across firm sizes from the gender gap among those without a college degree (see significant three-way interaction term in Table 2.2, model 9), the gender gap among those with master's degrees does not vary much across firms. These do not support hypothesis 4a or 4b.

Similarly, the fourth row of graphs in Figure 2.1 shows that there is no statistically significant difference in the gender gap among those with professional degrees across any of the firm-size categories. These result for professional degrees do not support hypothesis 4a or 4b.

The last rows of Table 2.3 and Figure 2.1 show that the gender gap favors women with doctorates, but that this advantage disappears in the largest firms. In contrast to women without college degrees, women with doctorates enjoy a rather large advantage (11.2 percent) over men with doctorates working in the smallest firms. These results do not support hypothesis 4a or 4b. A closer look at the detailed occupational and industrial codes for female managers with doctorates in smaller firms reveals that about 87 percent of these women are employed in the professional services sector, primarily in social services or grant writing organizations, business, professional, or political organizations, or private educational organizations. Women in smaller, professional service organizations may see higher authority returns to their doctoral degrees than men either because the nature of management work in these organizations is more gender-typed, or simply because women are well-represented in this area of the service sector (Kanter, 1977).

Results for Chief Executive Occupations

Table 2.4 presents estimates from regression models that predict whether managers are CEOs. Similar to the results predicting whether workers hold management occupations, age shows a positive effect on the likelihood managers are CEOs, but this effect declines among older workers. The effect of being a minority compared to being white remains negative and statistically significant. There are no significant effects for region.

Table 2.4: Coefficients from Logistic Regressions of CEO Occupations on Individual and Firm Characteristics

Coefficients from Logistic Regressions of CEO Occupations on Individual and Firm Characteristics									
Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
time	-0.01	-0.009	-0.014	-0.012	-0.012	-0.012	-0.012	-0.012	-0.012
age	0.126***	0.134***	0.142***	0.150***	0.150***	0.150***	0.149***	0.150***	0.150***
age squared	-0.001*	-0.001**	-0.001**	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
black	-0.890***	-0.852***	-0.838***	-0.798***	-0.798***	-0.802***	-0.792***	-0.796***	-0.797***
asian	-0.159	-0.158	-0.303*	-0.298*	-0.298*	-0.303*	-0.296*	-0.300*	-0.298*
other	-0.409	-0.407	-0.288	-0.279	-0.279	-0.282	-0.276	-0.279	-0.279
foreign born	-0.064	-0.083	-0.134	-0.16	-0.16	-0.156	-0.157	-0.154	-0.154
north	0.027	0.012	-0.057	-0.042	-0.042	-0.044	-0.037	-0.039	-0.038
midwest	-0.052	-0.057	-0.072	-0.073	-0.073	-0.075	-0.071	-0.074	-0.074
west	0.08	0.084	0.081	0.073	0.073	0.071	0.073	0.07	0.07
agriculture, forestry, fishing, mining	-0.01	-0.027	0.181	-0.071	-0.072	-0.074	-0.053	-0.057	-0.054
construction	0.021	-0.026	0.236*	-0.074	-0.074	-0.078	-0.054	-0.061	-0.06
utilities, transportation, communications	0.064	0.088	0.118	0.122	0.122	0.119	0.122	0.12	0.118
wholesale trade	0.940***	0.951***	1.061***	0.904***	0.904***	0.902***	0.908***	0.905***	0.902***
retail trade	0.362**	0.414***	0.566***	0.491***	0.491***	0.490***	0.494***	0.492***	0.491***
finance, insurance, and real estate	1.095***	1.219***	1.214***	1.175***	1.175***	1.173***	1.160***	1.157***	1.156***
business and personal services	0.581***	0.643***	0.738***	0.528***	0.528***	0.527***	0.532***	0.530***	0.530***
entertainment	-0.883***	-0.795***	-0.592***	-0.776***	-0.776***	-0.770***	-0.784***	-0.779***	-0.782***
professional services	0.13	0.268**	0.118	-0.035	-0.035	-0.034	-0.033	-0.031	-0.032
usual hours worked	0.046***	0.043***	0.039***	0.042***	0.042***	0.042***	0.042***	0.042***	0.042***
married with present spouse	0.486***	0.414***	0.401***	0.435***	0.435***	0.437***	0.435***	0.436***	0.435***
number of children	0.103***	0.081***	0.068**	0.072**	0.072**	0.072**	0.070**	0.070**	0.070**
child under 5	0.106	0.061	-0.03	-0.022	-0.022	-0.021	-0.024	-0.022	-0.021
gender (female=1)		-0.533***	-0.413***	-0.402***	-0.407***	-0.402***	-0.176	-0.229	-0.124
bachelor's degree			0.842***	0.929***	0.929***	0.898***	1.040***	0.998***	1.030***
master's degree			0.991***	1.151***	1.151***	1.136***	1.255***	1.236***	1.346***
professional degree			1.542***	1.651***	1.651***	0.895*	1.766***	0.993**	0.993**
doctorate			1.180***	1.318***	1.318***	1.421***	1.355***	1.444**	1.523**
firm size (logged)				-0.152***	-0.152***	-0.159***	-0.153***	-0.164***	-0.156***
gender*firm size					0.001			0.011	-0.01
bachelor's degree*firm size						0.007		0.009	0.002
master's degree*firm size						0.004		0.006	-0.014
professional degree*firm size						0.128*		0.132*	0.130*
doctorate*firm size						-0.017		-0.013	-0.029
bachelor's degree*gender							-0.342**	-0.351**	-0.427
master's degree*gender							-0.316*	-0.331*	-0.707*
professional degree*gender							-0.385	-0.417	-0.334
doctorate*gender							-0.064	-0.079	-0.32
bachelor's degree*gender*firm size									0.016
master's degree*gender*firm size									0.066
professional degree*gender*firm size									-0.008
doctorate*gender*firm size									0.045
constant	-8.950***	-8.720***	-9.285***	-8.713***	-8.711***	-8.691***	-8.789***	-8.745***	-8.785***
chi2	1296.442	1450.812	1692.421	1874.168	1957.243	1943.687	2080.325	2293.698	2310.313

Notes: * p<0.05; ** p<0.01; *** p<0.001

The effects of working in an industry other than manufacturing are notably different between CEOs and managers. Although workers in wholesale, retail, and business and personal services industries are less likely to be managers than workers in manufacturing, managers in these industries are more likely to be CEOs than manufacturing managers. In contrast, managers in entertainment are less likely to be CEOs, even though workers are more likely to be managers in the entertainment industry. The likelihood of being a CEO is no different for managers working in construction, utilities, or professional services than it is for managers in manufacturing, even though working in construction is positively associated with being a manager and working in utilities and professional services is negatively associated with being a manager. Workers and managers in FIRE are both more likely to be managers and CEOs. This comes as no surprise because management jobs have proliferated in this sector of the economy (Kalleberg, 2011). Similar to the results predicting whether or not worker are managers, managers that work more hours and are married with children are more likely to be CEOs. Results from separate regression models for male and female managers (not shown) do not indicate any gender differences in the effects of marital status and children. The gender gap in authority is much larger among those with authority than the gender gap in management as a whole. According to model 2 in Table 2.4, the odds of a being a CEO decrease by 41 percent if a manager is a woman. The gender gap is reduced after variables for education are added into model 3, but the gender gap remains large and statistically significant after all main effects are added into model 4.

Managers with bachelor's, master's, professional, and doctoral degrees are more likely to be CEOs than managers without bachelor's degrees according to model 3. Managers with bachelor's, master's, professional, and doctoral degrees increase their odds of being CEOs by factors of 2.5, 3.2, 5.2, and 3.8, respectively, over managers without bachelor's degrees. Note that professional degrees (law, medical, and health-related degrees) show a positive effect on authority outcomes among managers, even though they do not significantly affect whether or not a worker is a manager. It may be that managers are more likely to hold particular types of professional degrees connected to management outcomes, such as law degrees, that are better connected with authority outcomes than workers with professional degrees in the general population (Useem and Karabel, 1986). It may also be the case that workers with professional degrees only see authority returns from their degrees after some experience because the careers of doctors and lawyers are also associated with significant on-the-job training. For example, new lawyers start out as junior associates and work closely with more senior partners. It is only once they have proven themselves over time that they may be granted partnership in a firm with significant authority over subordinates (Gorman and Kmec, 2009).

The statistically insignificant coefficient for the interaction between gender and firm size in model 5, Table 2.4 lends no support to hypothesis 1 that the effect of gender varies significantly across firms of different sizes. Model 6 shows that the effect of a professional degree on the likelihood a manager is a CEO is greater in larger firms than smaller ones, but the effects of other degrees do vary significantly by firm size. Therefore, hypothesis 2 that the impact of education leads to greater increases in authority in larger firms than smaller ones is supported only for professional degrees. There may be more opportunities for managers with professional degrees to realize high authority returns from their education in larger firms than smaller firms because larger firms may put a premium on the highly specialized knowledge

garnered from particular types of professional degrees such as law and medical degrees. Among those with professional degrees in the CPS, the largest shares of chief executive positions are housed in large firms in FIRE and professional services sectors; precisely where high status management jobs have proliferated in recent years (Cappelli and Hamori, 2004).

Model 7 in Table 2.4 shows statistically significant, negative interaction effects between bachelors and master's degrees and gender. These results support hypothesis 3a because gender gaps are larger among those with bachelors and master's degrees compared to those without college degrees. The insignificant interaction terms between professional degrees and gender as well as between doctorates and gender lend support to hypothesis 3b that gender gaps will be smaller or non-existent among highly educated workers. None of the three-way interaction effects are statistically significant in model 9.

Table 2.5 presents the predicted probabilities of being a CEO for male and female managers with equivalent levels of education at the median value of each firm size category and the gender differences in these predicted probabilities. Table 2.5 shows that there are no significant gender differences in the predicted probability of being a CEO between men and women in all firm sizes among those who do not hold college degrees and those who hold professional degrees and doctorates, but there are significant gender differences in the probability of being a CEO among those with bachelors and master's degrees across firms of all sizes.

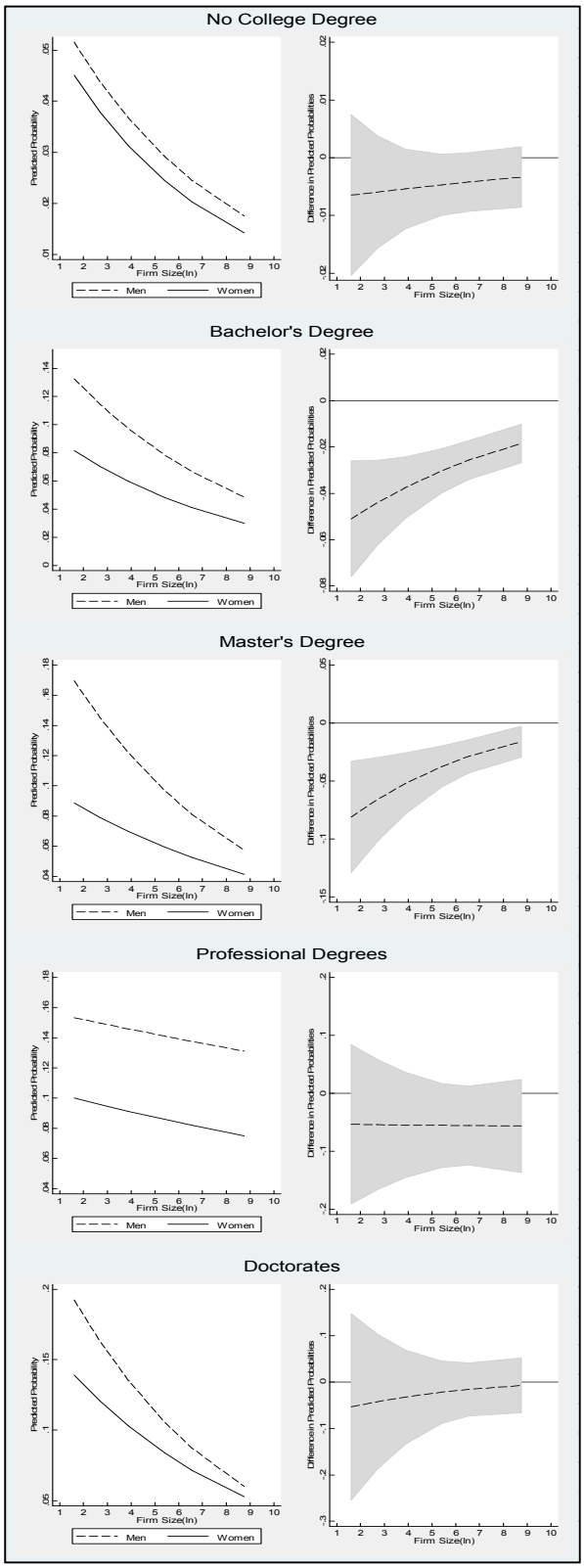
The graphs in the first column of Figure 2.2 depict the predicted probabilities of being a CEO by gender for each level of education and the graphs in the second column of Figure 2.2 illustrate gender differences in these predicted probabilities as well as the upper and lower bounds of the 95% confidence intervals. The graphs in Figure 2.2 show no differences in the gender gap in access to CEO positions between managers with no college degree and between

Table 2.5: Predicted Probabilities and Gender Differences in Predicted Probabilities of being a CEO by Education and Firm Size

		Median Firm Size					
Degree	Gender	5	15	49	222	706	6269
No college degree	Women	0.045***	0.038***	0.031***	0.025***	0.020***	0.014***
	Men	0.052***	0.044***	0.037***	0.029***	0.025***	0.017***
	Difference	-0.007	-0.006	-0.006	*-0.004*	-0.004	-0.003
Bachelor's Degree	Women	0.082***	0.070***	0.060***	0.048***	0.041***	0.030***
	Men	0.133***	0.114***	0.097***	0.078***	0.067***	0.049***
	Difference	-0.051***	-0.044***	-0.037***	-0.030***	-0.026***	-0.019***
Master's Degree	Women	0.089***	0.079***	0.070***	0.059***	0.052***	0.041***
	Men	0.170***	0.145***	0.122***	0.097***	0.081***	0.057***
	Difference	-0.081***	-0.066***	-0.052***	-0.039***	-0.029***	-0.016*
Professional Degree	Women	0.100	*0.096*	0.091*	0.086**	0.082**	0.075*
	Men	0.153***	0.150***	0.146***	0.141***	0.138***	0.131***
	Difference	-0.053	-0.054	-0.055	-0.056	-0.056	-0.056
Doctorate	Women	*0.139*	0.121*	0.103*	0.084**	0.072**	0.053*
	Men	0.192***	0.163***	0.135***	0.106***	0.087***	0.060***
	Difference	-0.053	-0.042	-0.032	-0.022	-0.016	-0.007

Notes: * $p<0.05$; ** $p<0.01$; *** $p<0.001$. Numbers in *italics* are marginally significant ($0.05 \leq p < 0.10$). Estimates are based on model 9 in Table 2.4.

Figure 2.2: Gender Differences in Predicted Probability of being a CEO by Education and Firm Size



managers holding professional degrees and doctorates across firms of different sizes.

The second row of graphs in Figure 2.2 illustrate that the gender gap is statistically significant among managers with bachelor's degrees, but this gap diminishes as firm size increases. Similarly, the third row of graphs in Figure 2.2 shows a statistically significant widening of the gender gap among managers with master's degrees that decreases from 8.1 percent in the smallest firms to 1.6 percent in the largest firms (see Table 2.5). The results for bachelor's and master's degrees support hypothesis 4a. The fourth and fifth row of graphs in Figure 2.2 show that there is no significant variation in the gender gap across firm sizes among those with professional and doctoral degrees. These results do not support hypothesis 4a or 4b.

Discussion and Conclusion

This study examines how the allocation of men and women into management jobs, on the basis of education, varies according to a fundamental characteristic of employing organizations; their size. The gender gap in authority is not ubiquitous; rather it is concentrated primarily among workers and managers with bachelor's degrees and managers with master's degrees in smaller firms. The gender gap in authority is virtually non-existent among workers with professional degrees and among managers with doctorates. Indeed, women with doctorates have an authority advantage over men with doctorates in all but the largest of firms and female managers without college degrees have an advantage over similarly educated men in firms with over 50 people.

Gender gaps in managerial authority among bachelor's degree holders tend to be narrower in larger firms than smaller ones. Among bachelor's degree holders formalization in larger firms helps reduce gender bias in personnel decisions, although it does not increase decision maker's reliance on education as a proxy for productivity; a relationship that was mostly confined to professional degree holders. Although the gender gap in managerial authority did not vary by firm size among those with master's degrees, the effect of firm size on the gender gap in management varied between those with a master's degree and those without a college degree. Gender gaps in authority among bachelor's and master's degree holders are also larger within management, providing evidence, albeit limited, of a glass ceiling effect among those with bachelor's and master's degrees that is most prominent in smaller firms (Cotter, Hermsen, Ovadia and Vanneman, 2001; Maume, 2004).

Why are gender gaps in managerial authority isolated to bachelor's and master's degree holders? It could be that women lack degrees in specific fields, such as business or STEM, that are highly connected to management and that they may see higher occupational returns to their bachelor's and master's degrees if they specialized in these fields. However, sex segregation by field is supposedly higher, not lower, among higher-level degree holders (Morgan, 2008). Therefore, if the gender gap is virtually non-existent among professional and doctoral degree holders without controlling for field of study (but controlling for other relevant variables), then attributing the gender gap to gender differences in field of study is problematic at lower levels of educational attainment.

It may be that men are better able to cash in their bachelor's and master's degrees for positions of authority because of persistent biases against women. Employers may assess women as being less productive than men despite their educational accolades due to their propensity to reduce their attachment to the workforce once they have children. At the same time, employers may also be more likely to connect managerial competence to bachelor's and master's degrees for men than women. This competence bias may dissipate among women with higher, more prestigious degrees that signal highly specialized knowledge rather than more general knowledge. Because professional degrees and doctorates are more highly specialized than bachelors and master's degrees they may also be more highly connected to clearly defined career paths where it is easier to assess competence on the basis of merit and harder to justify differential occupational rewards for equally high levels of educational attainment.

These results suggest a need for research that probes how employers differentially connect men's and women's education to jobs with varying amounts of authority. It is not clear if women's education is devalued because women earn bachelors and master's degrees in fields that are less likely to be connected to authority outcomes or if employers devalue women's education because they believe that education is not as strong a predictor of productivity for women compared to men. What is clear is that the gender gap is most prominent among those with bachelors and master's degrees in smaller firms. This means we cannot lump all college-educated workers together when assessing the gender gap. Rather the gender gap should be carefully assessed across all educational levels and according to the characteristics of the employing organizations where men and women work.

This study is limited by the cross-sectional nature of the CPS. Preferably, these hypotheses would be tested on nationally representative data that matches workers and firms. At this time, the U.S. lacks an accessible employer-employee matched data source with detailed information about workers occupations. In the absence of an employer-employee matched data source, future studies should test these hypotheses with panel data that follows the careers of managers and non-managers who work in firms of different sizes.

CHAPTER 3 - A matter of degrees: Educational specialization and the gender gap in authority and returns to authority among American college-graduates

Introduction

Women are less likely than men to earn degrees in business, economics, science, technology, engineering, and mathematics (STEM); fields that lead to jobs as supervisors and managers in corporate America – that is, jobs with authority (Wilson and Smith-Lovin, 1983; Turner and Bowen, 1999; Black et al., 2008). Degrees in business and economics teach future managers and supervisors about management, production, operations, and finance (Cannella, Finkelstein, and Hambrick, 2008). STEM degrees confer technical and mathematical skills that help managers and supervisors guide their organizations through technologically-driven marketplaces (Tyler and Steensma, 1998). These degrees legitimize managers and supervisor's control over their own work, and the work of others, as well as their authority to make strategic decisions that affect their organizations' relations with customers, investors, and other organizations (Wolf and Fligstein, 1979; Kalleberg, 2011).

Because young women are taught by their parents and teachers that men are more competent at disciplines that require analytical reasoning and mathematics, grown women are far less likely than men to specialize in fields that feed the pipeline into jobs with authority (Gerber and Cheung, 2008). Women may also shy away from degrees in business, economics, and STEM fields precisely because they cannot exchange these degrees for the same high status occupations as men (Paglin and Rufolo, 1990). Female graduates of top U.S. business schools earn less than their male counterparts with the same degrees (Bertrand, Goldin, and Katz, 2010). Women who major in business, engineering, and computer science have jobs with lower occupational status than similarly educated men (Roksa and Levey, 2010). Male scientists and engineers earn higher wages and are more likely to be promoted to management than female scientists and engineers, even after controlling for the segregation of men and women into different STEM fields (Long and Fox, 1995; Xie and Shaumann, 2003). Under these conditions, women overwhelmingly chose to earn degrees in the arts, humanities, education, and health-related fields that impart interpersonal, interpretive, and written and oral communication skills (Owen, 2008; Rask and Tiefenhaler, 2008). Degrees in these fields feed the pipeline into female-dominated occupations where earnings and job mobility are limited (Jacobs, 1995; Ayalon, 2003).

Human capital theorists argue that if the academic pipelines that feed into jobs with authority are repaired, then gender inequality in access to jobs with authority should improve (Bertrand, Goldin, and Katz, 2010). In other words, if women have the right kind of human capital conferred by business, economics, and STEM degrees, they should enjoy better, if not equal, representation in the upper echelons of corporate America. Nonetheless, even though women are slowly moving out of traditionally female majors and into business, economics, and STEM majors (Jacobs, 1995; Turner and Bowen, 1999; Charles and Bradley, 2002; Mann and DiPrete, 2012), they may not be able to cash these degrees in for the same amount of workplace authority and related earnings as men (Wilson and Smith-Lovin, 1983; McGuire and Reskin 1993; Hultin 1998). Women may not enjoy the same occupational returns to business,

economics and STEM degrees because of cultural assumptions that men are more competent than women at the highly valued, scarce strategic leadership and quantitative reasoning skills imparted by these degrees (Ridgeway, 2001). Whereas men are presumed to be competent at male sex-typed tasks, women are questioned, subjected to more stringent evaluation criteria, and negative information about their performance is more likely to influence hiring decisions compared to men (Heilman et al., 1995; Oakley, 2000).

In this chapter, I first assess the effects business, economics, and STEM degrees have, relative to humanities degrees, on workplace authority among college-educated Americans working for private-sector organizations in the U.S. I then assess gender differences in authority and returns to authority conferred by business, economics, and STEM degrees among college-educated workers in corporate America.

Research on gender differences in occupational returns to degrees primarily focuses on earnings, but earnings may not fully capture a person's position in the workplace hierarchy (Wilson and Smith-Lovin, 1983). Earnings and authority are distinct forms of occupational rewards because wages may vary independent of occupational titles. To date, very little research has explored how particular degrees in specific academic fields are related to the gender gap in authority and returns to authority (but see Abendroth, Maas, and van der Lippe, 2013).

This study contributes to the existing literature by highlighting the relevance of attaining specific degrees in particular fields to gender differences in occupational outcomes. That is, degrees have two independent sources of value – one imparted by their attainment or level (e.g., bachelor's, master's, and PhD) and another by their field of specialization (e.g., STEM fields vs. the humanities). Because gender inequality permeates these two dimensions of degrees unequally, it is important to unpack more precisely which degrees confer an authority advantage and which confer that advantage to men at higher rates than women. Differential rewards to degrees may perpetuate unequal gender relations in the workplace, despite the fact that there are now very few gender differences in educational attainment. This implies that as higher education has expanded, college majors have increasingly become mechanisms for maintaining gender inequality in the corporate hierarchy.

Theory and Hypotheses

What types of skills do you need to be the boss? Today, technical and economic competencies, rather than administrative skills, are more closely tied to jobs with authority than they were in the 1970s and earlier (Meyer, 2001). Managers do not just occupy command and control positions with responsibilities for planning, organizing, and directing subordinates' work, they re-engineer how their organizations operate and interact with other organizations, investors, customers, and employees by exploiting new technologies and financial products (Cannella, Finkelstein, and Hambrick, 2008). Success at these strategic activities requires technical training in the deployment of mathematical thinking to understand production processes and automation, in addition to competencies in commerce and business (Van de Werfhorst and Kraaykamp, 2001; Frydman, 2007). Although some of these skills are acquired through experience, degrees signal

strong competencies in the skills need to manage organizations (Useem and Karabel, 1986; Bills, 2003).

Degrees in business and economics teach "economic-administrative" skills that can be applied to operating and managing organizations and industries (Kalmijn and Van der Lippe, 1997). Business and economics degrees in general and master's degrees in business administration (MBAs) in particular, teach future business leaders how to make strategic decisions based on facts and figures. Managers with MBAs are schooled in the technology of financial management and their investment decisions follow financial-textbook standards (Graham and Harvey, 2001; Bertrand and Schoar, 2003). The analytical skills imparted by an MBA groom managers to be "organizers and rationalizers" that avoid big losses and mistakes by diligently responding to distinct changes in their organizations' environments and, thereby, tempering organizational uncertainty (Cannella, Finkelstein, and Hambrick, 2008).

Until the rise of the MBA in the late 1980s, top executives predominantly held STEM degrees (Frydman, 2007). In some industries, STEM degrees may be more valuable than business degrees – for example, most oil-industry executives hold degrees in chemical or petroleum engineering. Most STEM fields use mathematics to understand systematic, technical, or production processes (Van de Werfhorst, 2002). Executives with degrees in engineering or science apply their technical expertise to strategic management decisions and are more likely to capitalize on technology alliance partnerships, which may better position their firms in complex technological environments (Tyler and Steensma, 1998).

In contrast, degrees in the humanities seldom lead to jobs with authority because they do not confer the analytical skills believed to be relevant to managerial competency (Kalmijn and Van der Lippe, 1997; Van de Werfhorst, 2002; Roksa and Levey, 2010). Fields in the humanities, including art, music, literature, languages, history, philosophy, and other liberal arts, impart written and verbal communication skills and socio-cultural skills that help people understand symbols, culture, and society (Kalmijn and van der Lippe, 1997; Van de Werfhorst, 2002). The career prospects for college graduates with humanities degrees are bleak relative to those who specialize in other degree fields because there are no clear connections between jobs and degrees in humanities fields (Grubb, 1997). Those who major in humanities fields have lower occupational status, earnings, and control over their jobs than those who major in business, economics, and STEM fields (Eliason, 1995; Roska and Levey, 2010). Furthermore, the verbal and written communication skills imparted by humanities degrees are less valuable to employers relative to the scarce, quantitative skills conferred by mathematically-oriented fields (Paglin and Rufolo, 1990).

> Hypothesis 1: College-graduates with degrees in business, economics, and STEM fields are more likely to have authority in the workplace than college-graduates with bachelor's degrees in the humanities.

Degrees in the humanities are "feminized." Women are over-represented in the humanities, which feed the pipeline into female-dominated occupations with weaker earnings potential, fewer opportunities for advancement, and less authority than male-dominated occupations (Bielby and Baron, 1986; Reskin and Hartmann, 1986; England, 1992; Joy, 2006;

Blau and DeVaro, 2007). The cultural conception of the humanities also dovetails with cultural stereotypes about women's expressive, communal nature. Women are believed to be natural caregivers who are more expressive, communal, nurturing, and supportive than men (Eagly and Karau, 2002). Degrees in the humanities are conflated with feminine competencies and are believed to require expressiveness, empathy, and creativity (Van de Werfhorst, 2002).

In contrast, degrees in business, economics, and STEM fields are male dominated and "masculinized." Men are viewed as natural leaders who are competitive, objective, aggressive, and ambitious – characteristics that are associated with success in calculating, business-related fields and competitive STEM fields (Schein 1973 and 2001). Men are also believed to be more logical and able to separate feelings from ideas than women, and therefore, perhaps more naturally suited to excel in fields that require objective, scientific reasoning (Heilman, Block, and Martell, 1995). Specializing in fields that use scientific reasoning, in general, and require mathematical competence, in particular, may be conflated with masculine ambition because these fields are believed to be more difficult than the humanities due to their more stringent grading standards (Rask and Tiefenhaler, 2008; Owen, 2010).

Because men are more likely to hold degrees in business, economics, and STEM fields, men are perceived to be more competent at these skills than women (Foschi, 2000). Women's under-representation in these degree fields leads to more scrutiny and performance pressure. Because women with these degrees are scarce, they are more visible, which causes employers to question women's technical, mathematical, and managerial competencies more critically than their male counterparts and also increases pressure on women to perform (Kanter, 1977). Women with business, economics, and STEM degrees may be subjected to more competency testing where they have to prove they are competent at male sex-typed skills over and over again to advance in their organizations (Rosener, 1995; Foschi, 2000; Oakley, 2000; Ridgeway, 2001). These gender biases translate into job penalties when women use the same degrees as men to pursue technical, male-dominated jobs (Baron and Newman, 1990; Kilbourne et al., 1994; Shauman, 2006; Cech, 2013).

Women may be less successful than men at exchanging their business, economics, and STEM degrees for jobs with authority because employers believe men are more competent than women at the "masculine" skills imparted by degrees that feed into positions of authority (Gerber and Cheung, 2008). In one study, formal education in administration was rated as more relevant to men's success than women's success at the stereotypically male job of police chief (Uhlmann and Cohen, 2005). In a study of a large financial services firm, evaluators rated women's management skills in male-dominated line jobs less favorably than men's (Lyness and Heilman, 2006). In another study, male and female faculty members in biology, chemistry, and physics evaluated female undergraduate science majors as less hireable compared to identical male students because faculty viewed women as less competent in science (Moss-Racusin et al., 2012). Women also perceive themselves to be less competent at technical, economic, and strategic managerial activities even if they share the same abilities and aptitudes as men (Oppenheimer, 1968; Eccles, 1994; Heilman and Okimoto, 2007; Cech, 2013).

Women are generally believed to be less competent at mathematics, the backbone of business finance, economics, and most STEM degrees (Whyte, 1986; Heilman, Block, and

Martell, 1995; Seymour and Hewitt, 1997). Parents and teachers underestimate girls' math achievement, but overestimate boys' (Correll, 2001 and 2004). Women also do not believe they are competent enough to succeed at careers that require technical or mathematical skills (Eccles, 1994). Girls report more math anxiety, less confidence, and less self-efficiency in math (Fredricks and Eccles, 2002; Else-Quest, Hyde, and Linn, 2010). Similarly, girls rate themselves more negatively on their aptitude in science, despite better performance than boys, whereas boys report more positive attitudes toward science than girls (Weinburgh, 1995; Pomerantz, Altermatt and Saxon, 2002).

The assent up the authority hierarchy is confounded with presumed male characteristics and aptitudes such that people not only envision a man when they think of a successful business leader (Schein, 1973; Heilman, 2001; Schein, 2001), but they also believe men are better at the skills needed to be the boss. In other words, even if women have stellar credentials, women themselves as well as their superiors may not believe they are as competent at these skills as men because they contradict women's "natural" skills and attributes. Therefore, controlling for other relevant variables:

> Hypothesis 2: The effect of having a degree in business, economics, or STEM on workplace authority will be greater for college-educated men than college-educated women.

Women who already hold positions of authority may encounter more competency bias, and therefore, may accrue less authority and lower returns to their authority relative to men with workplace authority. As one moves up the corporate ladder, there are fewer and fewer women and gender stereotypes about women are more likely to conflict with the masculine attributes of top management jobs (Ridgeway, 2009; Carter and Silva, 2010). Within the ranks of management, especially upper-management, women are often tokens, whose status subjects them to more performance pressure and competency testing because of their visibility than women in positions without authority (Kanter, 1977; Oakley, 2000; Lyness and Heilman, 2006). When women with authority exhibit competency at male tasks in the workplace, they are judged more harshly than similar men (Heilman and Okimoto, 2007). As a result, women earn less money than men in jobs with similar levels of authority and are relegated to positions with less authority within the corporate hierarchy despite their qualifications (Halaby, 1979; Petersen and Morgan, 1995; Ridgeway, 2009). Therefore, controlling for other relevant variables:

> Hypothesis 3: The effect of having a degree in business, economics, or STEM on the amount of workplace authority and the financial returns to authority will be greater for male supervisors and managers than female supervisors and managers.

Data

To test these hypotheses, I analyzed the 2003 National Survey of College Graduates (NSCG). The NSCG is conducted by the Census Bureau for the National Science Foundation (NSF) and is a nationally representative sample of college graduates ages 23 to 76. For the 2003 NSCG, the NSF sampled people who had at least a bachelor's degree as of April 1, 2000

according to the Decennial Census Long Form. The 2003 NSCG contains approximately 100,400 records.

The 2003 NSCG survey first asked respondents if they were working for pay or profit during the week of October 1, 2003. Respondents were then asked about their principal employer, defined as the employer for whom they worked the most hours during the week of October 1, 2003. I restricted the sample to employed respondents working full-time (35 hours or more per week), full year (50-52 weeks) in private, for-profit U.S.-based organizations because I am interested in the authority gap among career-driven college graduates working in corporate America, where most of the labor force is employed and where management jobs are highly compensated (U.S. Census Bureau, 2010).

I excluded workers enrolled full or part-time in degree programs and those under age 30 or over age 65. By age 30 most workers have completed their education and those over 65 have likely reached the pinnacle of their careers and are heading toward retirement (McDaniel and Buchmann, 2012). These sample restrictions ensured that men and women in the sample shared similar career trajectories and were likely to be competing with each other for jobs with authority. Eighty-nine subjects were excluded because they did not indicate the industry of their principal employer. After these restrictions the sample included 26,300 workers.

My primary motivation for using the NSCG is its comprehensive coverage of factors that are known to affect the attainment or workplace authority, which allowed me to include a large number of controls in my models. The NSCG is an especially interesting dataset to test my hypotheses because it has extraordinarily detailed measures of educational attainment and field specialization along with multiple measures of workplace authority.

Measures

Dependent Variables

I measured authority with three dependent variables. First, I measured managerial authority with a dichotomous variable for whether or not a worker was a manager according to their job title. Second, I measured supervisory authority with a dichotomous variable for whether or not a worker was a supervisor who oversaw the work of a least one person. Third, I counted the total span of control among supervisors, which was equal to the number of their direct and indirect reports.

The use of different measures of authority is based on two approaches to measuring authority. Conflict theorists emphasize that authority determines class divisions where groups fight over control of the means of production, which include both physical and human resources (Dahrendorf, 1959). Status attainment theorists conceptualize authority as a status variable that increases life chances through market relations such that those with more authority have better life chances than those with less authority (Blau, 1977). Conflict theorists generally favor discrete measures of authority, whereas status attainment theorists prefer continuous measures.

This study uses both types of measures to provide a more complete picture of gender differences in authority (Robinson and Kelley, 1979; Spaeth, 1985).

I operationalized managerial authority based on distinct job codes for managers. The NSCG survey asked respondents to choose a job category from a list of jobs that best described their work at their principal job during the week of October 1, 2003. I created a variable for managerial authority equal to "1" if a worker indicated they had a management job and "0" otherwise. Management jobs were defined according to the following occupational categories: 1) computer and information systems managers; 2) engineering managers; 3) medical and health services managers; 4) natural sciences managers; 5) top-level managers and executives; and 6) other mid-level managers. There were 2,550 managers in the sample.

I created a dichotomous variable for supervisory authority that measured whether or not workers had sanctioning authority and the power to delegate tasks and influence the pay or promotion of others (Wright et al., 1995; Smith, 2002). The 2003 NSCG survey asked: "Did you supervise the work of others as part of your principal job held during the week of October 1?" Respondents were told: "Mark 'Yes' if you assigned duties to workers and recommended or initiated personnel actions such as hiring, firing, and promoting." The dichotomous measure for supervisory authority equaled "1" if the respondent indicated they were a supervisor and "0" otherwise. Approximately 13,300 (51 percent) workers in the sample were supervisors with authority over at least one person.

If respondents said they were supervisors, the NSCG survey asked how many people they supervised directly (direct reports) and indirectly through subordinate supervisors (indirect reports). I combined the two variables generated from these questions to measure supervisor's total span of control. The variables for the number of direct and indirect reports were highly skewed, with direct reports ranging from 1 to a top code of 996 and indirect reports ranging from 1 to a top code of 9,996. I capped the number of direct reports at 50, which was equal to the 99th percentile count of direct reports for the full sample and the subsamples of supervisors and managers. The 99th percentile cut-off varied across different measures of authority for indirect reports; supervisors in the 99th percentile had 350 indirect reports and managers in the 99th percentile had 1,500 indirect reports. Managers with the job title of "top-level managers and executives" had a larger number of indirect reports than managers with other titles. To help control for the fact that spans of control differ across jobs in different industries above and beyond the inclusion of controls for industry, I capped the number of indirect reports at 2,400, which was the 99th percentile count of indirect reports for top level managers and executives. Finally, I summed the number of direct and indirect reports together to get a measure of the total span of control.

Initially, I modeled direct reports separately, but the gender gap in the number of direct reports was not statistically significant. A measure of direct span of control may not accurately reflect the full distribution of supervisory authority because it is only possible to supervise the work of a finite number of people. Supervisors oversaw the work of 8.3 people on average, and managers oversaw the work of 8.8 people. Even "top-level managers and executives" had an average of only 9 direct reports. The number of indirect reports better captures a worker's position in the authority hierarchy of a given organization because most bureaucratic

organizations are vertically differentiated with multiple levels of management (Spaeth, 1979). By adding the number of direct and indirect reports together, I generated a measure of the number of people "under the jurisdiction of a given position in a work organization" (Blau, 1977: 225).

Managers had more authority than supervisors. Managers had larger spans of control than supervisors; managers had an average of approximately 104 total reports, whereas supervisors had an average of approximately 36 total reports (see Table 3.1). When asked which activities they devoted the most time to during a typical week, 58 percent of managers compared to 32 percent of supervisors indicated that they spent most of their time during a typical work week "managing or supervising people or projects." Managers also said that they spent more of their time addressing financial matters and employee relations than supervisors, which may reflect manager's greater participation in strategic decision-making in their organizations than that of supervisor's (Kalleberg, 2011). Furthermore, whereas 98 percent of managers were also supervisors, only 18.6 percent of supervisors were managers. This implied that manager's authority extended beyond managing people.

I measured financial returns to authority for managers and supervisors with two variables: the natural log of gross annual salaries of managers and supervisors. Income is a conservative estimate of the financial rewards associated with authority because it does not include bonuses, overtime, or additional compensation (e.g., stock options). Therefore, my analysis will yield conservative estimates of gender gaps in returns to authority.

Independent Variables

I measured gender with a dummy variable equal to "1" if the respondent was female and "0" if the respondent was a male. This variable represents the gender gap.

I measured degrees with categorical variables based on respondents' highest degree earned in particular fields. The NSCG gathered information about a respondent's most recent degree, second most recent degree, and first bachelor's degree for more than 140 different majors. The highest degree is determined by a rank ordering of these degrees from highest to lowest. Doctoral degrees are ranked highest, followed by professional degrees (medical and law degrees), then master's degrees, and finally, bachelor's degrees. If a respondent has more than one degree at the same level, then the most recent degree is equal to the highest degree. If a respondent has more than one degree awarded at the same time and at the same level, then educational field is used to determine which degree is the highest degree. Science and engineering degrees are given precedence over other technical degrees (e.g., math), and non-science and engineering degrees are given the lowest precedence.

I created dichotomous variables for highest degree held in broad fields of study (see the Appendix for a detailed list of degrees by field). I divided bachelor's and master's degrees into nine different fields: 1) biological and physical science; 2) computer science and related fields; 3) engineering and related fields; 4) math; 5) business; 6) economics; 7) other social sciences (excluding economics); 8) education, health, and other female-dominated, non-technical fields; and 9) humanities. Professional degrees were divided into law degrees and other professional

degrees, which consist mostly of medical degrees. Finally, doctoral degrees were divided into six categories: 1) science; 2) math and computer science; 3) engineering; 4) business and economics; 5) other social sciences; and 6) humanities, education, health, and other fields. I combined doctorates in math and computer science because both categories had too few observations to stand on their own, but they impart advanced computational and technical skills that are highly valued in the labor market. Both variables were also negatively, but not statistically significantly, correlated with being female and authority measures, but positively correlated with earnings among those with authority. I also combined doctorates in humanities, education, health and other fields because these categories were sparse and female-dominated.

I chose bachelor's degrees in humanities as my reference category because these degrees do not impart technical skills, they are female-dominate, and they are less likely to be connected to jobs with authority than degrees in other fields or levels of attainment. I relied on the NSF's Standardized Disciplinary Codes (National Science Foundation, 2012) and the 2010 Classification of Instructional Program (CIP) Codes from the National Center for Education Statistics to classify humanities fields, with the exception of "Area and Ethnic Studies," which I included under social sciences because degrees in this category are highly interdisciplinary with strong links to the social sciences (National Center for Education Statistics, 2010; American Academy of Arts and Sciences, 2013). The National Center for Education Statistics defines a humanities field as "a program that focuses on combined studies and research in the humanities subjects as distinguished from the social and physical sciences, emphasizing languages, literatures, art, music, philosophy, and religion (2010)." I categorized degrees in law, prelaw, and legal studies that were not professional degrees as part of the humanities in accordance with the CIP because these degrees are not formally a part of the legal profession and should capture degrees in legal studies, which are liberal arts degrees.

Controls

I controlled for several factors that influence authority, returns to authority, and the relationship between occupational attainment and education including race, parent's highest level of education, job preferences, firm size and age, industry, employer location, work experience, recent work history, working hours, marital and spousal employment status, the educational requirements of a spouse's job, and children. In models predicting supervisors' and managers' salaries I also controlled for the total span of control among supervisors and managers as independent variables.

I measured race with a set of indicator variables including white, black, Asian, and other. The omitted category is white. I controlled for parents' educational attainment because it reflects a respondent's class background that, in turn, affects occupational status and earnings through their accumulation of social capital (Blau and Duncan, 1967; Useem and Karabel, 1986). I measured this with a categorical variable equal to "1" if the respondent's most educated parent held a bachelor's degree or higher and "0" otherwise.

I controlled for job preferences because preferences for jobs that are more "family-friendly" (e.g., jobs that emphasize benefits and security at the expense of higher salaries and promotion opportunities) may cause women to self-select into less ambitious career paths than

men (Hakim, 2006). I controlled for the self-rated importance of salary, benefits, job security, job location, opportunities for advancement, intellectual challenge, level of responsibility, degree of independence, and contribution to society. Respondents rated each job characteristic as very important (4), somewhat important (3), somewhat unimportant (2), or not important at all (1). I constructed an authority preference index by combining opportunities for advancement, intellectual challenge, level of responsibility, and degree of independence into one index because these job preferences were positively related to measures of authority. The authority preference index has a reliability coefficient (Cronbach's alpha) equal to 0.73.

I controlled for the organizational features of workers' employers with a continuous variable for firm size, a binary variable for young organizations, and two sets of categorical variables for employer's location and industrial sector. The NSCG measured organizational size as the total number of people who worked for the respondents' principal employer at *all* locations. I converted a categorical measure of firm size into a continuous measure by plotting the cumulative distribution at the maximum value of each category and then fitting a logarithmic line to this distribution (Hollister, 2004). Using the equation for this line, I calculated the median firm size for each category. I recoded each categorical value of firm size to take on this median value and, finally, took the natural log of the continuous firm size measure.

The NSCG survey asked respondents if their principal employer was founded in the past five years. I created a dummy variable equal to "1" if the respondent indicated they worked for a new business and "0" otherwise. This measure serves as a control to net out firm size effects that may be attributable to firm age because smaller firms are often also younger firms. Smaller, younger firms are less formalized, face more uncertainty, and have weaker bargaining positions in the search for skilled employees and managers (Stinchcombe, 1965; Aldrich and Auster, 1986).

I measured industrial sector by consolidating and recoding Census industry variables into eleven major industrial sectors: 1) agriculture, fishing, forestry, and mining; 2) construction; 3) manufacturing; 4) transportation, communication, and other utilities; 5) wholesale trade; 6) retail trade; 7) finance, insurance, and real estate; 8) business, personal, social, and other services; 9) entertainment; 10) professional and health services; and 11) information services. By controlling for industrial sector, I control for gender segregation by industry because men are more likely than women to work in industries such as manufacturing, where firms are large and have more authority positions. Furthermore, women are more likely to work in industries in the service sector that require fewer technical skills (e.g., retail trade) than areas of the service sector that are dominated by men (e.g., finance). The omitted category is manufacturing. I also control for employer's regional location with variables for south, northeast, Midwest, and west. The omitted category is south.

I controlled for two types of work experience: firm-specific and general work experience. I measured firm-specific work experience as the number of years respondent's reported working for their principal employer. I measured general work experience as the number of years since respondents earned their highest degree. I generated these variables by subtracting the month and year respondents began working for their principal employer and the month and year they completed their highest degree from the year of the survey (2003). The NSCG administered

surveys between October 2003 and August 2004, but the data did not specify the exact date each survey was administered. Therefore, these measures of work experience may over-estimate work experience by approximately 3 months for some respondents and under-estimate work experience by approximately 8 months for others. I divided these monthly measures of work experience by 12 to convert the units into years. I included a squared term for general work experience because there may be a non-linear relationship between work experience and workplace authority: the contribution of more experience to authority outcomes may decrease as work experience increases (Powell and Butterfield, 1994).

To capture women's potentially weaker attachment to the workforce than men's, above and beyond years of work experience, I controlled for recent breaks in employment, employer changes, job changes, and promotions made within the past two-and-a-half years. I constructed these variables based on whether or not respondents were working during both the week of October 1, 2003 and April 1, 2001. If yes, respondents were asked if they were working for the same employer at the same job, for the same employer at a different job, for a different employer at the same job, or for a different employer at a different job. The excluded category is working for the same employer at the same job. I also included a control for promotions to net out the effect of job or employer changes made because of opportunities for career advancement with a binary variable equal to "1" if the respondent made employer or job changes because of pay or promotion opportunities and "0" otherwise.

I controlled for working hours as the natural log of typical, full-time hours worked per week. The NSCG applied a top code of 96 hours to people who reported working hours in excess of 96 hours per week, but only 28 respondents in the sample said they worked more than 96 hours per week. I took the natural log of this variable to restrict the influence of very long working hours because excessive working hours are more likely to be the result of having a position with high authority, rather than a determinant of authority (Elliot and Smith, 2004).

I controlled for family structure with a series of indicator variables that measured marital status, spousal employment status, and parenthood. To measure marital status and spousal employment I created a variable equal to "1" if a respondent was unmarried or not living in a marriage-like relationship and "0" otherwise, a variable equal to "1" if the respondent had an unemployed spouse or partner and "0" otherwise, a variable equal to "1" if the respondent had a spouse or partner who worked part-time and "0" otherwise, and a variable equal to "1" if the respondent had a spouse or partner who worked full-time and "0" otherwise. The reference category was respondents with full-time working spouses or partners. I also controlled for whether or not the duties on the spouse's job required a bachelor's degree or higher.

The NSCG asked respondents if they had any children living with them as part of their family. I created an indicator variable for parenthood equal to "1" if the respondent lived with at least one child and "0" otherwise. Gender gaps in pay and promotion are pronounced between mothers and fathers and the childless as-a-whole as well as those with similar degrees in STEM fields (Xie and Schuman, 2003; Correll, Benard, and Paik, 2007.)

Methods of Analysis

I estimated two logistic regression models to predict whether a worker is either a supervisor or a manager. The equation for the logistic regression model is:

$$P(Y = 1|x_1, x_2, x_3 \ldots) = \mathrm{F}\big(\beta_0 x_0 + \beta_1 x_1 + \tilde{\beta}_2 \tilde{x}_2 + \bar{\beta}_3 \bar{x}_3 + \hat{\beta}_4 x_1 * \bar{x}_3\big) = F(x\beta)$$

where *Y* is a binary dependent variable for either supervisory or managerial authority, x_0 is the constant, x_1 is a binary variable for gender (female=1), $\tilde{x}_2$ is a set of control variables, $\bar{x}_3$ is a set of binary variables for highest degree, $x_1 * \bar{x}_3$ represents interactions between gender and each degree variable, and *F* is the cumulative density function of the logistic distribution. I first estimated this model for both men and women without interaction effects. I then estimated main effects models for women and men separately. Finally, I estimated the pooled model for men and women with interaction effects as written above.

I estimated zero-truncated negative-binomial models to predict the span of control among those with supervisor authority. I excluded those without supervisory authority because my goal was to model the vertical gender gap in authority among those who have authority. Zero-truncated count models account for the exclusion of zero outcomes – those without supervisory authority. I used a negative-binomial model because the variable for total span of control was over dispersed (i.e., the variance exceeded the mean). Over-dispersion can generate spuriously small standard errors and inflate significance levels (Long and Freese, 2006). The negative-binomial model accounts for over dispersion by adding the parameter α, which reflects unobserved heterogeneity among observations. The equation for the zero-truncated negative binomial model is:

$$\mu = \exp\big(\beta_0 x_0 + \beta_1 x_1 + \tilde{\beta}_2 \tilde{x}_2 + \beta_3 \bar{x}_3 + \hat{\beta}_4 x_1 * \bar{x}_3\big)\,\delta \;\; for\; Y > 0$$
$$\delta \equiv \exp(\epsilon)$$

where μ is the expected number of total subordinates, x_0 is the constant, x_1 is a binary variable for gender (female=1), $\tilde{x}_2$ is a set of control variables, $\bar{x}_3$ is a set of binary variables for highest degree, $x_1 * \bar{x}_3$ represents interactions between gender and each degree variable, Y is the observed count of total subordinates given that Y is greater than 0, and δ is the expectation of the error term drawn from a gamma distribution. The error term, ϵ, is assumed to be uncorrelated with the *x*s. The conditional probability in the zero-truncated negative binomial model is:

$$P(Y_i|Y_i > 0, x_i) = \frac{P(Y_i|x_i)}{1 - (1 + \alpha\mu_i)^{-1/\alpha}}$$

where the probability of each observed, positive outcome, Y, for a given set of *x*s is computed given that we know the outcome is greater than zero. μ_i is the expected number of total reports and α is the over-dispersion parameter. Statistical significance of the over-dispersion parameter α indicates evidence of over-dispersion in favor of the zero-truncated negative binomial model. I followed the same modeling strategy used for the logistic regression models to test my hypotheses – I first estimated a pooled main effects model, separate main effects models by

gender, and then the final model for the pooled sample of men and women with interaction effects.

To estimate annual salaries of supervisors and managers I estimated log-linear models given by the equation:

$$\ln(Y) = \beta_0 x_0 + \beta_1 x_1 + \tilde{\beta}_2 \tilde{x}_2 + \beta_3 \bar{x}_3 + \hat{\beta}_4 x_1 * \bar{x}_3 \ldots + \epsilon,$$
$$\epsilon | x_i \sim N(0, \sigma^2)$$

where $\ln(Y_i)$ is the natural logarithm of annual salary for supervisors and managers, respectively, x_0 is the constant, x_1 is a binary variable for gender (female=1), $\tilde{x}_2$ is the same set of control variables used in the logistic and negative-binomial models with the addition of total span of control, $\bar{x}_3$ is a set of binary variables for highest degree, $x_1 * \bar{x}_3$ represents interaction terms between gender and each degree variable, and ϵ is the residual or error term, which is normally distributed with a mean of zero and variance σ^2. I repeated the same model building techniques used in the logistic and negative binomial models to test my hypotheses for the log-linear models.

The models are estimated using survey weights to generate accurate standard errors and to make it possible to generalize to the population of U.S. college-graduates. The NSCG oversamples some smaller populations in less common fields of study. Response rates to the 2003 NSCG also varied by age, race, and marital status (White, 2010). The sampling weights reflect differential selection probabilities and adjustments needed to compensate for non-response and under-coverage. The sampling weights are defined as the reciprocal of the probability of selection for each sampled unit.

Results

Table 3.1 presents ranges, means, and standard deviations calculated using survey weights for all variables in the analysis for the full sample of workers and the subsamples of supervisors and managers by gender. The means in bold italics vary significantly between men and women according to t-tests ($p<0.05$). Rows 1 and 2 of Table 3.1 show that women are underrepresented as managers and supervisors. According to the third row of Table 3.1, women have an average of approximately 10 fewer reports than men. Men in the sample also earn considerably more than women. The average gender gap in earnings for the full sample is approximately $22,800. The gender gap in earnings widens to approximately $25,500 among supervisors and managers.

Descriptive statistics from Table 3.1 show that women in the sample are less likely than men to hold most business, economics, and STEM degrees – they are less likely than men to earn master's degrees in business (MBAs), bachelor's degrees and PhDs in economics, PhDs in science, master's degrees and PhDs in computer science, all engineering degrees, and BAs in math. However, college-educated women who work in private, for-profit organizations are not

Table 3.1: Descriptive Statistics for the NSCG 2003

2003 NSCG Descriptive Statistics			Full Sample						Supervisor Sample						Manager Sample					
			Men and Women		Men (N=6,882,521)		Women (N=3,000,039)		Men and Women		Men (N=3,950,593)		Women (N=1,445,060)		Men and Women		Men (N=944,322)		Women (N=207,224)	
	Min	Max	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Dependent Variables																				
manager	0	1	***0.117***	0.333	0.137	0.366	0.069	0.246	***0.209***	0.407	0.234	0.433	0.138	0.325						
supervisor	0	1	***0.546***	0.517	0.574	0.527	0.482	0.485							0.977	0.141	0.981	0.129	0.961	0.183
span of control (direct + indirect reports)	0	2429	***19.470***	107.677	22.596	120.316	12.297	76.050	***35.660***	138.646	39.365	150.160	25.530	105.026	103.890	252.662	107.959	259.510	85.350	217.476
salary	1	565172	***81740***	64931	88701	69569	65807	50964	***94473***	71015	101325	75803	75743	53809	***121904***	72044	126461	74416	101141	55805
Independent Variables																				
female	0	1	0.304	0.477					0.268	0.444					0.180	0.364				
BA - business	0	1	0.207	0.420	0.208	0.432	0.203	0.391	0.216	0.412	0.218	0.422	0.210	0.385	0.252	0.411	0.248	0.408	0.275	0.425
MA - business	0	1	***0.095***	0.305	0.102	0.323	0.080	0.263	***0.117***	0.322	0.124	0.337	0.099	0.282	0.166	0.352	0.169	0.354	0.156	0.345
BA - economics	0	1	***0.020***	0.146	0.024	0.163	0.011	0.102	***0.021***	0.144	0.026	0.163	0.008	0.082	***0.028***	0.157	0.032	0.167	0.011	0.099
MA - economics	0	1	0.003	0.054	0.003	0.059	0.002	0.040	0.003	0.056	0.004	0.061	0.002	0.044	***0.004***	0.060	0.005	0.065	0.001	0.027
PhD - economics and business	0	1	***0.001***	0.030	0.001	0.034	0.0004	0.019	***0.001***	0.025	0.001	0.029	0.0002	0.012	0.001	0.034	0.001	0.035	0.001	0.026
BA - science	0	1	0.044	0.212	0.044	0.217	0.044	0.199	0.039	0.194	0.041	0.203	0.034	0.172	0.044	0.193	0.040	0.184	0.062	0.230
MA - science	0	1	0.009	0.101	0.010	0.105	0.009	0.090	0.009	0.093	0.009	0.098	0.007	0.081	0.006	0.075	0.007	0.079	0.003	0.054
PhD - science	0	1	***0.009***	0.097	0.010	0.105	0.006	0.077	0.010	0.102	0.011	0.107	0.009	0.087	0.010	0.094	0.010	0.095	0.009	0.088
BA - computer science	0	1	0.034	0.188	0.037	0.201	0.027	0.158	0.028	0.166	0.030	0.173	0.024	0.145	0.025	0.149	0.028	0.155	0.015	0.116
MA - computer science	0	1	***0.016***	0.129	0.017	0.137	0.013	0.112	***0.013***	0.115	0.014	0.122	0.010	0.095	0.013	0.106	0.013	0.108	0.010	0.095
PhD - computer science/math	0	1	***0.001***	0.040	0.002	0.045	0.001	0.027	***0.001***	0.033	0.001	0.037	0.001	0.021	0.001	0.031	0.001	0.031	0.001	0.031
BA - engineering	0	1	***0.104***	0.316	0.138	0.367	0.026	0.156	***0.108***	0.312	0.138	0.353	0.028	0.155	***0.131***	0.320	0.151	0.338	0.042	0.191
MA - engineering	0	1	***0.033***	0.185	0.042	0.213	0.012	0.107	***0.033***	0.178	0.041	0.202	0.010	0.096	***0.029***	0.160	0.034	0.171	0.009	0.091
PhD - engineering	0	1	***0.006***	0.078	0.007	0.091	0.002	0.041	***0.006***	0.075	0.007	0.083	0.003	0.049	0.007	0.080	0.007	0.078	0.009	0.091
BA - math	0	1	***0.014***	0.121	0.015	0.130	0.011	0.099	0.012	0.107	0.012	0.112	0.010	0.094	0.010	0.096	0.009	0.091	0.014	0.113
MA - math	0	1	0.004	0.067	0.004	0.065	0.005	0.069	0.003	0.056	0.003	0.053	0.004	0.062	0.003	0.052	0.003	0.050	0.004	0.058
BA - social science	0	1	***0.054***	0.235	0.048	0.228	0.069	0.245	***0.054***	0.226	0.046	0.215	0.074	0.247	0.046	0.199	0.044	0.195	0.056	0.219
MA - social science	0	1	***0.008***	0.094	0.007	0.087	0.012	0.104	0.008	0.089	0.007	0.087	0.010	0.093	***0.012***	0.104	0.014	0.113	0.002	0.046
PhD - social science	0	1	***0.002***	0.046	0.001	0.038	0.004	0.059	***0.003***	0.050	0.001	0.036	0.006	0.073	0.003	0.048	0.002	0.037	0.007	0.080
BA - health, education, other	0	1	***0.160***	0.381	0.124	0.351	0.244	0.417	***0.146***	0.354	0.116	0.327	0.230	0.397	***0.104***	0.289	0.094	0.276	0.150	0.339
MA - health, education, other	0	1	***0.040***	0.203	0.030	0.183	0.062	0.234	***0.037***	0.190	0.029	0.173	0.059	0.222	0.039	0.182	0.035	0.173	0.058	0.221
BA - humanities	0	1	***0.075***	0.273	0.065	0.262	0.098	0.288	***0.061***	0.241	0.053	0.228	0.085	0.264	***0.043***	0.193	0.036	0.176	0.077	0.253
MA - humanities	0	1	0.011	0.108	0.010	0.106	0.013	0.111	0.011	0.103	0.009	0.097	0.015	0.116	0.005	0.070	0.005	0.064	0.009	0.092
PhD - humanities, health, education, other	0	1	0.003	0.059	0.003	0.058	0.004	0.059	0.004	0.059	0.003	0.059	0.004	0.059	0.004	0.057	0.003	0.054	0.005	0.070
professional degree - law	0	1	0.029	0.175	0.030	0.181	0.028	0.161	0.037	0.189	0.036	0.191	0.040	0.185	0.008	0.084	0.008	0.082	0.010	0.093
professional degree - medical/other	0	1	0.018	0.138	0.019	0.146	0.015	0.118	0.020	0.139	0.020	0.144	0.018	0.125	0.003	0.050	0.003	0.049	0.003	0.056
Controls																				
white	0	1	***0.847***	0.374	0.868	0.361	0.799	0.389	***0.873***	0.333	0.887	0.324	0.836	0.350	0.909	0.273	0.914	0.266	0.887	0.302
black	0	1	***0.050***	0.227	0.039	0.206	0.077	0.258	***0.042***	0.201	0.034	0.185	0.065	0.232	***0.028***	0.157	0.024	0.144	0.049	0.205
asian	0	1	***0.088***	0.294	0.080	0.289	0.107	0.301	0.070	0.256	0.067	0.255	0.079	0.254	0.052	0.210	0.054	0.214	0.043	0.192
other race	0	1	0.014	0.124	0.013	0.122	0.017	0.125	***0.015***	0.121	0.013	0.114	0.021	0.135	***0.011***	0.099	0.009	0.088	0.022	0.140
parent's education - some college or less	0	1	0.543	0.517	0.543	0.531	0.542	0.484	0.530	0.500	0.532	0.510	0.525	0.471	***0.534***	0.472	0.546	0.471	0.477	0.475
parent's education - BA	0	1	***0.256***	0.453	0.263	0.469	0.240	0.415	***0.259***	0.439	0.267	0.452	0.238	0.402	0.272	0.421	0.277	0.423	0.248	0.410
parent's education - MA+	0	1	***0.201***	0.416	0.194	0.421	0.218	0.401	***0.211***	0.409	0.201	0.410	0.237	0.401	***0.194***	0.375	0.177	0.361	0.275	0.425
preferences - authority (index)	4	16	***13.940***	1.881	13.860	1.955	14.124	1.694	***14.125***	1.720	14.062	1.781	14.300	1.543	14.400	1.448	14.375	1.471	14.516	1.336
preferences - salary	1	4	***3.632***	0.529	3.618	0.551	3.665	0.479	***3.626***	0.508	3.612	0.524	3.665	0.461	3.608	0.471	3.598	0.474	3.654	0.452
preferences - benefits	1	4	***3.660***	0.555	3.641	0.571	3.702	0.513	***3.654***	0.523	3.634	0.540	3.708	0.474	3.621	0.488	3.610	0.490	3.672	0.473
preferences - security	1	4	***3.601***	0.601	3.571	0.634	3.669	0.521	***3.587***	0.586	3.557	0.612	3.670	0.505	***3.532***	0.560	3.517	0.567	3.597	0.521
preferences - social importance	1	4	***3.179***	0.764	3.126	0.794	3.301	0.678	***3.183***	0.727	3.143	0.745	3.295	0.666	***3.153***	0.668	3.121	0.674	3.296	0.619
preferences - location	1	4	***3.440***	0.639	3.399	0.666	3.532	0.568	***3.427***	0.618	3.392	0.636	3.524	0.558	***3.423***	0.575	3.399	0.582	3.536	0.530
firm size (ln)	1.609	11.646	***7.192***	3.413	7.116	3.532	7.369	3.129	***7.070***	3.298	6.979	3.378	7.316	3.063	***7.315***	2.938	7.177	2.946	7.943	2.827
new firm	0	1	***0.063***	0.252	0.067	0.267	0.054	0.219	***0.062***	0.242	0.067	0.256	0.047	0.200	0.072	0.245	0.077	0.252	0.050	0.207
south	0	1	0.312	0.481	0.309	0.492	0.321	0.454	0.311	0.464	0.310	0.473	0.315	0.439	0.297	0.433	0.303	0.435	0.269	0.421
northeast	0	1	0.236	0.440	0.232	0.449	0.245	0.418	***0.238***	0.427	0.231	0.431	0.259	0.413	0.242	0.405	0.233	0.400	0.283	0.428
midwest	0	1	***0.233***	0.439	0.240	0.455	0.216	0.400	0.234	0.424	0.240	0.437	0.218	0.390	0.240	0.404	0.244	0.406	0.222	0.395
west	0	1	0.219	0.429	0.220	0.441	0.218	0.401	0.216	0.412	0.219	0.423	0.208	0.383	0.221	0.393	0.220	0.392	0.227	0.398
manufacturing	0	1	***0.213***	0.425	0.239	0.454	0.151	0.348	***0.213***	0.410	0.237	0.435	0.146	0.333	***0.283***	0.426	0.294	0.431	0.231	0.401
agriculture, fishing, forestry, mining	0	1	***0.011***	0.106	0.012	0.117	0.007	0.080	***0.012***	0.108	0.013	0.117	0.007	0.078	***0.012***	0.104	0.014	0.111	0.004	0.063
construction	0	1	***0.031***	0.179	0.039	0.207	0.011	0.101	***0.038***	0.193	0.048	0.219	0.012	0.101	***0.062***	0.229	0.072	0.244	0.018	0.127
transportation, communication, utilities	0	1	***0.045***	0.215	0.050	0.231	0.034	0.176	***0.040***	0.197	0.045	0.213	0.027	0.152	0.046	0.198	0.047	0.200	0.039	0.185
wholesale	0	1	***0.058***	0.243	0.064	0.261	0.045	0.202	***0.056***	0.231	0.061	0.245	0.042	0.190	0.069	0.240	0.068	0.239	0.070	0.243
retail	0	1	0.084	0.288	0.083	0.293	0.088	0.275	***0.093***	0.291	0.086	0.287	0.112	0.297	0.072	0.244	0.069	0.240	0.084	0.264
FIRE	0	1	***0.160***	0.380	0.149	0.379	0.184	0.377	***0.152***	0.359	0.146	0.361	0.168	0.353	0.143	0.332	0.136	0.324	0.178	0.364
business, personal, social services	0	1	***0.044***	0.212	0.041	0.211	0.050	0.212	***0.039***	0.194	0.036	0.190	0.049	0.203	0.040	0.185	0.037	0.178	0.055	0.217
entertainment	0	1	0.027	0.167	0.025	0.167	0.030	0.166	0.032	0.176	0.032	0.179	0.033	0.167	0.034	0.172	0.033	0.169	0.040	0.186
professional services	0	1	***0.259***	0.454	0.235	0.452	0.312	0.450	***0.264***	0.442	0.242	0.438	0.325	0.442	0.177	0.361	0.171	0.356	0.202	0.382
information services	0	1	***0.070***	0.264	0.062	0.257	0.087	0.274	***0.061***	0.239	0.053	0.230	0.081	0.258	0.062	0.228	0.059	0.222	0.077	0.253

Table 3.1: Descriptive Statistics continued

2003 NSCG Descriptive Statistics continued			Full Sample						Supervisor Sample						Manager Sample					
			Men and Women		Men (N=6,882,521)		Women (N=3,000,039)		Men and Women		Men (N=3,950,593)		Women (N=1,445,060)		Men and Women		Men (N=944,322)		Women (N=207,224)	
	Min	Max	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
same job, same employer 2001	0	1	***0.674***	0.486	0.687	0.494	0.643	0.466	***0.703***	0.458	0.711	0.464	0.683	0.439	***0.692***	0.437	0.705	0.431	0.632	0.459
not working in 2001	0	1	***0.045***	0.214	0.039	0.207	0.056	0.224	0.033	0.180	0.030	0.176	0.041	0.188	0.024	0.144	0.024	0.144	0.023	0.144
different job, same employer 2001	0	1	***0.089***	0.296	0.083	0.294	0.103	0.295	***0.102***	0.303	0.096	0.301	0.118	0.304	***0.145***	0.333	0.133	0.322	0.195	0.377
same job, different employer 2001	0	1	0.093	0.302	0.095	0.312	0.091	0.279	0.086	0.281	0.087	0.289	0.083	0.260	0.066	0.235	0.064	0.232	0.073	0.247
different job, different employer 2001	0	1	0.099	0.310	0.095	0.312	0.107	0.301	0.076	0.265	0.076	0.270	0.076	0.249	0.074	0.248	0.074	0.247	0.076	0.252
promoted in 2001	0	1	***0.147***	0.368	0.142	0.372	0.160	0.356	0.161	0.368	0.155	0.370	0.683	0.439	0.190	0.371	0.181	0.364	0.231	0.401
working hours	35	96	***47.044***	8.693	48.044	9.091	44.748	7.305	***49.116***	8.743	50.007	8.952	46.678	7.702	***52.431***	8.067	52.761	8.094	50.931	7.786
firm-specific work experience	0.167	43.580	***7.595***	7.660	7.929	8.160	6.829	6.450	***8.200***	7.540	8.390	7.920	7.660	6.460	7.910	6.920	7.990	6.950	7.540	6.770
general work experience	0.250	47	***17.560***	9.560	18.170	9.890	16.160	8.630	***17.730***	9.010	18.380	9.300	15.940	7.960	***19.490***	8.530	19.990	8.550	17.260	8.110
single	0	1	***0.217***	0.428	0.169	0.399	0.329	0.457	***0.187***	0.391	0.143	0.358	0.307	0.435	***0.119***	0.306	0.092	0.273	0.244	0.408
unemployed spouse	0	1	***0.227***	0.428	0.294	0.485	0.075	0.256	***0.246***	0.432	0.309	0.472	0.075	0.248	***0.337***	0.447	0.384	0.460	0.120	0.309
spouse working full-time	0	1	***0.442***	0.428	0.390	0.520	0.562	0.482	***0.439***	0.497	0.387	0.498	0.582	0.466	***0.391***	0.462	0.344	0.449	0.607	0.464
spouse working part-time	0	1	***0.113***	0.428	0.147	0.378	0.033	0.174	***0.128***	0.334	0.161	0.376	0.036	0.176	***0.153***	0.341	0.180	0.364	0.030	0.161
spouse's job requires a BA	0	1	***0.330***	0.490	0.320	0.500	0.350	0.460	***0.340***	0.470	0.320	0.480	0.360	0.450	***0.330***	0.440	0.314	0.438	0.387	0.463
children	0	1	***0.580***	0.510	0.610	0.520	0.510	0.480	***0.610***	0.490	0.650	0.490	0.530	0.470	***0.650***	0.450	0.680	0.440	0.500	0.480

Notes: N=subpopulation size. Reference category is listed in *italics*. Means in ***bold, italics*** are statistically different for men and women ($p<0.05$).

under-represented among bachelor's degree holders in business, science, and computer science or among master's degree holders in economics, science, and mathematics.

Women are over-represented among all social science degree holders, bachelors and master's degree holders in health, education and other vocational fields as well as among holders of bachelor's degrees in the humanities. Among college-educated supervisors and managers, there are fewer gender differences in specialized degrees. However, gender differences in degrees are particularly persistent in business, economics, and engineering among supervisors and managers.

Descriptive statistics for the control variables show that men in the sample are more likely to be white and come from slightly less educated families than women. Gender differences favor women in terms of work preferences – in particular, women are more likely to prefer jobs with more authority and higher salaries than men. Men and women also work in different types of firms. Women are more likely to work in slightly larger firms than men, who are more likely to work in new firms, which are often small in size. Men are also more likely to work in manufacturing than women, who outnumber men in the service sector. Men and women also have very different employment experiences – men are more likely to stick with the same job working at the same employer, where they work longer hours. Men also have more firm-specific and general work experience than women. Gender differences also extend beyond work and into family life. Men are more likely than women to have a spouse whose job requires less education and fewer hours. Men in the sample were also more likely than women to have children. These gender differences in the life experiences of men and women make it reasonable to assume that gender differences in the effect of educational degrees on authority outcomes are best modeled separately for men and women rather than together using interaction effects. Nonetheless, I present results from both types of models to make assessments about the statistical significance of the difference in size of the degree effects between men and women.

Table 3.2 shows the main effects of the independent variables for each dependent variable. Although these results include the control variables, I do not include the coefficients for controls in Table 3.2. The coefficients for the control variables are available in the Appendix. The upper half of the table presents coefficients for business, economics and STEM degrees, whereas the lower half reports coefficients for other degrees. In every field, at least two degrees are more likely to grant access to jobs with authority or confer more authority to those already in positions of authority than bachelor's degrees in the humanities.

The first two rows of Table 3.2 provide support for hypothesis 1 that college graduates with bachelors and master's degrees in business are more likely to hold positions of authority than those with bachelor's degrees in the humanities. Models 1 through 3 show that college graduates with bachelor's degrees in business are more likely to be supervisors and managers, and have more authority if they are supervisors, than college graduates with bachelor's degrees in the humanities. Models 1 through 5 further demonstrate that MBAs have a large, consistent effect on authority outcomes and are associated with 29 percent higher salaries for supervisors and 20 percent higher salaries for managers.

Economics degrees also positively affect authority outcomes – particularly at the bachelor's degree level for access to jobs with authority and at the master's degree level with regard to the extent of authority and the financial returns to authority. Supervisors and managers with master's degrees in economics earn 21 and 24 percent more, respectively, than supervisors and managers with bachelor's degrees in the humanities. These results lend some support to hypothesis 1 for bachelors and master's degrees in economics.

Table 3.2 shows that the effect of science and computer science degrees on the attainment of authority and financial returns to authority are more dispersed and weaker than for college graduates with business and economics degrees. College graduates with bachelor's degrees in science are more likely to be managers and have larger spans of control if they are supervisors, but they are not more likely to be supervisors or earn higher salaries if they are supervisors or managers than those with bachelor's degrees in the humanities. Master's degrees in science do not confer any authority benefits to their holders over and above bachelor's degrees in the humanities. PhDs in science, however, are more likely to be supervisors and earn salaries that are 41 percent higher if they are supervisors and 35 percent higher if they are managers than supervisors and managers with bachelor's degrees in the humanities. These results lend some, albeit weak, support to hypothesis 1 for science degrees because only bachelor's degrees and PhDs in science confer advantages over bachelor's degrees in the humanities in access to authority as managers and supervisors. Furthermore, financial returns to authority are only greater for PhDs in science relative to those with bachelor's degrees in the humanities.

The effects of computer science degrees on the attainment of authority are confined to master's degree holders who increase their odds of being managers by approximately 91 percent over those with bachelor's degrees in the humanities. Supervisors and managers with master's degrees in computer science also enjoy salaries that are 21 and 23 percent higher, respectively, than supervisors and managers with bachelor's degrees in the humanities. Supervisors with

Table 3.2: Coefficients of Regressions of Authority and Returns to Authority

italics are marginal	Supervisory Authority	Managerial Authority	Supervisor's Span of Control	Supervisors' Salaires	Managers' Salaries
	Model 1	Model 2	Model 3	Model 4	Model 5
Independent Variables	Women and Men	Women and Men	Women and Men	Women and Men	Women and Men
gender (female=1)	-0.036	-0.119	-0.155*	-0.128***	-0.096***
BA - business	0.363***	0.647***	0.592***	0.071	0.042
MA - business	0.751***	0.989***	0.798***	0.287***	0.199***
BA - economics	0.382*	0.748**	0.693**	0.102	0.083
MA - economics	0.509	0.324	1.406**	0.214*	0.241*
PhD - economics and business	-0.150	1.175	1.144	0.399***	0.114
BA - science	0.035	0.401*	0.534**	-0.009	-0.068
MA - science	0.244	0.126	0.250	0.015	-0.093
PhD - science	0.691***	0.389	-0.208	0.407***	0.350***
BA - computer science	-0.044	0.337	0.143	0.170***	-0.002
MA - computer science	0.159	0.646**	0.119	0.212***	0.228*
PhD - computer science/math	-0.431	-0.04	-0.200	0.622***	0.729
BA - engineering	0.284**	0.430*	0.393**	0.093*	0.041
MA - engineering	0.331**	0.318	0.203	0.199***	0.193**
PhD - engineering	0.316*	0.591*	1.033	0.401***	0.309***
BA - math	0.034	0.121	0.517*	0.090	0.054
MA - math	-0.083	0.200	0.064	0.289***	0.138
BA - social science	0.297*	0.285	0.509**	0.019	-0.004
MA - social science	0.265	1.127***	1.568**	0.171*	0.031
PhD - social science	0.994*	0.919	0.644	0.269**	-0.008
BA - health, education, other	0.204*	0.103	0.611***	0.003	-0.017
MA - health, education, other	0.181	0.566**	0.794***	0.086	0.082
MA - humanities	0.417	-0.139	0.227	-0.074	0.147
PhD - humanities, health, education, other	0.326	0.429	0.690*	0.276***	0.054
professional degree - law	0.578***	-1.216***	0.081	0.548***	0.455**
professional degree - medical/other	0.106	-1.847***	0.355	0.615***	0.233*
constant	-2.705***	-7.316***	-1.155**	9.697***	10.119***
chi squared	1378.674	1152.822			
lnalpha			1.498***		
R squared				0.288	0.314

Notes: * p<0.05; ** p<0.01; *** p<0.001. These models include controls for race, parent's education, work preferences, firm characteristics, region, industry, recent work history, work experience, working hours, marital status, spouse's employment status, and parenthood. See Tables 3.1A and 3.2A in the Appendix for coefficients for controls.

bachelor's degrees and PhDs in math or computer science also earn 17 and 62 percent more, respectively, than supervisors with bachelor's degrees in the humanities. These results lend partial support to hypothesis 1 for computer science degrees because authority benefits to

computer science degrees are mainly concentrated among master's degree holders and financial returns to authority primarily benefit supervisors.

Models 1 and 2 in Table 3.2 show that all engineering degrees are more likely to lead to jobs with supervisory authority and bachelor's degrees and PhDs in engineering are more likely to lead to management jobs than bachelor's degrees in the humanities. Among supervisors, bachelor's degrees in engineering increase supervisors' expected number of total reports by 48 percent and their salaries by about 9 percent. Supervisors and managers with master's degrees or PhDs in engineering also earn higher salaries than college graduates with bachelor's degrees in the humanities. These results lend support to hypothesis 1 for engineering degrees.

Surprisingly, there is little evidence that mathematics majors enjoy far greater authority or returns to authority than those with bachelor's degrees in the humanities. College graduates with bachelor's and master's degrees in mathematics are no more likely to be supervisors or managers than those with bachelor's degrees in the humanities. The authority advantages conferred by math degrees are isolated to the level of supervisors. Supervisors with bachelor's degrees in math increase their expected number of reports by approximately 68 percent and supervisors with master's degrees in math earn 29 percent higher wages than supervisors with bachelor's degrees in the humanities. These results imply that there may be an over-emphasis on the benefits of mathematical competence in the literature because mathematical expertise is clearly not enough to get ahead in the corporate world. In particular, the fields of business, economics, and engineering appear to confer a particular set of skills over and above mathematical competence, and in contrast to the skills imparted by humanities degrees, that propel workers into legitimate positions of power in the workplace. Perhaps it is the applied use of mathematics as an analytical tool in business administration, finance, and engineering that confers an authority advantage.

The lower half of Table 3.2 shows that degrees in female-dominated and gender-neutral fields also confer authority advantages over bachelor's degrees in the humanities. Indeed, there are especially large effects for master's degrees in the social sciences on managerial authority and supervisor's total span of control. Degrees in health, education, and other vocational fields may provide greater access to positions of authority and more authority among supervisors than bachelor's degrees in the humanities, but no salary advantage to those with authority. Master's degrees in the humanities do not provide greater access to authority positions or greater financial returns to authority than bachelor's degrees in humanities fields. Supervisors with PhDs in the combined categories of the humanities, health, education, and other vocational fields have larger spans of control and earn salaries that are about 28 percent higher than the salaries earned by supervisors with bachelor's degrees in the humanities. Finally, the results show that professional degrees in law and medicine confer salary benefits to supervisors and managers, but little access to authority structures.

Table 3.3 presents coefficients from regressions of supervisory and managerial authority separately for women and men and includes a main effects model with interactions between gender and degree. The models in Table 3.3 test hypothesis 2. The first row of models 1 and 2 shows that men with bachelor's degrees in business increase their odds of being supervisors by about 49 percent over men with bachelor's degrees in humanities, but that women do not

Table 3.3: Coefficients from Regressions of Authority for Men and Women and Interaction Effects

italics are marginal	Supervisory Authority			Managerial Authority		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Independent Variables	Women	Men	Main Effects + Interactions	Women	Men	Main Effects + Interactions
gender (female=1)			0.003			0.105
BA - business	0.272	0.396**	0.401**	0.595*	0.686***	0.705***
MA - business	0.704***	0.772***	0.778***	0.890**	1.033***	1.036***
BA - economics	-0.318	0.512*	0.535*	0.635	0.815**	0.828**
MA - economics	0.354	0.519	0.545	-1.163	0.554	0.498
PhD - economics and business	-1.172	0.001	0.020	0.838	1.298	1.298
BA - science	-0.187	0.143	0.142	0.578	0.346	0.364
MA - science	-0.060	0.363	0.365	-0.592	0.257	0.288
PhD - science	0.853*	0.600***	0.630***	0.277	0.415	0.432
BA - computer science	-0.074	-0.019	-0.039	-0.467	0.517	0.539
MA - computer science	-0.037	0.237	0.232	0.407	0.726**	0.757**
PhD - computer science/math	-0.253	-0.440	-0.450	0.864	-0.126	-0.113
BA - engineering	0.179	0.294*	0.306*	0.467	0.460*	0.487*
MA - engineering	0.089	0.368**	0.377**	-0.125	0.374	0.405
PhD - engineering	1.242*	0.203	0.247	*1.379*	0.448	0.489
BA - math	0.085	0.014	0.025	0.264	0.067	0.104
MA - math	-0.050	-0.089	-0.061	-0.395	0.410	0.451
BA - social science	0.386*	0.222	0.236	-0.026	0.392	0.400
MA - social science	-0.058	0.507	0.508	-1.345	1.607***	1.625***
PhD - social science	1.727**	0.044	0.022	1.272	0.576	0.590
BA - health, education, other	0.215	0.184	0.171	-0.182	0.209	0.225
MA - health, education, other	0.091	0.223	0.221	0.142	0.741**	0.740**
MA - humanities	0.967*	0.118	0.101	0.191	-0.222	-0.240
PhD - humanities, health, education, other	0.281	0.339	0.330	0.278	0.437	0.449
professional degree - law	0.672**	0.530**	0.513**	-1.358*	-1.170**	-1.188**
professional degree - medical/other	0.288	0.053	0.031	-1.655*	-1.869***	-1.887***
BA - business*female			-0.119			-0.159
MA - business*female			-0.094			-0.076
BA - economics*female			-0.840*			-0.332
MA - economics*female			-0.146			-1.530
PhD - economics and business*female			-1.343			-0.621
BA - science*female			-0.349			0.237
MA - science*female			-0.418			-0.904
PhD - science*female			0.292			-0.056
BA - computer science*female			-0.003			-1.029
MA - computer science*female			-0.286			-0.447
PhD - computer science/math*female			0.167			0.891
BA - engineering*female			-0.145			-0.010
MA - engineering*female			-0.330			-0.462
PhD - engineering*female			0.835			1.003

Table 3.3: continued

italics are marginal	Supervisory Authority			Managerial Authority		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Independent Variables - Interaction Terms	Women	Men	Main Effects + Interactions	Women	Men	Main Effects + Interactions
BA - math*female			0.063			0.176
MA - math*female			-0.061			-0.836
BA - social science*female			0.152			-0.394
MA - social science*female			-0.549			-2.882***
PhD - social science*female			1.738*			0.642
BA - health, education, other*female			0.065			-0.399
MA - health, education, other*female			-0.094			-0.547
MA - humanities*female			0.878			0.393
PhD - humanities, health, education, other*female			-0.016			-0.041
professional degree - law*female			0.215			-0.025
professional degree - medical/other*female			0.299			0.367
constant	-2.865***	-2.767***	-2.721***	-7.309***	-7.291***	-7.367***
chi squared	498.94	914.55	1431.43	325.065	853.775	1188.005

Notes: * p<0.05; ** p<0.01; *** p<0.001. These models include controls for race, parent's education, work preferences, firm characteristics, region, industry, recent work history, work experience, working hours, marital status, spouse's employment status, and parenthood. See Tables 3.1A and 3.2A for coefficients for the controls. Coefficients in *italics* indicate marginal significance (p<0.10).

experience this same authority advantage from their bachelor's degrees in business. Model 3, however, indicates that this male authority advantage is not significantly large. Models 4 and 5 show that both women and men are more likely to be managers if they have bachelor's degrees in business rather than bachelor's degrees in the humanities, however, men with bachelor's degrees in business increase their odds of being managers by 98 percent, whereas women increase their odds by 81 percent.

Nonetheless, model 6 does not indicate that gender differences in the effects of bachelor's degrees in business on managerial authority are significantly large. The second row of Table 3.3 shows that men also glean greater workplace authority from their MBAs than women, yet models 3 and 6 do not indicate that the differences in these effects are significantly large between men and women. These results lend some, albeit weak, support to hypothesis 2 that men benefit more from their business degrees than women in terms of access to workplace authority.

Table 3.3 shows that men, but not women, with bachelor's degrees in economics are more likely to be supervisors and managers than their counterparts with bachelor's degrees in the humanities. Men with bachelor's degrees in economics increase their odds of being supervisors by 66 percent and their odds of being managers by a factor of 2.26 over men with bachelor's degrees in the humanities. Meanwhile, women with economics degrees are just as likely to be supervisors and managers as women with bachelor's degrees in the humanities. The interaction effect in model 3 indicates that the difference in the effect of bachelor's degrees in economics on supervisory authority is statistically significantly different between men and women (p<0.05). This result lends support to hypothesis 2 that men with economics degrees, at least at the bachelor's degree level, are more likely to have jobs with workplace authority than women with the same degrees.

The results from Table 3.3 do not support hypothesis 2 for science degrees. Women with PhDs in science increase their odds of being supervisors at a greater rate over their counterparts with bachelor's degrees in the humanities than men. Model 5 presents little support for hypothesis 2 with regard to computer science. Men with master's degrees in computer science have much higher odds of being managers than men with bachelor's degrees in the humanities. Yet, women do not enjoy a similar benefit from their master's degrees in computer science. Model 6 does not show that this authority advantage is significantly large. The result lends weak support to hypothesis 2 that men with computer science degrees are more likely to have jobs with workplace authority than women with computer science degrees.

Bachelor's and master's degrees in engineering confer supervisory and managerial authority on men over and above bachelor's degrees in the humanities, but women see no authority benefit from these engineering degrees. Women with PhDs in engineering, however, see an authority gain over their female counterparts with bachelor's degrees in the humanities, whereas male engineering PhDs do not. Models 3 and 6 show that gender differences in the effect of engineering degrees on authority are not significantly large. Therefore, while some evidence supports small authority advantages in access to workplace authority for men with some engineering degrees, these effects appear to be small in size. These results support hypothesis 2 for bachelors and master's degrees in engineering, but not for engineering PhDs.

Hypothesis 2 is rejected for mathematics degrees. Even though real or perceived mathematical competence is highlighted as a fundamental divide between the genders in access to occupational outcomes, degrees in mathematics do not differentially benefit men and women in access to workplace authority.

There are some interesting gender differences in the effects of social science degrees on access to supervisory and managerial authority. Models 1 through 3 indicate that women with PhDs in social science are more likely to be supervisors than women with bachelor's degrees in the humanities, but that men do not enjoy a similar benefit. Nonetheless, models 4 through 6 show that women do not benefit in terms of managerial authority from master's degrees in the social sciences, but that men, in fact, enjoy a large authority benefit. This may be because men in the sample are more likely to earn social science master's degrees in political science, public policy or international relations, fields with closer connections to economics, than women who are more likely to earn social science master's degrees in psychology.

Table 3.4 presents coefficients from regressions of supervisor's total span of control (total reports) and supervisors and managers' salaries separately for women and men and accompanying main effects models with interactions between gender and degree. The models in Table 3.4 test hypothesis 3 that the effects of having degrees in business, economics, or STEM on the amount of workplace authority and financial returns to authority will be greater for male supervisors and managers than for female supervisors and managers. Models 1, 2, 4, and 5 show that male supervisors with bachelor's degrees in business supervise more people and earn higher salaries than male supervisors with bachelor's degrees in humanities, but that female supervisors do not glean more workplace authority or higher salaries from their bachelor's degrees in business. Male supervisors with MBAs also amass larger spans of control than male supervisors with bachelor's degrees in the humanities, whereas female supervisors with MBAs see a smaller

authority benefit from their degrees. Furthermore, male supervisors with MBAs earn salaries that are 36 percent larger than the salaries earned by their counterparts with bachelor's degrees in the humanities, yet there is no salary effect for female MBAs. Model 6 shows that the gender differences in the effect of business degrees on supervisors' earnings are large enough to be significantly different between male and female supervisors ($p<0.01$ for bachelor's degrees in business and $p<0.05$ for MBAs). Yet models 1 through 9 do not show statistically significant gender differences in the effects of business degrees on managers' salaries. These results lend partial support to hypothesis 3 for business degrees, but only at the level of supervisory authority. Among those with authority, business degrees only appear to advantage men over women at the supervisory level of authority.

Model 1 in Table 3.4 shows that female supervisors with bachelor's degrees in economics have much larger spans of control than female supervisors with bachelor's degrees in the humanities. Models 2 and 3 show, however, that male supervisors also benefit from bachelor's degrees in economics and that gender differences in the effect of this degree on supervisor's span of control are not significantly large. Models 1 and 2 also show that master's degrees and PhDs in economics add significantly to male supervisor's total span of control, whereas these degrees work to the detriment of female supervisor's total span of control relative to their counterparts with bachelor's degrees in the humanities.

Model 3 shows that differences in the effects of master's degrees and PhDs in economics on supervisor's total span of control are large enough to be statistically significant ($p<0.001$). Male supervisors also enjoy greater salary benefits from their economics degrees than women at every degree level according to models 4 through 6. Model 6 shows that gender differences in the effect of a PhD in economics on supervisors' salaries is significantly large ($p<0.05$). Nonetheless, models 7 through 9 show that female managers with PhDs in economics or business earn salaries that are approximately 35 percent higher than female managers with bachelor's degrees in the humanities. In contrast, male managers do not enjoy large salary benefits from their business and economics PhDs. These results lend partial support to hypothesis 3 because gender differences in the effects of economics degrees on returns to authority are mainly confined to supervisory authority, and not management, where women may enjoy greater returns to PhDs.

There is some, although not overwhelming, evidence that science degrees benefit male supervisors more than female supervisors in terms of span of control and higher salaries. Model 1 shows that female supervisors with PhDs in science have spans of control that are 52 percent smaller than those of female supervisors with bachelor's degrees in the humanities. In contrast, model 2 shows that male supervisors with science PhDs do not enjoy larger spans of control, but those with bachelor's degrees in science have an expected number of total reports that is 69 percent higher than the expected number of total reports for male supervisors with bachelor's degrees in the humanities. Model 1 shows that female supervisors with bachelor's degrees in science do not have significantly more reports than female supervisors with bachelor's degrees in the humanities. Model 3, however, shows that these gender differences in the effect of science

Table 3.4: Coefficients from Regressions of Total Span of Control and Financial Returns to Authority for Men and Women and Interaction Effects

italics are marginal	Supervisor's Span of Control			Supervisors' Salaries			Managers' Salaries		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Independent Variables	Women	Men	Main Effects + Interactions	Women	Men	Main Effects + Interactions	Women	Men	Main Effects + Interactions
gender (female=1)			-0.247			0.044			-0.153
BA - business	0.304	0.657***	0.620**	-0.120	0.155***	0.149**	0.011	0.043	0.038
MA - business	0.526*	0.883***	0.806***	0.106	0.364***	0.353***	0.209*	0.185**	0.176**
BA - economics	2.059**	0.492*	0.474*	-0.164	0.175*	0.177*	0.011	0.075	0.077
MA - economics	-2.527***	1.619**	1.546**	0.204*	0.274*	0.273*	0.119	*0.233*	0.236*
PhD - business and economics	-1.521***	1.183*	1.195*	0.150	0.477***	0.472***	0.349*	0.066	0.067
BA - science	0.495	0.527*	0.525*	-0.070	0.035	0.027	0.048	-0.109	-0.115
MA - science	0.147	0.269	0.222	-0.081	0.064	0.053	0.642***	-0.191	-0.186
PhD - science	-0.736***	-0.043	-0.181	0.198*	0.508***	0.492***	0.355*	0.358***	0.356***
BA - computer science	0.178	0.176	0.092	-0.031	0.261***	0.241***	-0.007	-0.011	-0.026
MA - computer science	-0.137	0.215	0.128	0.180*	0.258***	0.235**	0.184	0.221	0.210
PhD - computer science/math	-0.135	-0.110	-0.223	0.368**	0.686***	0.676***	*0.303*	0.776	0.788
BA - engineering	0.435	0.397*	0.358	-0.064	0.169***	0.157***	0.114	0.023	0.019
MA - engineering	-0.592**	0.317	0.223	0.119	0.277***	0.256***	0.081	0.188**	0.180*
PhD - engineering	3.025***	0.153	0.039	0.313*	0.469***	0.454***	0.128	0.306***	0.294***
BA - math	1.603**	0.346	0.277	0.076	0.118	0.115	0.124	0.044	0.046
MA - math	0.446	-0.200	-0.240	0.201	0.290***	0.274***	0.179	0.115	0.097
BA - social science	0.587*	0.447*	0.436	-0.284**	0.167**	0.159**	-0.063	-0.022	-0.019
MA - social science	-0.162	1.897***	1.890**	-0.077	0.300***	0.286**	0.114	0.020	0.014
PhD - social science	0.767	0.340	0.186	0.190	0.245*	0.252*	0.321*	-0.343*	-0.320*
BA - health, education, other	0.649***	0.490*	0.451*	-0.104	0.052	0.051	0.093	-0.036	-0.039
MA - health, education, other	0.387	1.014***	0.903**	-0.104	0.202***	0.198***	0.238*	0.050	0.043
MA - humanities	-0.126	0.470	0.284	-0.440*	0.139	0.159	0.107	0.147	0.190
PhD - humanities, health, education, other	1.130**	-0.007	-0.103	0.058	0.369***	0.377***	0.282*	-0.034	-0.021
professional degree - law	-0.345	0.267	0.199	0.511***	0.586***	0.586***	0.324*	0.495**	0.497**
professional degree - medical/other	0.050	0.451	0.324	0.606***	0.638***	0.648***	0.449	0.210	0.189
BA - business*female			-0.144			-0.226**			-0.009
MA - business*female			-0.030			-0.170*			0.087
BA - economics*female			1.304			-0.278			-0.112
MA - economics*female			-3.703***			-0.135			-0.244
PhD - economics and business*female			-2.495***			-0.295*			0.334*

Table 3.4: continued

italics are marginal	Supervisor's Span of Control			Supervisors' Salaries			Managers' Salaries		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Independent Variables	Women	Men	Main Effects + Interactions	Women	Men	Main Effects + Interactions	Women	Men	Main Effects + Interactions
BA - science*female			0.057			-0.051			0.177
MA - science*female			0.129			-0.050			0.872***
PhD - science*female			-0.188			-0.259*			-0.091
BA - computer science*female			0.203			-0.194*			0.120
MA - computer science*female			-0.084			0.032			0.052
PhD - computer science/math*female			0.131			-0.072			-0.388
BA - engineering*female			0.264			-0.151			0.150
MA - engineering*female			*-0.574*			-0.073			-0.008
PhD - engineering*female			2.976***			-0.080			0.053
BA - math*female			0.849			0.001			0.017
MA - math*female			0.728			0.046			0.159
BA - social science*female			0.214			-0.378***			0.052
MA - social science*female			-1.633*			-0.324			0.034
PhD - social science*female			0.685			-0.038			0.642***
BA - health, education, other*female			0.373			-0.134			0.077
MA - health, education, other*female			-0.263			-0.279**			0.135
MA - humanities*female			-0.187			-0.605**			-0.135
PhD - humanities, health, education, other*female			1.670**			-0.287*			0.277
professional degree - law*female			-0.398			-0.068			-0.215
professional degree - medical/other*female			0.061			-0.029			0.176
constant	-0.624	-1.330**	-1.075**	9.916***	9.553***	9.643***	10.460***	10.052***	10.139***
R squared				0.245	0.288	0.293	0.443	0.298	0.320
lnalpha	1.437***	1.407***	1.462***						

Notes: * p<0.05; ** p<0.01; *** p<0.001. These models include controls for race, parent's education, work preferences, firm characteristics, region, industry, recent work history, work experience, working hours, marital status, spouse's employment status, and parenthood. See Tables 3.1A and 3.2A for coefficients for the controls. Coefficients in *italics* indicate marginal significance (p<0.10).

degrees on supervisor's span of control are not large enough to be statistically significant. The results for supervisors and managers' salaries are mixed for science degrees. Male supervisors with PhDs in science earn higher salaries than female PhDs in science (see models 4-6), but female managers with master's degrees in science earn higher salaries than male managers with master's degrees in science and both male and female managers with PhDs in science enjoy nearly equal salary benefits. These results lead me to reject hypothesis 3 for science degrees because no discernible, consistent pattern can be detected from these results.

Models 1 through 3 in Table 3.4 show no gender differences in the effect of computer science degrees on the total span of control among supervisors. However, models 4 through 6 show that male supervisors glean higher salaries from their computer science degrees than female supervisors. Model 6 shows that gender differences in the effects of computer science degrees on supervisors' salaries are largely confined to bachelor's degree holders. These results provide very little support for hypothesis 3 with regard to computer science degrees because the gender wage gap is primarily confined to supervisors with bachelor's degrees in computer science and does not apply to other degree holders or measurements of returns to authority.

The results for engineering largely support hypothesis 3, with one exception – model 1 shows that female supervisors with PhDs in engineering have much greater spans of control than female supervisors with bachelor's degrees in the humanities and that, according to models 2 and 3, the difference in the effect of this degree varies significantly between men and women. Models 4 through 6 show that male supervisors have higher financial returns to their engineering degrees than female supervisors, although the gap is not large enough to be statistically significant. Likewise, models 7 through 9 show that male managers have higher financial returns to their master's degrees and PhDs in engineering than male managers with bachelor's degrees in the humanities, but that female managers with engineering degrees do not have a salary advantage over female managers with bachelor's degrees in the humanities.

Finally, the results from Table 3.4 show little support for hypothesis 3 for math degrees. Model 1 shows that female supervisors with bachelor's degrees in math have larger spans of control than female supervisors with bachelor's degrees in the humanities, while model 2 shows no effect of math degrees on male supervisor's span of control. Furthermore, model 3 shows that gender differences in the effects of math degrees on supervisor's span of control are not significantly large. Models 4 through 6 show that master's degrees in math increase male supervisor's salaries by 29 percent, but do not affect female supervisor's salaries.

Male supervisors reap greater authority and financial returns to some female-dominated degree fields. In particular, male supervisors with master's degrees in social science have larger spans of control than female supervisors with comparable degrees (see Table 3.4, model 3). Male supervisors with bachelor's degrees in the social sciences also earn higher salaries than female supervisors with social science degrees (see Table 3.4, model 6). According to model 6 in Table 3.4, male supervisors with master's degrees in health, education, or other vocational fields, master's degrees in the humanities, and PhDs in the humanities, health, education or other vocational fields earn higher salaries than female supervisors with comparable degrees. Nonetheless, female supervisors with PhDs in the humanities, health, education, or other vocational fields have larger spans of control than male supervisors with comparable degrees and female managers with PhDs in the social sciences earn higher salaries than male managers with comparable degrees.

Discussion and Conclusion

Business, economics, science, and engineering degrees confer authority advantages to their holders over those with bachelor's degrees in the humanities. The results for degrees in these fields supports hypothesis 1 that college graduates with degrees in business, economics,

and STEM fields will have more workplace authority than college graduates with bachelor's degrees in the humanities. Nonetheless, evidence in support of hypothesis 1 for science and computer science degrees was weak and there was no evidence to support hypothesis 1 for mathematics.

Gender differences in the effects of degrees on access to jobs with workplace authority were primarily confined to business degrees, bachelor's degrees in economics, and bachelor's and master's degrees in engineering. These findings provided only partial support for hypothesis 2 because there was little evidence of large gender differences in the effects of science, computer science, and mathematics degrees on the attainment of authority.

Gender differences in the effects of degrees in business, economics, and STEM fields on supervisor's span of control and salaries, as well as on manager's salaries, were mostly confined to business, economics, and engineering degrees in support of hypothesis 3. These gender differences, which favored men at the expense of women, were largely found at the supervisory level of authority. Business and economics degrees afforded male supervisors greater spans of control and higher salaries than the business and economics degrees earned by female supervisors. Male supervisors with computer science degrees were also better able to exchange their degrees in for higher paying jobs than female supervisors. Male supervisors with master's degrees in engineering controlled the work of a substantially greater number of people than female supervisors with master's degrees in engineering.

Contrary to my predictions, female managers experienced financial benefits to their advanced degrees over and beyond that of male managers if they had PhDs in economics and business and master's degrees in science. Female supervisors with PhDs in engineering also enjoyed larger spans of control than their male counterparts. These results support previous findings that women need to acquire greater amounts of human capital to receive the financial advantages associated with high levels of authority (Hultin, 1998). These results are also supported by literature that suggests that men's advantages over women may dampen at later career stages when they enter senior management positions (Long, 1992; Petersen and Saporta, 2004).

Some economics and STEM degrees negatively affected female supervisors' spans of control (see Table 3.4, model 1). These results are supported by research that suggests that if women are successful at male tasks, they may encounter disapproval and penalties for their success because in adopting male behaviors they are violating gender norms (Schein, 2001; Powell, Butterfield, and Parent, 2002). Women who are successful at "men's work" are believed to be less desirable bosses, relative to comparable men, because success at masculine activities is perceived as a deficiency in communal female character traits (Heilman and Okimoto, 2007).

The results of this study highlight that educational attainment and field of study cannot be measured separately because different degrees in the same field signal different competencies to employers. This study clearly shows that STEM degrees do not all have the same effect on authority and returns to authority among college graduates. This is particularly important because so much emphasis is placed on the mathematical skills imparted by STEM degrees to explain why women, who are under-represented in these fields of study, are subsequently under-represented in positions of authority in the workplace. This study indicates gender bias in

mathematical competence may only be the tip of the iceberg and that the application of mathematical concepts to analyze complex problems in the context of strategic decision making in the workplace may be more germane to understanding how competency bias reproduces the gender gap in workplace authority. In other words, colleagues and supervisors' doubts about women's competence at male sex-typed tasks may be exacerbated in fields where they are asked to strategically deploy their skills to solve organizational problems. At lower levels of the corporate hierarchy, among supervisors, women may be subjected to more competency testing than at higher levels among managers where women have already run the gauntlet. These results imply that until our cultural conceptions change about what men and women are good at, gender inequality in the workforce will remain a problem even if more women earn degrees in male-dominated fields like engineering.

This study is limited by its cross-sectional nature. Future research should evaluate longitudinal data to see if degree effects persist over time or if some degree effects are artifacts of previous eras of discrimination. It is hard to tell from this data exactly when in a person's career their degrees count for more or less and how this affects their career trajectories over time. Once larger stores of data on degree fields become available, future research should also examine more fine-grained degrees by field of study.

CHAPTER 4 - It's all in the family: How gender differences in working hours, work experience, and family structure explain gender gaps in authority and returns to authority among American college-graduates

Introduction

Jobs with authority allow people to control their own work and the work of others and empower them to make strategic decisions that affect relations with customers, investors, and other organizations (Wolf and Fligstein, 1979; Kalleberg, 2011). People in positions of authority in the workplace – managers and supervisors – earn higher salaries and enjoy higher status than those without authority (Reskin and Ross, 1992; Wright, Baxter, and Birkelund, 1995; Choi, Leiter, and Tomaskovic-Devey, 2008). Yet authority comes with a price. Jobs with authority are among the most demanding in terms of work intensity and working hours – those who aspire to be leaders in their organizations must be highly productive across long, consecutive work weeks (Kalleberg, 2011).

This type of work commitment requires personal sacrifice – particularly in family life (Epstein et al., 1999). Because gender roles in the family generate different time demands on men and women, career-oriented men and women must negotiate work and family under different structural constraints. Men have to decide whether they want to marry a career woman whose primary devotion is to her career or a woman who will put her career second to support his career and personal needs, while caring for the home and children. Women must wrangle with how marriage and children could stymie their careers if they marry traditional "breadwinning" men or if they reduce their working hours or take breaks in their careers to raise children (Gerson, 2010). Ultimately, men and women who are climbing the same corporate ladder end up with fundamentally different family structures – men are more likely to marry and have children with less career-committed partners than their female counterparts, whereas women either marry equally career-driven men who have little time to devote to family (Xie and Shauman, 2003; Stone, 2007) or forgo marriage and children altogether (Hewlett, 2002).

Gender differences in working hours, work experience, and the resources imparted by divergent family structures, may be particularly powerful in explaining gender gaps in authority and returns to authority among college-educated Americans – the workers who are most likely to be vying for positions of authority in the workplace (Blair-Loy and Wharton, 2004; Bygren and Gähler, 2012). College-educated workers are pitted between two "greedy institutions" – work and family – that demand intense, full-time devotion (Coser and Coser, 1974). College-educated Americans are more likely than those without college degrees to experience high levels of work-family conflict because they work longer hours, are more likely to embrace dual-career family structures, and hold more intensive parenting beliefs (Jacobs and Gerson, 2004; Kalleberg, 2011). Highly-educated, middle-to-upper class mothers and fathers invest heavily in the emotional and intellectual cultivation of their children (Lareau, 2003). Although fathers today are spending more time with their children than previous generations, working mothers still spend more time taking care of children than fathers (Bianchi et al., 2000; Maume, 2008).

Employing organizations may also reinforce traditional family structures by rewarding men who embrace the traditional male-breadwinner role with more workplace authority and

higher salaries (Pfeffer and Ross, 1982; Hersch and Stratton, 2000). As a result, women's careers may suffer because they do not enjoy the same benefits as men. Women may also be directly penalized for family formation or their careers may indirectly suffer under dual-career family structures simply because they have – or are commonly expected to have – less time to devote to paid work (Correll, Bernard and Paik, 2007; Cha, 2010).

In what follows I assess the extent to which gender differences in working hours, work experience and family structures explain gender gaps in workplace authority and returns to authority among college graduates. I also explore how traditional male-breadwinner family structures lead to greater workplace authority and returns to authority for men, but not for women. Finally, I interrogate how children indirectly affect women's workplace authority by reducing their working hours and the extent to which the negative effect of children is exacerbated for women in dual-career partnerships.

This study contributes to the existing literature by extending our knowledge about how time demands and family structures not only affect gender differences in earnings, but also authority in the workplace. The gender gap in authority is related to the gender gap in earnings because those with authority earn more money (Halaby, 1979; Wright et al., 1995). Yet the gender gap in authority extends beyond the wage gap to encompass gender differences in status, respect, positionality, and legitimate power in society. This study also contributes to our understanding of gender gaps among college graduates, who are more likely to hold authority positions and are also more likely to work long hours and spend considerable time and resources cultivating their children than other educational groups (Lareau, 2003; Kalleberg, 2011).

Theory and Hypotheses

Working Hours

Working hours are often treated as proxies for motivation (Cox and Cooper, 1989; Whitely, Dougherty, and Dreher, 1991), commitment (Becker, 1985), and even devotion (Blair-Loy, 2003), but more generally, working hours measure how hard people work (Kalleberg, 2011). The ideal worker is the committed worker who sacrifices all else for work (Williams, 2010). Long hours and "face time" are a cultural signal of effort that is relevant to performance, even if these practices are not necessarily associated with actual performance or productivity (Epstein et al., 1999).

Highly-educated professionals and managers are expected to put in more hours than other workers (Jacobs and Gerson, 2004). People in well-paid jobs with good mobility prospects face the greatest pressure to work more, as well as the largest penalties for working less (Jacobs and Gerson, 2004). Although working long hours may help workers land positions of authority by signaling motivation, commitment, or devotion, these workers are sure to be working even longer hours once they attain positions of authority as managers and supervisors (Jacobs and Gerson, 2004; Kalleberg, 2011). Managers, in particular, are expected to show commitment to work by making it the focus of their lives (Blair-Loy, 2003) and are rewarded or penalized accordingly for working hours that demonstrate the strength of their commitment (Blair-Loy and Wharton, 2004).

The requirement of long working hours may explain why fewer women hold authority positions and earn less when they occupy positions of authority because women work fewer hours per week than men (Kalleberg, 2011). Reduced work time has consequences beyond perceived lack of commitment. Those viewed as less committed may not be asked to provide input on important decisions, they may be given less important, lower-profile projects, and they may miss out on mentoring opportunities or access to informal networks (Epstein et al., 1999). As a result, those who work fewer hours may be passed over for promotion or relegated into lower-paying jobs even if they become managers. Therefore, controlling for other relevant variables:

> Hypothesis 1: Differences in working hours between college-educated men and women will mediate gender differences in authority and returns to authority.

Work experience

More experienced workers are more likely to have authority (Halaby, 1979). Although managers today have shorter tenures at firms than they had in the 1950s, the heyday of "the organization man" (Whyte, 1956), general work experience, which imparts general management skills, continues to be important because top managers with the most authority in the workplace are more likely to be hired externally than promoted from within a firm (Cappelli and Hamori, 2004). Women accumulate less work experience than men – they have shorter tenures at their firms and are more likely to drop out of the labor force to raise children (Cappelli and Hamori, 2004; Bertrand, Goldin, and Katz, 2010). Women's career histories may be more discontinuous because they change jobs and employers more frequently to strike a balance between the time demands of career and family. In the first ten years following college, women and men have roughly equivalent years of work experience. Thereafter, female college graduates are more likely than their male counterparts to interrupt their careers to raise children (Black et al., 2008). These career interruptions are costly – they exact large, lasting tolls on women's lifetime earning power that exceed any deterioration in their skills (Rose and Hartmann, 2004; Spivey, 2005; Williams, 2010). Therefore, controlling for other relevant variables:

> Hypothesis 2: Differences in accumulated work experience between college-educated men and women will mediate gender differences in authority and returns to authority.

Family Structure

Family structure is not just about marriage and children, but the resources that spouses bring to the table, which are used to negotiate the division of paid and unpaid labor (Budig and Hodges, 2010). Differences in the resources imparted by family structure between college-educated men and women may explain why women are less likely to hold authority positions and enjoy smaller returns to authority. Spouses who do not work, or who work part-time, provide additional resources to their full-time working partners such as advice about job matters and emotional support (Kanter, 1977), not to mention additional housework and childcare (Hochschild, 1989; Bunting, 2004). Workers with spouses who work part-time or not at all may be better able to devote themselves to their work than those with spouses who work full-time

because the former can rely on someone else to pick up the slack at home. Women may benefit as much as men from spouses who have fewer work obligations; it is just that women are far less likely to have "house-husbands" and men are much more likely to have house-wives or wives who work part-time. Furthermore, career-oriented women are more likely to marry men who work full-time or to not marry at all (Davidson and Burke, 2000; Kirchmeyer, 2002). Therefore, controlling for other relevant variables:

> Hypothesis 3: Differences between college-educated men and women in marital status and spouses' employment status will mediate gender differences in authority and returns to authority.

Indeed, women in high positions of authority may have got there by forgoing marriage and children altogether because having a family can have negative effects on women's careers (Kirchmeyer, 2002; Bygren and Gähler, 2012) and their returns to authority (Budig and England, 2001). In contrast, men with housewives and children hold higher-status positions and reap greater financial rewards than unmarried, childless men (Pfeffer and Ross, 1982; Hersch and Stratton, 2000).

The additional resources that men garner from being married to a non-working wife may contribute more toward their career success because their housewives may help them with work that could be performed by paid employees (e.g., administrative support tasks such as answering telephone calls or filing) or entertain and build relationships with their husbands' business colleagues (Kanter, 1977). These are support activities that husbands of female managers and supervisors are less likely to do because they conflict with masculine gender norms that equate manhood with dominance, in opposition to female gender norms that urge women to sensitively nurture relationships (Eagly and Carli, 2007; Williams, 2010). Therefore, controlling for other relevant variables:

> Hypothesis 4: College-educated men with spouses who are unemployed or work part-time will have more authority and earn higher returns to their authority positions than college-educated women with spouses who are unemployed or work part-time.

Similarly, having children is associated with greater career success for men than women (Kirchmeyer, 2002). Children may affect men's and women's careers differently because of different social expectations about what parenthood means for men and women. Fathers are expected to financially support their families, whereas mothers are expected to be the primary caretakers of the home and children (Talbert and Bose, 1977; Epstein et al., 1999; Williams, 2010). Therefore, working fathers conform to social expectations, but working mothers do not (Pfeffer and Ross, 1982).

Conformity to social expectations may affect how employers evaluate men and women for management jobs and so may produce gender differences in returns to authority. According to experimental studies, parental status activates stringent evaluation standards for women, but lenient standards for men, which result in less interest in hiring or promoting working mothers relative to working fathers or childless employees (Cuddy, Fisk, and Glick, 2004; Fuegen et al., 2004; Correll et al., 2007). Decision makers in employing organizations may assess mothers as

less suitable than fathers for hiring, promoting, and training for management because they believe women's performance and ability to carry out their job is impaired by their devotion to their family (Correll et al., 2007; Hoobler, Wayne, and Lemmon, 2009).

Men may benefit from fatherhood because it may increase their work motivation and commitment to fulfill the role of breadwinner (Jacobs and Gerson, 2004). Employers may also favor fathers, whom they assume support dependent wives and children, because they expect married men with children to be more responsible than unmarried men or married men without children (Orloff, 1996; Correll et al., 2007). Even if fatherhood does not cause men to put in longer hours at the office (Percheski and Wildeman, 2008; Astone et al., 2010), perceived increases in career motivation by employers, and by fathers themselves, may confer career advantages (Kmec, 2011; Killewald, 2012). Therefore, controlling for other relevant variables:

> Hypothesis 5: Parenthood will increase college-educated men's, but not women's, workplace authority and returns to authority.

Having children may also indirectly affect women's workplace authority and returns to authority by depressing their working hours. Traditional gender roles demand that working women take on a "second shift" of housework and childcare, which reduces their time at work (Hochschild, 1989; Bianchi et al., 2000; Jacobs and Gerson, 2004). Cultural expectations that urge women to engage in "intensive" mothering that places children above all else conflict with the concept of the ideal worker who is unencumbered by competing demands and is always available for work (Blair-Loy, 2003). In contrast, working men are expected to be breadwinners who devote all of their time to work. Because of these traditional expectations, men often increase their working hours when they become fathers, but women decrease their working hours when they become mothers (Kaufman and Uhlenberg, 2000).

This argument is consistent with the human capital argument that women's family responsibilities limit their work effort (Becker, 1985). A study of University of Chicago MBAs showed that women with children were more likely to not work, to work fewer hours, and to, therefore, accumulate less work experience than men with children (Bertrand et al., 2009). Reduced working hours translate into gender differences in work experience that exact large tolls on women's careers (Rose and Hartmann, 2004; Hewlett and Luce, 2005). Therefore, controlling for other relevant variables:

> Hypothesis 6: Having children will negatively affect college-educated women's working hours, but not men's.

The negative effect of having children on women's working hours may depend on how much their spouses work. Husbands' excessive working hours adversely affect their wives' careers, but men's careers are not affected if their wives spend late nights at the office (Cha, 2010). Married women whose husbands work long hours (50 or more hours a week) are more likely to be out of the labor force (Shafer, 2011), but professional mothers whose husbands work long hours are even more likely to reduce their labor force attachment than professional mothers with spouses who work less (Cha, 2010).

Women are more likely than men to restructure their working hours to accommodate their spouses and children because of widely held cultural beliefs, which stipulate that men's careers are more important than women's (Spain and Bianchi, 1996; Becker and Moen, 1999) and that men who quit work or work part-time are shirking their responsibility to financially support their families (Epstein et al., 1999). Men with demanding jobs may also place greater time demands on their wives. A study of engineers and managers found that men who experience work-family conflict believe that their wives should provide more support for their careers (Legault and Chasserio, 2003). Career women with career-devoted husbands likely feel greater time demands than women with other family structures because they bear the brunt of the responsibility when the house is dirty or when the children misbehave at school (Hochschild, 1989; Brines, 1994; Epstein et al. 1999; Hewlett, 2002). Therefore, controlling for other relevant variables:

> Hypothesis 7: The negative effect of having children on college-educated women's working hours will be larger for women with husbands who work full-time than women with unemployed spouses or spouses who work part-time.

Data

To test these hypotheses, I analyzed the 2003 National Survey of College Graduates (NSCG). The NSCG is conducted by the Census Bureau for the National Science Foundation (NSF) and is a nationally representative sample of college graduates ages 23 to 76. For the 2003 NSCG, the NSF sampled people who had at least a bachelor's degree as of April 1, 2000 according to the Decennial Census Long Form. The 2003 NSCG contains approximately 100,400 records, representing an estimated 40.6 million college graduates residing in the U.S. during the reference week of October 1, 2003.

The 2003 NSCG survey first asked respondents if they were working for pay or profit during the week of October 1, 2003. Respondents were then asked about their principal employer, defined as the employer for whom they worked the most hours during the week of October 1, 2003. I restricted the sample to employed respondents working full-time (35 hours or more per week), full year (50-52 weeks) in private, for-profit U.S.-based organizations because I am interested in the authority gap among career-driven college graduates working in corporate America. I focus on the private, for-profit sector because women are particularly under-represented in positions of authority in this sector of the economy compared to the non-profit and public sectors. I also excluded workers enrolled full or part-time in degree programs and those under age 30 or over age 65. By age 30 most workers have completed their education and established their career and family formation trajectories and those over 65 are likely heading toward retirement (McDaniel and Buchmann, 2012). Working hours also begin to peak for workers at age 30 (Jacobs and Gerson, 2004). Women's and men's accumulated work experience is also roughly equivalent up to age 30 (Williams, 2010). Eighty-nine subjects were excluded because they did not indicate the industry of their principal employer. After these restrictions, the sample included 26,300 workers representing approximately 9.8 million college graduates.

Many women were excluded due to these sample restrictions because women surveyed in the 2003 NSCG did not have the same labor force attachment as men. Women in the 2003 NSCG were more likely to be out of the labor force (18 percent of women, 11 percent of men), less likely to be employed full-time (80 percent of working women, 93 percent of working men), and less likely to be employed full-year (76 percent of full-time working women, 87 percent of full-time working men). Furthermore, women in the NSCG were under-represented in the private sector (40 percent of full-time, full-year working women, 55 percent of full-time, and full-year working men). Nonetheless, the sample restrictions ensured that men and women in the sample were similarly devoted to their careers and were likely to be vying against each other for vertical promotions into positions of authority.

The NSCG is an especially interesting dataset to test my hypotheses because it has never been used to analyze gender gaps in authority or returns to authority. My primary motivation for using the NSCG is its comprehensive coverage of factors that are known to affect the attainment or workplace authority. It is to a discussion of these measures that I now turn.

Measures

Dependent Variables

I measured authority with three dependent variables. First, I constructed a dichotomous variable for whether or not a worker was a manager according to their job title. Second, I constructed a dichotomous variable for whether or not a worker was a supervisor who oversaw the work of a least one person. Third, I counted the total span of control among supervisors, which was equal to the number of direct and indirect reports.

The use of different measures of authority is based on two approaches to measuring authority. Conflict theorists emphasize that authority determines class divisions where groups fight over control of the means of production, which include both physical and human resources (Dahrendorf, 1959). Status attainment theorists conceptualize authority as a status variable that increases life chances through market relations such that those with more authority have better life chances than those with less authority (Blau, 1977). Conflict theorists generally favor discrete measures of authority, whereas status attainment theorists prefer continuous measures. This study uses both types of measures to provide a more complete picture of gender differences in authority (Robinson and Kelley, 1979; Spaeth, 1985).

I operationalized managerial authority based on distinct job codes for managers. The NSCG survey asked respondents to choose a job category from a list of jobs that best described their work at their principal job during the week of October 1, 2003. I created a variable for managerial authority equal to "1" if a worker indicated they had a management job and "0" otherwise. Management jobs were defined according to the following occupational categories: 1) computer and information systems managers; 2) engineering managers; 3) medical and health services managers; 4) natural sciences managers; 5) top-level managers and executives; and 6) other mid-level managers. There were 2,550 managers in the sample.

I created a dichotomous variable for supervisory authority that measured whether or not workers had sanctioning authority and the power to delegate tasks and influence the pay or promotion of others (Wright et al., 1995; Smith, 2002). The 2003 NSCG survey asked: "Did you supervise the work of others as part of your principal job held during the week of October 1?" Respondents were told: "Mark 'Yes' if you assigned duties to workers and recommended or initiated personnel actions such as hiring, firing, and promoting." The dichotomous measure for supervisory authority equaled "1" if the respondent indicated they were a supervisor and "0" otherwise. Approximately 13,300 (51 percent) workers in the sample were supervisors with supervisory authority over at least one person.

If respondents said they were supervisors, the NSCG survey asked them how many people they supervised directly (direct reports) and indirectly through subordinate supervisors (indirect reports). The variables for the number of direct and indirect reports were highly skewed, with direct reports ranging from 1 to a top code of 996 and indirect reports ranging from 1 to a top code of 9,996. I capped the number of direct reports at 50, which was equal to the 99th percentile count of direct reports for the full sample and the subsamples of supervisors and managers. The 99th percentile cut-off varied across different measures of authority for indirect reports; supervisors in the 99th percentile had 350 indirect reports and managers in the 99th percentile had 1,500 indirect reports. Managers with the job title of "top-level managers and executives" had a larger number of indirect reports than managers with other titles. To help control for the fact that spans of control differ across jobs in different industries above and beyond the inclusion of controls for industry, I capped the number of indirect reports at 2,400, which was the 99th percentile count of indirect reports for top level managers and executives. Finally, I summed the number of direct and indirect reports together to get a measure of the total span of control.

Initially, I modeled direct reports separately, but the gender gap in the number of direct reports was not statistically significant indicating that there is no gender gap in the direct span of control. However, a measure of direct span of control may not accurately reflect the full distribution of supervisory authority because it is only humanly possible to supervise the work of a finite number of people. Supervisors directly oversaw the work of 8.3 people on average and managers directly oversaw the work of 8.8 people. Even "top-level managers, executives, and administrators" had an average of only 9 direct reports. The number of indirect reports better captures a worker's position in the authority hierarchy of a given organization because most bureaucratic organizations are vertically differentiated with multiple levels of management (Spaeth, 1979). By adding the number of direct and indirect reports together, I generated a measure of the number of people "under the jurisdiction of a given position in a work organization" (Blau, 1977: 225).

Managers had more authority than supervisors. Managers had larger spans of control than supervisors; managers had an average of approximately 104 total reports, whereas supervisors had an average of approximately 36 total reports (see Table 4.1). When asked which activities they devoted the most time to during a typical week, 58 percent of managers compared to 32 percent of supervisors indicated that they spent most of their time during a typical work week "managing or supervising people or projects." Managers also said that they spent more of their time addressing financial matters and employee relations than supervisors, which may reflect manager's greater participation in strategic decision-making in their organizations than

supervisor's (Kalleberg, 2011). Furthermore, whereas 98 percent of managers were also supervisors, only 18.6 percent of supervisors were managers. This implied that manager's authority extended beyond managing people.

I measured financial returns to authority for managers and supervisors with two variables: the natural log of gross annual salaries of managers and supervisors. Income is a conservative estimate of the financial rewards associated with authority because it does not include bonuses, overtime, or additional compensation (e.g., stock options). Therefore, my analysis will yield conservative estimates of gender gaps in returns to authority.

To test hypotheses 6 and 7, I used working hours as a dependent variable. I discuss the measurement of working hours below with my discussion of how I measured the independent variables.

Independent Variables

I measured gender with a dummy variable equal to "1" if the respondent was female and "0" if the respondent was male. This variable represents the gender gap.

I measured working hours as the natural log of typical, full-time hours worked per week. Working hours are measured weekly because the week is the best unit of time to use with regard to family life as it parallels families' needs to take care of their children (Jacobs and Gerson, 2004). The NSCG applied a top code of 96 hours to people who reported working hours in excess of 96 hours per week, but only 28 respondents in the sample said they worked more than 96 hours per week. I took the natural log of this variable to restrict the influence of very long working hours because excessive working hours are more likely to be the result of having a position with high authority, rather than a determinant of authority (Elliot and Smith, 2004). This variable tests hypothesis 1 and is used as a dependent variable to test hypotheses 6 and 7.

Working hours may present an endogeneity problem because long working hours are also a result of having authority. According to Table 4.1, workers in the sample work an average of 47 hours per week, whereas supervisors work an average of 49 hours per week and managers work an average of 52 hours per week. Although the distribution of working hours for supervisors and managers is not narrowly distributed among high values in this sample (see Figure A1 in the Appendix), working hours may still be a consequence of having greater workplace authority rather than the reason why workers have authority. The endogeneity of working hours may be less of a problem in a sample of college graduates compared to a sample that contains those without college degrees because both male and female college graduates tend to work jobs that require longer hours than those without college degrees, regardless of whether or not they are in management (Jacobs and Gerson, 2004; Kalleberg, 2011). The distribution of working hours for women is more narrowly confined to shorter work weeks than the distribution for men, but approximately one-fourth to two-thirds of male and female supervisors and managers are working less than 50 hours per week (see Figure A2 in the Appendix).

I measured two types of work experience: firm-specific and general work experience. I measured firm-specific work experience as the number of years respondents' reported working for their principal employer. I measured general work experience as the number of years since

respondents earned their highest degree. I generated these variables by subtracting the month and year respondents began working for their principal employer and the month and year they completed their highest degree from the year of the survey (2003). The NSCG administered surveys between October 2003 and August 2004, but the data did not specify the exact date each survey was administered. Therefore, these measures of work experience may be over-estimated by approximately 3 months for some respondents and under-estimated by approximately 8 months for others. I divided these monthly measures of work experience by 12 to convert the units into years. I included a squared term for general work experience because there may be a non-linear relationship between work experience and workplace authority: the contribution of more experience to authority outcomes may decrease as work experience increases (Powell and Butterfield, 1994). This curvilinear relationship may appear because if people haven't attained positions of authority by a certain point in their careers, more experience in a firm or in the labor market is unlikely to help them advance at the end of their careers. General work experience also increases with age, which was not included due to collinearity. The work experience variables test hypothesis 2.

To measure the effect of family structure, I created a series of indicator variables that measured marital status, spousal employment status, and parenthood. To measure marital status and spousal employment I included a dummy variable equal to "1" if a respondent was not married or living in a marriage-like relationship and "0" otherwise, a dummy variable equal to "1" if the respondent's spouse or partner was not working and "0" otherwise, a dummy variable equal to "1" if the respondent's spouse or partner was working part-time and "0" otherwise. The omitted category is a full-time working spouse or partner. The marital and spousal employment status variables test hypotheses 3 and 4 and are interacted with the parenthood variable to test hypothesis 7.

The NSCG asked respondents if they had any children living with them as part of their family. I created an indicator variable for parenthood equal to "1" if the respondent lived with at least one child and "0" otherwise. I do not use a variable for the number of children because simply being a parent, not the number of children, is associated with gender differences in caregiving and time allocation. Furthermore, the coefficient for number of children was not significant when added to models with indicator variables for parenthood. Parenthood also produces gender differences in perceived worker competence and commitment and is used to test hypotheses 5, 6, and 7 (Correll et al., 2007).

Controls

I controlled for several factors that influence authority, returns to authority, and work-family conflict: race, parents' education, job preferences, firm size and age, industry, educational attainment by field of study, recent work history, the presence of young children and the educational requirements of a spouse's job. By including a large number of control variables, I am able to eliminate potential alternative explanations for gender gaps in authority and returns to authority.

I measured race with a set of indicator variables including white, black, Asian, and other. The omitted category is white. Originally, I also included a dummy variable for foreign-born

status, but it was highly correlated with the variable for Asian descent, so I dropped it from the analysis.

I controlled for parents' educational attainment because it reflects a respondent's class background that, in turn, affects occupational status and earnings through their accumulation of social capital (Blau and Duncan, 1967; Useem and Karabel, 1986). The NSCG asked respondents to choose the highest level of education completed by their mother and father: 1) less than high school; 2) high school diploma or equivalent; 3) some college, vocational, or trade school; 4) bachelor's degree; 5) master's degree; 6) professional degree; or 7) doctorate. I collapsed these into three categories: some college or less (the reference category), bachelor's degree, and master's degree or higher. I created a single variable equal to parent's highest level of educational attainment. For instance, if a respondent's father held a doctorate and his or her mother held a bachelor's degree, the highest level of parent's education equaled the category containing doctorates (i.e., master's degree or higher).

I controlled for job preferences because preferences for certain types of jobs may cause women to self-select into certain career paths that are more "family friendly" or less associated with authority outcomes. The NSCG asked respondents how important nine job characteristics are: salary, benefits, job security, job location, opportunities for advancement, intellectual challenge, level of responsibility, degree of independence, and contribution to society. Respondents rated each job characteristic as very important (4), somewhat important (3), somewhat unimportant (2), or not important at all (1). The zero-order correlations between opportunities for advancement, intellectual challenge, level of responsibility, and degree of independence were positive and statistically significant. Because these job preferences were also positively related to measures of authority, I constructed an authority preference index by combining these variables into one index. The authority preference index has a reliability coefficient (Cronbach's alpha) equal to 0.73.

I controlled for the organizational features of workers' employers with a continuous variable for firm size, a binary variable for young organizations, and categorical variables for industrial sector. The NSCG measured organizational size as the total number of people who worked for the respondents' principal employer at *all* locations. Thus, the NSCG survey captured firm size rather than establishment size. Firm size is positively correlated with establishment size (Mellow, 1982) and should pick up part of the effect of establishment size (Hollister, 2004). The variable for organizational size is based on eight categories: 1) 10 or fewer employees; 2) 11 to 24 employees; 3) 25 to 99 employees; 4) 100 to 499 employees; 5) 500 to 999 employees; 6) 1,000 to 4,999 employees; 7) 5,000 to 24,999 employees; and 8) 25,000 or more employees. I converted this categorical measure into a continuous measure of firm size by plotting the cumulative distribution at the maximum value of each category and then fitting a logarithmic line to this distribution (Hollister, 2004). Using the equation for this line, I calculated the median firm size for each category. I recoded each categorical value of firm size to take on this median value and, finally, took the natural log of the continuous firm size measure.

The NSCG survey asked respondents if their principal employer was founded in the past five years. I created a dummy variable equal to "1" if the respondent indicated they worked for a new business and "0" otherwise. This measure serves as a control to net out firm size effects that

may be attributable to firm age because smaller firms are often also younger firms. Smaller, younger firms are less formalized, face more uncertainty, and have weaker bargaining positions in the search for skilled employees and managers (Stinchcombe, 1965; Aldrich and Auster, 1986).

I measured industrial sector by consolidating and recoding Census industry variables into eleven major industrial sectors: 1) agriculture, fishing, forestry, and mining; 2) construction; 3) manufacturing; 4) transportation, communication, and other utilities; 5) wholesale trade; 6) retail trade; 7) finance, insurance, and real estate (FIRE); 8) business, personal, social, and other services; 9) entertainment; 10) professional and health services; and 11) information services. This variable controls for gender segregation by industry because men are more likely to work in industries such as manufacturing, where firms are larger and have more authority positions than those in the service sector, where women are concentrated. The omitted category is manufacturing.

I controlled for educational attainment and field specialization with categorical variables based on respondents' highest degree earned in particular fields because previous research shows that sex segregation by degree field explains a portion of the gender gap in other measures of occupational attainment such as earnings (Morgan, 2008; Weinberger, 2011). This variable is a control and not an independent variable because I expect that little of the gender gap in authority among career-committed, full-time working college graduates to be explained by gender differences in educational attainment and choice of major. Earnings gaps persist and remain large between college-educated, full-time working men and women with the same educational credentials, even at the beginning of their careers (Weinberger, 2011).

The NSCG gathers information about respondents' most recent degree, second most recent degree, and first bachelor's degree for more than 140 different majors. The highest degree is determined by a rank ordering of these degrees from highest to lowest. Doctorates are ranked highest, followed by professional degrees (medical and law degrees), then master's degrees, and finally, bachelor's degrees. If a respondent has more than one degree at the same level, then the most recent degree is equal to the highest degree. If a respondent has more than one degree awarded at the same time and at the same level, then educational field is used to determine which degree is the highest degree. Science and engineering degrees are given precedence over other technical degrees (e.g., math), and non-science and engineering degrees are given the least precedence.

I created dichotomous variables for highest degree held in broad fields of study. Bachelor's degrees are divided into seven different fields: 1) business; 2) engineering and related fields; 3) physical and biological sciences; 4) math and computer sciences; 5) social sciences; 6) education, health, and other non-technical or vocational fields; and 7) arts and humanities. Master's degrees are divided into: 1) business administration, financial management and other business-related fields; 2) engineering and related fields; 3) physical and biological sciences; 4) math and computer sciences; 5) social sciences; 6) arts and humanities; and 7) education, health, and other non-technical or vocational fields. Professional degrees were divided into categories for law degrees and other professional degrees, which consist mostly of medical degrees. Finally, doctoral degrees were divided into science, technology, engineering and mathematics (STEM) degrees and non-STEM degrees. The omitted category is a bachelor's degree in the arts

and humanities. I chose this category because it was the most cohesive, non-technical group of socio-cultural majors at the lowest level of educational attainment that was least likely to be related to jobs with authority. These measures are different from the measures in chapter 3. In chapter 3, I broke economics out of the social sciences because economics is more closely related to business than the other degrees in the social sciences. I also looked at more fine-grained degree fields for doctorates in chapter 3 to see if there were disparate effects on authority for different types of doctorates among men and women.

I also controlled for recent breaks in employment, employer changes, job changes and promotions made within the past two-and-a-half years. I constructed these variables based on whether or not respondents' were working during both the week of October 1, 2003 and April 1, 2001. If yes, respondents were asked if they were working for the same employer at the same job, for the same employer at a different job, for a different employer at the same job, or for a different employer at a different job. I coded these responses into a series of dummy variables. I first created a variable equal to "1" if the respondent said they were not working in 2001 and "0" otherwise. I then created four variables for each of the employment statuses in 2001 equal to "1" if the respondent said they were working at the same employer and same job, a different job with the same employer, the same job at a different employer, or a different job with a different employer and "0" otherwise. The excluded category is working for the same employer at the same job. These variables should capture weaker attachment to the labor force above and beyond years of firm-specific or general work experience.

I also included a control for promotions to net out the effect of job or employer changes made because of opportunities for career advancement with a binary variable equal to "1" if the respondent made employer or job changes because of pay or promotion opportunities and "0" otherwise. Employer changes made for reasons other than advancement are likely to hamper opportunities for workplace authority because they deplete stores of firm-specific human capital. Women may be more likely to make such changes to accommodate the greater demands of family time by transitioning to less demanding jobs or to follow a spouse.

I also included an indicator variable equal to "1" for those living with a child under age six and "0" otherwise because small children may push men to work even harder and pull women away from the workplace and towards the home (Gerson and Jacobs, 2004). Small children may also require more care, which depletes time and energy that could be expended at work.

Finally, I controlled for whether or not a spouse's job requires at least a bachelor's degree or higher. The NSCG survey asked: "Did your spouse's or partner's duties on this job (full or part-time job held the week of October 1, 2003) require the technical expertise of a bachelor's degree or higher in 1) engineering, computer science, math, or the natural sciences; 2) the social sciences; or 3) some other field (e.g., health, business, or education)?" Respondents were asked to mark "yes" or "no" for each item. I created a variable equal to "1" if the respondent indicated that their spouse's job required technical expertise in any of these areas. This variable is an important control because jobs requiring more education and technical expertise are not only better jobs with higher pay and security (Kalleberg, 2011), they also demand longer working hours than jobs that require less education (Jacobs and Gerson, 2004). Women with high-earning spouses who work long hours may be more likely to reduce their commitment to work

due to children by either dropping out of the labor force or reducing their working hours, thereby hampering their chances of attaining positions of authority at work (Blank, 1990; Epstein et al., 1999; Cha, 2010).

In models predicting supervisors' and managers' salaries I include the total span of control among supervisors and managers as independent variables. Models predicting working hours also control for total span of control.

Methods

I estimated two logistic regression models to predict whether or not a worker is a supervisor or a manager. The equation for the logistic regression model is:

$$P(Y = 1|x_1, x_2, x_3 \dots) = \mathrm{F}\left(\beta_0 x_0 + \beta_1 x_1 + \tilde{\beta}_2 \tilde{x}_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_5^2 + \beta_7 x_6 + \beta_8 x_7 \right) = F(x\beta)$$

where *Y* is a binary dependent variable for either supervisory or managerial authority, x_0 is the constant, x_1 is a binary variable for gender (female=1), $\tilde{x}_2$ is a set of control variables, x_3 is the natural log of the number of full-time working hours, x_4 is firm-specific work experience, x_5 and x_5^2 are general work experience and general work experience squared, x_6 is a set of indicator variables for marital status and spouses' employment status, and x_7 is a binary variable for the presence of children, and *F* is the cumulative density function of the logistic distribution.

I estimated zero-truncated negative-binomial models to predict the span of control among those with supervisor authority. I excluded those without supervisory authority because my goal was to model the vertical gender gap in authority among those with authority. Zero-truncated count models account for the exclusion of zero outcomes – those without supervisory authority. I used a negative-binomial model because the variable for total span of control was over dispersed (i.e., the variance exceeded the mean). Over-dispersion can generate spuriously small standard errors and inflate significance levels (Long and Freese, 2006). The negative-binomial model accounts for over dispersion by adding the parameter α, which reflects unobserved heterogeneity among observations. The equation for the zero-truncated negative binomial model is:

$$\mu = \exp\left(\beta_0 x_0 + \beta_1 x_1 + \tilde{\beta}_2 \tilde{x}_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_5^2 + \beta_7 x_6 + \beta_8 x_7\right) \delta \ \ for\ Y > 0$$
$$\delta \equiv \exp(\epsilon)$$

where μ is the expected number of total subordinates, x_0 is the constant, x_1 is a binary variable for gender (female=1), $\tilde{x}_2$ is a set of control variables, x_3 is the natural log of the number of full-time working hours, x_4 is firm-specific work experience, x_5 and x_5^2 are general work experience and general work experience squared, x_6 is a set of indicator variables for marital status and spouses' employment status, and x_7 is a binary variable for the presence of children, Y is the observed count of total subordinates given that Y is greater than 0, and δ is the expectation of the

error term drawn from a gamma distribution. The error term, ϵ, is assumed to be uncorrelated with the *x*s. The conditional probability in the zero-truncated negative binomial model is:

$$P(Y_i|Y_i > 0, x_i) = \frac{P(Y_i|x_i)}{1-(1+\alpha\mu_i)^{-1/\alpha}}$$

where the probability of each observed, positive outcome, Y, for a given set of *x*s is computed given that we know the outcome is greater than zero. μ_i is the expected number of total reports and α is the over-dispersion parameter. Statistical significance of the over-dispersion parameter α indicates evidence of over-dispersion in favor of the zero-truncated negative binomial model.

To predict annual salaries of supervisors and managers I estimated log-linear models given by the equation:

$$\ln(Y) = \beta_0 x_0 + \beta_1 x_1 + \tilde{\beta}_2 \tilde{x}_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_5^2 + \beta_7 x_6 + \beta_8 x_7 \ldots + \epsilon,$$
$$\epsilon|x_i \sim N(0, \sigma^2)$$

where $\ln(Y_i)$ is the natural logarithm of annual salary for supervisors and managers, respectively, x_0 is the constant, x_1 is a binary variable for gender (female=1), $\tilde{x}_2$ is the same set of control variables used in the logistic and negative-binomial models with the addition of total span of control, x_3 is the natural log of the number of full-time working hours, x_4 is firm-specific work experience, x_5 and x_5^2 are general work experience and general work experience squared, x_6 is a set of indicator variables for marital status and spouses' employment status, x_7 is a binary variable for the presence of children, and ϵ is the residual or error term, which is normally distributed with a mean of zero and variance σ^2.

To test hypotheses 6 and 7, I estimated a model with the same functional form as the salary models with a dependent variable for working hours. I tested interaction effects by estimating models separately for men and women and then including interactions between the presence of children and marital and spousal employment status.

The models were built incrementally by first estimating the gross gender gap with equations that include only the variable for gender. I then added variables one at a time starting with controls followed by working hours, firm-specific work experience, general work experience and general work experience squared, marital and spousal employment status, and children. As I added variables into the model, I assessed the change in the gender variable. A reduction in the gender coefficient indicates a mediating effect whereby a portion of the gender gap is explained by the added independent variable. I tested if the effects of the covariates in the model were the same for men and women by estimating separate regression equations for men and women for each specification.

The models are estimated using survey weights to generate accurate standard errors and to make it possible to generalize to the population of U.S. college-graduates. The NSCG oversamples some smaller populations in less common fields of study. Response rates to the 2003 NSCG also varied by age, race, and marital status (White, 2010). The sampling weights reflect differential selection probabilities and adjustments needed to compensate for non-

response and under-coverage. The sampling weights are defined as the reciprocal of the probability of selection for each sampled unit.

Results

Table 4.1 presents ranges, means, and standard deviations calculated using survey weights for all variables in the analysis for the full sample of workers and the subsamples of supervisors and managers by gender. The N's presented in Table 4.1 are calculated using the survey weights and represent the estimated total number of people in the U.S. captured in each subpopulation not the number of observations used to calculate the coefficients in the models. The means in bold italics vary significantly between men and women according to t-tests ($p<0.05$).

Rows 1 and 2 of Table 4.1 show that women are underrepresented as managers and supervisors. According to the third row of Table 4.1, women have an average of approximately 10 fewer reports than men. Men in the sample also earn considerably more than women. The average gender gap in earnings for the full sample is approximately $22,800. The gender gap in earnings widens to approximately $25,500 among supervisors and managers.

Descriptive statistics for the independent variables show that across the full sample and subsamples of supervisors and managers, women work approximately two to three hours less per week than men, have approximately one-half to one year less firm-specific work experience, and approximately two to three years less general work experience. Women are more likely to be single than men, and if they are married they are more likely to have a spouse that works full-time, whereas men are more likely to have a spouse that doesn't work or works part-time. Men are also more likely to have children.

Before reporting results from the full regression models, I briefly report the small mediating effects of some of the control variables in Table 4.2. Tables with coefficients for the controls are included in the Appendix (see Table 4.A1-4.A5). Table 4.2 presents the gross gender gap without controls for each dependent variable and shows how each set of control variables affects the gender gap. I calculate the percentage of the gender gap that is explained by the control variables by subtracting the new coefficient for female (after a control variable is added into the model) from the gross gender gap, dividing this number by the gross gender gap, and finally multiplying by 100 (e.g., (0.762-0.730)/0.762*100)=4). I discuss only the largest mediating effects for each dependent variable.

According to Table 4.2, gender differences in industry explain 11 percent of the gross gender gap in management. According to Table 4.1, women are more likely to work in service industries than men, who are more likely to work in manufacturing, agriculture, construction, transportation, communication, and utilities. Education also explains seven percent of the gross gender gap in management. Table 4.1 shows that men are more likely to have MBAs or degrees in STEM fields than women. Gender differences in education among managers also explain 9 percent of the gender gap in managers' salaries. Table 4.1 shows that educational differences between male and female managers are largely confined to the field of engineering, where management jobs may command higher salaries and women are severely underrepresented.

Table 4.1: Descriptive Statistics for the NSCG 2003

2003 NSCG Descriptive Statistics			Full Sample						Supervisor Sample						Manager Sample					
			Men and Women (N=9,882,560)		Men (N=6,882,521)		Women (N=3,000,039)		Men and Women (N=5,395,653)		Men (N=3,950,593)		Women (N=1,445,060)		Men and Women (N=1,151,546)		Men (N=944,322)		Women (N=207,224)	
	Min	Max	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Dependent Variables																				
Manager	0	1	***0.117***	0.333	0.137	0.366	0.069	0.246	***0.209***	0.407	0.234	0.433	0.138	0.325						
Supervisor	0	1	***0.546***	0.517	0.574	0.527	0.482	0.485							0.977	0.141	0.981	0.129	0.961	0.183
Span of control (direct + indirect reports)	0	2429	***19.470***	107.677	22.596	120.316	12.297	76.050	***35.660***	138.646	39.365	150.160	25.530	105.026	103.890	252.662	107.959	259.510	85.350	217.476
Salary	1	565172	***81740***	64931	88701	69569	65807	50964	***94473***	71015	101325	75803	75743	53809	***121904***	72044	126461	74416	101141	55805
Independent Variables																				
Female	0	1	0.304	0.477					0.268	0.444					0.180	0.364				
Working hours	35	96	***47.044***	8.693	48.044	9.091	44.748	7.305	***49.116***	8.743	50.007	8.952	46.678	7.702	***52.431***	8.067	52.761	8.094	50.931	7.786
Firm-specific work experience	0.167	43.580	***7.595***	7.660	7.929	8.160	6.829	6.450	***8.200***	7.540	8.390	7.920	7.660	6.460	7.910	6.920	7.990	6.950	7.540	6.770
General work experience	0.250	47	***17.560***	9.560	18.170	9.890	16.160	8.630	***17.730***	9.010	18.380	9.300	15.940	7.960	***19.490***	8.530	19.990	8.550	17.260	8.110
Single	0	1	***0.217***	0.428	0.169	0.399	0.329	0.457	***0.187***	0.391	0.143	0.358	0.307	0.435	***0.119***	0.306	0.092	0.273	0.244	0.408
Unemployed Spouse	0	1	***0.227***	0.428	0.294	0.485	0.075	0.256	***0.246***	0.432	0.309	0.472	0.075	0.248	***0.337***	0.447	0.384	0.460	0.120	0.309
Spouse working part-time	0	1	***0.113***	0.428	0.147	0.378	0.033	0.174	***0.128***	0.334	0.161	0.376	0.036	0.176	***0.153***	0.341	0.180	0.364	0.030	0.161
Spouse working full-time	0	1	***0.442***	0.428	0.390	0.520	0.562	0.482	***0.439***	0.497	0.387	0.498	0.582	0.466	***0.391***	0.462	0.344	0.449	0.607	0.464
Children	0	1	***0.580***	0.510	0.610	0.520	0.510	0.480	***0.610***	0.490	0.650	0.490	0.530	0.470	***0.650***	0.450	0.680	0.440	0.500	0.480
Controls																				
White	0	1	***0.847***	0.374	0.868	0.361	0.799	0.389	***0.873***	0.333	0.887	0.324	0.836	0.350	0.909	0.273	0.914	0.266	0.887	0.302
Black	0	1	***0.050***	0.227	0.039	0.206	0.077	0.258	***0.042***	0.201	0.034	0.185	0.065	0.232	***0.028***	0.157	0.024	0.144	0.049	0.205
Asian	0	1	***0.088***	0.294	0.080	0.289	0.107	0.301	0.070	0.256	0.067	0.255	0.079	0.254	0.052	0.210	0.054	0.214	0.043	0.192
Other race	0	1	0.014	0.124	0.013	0.122	0.017	0.125	***0.015***	0.121	0.013	0.114	0.021	0.135	***0.011***	0.099	0.009	0.088	0.022	0.140
Parent's ed - some college or less	0	1	0.543	0.517	0.543	0.531	0.542	0.484	0.530	0.500	0.532	0.510	0.525	0.471	***0.534***	0.472	0.546	0.471	0.477	0.475
Parent's ed - BA	0	1	***0.256***	0.453	0.263	0.469	0.240	0.415	***0.259***	0.439	0.267	0.452	0.238	0.402	0.272	0.421	0.277	0.423	0.248	0.410
Parent's ed - MA+	0	1	***0.201***	0.416	0.194	0.421	0.218	0.401	***0.211***	0.409	0.201	0.410	0.237	0.401	***0.194***	0.375	0.177	0.361	0.275	0.425
Preferences - authority (index)	4	16	***13.940***	1.881	13.860	1.955	14.124	1.694	***14.125***	1.720	14.062	1.781	14.300	1.543	14.400	1.448	14.375	1.471	14.516	1.336
Preferences - salary	1	4	***3.632***	0.529	3.618	0.551	3.665	0.479	***3.626***	0.508	3.612	0.524	3.665	0.461	3.608	0.471	3.598	0.474	3.654	0.452
Preferences - benefits	1	4	***3.660***	0.555	3.641	0.571	3.702	0.513	***3.654***	0.523	3.634	0.540	3.708	0.474	3.621	0.488	3.610	0.490	3.672	0.473
Preferences - security	1	4	***3.601***	0.601	3.571	0.634	3.669	0.521	***3.587***	0.586	3.557	0.612	3.670	0.505	***3.532***	0.560	3.517	0.567	3.597	0.521
Preferences - social importance	1	4	***3.179***	0.764	3.126	0.794	3.301	0.678	***3.183***	0.727	3.143	0.745	3.295	0.666	***3.153***	0.668	3.121	0.674	3.296	0.619
Preferences - location	1	4	***3.440***	0.639	3.399	0.666	3.532	0.568	***3.427***	0.618	3.392	0.636	3.524	0.558	***3.423***	0.575	3.399	0.582	3.536	0.530
Firm size (ln)	1.609	11.646	***7.192***	3.413	7.116	3.532	7.369	3.129	***7.070***	3.298	6.979	3.378	7.316	3.063	***7.315***	2.938	7.177	2.946	7.943	2.827
New Firm	0	1	***0.063***	0.252	0.067	0.267	0.054	0.219	**0.062**	0.242	0.067	0.256	0.047	0.200	0.072	0.245	0.077	0.252	0.050	0.207
Manufacturing	0	1	***0.213***	0.425	0.239	0.454	0.151	0.348	***0.213***	0.410	0.237	0.435	0.146	0.333	***0.283***	0.426	0.294	0.431	0.231	0.401
Agriculture, Fishing, Forestry, Mining	0	1	***0.011***	0.106	0.012	0.117	0.007	0.080	***0.012***	0.108	0.013	0.117	0.007	0.078	***0.012***	0.104	0.014	0.111	0.004	0.063
Construction	0	1	***0.031***	0.179	0.039	0.207	0.011	0.101	***0.038***	0.193	0.048	0.219	0.012	0.101	***0.062***	0.229	0.072	0.244	0.018	0.127
Transportation, Communication, Utilities	0	1	***0.045***	0.215	0.050	0.231	0.034	0.176	***0.040***	0.197	0.045	0.213	0.027	0.152	0.046	0.198	0.047	0.200	0.039	0.185
Wholesale	0	1	***0.058***	0.243	0.064	0.261	0.045	0.202	***0.056***	0.231	0.061	0.245	0.042	0.190	0.069	0.240	0.068	0.239	0.070	0.243
Retail	0	1	0.084	0.288	0.083	0.293	0.088	0.275	***0.093***	0.291	0.086	0.287	0.112	0.297	0.072	0.244	0.069	0.240	0.084	0.264
FIRE	0	1	***0.160***	0.380	0.149	0.379	0.184	0.377	***0.152***	0.359	0.146	0.361	0.168	0.353	0.143	0.332	0.136	0.324	0.178	0.364
Business, Personal, Social Services	0	1	***0.044***	0.212	0.041	0.211	0.050	0.212	***0.039***	0.194	0.036	0.190	0.049	0.203	0.040	0.185	0.037	0.178	0.055	0.217
Entertainment	0	1	0.027	0.167	0.025	0.167	0.030	0.166	0.032	0.176	0.032	0.179	0.033	0.167	0.034	0.172	0.033	0.169	0.040	0.186
Professional Services	0	1	***0.259***	0.454	0.235	0.452	0.312	0.450	***0.264***	0.442	0.242	0.438	0.325	0.442	0.177	0.361	0.171	0.356	0.202	0.382
Information Services	0	1	***0.070***	0.264	0.062	0.257	0.087	0.274	***0.061***	0.239	0.053	0.230	0.081	0.258	0.062	0.228	0.059	0.222	0.077	0.253

Table 4.1: continued

2003 NSCG Descriptive Statistics continued			Full Sample						Supervisor Sample						Manager Sample					
			Men and Women (N=9,882,560)		Men (N=6,882,521)		Women (N=3,000,039)		Men and Women (N=5,395,653)		Men (N=3,950,593)		Women (N=1,445,060)		Men and Women (N=1,151,546)		Men (N=944,322)		Women (N=207,224)	
	Min	Max	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
BA - arts and humanities	0	1	***0.073***	0.269	0.063	0.259	0.094	0.284	***0.060***	0.238	0.051	0.225	0.084	0.262	***0.042***	0.189	0.034	0.171	0.077	0.253
BA - business	0	1	0.207	0.420	0.208	0.432	0.203	0.391	0.216	0.412	0.218	0.422	0.210	0.385	0.252	0.411	0.248	0.408	0.275	0.425
BA - engineering	0	1	***0.104***	0.316	0.138	0.367	0.026	0.156	***0.108***	0.312	0.138	0.353	0.028	0.155	***0.131***	0.320	0.151	0.338	0.042	0.191
BA - science	0	1	0.044	0.212	0.044	0.217	0.044	0.199	0.039	0.194	0.041	0.203	0.034	0.172	0.044	0.193	0.040	0.184	0.062	0.230
BA - math/computer science	0	1	***0.048***	0.222	0.052	0.237	0.038	0.186	0.040	0.196	0.042	0.204	0.034	0.171	0.036	0.176	0.037	0.179	0.029	0.160
BA - social science	0	1	0.076	0.276	0.074	0.278	0.083	0.268	0.076	0.266	0.074	0.268	0.082	0.260	0.076	0.251	0.078	0.254	0.067	0.238
BA - other	0	1	***0.160***	0.381	0.124	0.351	0.244	0.417	***0.146***	0.354	0.116	0.327	0.230	0.397	***0.104***	0.289	0.094	0.276	0.150	0.339
MA - business	0	1	***0.095***	0.305	0.102	0.323	0.080	0.263	**0.117**	0.322	0.123	0.336	0.099	0.282	0.166	0.352	0.168	0.354	0.156	0.345
MA - engineering	0	1	***0.033***	0.185	0.042	0.213	0.012	0.107	***0.033***	0.178	0.041	0.202	0.010	0.096	***0.029***	0.160	0.034	0.171	0.009	0.091
MA - science	0	1	0.009	0.101	0.010	0.105	0.009	0.090	0.009	0.093	0.009	0.098	0.007	0.081	0.006	0.075	0.007	0.079	0.003	0.054
MA - math/computer science	0	1	0.020	0.145	0.021	0.151	0.018	0.131	0.016	0.127	0.017	0.133	0.015	0.113	0.016	0.118	0.016	0.119	0.014	0.111
MA - social science	0	1	0.011	0.109	0.010	0.106	0.014	0.112	0.011	0.105	0.011	0.106	0.012	0.103	**0.016**	0.120	0.019	0.129	0.003	0.056
MA - arts and humanities	0	1	0.011	0.107	0.010	0.105	0.013	0.110	0.011	0.103	0.009	0.096	0.015	0.116	0.005	0.069	0.004	0.063	0.009	0.091
MA - other	0	1	***0.040***	0.203	0.030	0.182	0.062	0.234	***0.037***	0.190	0.029	0.173	0.059	0.222	0.038	0.181	0.034	0.170	0.058	0.221
Professional degree - law	0	1	0.029	0.175	0.030	0.181	0.028	0.161	0.037	0.189	0.036	0.191	0.040	0.185	0.008	0.084	0.008	0.082	0.010	0.093
Professional degree - medical/other	0	1	***0.018***	0.139	0.020	0.149	0.010	0.119	0.020	0.140	0.021	0.146	0.018	0.125	0.004	0.059	0.004	0.060	0.003	0.056
Doctorate - non-STEM	0	1	0.006	0.080	0.005	0.077	0.008	0.085	0.007	0.082	0.005	0.075	0.010	0.094	0.008	0.082	0.006	0.074	0.013	0.109
Doctorate - STEM	0	1	***0.016***	0.130	0.019	0.145	0.009	0.092	***0.017***	0.130	0.019	0.140	0.012	0.102	0.018	0.126	0.018	0.126	0.019	0.130
Same job, same employer 2001	0	1	***0.674***	0.486	0.687	0.494	0.643	0.466	***0.703***	0.458	0.711	0.464	0.683	0.439	***0.692***	0.437	0.705	0.431	0.632	0.459
Not working in 2001	0	1	***0.045***	0.214	0.039	0.207	0.056	0.224	0.033	0.180	0.030	0.176	0.041	0.188	0.024	0.144	0.024	0.144	0.023	0.144
Different job, same employer 2001	0	1	***0.089***	0.296	0.083	0.294	0.103	0.295	***0.102***	0.303	0.096	0.301	0.118	0.304	***0.145***	0.333	0.133	0.322	0.195	0.377
Same job, different employer 2001	0	1	0.093	0.302	0.095	0.312	0.091	0.279	0.086	0.281	0.087	0.289	0.083	0.260	0.066	0.235	0.064	0.232	0.073	0.247
Different job, different employer 2001	0	1	0.099	0.310	0.095	0.312	0.107	0.301	0.076	0.265	0.076	0.270	0.076	0.249	0.074	0.248	0.074	0.247	0.076	0.252
Promoted in 2001	0	1	***0.147***	0.368	0.142	0.372	0.160	0.356	0.161	0.368	0.155	0.370	0.683	0.439	0.190	0.371	0.181	0.364	0.231	0.401
Children under 6	0	1	***0.237***	0.441	0.257	0.466	0.191	0.382	***0.250***	0.434	0.271	0.454	0.193	0.373	***0.219***	0.392	0.235	0.401	0.150	0.339
Spouse's job requires a BA	0	1	***0.330***	0.490	0.320	0.500	0.350	0.460	***0.340***	0.470	0.320	0.480	0.360	0.450	***0.330***	0.440	0.314	0.438	0.387	0.463

Notes: N=subpopulation size with weights. Reference category is listed in *italics*. Means in ***bold, italics*** are statistically different for men and women ($p<0.05$).

Gender differences in education and race also help explain the gender gap in supervisory authority. Table 4.1 shows that men in the full sample are more likely to be white than women. Gender differences in industry, education, and the educational requirements of a spouse's job explain portions of the gender gap in span of control among supervisors. The last row of Table 4.1 shows that women are more likely than men to marry partners whose jobs' require high levels of expertise imparted by education. Gender differences in education also explain around 14 percent of the gender gap in supervisors' salaries.

Table 4.3 illustrates that larger portions of gender gaps in authority and returns to authority are explained by gender differences in working hours, work experience, and the resources imparted by family structure than those explained by gender differences in the

Table 4.2: Reductions in Female Coefficients from Regressions of Workplace Authority and Returns to Authority on Control Variables

Dependent Variable	Manager		Manager's Salary		Supervisor		Span of Control		Supervisor's Salary	
Gross Gender Gap	**-0.762*****		**-0.203*****		**-0.372*****		**-0.522*****		**-0.308*****	
Control Variables	% gender gap explained	female coefficient	% gender gap explained	female coefficient	% gender gap explained	female coefficient	% gender gap explained	female coefficient	% gender gap explained	female coefficient
span of control			4	-0.194***					3	-0.298***
race	4	-0.730***	1	-0.201***	7	-0.346***	1	-0.516***	2	-0.301***
parent's education	0	-0.761***	-3	-0.210***	-1	-0.374***	3	-0.506***	-1	-0.310***
preferences	0	-0.762***	2	-0.199***	-1	-0.376***	-9	-0.569***	0	-0.308***
firm size	-1	-0.767***	-7	-0.217***	2	-0.366***	-11	-0.580***	-2	-0.315***
new firm	0	-0.760***	1	-0.201***	0	-0.372***	3	-0.506***	0	-0.307***
industry	11	-0.676***	-4	-0.211***	2	-0.364***	17	-0.431***	0	-0.309***
education	8	-0.703***	9	-0.185***	9	-0.340***	11	-0.463***	14	-0.266***
recent work history	-2	-0.774***	2	-0.198***	2	-0.366***	2	-0.509***	1	-0.306***
children under 6	-1	-0.773***	-2	-0.208***	2	-0.363***	2	-0.509***	1	-0.306***
spouse's job requires a BA	0	-0.763***	1	-0.201***	-1	-0.374***	11	-0.463***	0	-0.309***

Notes: * p<0.05, **p<0.01, *** p<0.001.

control variables. For each dependent variable, model 1 shows the gross gender gap which represents the raw gender differential without any control variables. Model 2 adds in controls and shows the net gender gap. Together, the control variables explain 16 percent of the gender gap in management, four percent in managers' salaries, 23 percent in supervisory authority, 14 percent in supervisors' span of control, and 13 percent in supervisors' salaries.

In models 3 through 7 in Table 4.3, I evaluate how much each set of independent variables reduces the gender gap by comparing the percent reduction in the gender gap in model 2 to the percent reduction in the gender gap attributable to each set of independent variables. For each dependent variable, model 3 adds working hours and shows that the more hours college graduates work, the more likely they are to hold positions of authority and enjoy greater financial returns to authority. Managers' and supervisors' salaries increase by approximately 1.9 percent and supervisors' expected number of subordinates increase by 7.1 percent if they increase their working hours by 10 percent. In support of hypothesis 1, gender differences in working hours mediate gender differences in managerial and supervisory authority. However, gender differences in working hours do little to mediate gender differences in monetary returns to this authority.

With the addition of working hours, gender gaps in managerial authority and returns to managerial authority are reduced by an additional 34 (50-16=34) and 1.1 (1.5-0.4=11) percent, respectively. Gender differences in working hours reduce gender gaps in supervisory authority, supervisor's total span of control, and supervisors' salaries by an additional 51, 23, and 1.6 percent, respectively. This means that although equalizing working hours between men and women may do much to improve the gender gap in authority, it will do little to curb the gender gap in pay.

Model 4 adds firm-specific work experience, while model 5 adds general work experience and its squared term. According to model 4, increases in firm-specific work experience increase managers' and supervisors' salaries and the likelihood of being a supervisor.

Table 4.3: Coefficients from Regressions of Authority and Returns to Authority on Working Hours, Work Experience, and Family Structure and Percent Reduction in Gender Gap due to Working Hours, Work Experience, and Family Structure

Manager (N=9,882,560)											
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9		
Percent reduction in gender gap		*16%*	*50%*	*16%*	*29%*	*28%*	*44%*	*82%*	*82%*		
gender (female=1)	-0.762***	-0.637***	-0.379***	-0.637***	-0.541***	-0.547***	-0.427***	-0.14	-0.135	**Men**	**Women**
working hours (ln)			1.219***					1.173***	1.175***	1.119***	1.362***
firm-specific work experience				0.0001		-0.012**		-0.013**	-0.013**	-0.018***	0.007
general work experience					0.090***	0.092***		0.064***	0.058***	0.061***	0.042
general work experience squared					-0.001***	-0.001***		-0.001*	-0.001*	-0.001	-0.001
single							-0.462***	-0.363**	-0.303*	-0.228	-0.473*
unemployed spouse							0.576***	0.451***	0.444***	0.472***	0.39
part-time spouse							0.347***	0.259**	0.237*	0.292**	-0.484
children									0.167*	0.191*	0.105
constant	-1.839***	-3.447***	-6.220***	-3.447***	-4.840***	-4.778***	-3.444***	-7.063***	-7.088***	-7.084***	-6.947***
chi2	108.609	749.232	1019.739	749.602	804.25	804.015	857.667	1141.745	1144.024	845.13	308.44
Managers' Salaries (N=1,151,546)											
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9		
Percent reduction in gender gap		*4%*	*15%*	*6%*	*24%*	*24%*	*30%*	*53%*	*54%*		
gender	-0.203***	-0.194***	-0.172***	-0.190***	-0.154***	-0.154***	-0.143***	-0.095***	-0.094***	**Men**	**Women**
working hours (ln)			0.188***					0.186***	0.186***	0.198***	0.149***
firm-specific work experience				0.008***		0.005**		0.005**	0.005**	0.006**	0.002
general work experience					0.031***	0.031***		0.025***	0.024***	0.025***	0.019*
general work experience squared					-.0004**	-0.0001**		-0.0003*	-0.0003*	-0.0002	-0.0002
single							-0.045	0.004	0.013	0.040	-0.053
unemployed spouse							0.190***	0.163***	0.162***	0.175***	0.137
part-time spouse							0.057	0.054	0.051	0.064	-0.012
children									0.021	0.009	0.045
constant	11.618***	11.106***	10.614***	11.053***	10.643***	10.631***	11.071***	10.152***	10.150***	10.080***	10.601***
r2	0.026	0.204	0.241	0.216	0.253	0.257	0.227	0.309	0.309	0.291	0.438
Supervisor (N=9,882,560)											
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9		
Percent reduction in gender gap		*23%*	*74%*	*29%*	*30%*	*32%*	*42%*	*92%*	*91%*		
gender	-0.372***	-0.286***	-0.095*	-0.265***	-0.260***	-0.252***	-0.217***	-0.031	-0.035	**Men**	**Women**
working hours (ln)			0.757***					0.747***	0.748***	0.799***	0.676***
firm-specific work experience				0.024***		0.023***		0.024***	0.024***	0.017***	0.048***
general work experience					0.062***	0.059***		0.045***	0.039***	0.038***	0.048**
general work experience squared					-0.001***	-0.001***		-0.001***	-0.001***	-0.001**	-0.002***
single							-0.232***	-0.214***	-0.165*	-0.162	-0.148
unemployed spouse							0.083	-0.019	-0.026	-0.039	-0.0003
part-time spouse							0.209***	0.129*	0.110	0.127	0.025
children									0.151**	0.139*	0.157
constant	0.298***	-0.695**	-2.233***	-0.940***	-1.341***	-1.458***	-0.644**	-2.747***	-2.760***	-2.856***	-2.846***
chi2	82.638	872.592	1252.979	935.116	912.65	964.92	895.254	1331.55	1344.672	877.745	482.9
Supervisors' Total Span of Control (N=5,395,653)											
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9		
Percent reduction in gender gap		*14%*	*37%*	*14%*	*31%*	*31%*	*46%*	*73%*	*73%*		
gender	-0.522***	-0.450***	-0.330***	-0.447***	-0.358***	-0.358***	-0.284**	-0.142	-0.140	**Men**	**Women**
working hours (ln)			0.539***					0.524***	0.527***	0.511***	0.601***
firm-specific work experience				0.007		-0.001		0.0002	-0.0003	-0.002	0.011
general work experience					0.074***	0.074***		0.060***	0.055***	0.054**	0.038
general work experience squared					-0.001**	-0.001**		-0.001**	-0.001*	-0.001*	-0.001
single							0.024	0.104	0.145	0.052	0.356**
unemployed spouse							0.713***	0.654***	0.637***	0.570***	0.659**
part-time spouse							0.145	0.043	0.022	-0.035	0.458
children									0.160*	0.189*	0.070
constant	2.466***	0.797*	-0.340	0.747	-0.171	-0.167	0.756*	-1.129**	-1.158**	-1.111**	-0.689
lnalpha	2.672***	1.797***	1.608***	1.794***	1.728***	1.728***	1.722***	1.507***	1.503***	1.399***	1.508***
Supervisors' Salaries (N=5,395,653)											
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9		
Percent reduction in gender gap		*13%*	*29%*	*15%*	*26%*	*26%*	*37%*	*59%*	*59%*		
gender	-0.308***	-0.267***	-0.219***	-0.262***	-0.227***	-0.227***	-0.193***	-0.127***	-0.127***	**Men**	**Women**
working hours (ln)			0.196***					0.184***	0.184***	0.190***	0.158***
firm-specific work experience				0.007***		0.003		0.003*	0.003*	0.004***	-0.003
general work experience					0.029***	0.029***		0.023***	0.022***	0.020***	0.033***
general work experience squared					-0.0004***	-0.0004***		-0.0003***	-0.0003***	-0.0002**	-0.001***
single							-0.058*	-0.024	-0.015	0.005	-0.043
unemployed spouse							0.261***	0.224***	0.222***	0.256***	0.085
part-time spouse							0.156***	0.130***	0.126***	0.143***	0.071
children									0.030	0.033	0.018
constant	11.340***	10.586***	10.157***	10.507***	10.125***	10.110***	10.540***	9.731***	9.730***	9.599***	9.950***
r2	0.041	0.208	0.242	0.213	0.236	0.237	0.233	0.285	0.285	0.284	0.244

Notes: * p<0.05, **p<0.01, *** p<0.001. Bold, italicized coefficients indicate a significant interaction effect in the pooled models. These models include controls for race, parent's education, work preferences, firm characteristics, industry, recent work history, the presence of small children, and the educational requirements for a spouse's job. See Tables 4.A1-4.A5 in the Appendix for coefficients for the control variables.

The positive effect of firm-specific work experience is very small; each additional year of firm-specific work experience increases managers' salaries by 0.8 percent, supervisors' salaries by a mere 0.7 percent, and increases the odds that workers are supervisors by 2.4 percent.

Model 5 shows that general work experience increases all types of workplace authority and returns to authority. The effect of general work experience on managers' and supervisors' salaries is relatively small; each additional year of work experience only increases salaries by about 3 percent. Yet each additional year of work experience increases the odds that workers are managers by 9.4, the odds they are supervisors by 6.4 percent, and the expected number of a supervisor's subordinates by 7.7 percent. The statistical significance of the squared term for general work experience indicates that the positive effect of general work experience diminishes for very experienced workers who are likely older and heading toward retirement.

Model 6 includes both measures of firm-specific and general work experience. In support of hypothesis 2, model 6 shows that gender differences in work experience between college-educated men and women mediate gender differences in authority and returns to authority. However, when we compare the percent reduction in the gender gap between models 4 and 5, we see that general work experience explains larger portions of the gender gaps in authority and returns to authority than firm-specific work experience. This is because gender differences in firm-specific work experience are relatively small (approximately one year in the full sample) and these gender differences diminish among supervisors (less than nine months) and managers (less than six months). Gender differences in general work experience are larger (2 years in the full sample) and increase among supervisors (almost two-and-a-half years) and managers (about two years and nine months).

Model 7 adds variables for marital status and spousal employment. The odds of being a manager are 37 percent lower for those who are single than for those with a spouse who works full-time. Likewise, the odds of being a supervisor are 21 percent lower for singles than for those with a full-time, working spouse. Single supervisors earn six percent less than supervisors with spouses who work full-time. These results for singles may be the result of less desirable personality traits among singles that make them inept leaders than more affable married workers. Employers may also view marital status as a signal for personality traits such as stability and responsibility, with subsequent penalties for the unmarried (Bloch and Kuskin, 1978).

Model 7 also shows that being married to someone with less work commitment benefits workers' careers. The odds of being a manager are 78 percent greater if a worker has an unemployed spouse and 41 percent greater if a worker has a spouse who works part-time (compared to a spouse who works full-time). Managers with unemployed spouses also earn 19 percent more than managers with spouses who work full-time. The odds of being a supervisor are also 23 percent higher for those with a spouse who works part-time (compared to a spouse who works full-time). Supervisors with unemployed spouses supervise a larger number of people and earn salaries that are 26 percent higher than supervisors with spouses who work full-time.

In support of hypothesis 3, gender differences in marital status and spousal employment mediate gender differences in authority and returns to authority. With the addition of the family

structure variables 44 percent of the gender gap in management is explained, 30 percent of the gender gap in managers' salaries is explained, 42 percent of the gender gap in supervisory authority is explained, 46 percent of the gender gap in supervisor's span of control is explained, and 37 percent of the gender gap in supervisors' salaries is explained. Gender differences in family structure and the resources imparted by spousal employment explain more of the gender gap than work experience.

Model 8 includes all mediating variables to check the robustness of these findings. Gender gaps in management, supervisory authority, and supervisors' spans of control are completely explained after all mediating variables are included. Nonetheless, substantial gender gaps in managers' and supervisors' salaries remain unexplained. Model 8 shows that, after all mediating variables are included, a 9.5 percent gender gap in managers' salaries and a 12.7 percent gender gap in supervisors' salaries remain. These gaps may be explained by gender differences in the types of jobs held by male and female managers and supervisors. Women may occupy bottom-tier positions of authority, which have proliferated over the past 30 years, while men likely dominate top management jobs (Cappelli and Hamori, 2004). The control variable for total span of control in the salary models, which explains 4 percent of the gender gap in managers' salaries and 3 percent of the gender gap in supervisors' salaries (see Table 4.2), may not fully capture gender differences in the types of jobs male and female managers and supervisors hold (Shin, 2012).

Model 9 tests hypotheses 4 and 5 by adding in the main effect of children and estimating separate models for men and women. In support of hypothesis 4, the results show that men with spouses who are unemployed or work part-time are more likely to be managers than men with wives who work full-time. The odds of being a manager are 60 percent greater for men with unemployed spouses and 34 percent greater for men with spouses who work part-time compared to men with full-time, working spouses. Women, in contrast, do not benefit from having an unemployed spouse or spouse who works part-time. Male managers with unemployed spouses also earn salaries that are 17.5 percent higher than male managers with spouses who work full-time. Contrary to these results, having an unemployed spouse or spouse who works part-time does not affect whether or not workers are supervisors. Both male and female supervisors with unemployed spouses have larger spans of control than their counterparts with spouses who work full-time. Single female supervisors have spans of control that are 43 percent larger than their married counterparts with full-time working spouses. Nonetheless, male supervisors with unemployed spouses and spouses that work part-time earn 26 and 14 percent more, respectively, than male supervisors with spouses who work full-time. Therefore, hypothesis 4 is only partially supported because it only holds for managerial authority and financial returns to authority.

Model 9 also shows that parenthood increases the odds of being a manager, supervisor, and the expected number of subordinates among supervisors, but not managers' and supervisors' salaries. Separate models for men and women show that parenthood only benefits men's workplace authority, providing partial support for hypothesis 5. Fatherhood increases the odds of being a manager by 21 percent, the odds of being a supervisor by 15 percent, and male supervisor's total span of control by 21 percent. However, parenthood does not affect male supervisors' or managers' salaries. The fatherhood bonus may in fact be an authority bonus and not a product of employers directly awarding men with higher salaries upon the birth of a child.

The male marriage salary premium, however, seems to benefit men in authority when they have spouses whose primary devotion is to the home.

The results from model 9 for women show that motherhood does not exert a direct, negative effect on women's workplace authority or returns to authority. The absence of motherhood penalties for female managers' and supervisors' salaries accords with previous research that found no significant income penalties for children among college-educated women in elite occupations (Amuedo-Dorantes and Kimmel, 2005; McDaniel and Buchmann, 2012). High-earning, college-educated women, who are typically married to high-earning men, have greater financial resources than women with less education working in low-paid jobs (Kalleberg, 2011), which allow them to purchase high-quality childcare and household services (Budig and Hodges, 2010).

Motherhood mainly affects college-educated women's careers through reductions in their work time. Results from Table 4.4 show that children indirectly affect women's workplace authority and returns to authority by depressing their working hours. Models 1 and 2 in Table 4.4 show that parenthood is associated with an 11 percent decrease in women's number of working hours, but parenthood does not affect men's working hours. Indeed, men's working hours depend more on their marital status and spouses' employment status – men work more if they have an unemployed spouse or spouse who works part-time and less if they are single. This result is similar to the "child penalty" in work hours found for college-educated and professional women (Jacobs and Gerson, 2004; McDaniel and Buchmann, 2012). These results support hypothesis 6 that children negatively affect college-educated women's, but not men's, working hours.

Table 4.4: Coefficients from Regressions of Men's and Women's Working Hours on Family Structure

DV=Working Hours	Model 1	Model 2	Model 3	Model 4
Family Structure Variables	Men	Women	Men	Women
single	-0.060*	0.037	-0.043	0.009
unemployed spouse	0.084***	0.001	0.115***	-0.168*
part-time spouse	0.051*	0.136*	0.074	0.105
children	0.025	-0.112***	0.046	-0.155***
children*single			-0.052	0.048
children*unemployed spouse			-0.045	0.304**
children*full-time spouse			-0.034	0.05
constant	1.880***	1.310***	1.868***	1.332***
r2	0.099	0.117	0.099	0.12

Notes: * p<0.05, **p<0.01, *** p<0.001. These models include a full set of controls. See Table 4.A6 in the Appendix for coefficients for the controls.

Model 3 in Table 4.4 lends support to hypothesis 7 that the effect of children on women's working hours depends on her spouse's employment status. Children decrease women's working hours by about 16 percent if they have a spouse who works full-time. In comparison, children decrease single women's working hours by 11 percent, do not affect women's working hours if their spouses works part-time, and may even increase women's working hours if their

spouses are unemployed (marginally significant at p=.099). Although children do not directly affect women's authority outcomes, children do have an indirect negative effect on women's workplace authority through reductions in working hours, but the negative effect of children is greatest for women who have spouses that work full-time.

Discussion and Conclusion

Gender differences in working hours, work experience, and the resources imparted by family structures are the chief explanations for the gender gap in workplace authority among college graduates who work full-time jobs in corporate America. Although these variables do not explain the entire gender gap in returns to authority, they do account for larger shares of the gender gaps in managers' and supervisors' salaries than gender differences in the control variables. Indeed, gender disparities in working hours, work experience, and family structures explain more of the gender gap in authority and returns to authority than gender differences in educational attainment and field specialization or the types of industries and firms where men and women work, which are often proffered as compelling explanations for gender inequality in the workplace (Huffman, 1995 and 1999; Reskin and McBrier, 2000; Morgan, 2008; CONSAD, 2009).

Gender differences in working hours explain especially large portions of the gender gap in access to authority positions. Working hours may signal the career motivation or devotion required for positions of authority. Among managers and supervisors, women's advancement into jobs with larger spans of control and higher earnings are strongly hampered by gender differences in family structure that benefit men, but not women. College-educated, career-oriented men are more likely to be supported by traditional family structures with a spouse that doesn't work or works part-time, whereas most career-oriented, college-educated women are single or have a spouse that works full-time. Breadwinning men with children are more likely to be managers and earn higher salaries if they hold positions of authority than men with wives who are devoted to their careers full-time. Although women are not penalized for being mothers, their careers do not benefit from children and there is little evidence that having a less career-oriented spouse does much to benefit the entrance of women into management.

Although women's authority and returns to authority are not directly affected by children, children indirectly affect women by reducing their working hours. Today's college-educated women working in corporate America may not be making an "either-or" choice between career and family, but their struggles to negotiate time-binds between these two greedy institutions certainly hamper their advancement up the corporate ladder (Goldin, 2004). As a result, women on track to careers in management may choose to have fewer children than their male counterparts. If women decide to take breaks in employment or reduce their working hours to accommodate family responsibilities, the career penalties for doing so appear to be more severe than any reduction in human capital or productivity might warrant.

When it comes to negotiating career and family, women face a different set of decisions than men. Although cultural gender norms and roles may be the mechanisms driving women to make decisions that accommodate family at the expense of work, while rewarding men for

unfailing devotion to their jobs, these mechanisms cannot be directly tested here. Future research should explore how gender ideology affects the labor market behavior of college-educate men and women as a whole compared to college-educated men and women in positions of authority.

Although this study does not address the question of discrimination, it is worth noting that the gender gap in authority is unlikely to be the result of direct discrimination in the allocation of authority because gender gaps in authority disappear after all variables are added into the models. If discrimination is going on it is occurring through the segregation of women into lower-paying supervisory or management jobs. Because of stereotypes about women's weak labor force attachment based on their propensity to exit the labor force or reduce working hours upon family formation, employers may relegate women to lower paying positions in the authority hierarchy. Future research should further probe how employers determine earnings for similarly qualified men and women with similar authority positions working in the same or similar types of firms.

What do these results imply for workplace and government policies that seek to narrow the gender gap in authority and earnings? First of all, time at the office is of paramount importance to move up the corporate ladder, so policies should aim to equalize the time men and women spend caring for family and being productive at work. That being said, face time may be more important than actual time spent working. Flexible work or reduced-work policies that allow work from home backfire on women because these policies make work commitment invisible (Epstein et al., 1999). Parental leave policies may also backfire on women because they not only reduce women's work experience, but they also reinforce normative gender roles and ideas about a gendered division of labor in the household (Pettit and Hook, 2009). Similarly, part-time work policies can spell career suicide for professional women (Epstein et al., 1999; Blair-Loy, 2003).

What may be most needed, although politically difficult if not impossible to bring about, is legislation that caps working hours for salaried workers and demands that employers compensate salaried workers for excessive hours. In 2003, the European Union instituted the Working Time Directive, which caps working hours at 48 hours per week and gives all workers the right to at least 11 hours of rest in a 24-hour period (European Parliament and Council, 2003). By universally capping working hours for all types of workers, the excessive time demands of management jobs may be tempered. Ideally, time demands at work would be lessened for women making them less likely to take employment breaks, drop out, or reduce their working hours. Men would also benefit from reduced time demands and may even be convinced to use their extra time to do house work or care for children.

Universal, rather than targeted, high-quality childcare may also help equalize the gender gap in working hours and experience. The provision of high-quality childcare may help assuage the competing demands of family and work for middle and upper-class workers as well as those in the lower class. Highly-educated mothers are less likely to drop out of the labor force or reduce their working hours when child care is publically provided (Pettit and Hook, 2009).

Because of the cross-sectional nature of this study, I cannot definitively sort out the direction of causality among these variables. Future research should evaluate longitudinal data sources to better evaluate the causal mechanisms behind gender gaps in authority and returns to authority. An ideal data set would contain work histories for men and women matched with firms. Future research should also examine how employers assess suitable candidates for authority positions on the basis of working hours and how workers in positions of authority, especially women, negotiate time spent at work and time spent with family.

CONCLUSION

In this dissertation, I first asked if the size of the gender gap in authority varied by educational attainment and if this gap widened for different degree holders according to the size of their employing organizations. Using CPS data from 2003-2011, I found that the gender gap in authority is concentrated among workers and managers with bachelor's degrees and managers with master's degrees in smaller American firms. Among the most educated workers with professional degrees and doctorates, the gender gap in authority is virtually non-existent. Women with doctorates have jobs with more authority than men with doctorates in all but the largest of firms.

These results suggest a need for research that probes how organizations of different sizes differentially connect men's and women's education to jobs with varying amounts of authority. The gender gap in authority appears to be largest for workers with bachelor's degrees. It is not clear why this might be the case because fields of study are, albeit slowly, desegregating and gender differences in college major only explain a small portion of gender gaps in pay and authority. Employers may be more inclined to select workers with bachelor's degrees into management on the basis of ascribed characteristics rather than merit because the ubiquity of college degrees may now make them poor indicators of future productivity, causing employers to fall back on "good old boy" qualifications. Women with advanced degrees are viewed more equitably by their employers than women with bachelor's degrees. Perhaps employers believe that women with MDs, JDs, and PhDs are more savvy and, therefore, more likely to pursue litigation for gender biased hiring practices than women with bachelor's degrees. Employers may also believe that women with advanced degrees are more committed to their careers than women with bachelor's degrees and, therefore, biases about women's hampered devotion to work, because of real or future family obligations, is less pronounced. Women may also need to acquire advanced degrees to assuage employer's doubts about their competence at traditionally male-dominated managerial tasks that require analytical thinking and numeracy.

These results also imply that smaller firms, which comprise most U.S. businesses, are more likely to discriminate against women in access to management positions than large American corporations. Although research often focuses on large American firms, it is important to understand the mechanism at work in smaller firms that are reproducing the gender gap in authority. Smaller firms may overlook women for management jobs because they lack formal structures to temper gender biases in hiring practices. The scarcity of female CEOs relative to male CEOs may exacerbate gender biases in hiring within very young, start-up firms who often rely on homogenous personal networks to recruit prospective employees.

The third chapter of this dissertation delved more deeply into the relationship between education and the gender gap in authority by examining unequal returns for men and women to degrees in fields that feed the pipeline into management: business, economics, and STEM degrees. Using data on career-driven U.S. college graduates from the 2003 NSCG, I found that business, economics, science, and engineering degrees confer authority advantages in corporate America. Yet men with business degrees, bachelor's degrees in economics, and bachelor's and master's degrees in engineering enjoy more workplace authority than women with these same

degrees. Some STEM fields, including science, computer science, and mathematics showed few if any gender differences in authority among degree holders. Male supervisors and managers with degrees in business, economics, and engineering also supervised the work of more people and earned higher salaries than women with degrees in the same fields. My results also showed that women with PhDs have some workplace advantages over men – female managers with PhDs in economics and business earned higher salaries than comparable men and female supervisors with PhDs in engineering supervised the work of more people than male supervisors with the same degrees.

These results support the suggestion that women may need to acquire higher levels of education to be viewed as competent in male-dominated fields so that they can reap the occupational rewards associated with these specialized areas of expertise. These results further highlight that competency bias in male-dominated fields is likely related to gender stereotypes about mathematical competency in a more nuanced way than previously thought. We need a better understanding of gender stereotypes with regard to different types of skills and more varied types of skills that require the application of quantitative skills. What is clear from these results is that even if women earn just as many business, economics, and engineering degrees as men, they will not be able to exchange their degrees for jobs with the same amount of authority and earnings until we change our cultural assumptions about what men and women are fundamentally good at. This chapter brings the role of culture in the shaping of the gender gap in management into sharp relief.

The final chapter of this dissertation asks why college-educated women in corporate America are less likely to be managers in the first place. I eliminate prominent human capital explanations such as gender differences in degree fields from the list of possible contending explanations. Data from the 2003 NSCG shows that the problem lies in gender differences in family structures that support men's work, but not women's, and gender norms and roles that push men into the board room and women into the nursery.

Gender differences in working hours explain especially large portions of the gender gap in access to positions of authority even if men are only spending four additional hours in the office each week. Although this extra time may not actually contribute to increased productivity, it sends a signal to employers that male workers are more committed and willing to sacrifice more personal time for the good of the company than women. College-educated men are also more likely to be supported at home by a spouse who does not work or works part-time, whereas college-educated women are more likely to be single or married to a career-committed spouse who works full-time. Indeed breadwinning men with children are more likely to be managers and earn higher salaries if they are managers than men with career-committed wives that work full-time. Women do not benefit from being breadwinners in their families or from being mothers. Rather, children reduce women's working hours, which puts women out of the running for management jobs.

These results suggest that the cultural institutions of work and family are waging war on women's advancement into positions of authority in corporate America. Women are viewed as having a "choice" – they can either choose to devote their lives to work as career women, but face ill marriage prospects or forego motherhood, or they can put their educational accolades

aside and choose to get married and have a family, but risk being passed over for promotion or dismissed from challenging projects that could propel them into management. But these are false choices because they are laden with the onus of gendered norms and roles that shape women's identities and the expectations placed upon women by their families, peers, and society. These are also choices that men do not have to make.

So what is to be done? This question haunts me because I do not see any forthcoming or easy solutions. To start, we need to think about equality of outcomes, not just equality of conditions. We need better mechanisms for guarding against discrimination and gender biases in small firms, where most Americans are employed. Although small firms lack the resources to create oversight structures, governmental bodies or non-profits that support coalitions of workers across small firms could bridge this gap if Americans could muster the political will to counteract discrimination in firms. This sort of solution is difficult because American businesses are highly invested in protecting their privacy as well as their independence from the government with regard to who they hire, fire, and how well executives are compensated.

Encouraging more women to earn advanced degrees in business, economics, and engineering is a worthwhile goal. However, it does not guarantee that these women will fare as well in the workplace as they might in school. If employers doubt women's competence in these degree fields because of cultural stereotypes, which declare that men are analytical and better at math and science and women are expressive and better at the humanities, fixing the pipeline will not fix the problem. Expunging gender stereotypes is a difficult task, because even though competency testing and cognitive biases play out at the point of hire, gender stereotypes are cultivated over a life time – first at an early age in the family, then at school, and finally later in the work force. Educating children about gender stereotypes at a young age might help produce adults who are less likely to discriminate, but such a goal would necessitate a national public education program that is supported by parents and teachers alike. Such a program would teach young people about their own stereotypes and how to deconstruct them so that they do not lead to sexist behavior. A program of this sort is unlikely to materialize. At present, only whispers of how we are affecting our children through our own gender biases are found in hidden progressive newspaper articles. In other words, educating our children about current, lived gender biases is not a part of the public agenda in the U.S.

We also need to create workplaces that value both work and family and provide the time for employees to excel at both. Working hours should be capped at 50 hours a week for all salaried workers and salaried workers who work in excess of 40 hours a week should be compensated with overtime pay. To be affective, such a policy would have to be legislated at the federal level. Because of the weakening power of labor and the continual growth of business lobbies in Washington D.C., such legislation is likely a pipe dream. The state could also further alleviate the competing demands of work and family by providing publically assessable, high quality, but affordable, childcare to all workers. Given recent cuts to social service programs, such a program is unlikely to receive funding or political support.

In short, we need to restructure American businesses and create new governmental or quasi-governmental structures to support more equal workplaces by focusing on corporate and public policies that change culture. The question is – in an unideal world, how do we do this?

This question gives me great pause. It is always easier to analyze and understand a problem than it is to come up with a viable solution. Culture lingers at the root of the problem – the culture of the firm, the culture of the family, and the culture in our educational institutions that encourage boys to be leaders and girls to be followers.

What can always be done is more research. We need a richer understanding of why highly qualified women lag so far behind men in positions of authority in the world's largest democracy. The results from this dissertation imply that there are large cultural forces that are keeping women from reaching the top of corporate America. This means we need a better understanding of how gender plays out in American firms – and not just large, powerful American firms, but also small firms where most people work. Qualitative research is best positioned to answer questions about culture and stereotypical gender beliefs. We need more, contemporary, and richer data collection on the occupational outcomes at the middle and top of organizations. Understanding the withering middle of the American economy is just as important as understanding the rich and the poor because jobs that provide middle-class livelihoods and upward mobility forge pathways from the bottom to the top of the class hierarchy.

To collect data from middle and top managers, academics need to engage with constituents outside of the academy in government and business. Collecting data about the nature of work in the U.S. and inequality should be a national project that incorporates the motivations of a variety of stakeholders including academics, government officials, business management consultancies, business executives, unions, and other non-governmental organizations with a vested interest in workplace equality (e.g., Catalyst). Collecting this data should not be just about producing more academic publications, but about helping to create a better, more equitable society.

We also need more collaborative work across national boundaries to understand the nuances of the gender gap in management in different cultural contexts. Many nations in Europe (e.g., Norway, Germany, and Sweden) collect detailed information about workers' jobs in firms. The problem is that these data projects are disparate and cannot be used to compare outcomes between countries. If we are to gain a better understanding of cultural mechanisms, we need to understand how the same cultural forces operate across national boundaries to reproduce the gender gap in management. Although the International Social Survey Programme (ISSP) collects data on jobs and gender beliefs, it contains too few observations for management jobs to study the gender gap in management across nations and does not contain information on firms. We need to organize researchers on an international scale to come up with creative ways of challenging systematic gender inequalities based on empirically sound research.

One of the greatest limitations of this dissertation lies in the paucity of nationally representative data on American firms over time. The data that does exist is either almost impossible to access (e.g., the Longitudinal-Employer Household Dynamics (LEHD) dataset) or is limited to top executives in America's largest firms (e.g., ExecuComp). Large, nationally representative, longitudinal data sets like the Panel Study of Income Dynamics (PSID) often have too few observations for managers over time to conduct meaningful analyses and also contain very little information about the nature of American's employing organizations.

Furthermore, the LEHD lacks detailed information on worker's occupations, making it impossible to study jobs in American firms (Abowd et al., 2005). Sadly enough, what we don't know about gender inequality among American managers is mostly motivated by the lack of empirical data. Without a nationally representative, longitudinal dataset that contains data on workers nested in firms, it is hard to disentangle the causal direction of the mechanisms behind the gender gap in management.

Chapter 2 shows that the gender gap among Americans with bachelor's degrees is wider in small firms than larger ones, but without direct data on these firms we can only speculate as to why this may be so. In other words, the data do not allow us to pinpoint the mechanisms at work in smaller firms or larger firms that contribute to variations in the size of the gender gap. It may be that gender stereotypes run more rampant and unchecked in smaller firms than larger ones, but without direct measures of this cultural phenomenon transpiring in firms, we can only postulate.

Chapter 3 is limited by the availability of information on how decision makers in American firms match employees with jobs based on their education. Although the NSCG provides rich information on college-educated American's field of study, it is not clear how organizations use information about degrees to make inferences about men's and women's competencies. A dataset that matched detailed work and educational histories of workers within firms would help us better understand why men's business, economics, and engineering degrees seem to land them jobs with greater authority than women. Without direct knowledge about firms' formal structures, their hiring and promotion policies, and knowledge about how hiring decisions are vetted to counteract bias, it is not clear exactly how decision makers come to select men for management jobs over women when both hold degrees in fields that feed the pipeline into management.

Chapter 4 indicates that working hours explain a large portion of the gender gap in authority, but without longitudinal data we cannot say with certainty that gender differences in working hours cause the gender gap in management or if the gender gap in management causes gender differences in working hours because managers are both more likely to be male and more likely to work longer hours than other workers. Also, without data about how Americans divide their time between the home and office more concretely, it is difficult to postulate how American men and women spend their free time outside of the office. It is also not clear how firms might attenuate or exacerbate the time bind between work and family because the NSCG collects very limited information on the organizations where college-educated men and women work.

Despite these data limitations, the results from this dissertation are meaningful. Both the CPS and NSCG are large, nationally representative datasets that are widely used to study the American workforce and education. The empirical evidence from these datasets suggests that we need to take a harder look at firms, families, and our educational system to understand why women have made so little progress into the upper echelons of corporate America over the last twenty years. In particular, we need to address the cultural assumptions that are embedded in these institutions that keep 50 percent of the population from contributing equally to our society.

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APPENDICES

Chapter 3 Appendix

Degrees by Fields of Study – Coding Scheme

Bachelor's degrees:

BA - Business
- Accounting
- Business administration & management
- Business & managerial economics
- Business, general
- Financial management
- Other agricultural business & production
- Other business management/administrative svs.

BA - Economics
- Agricultural economics
- Economics

BA - Science
- Animal sciences
- Astronomy & astrophysics
- Atmospheric sciences & meteorology
- Biochemistry & biophysics
- Biology, general
- Botany
- Cell & molecular biology
- Chemistry except biochemistry
- Earth sciences
- Ecology
- Environmental science or studies
- Food sciences & technology
- Forestry sciences
- Genetics animal & plant
- Geological sciences, other
- Geology
- Microbiological sciences & immunology
- Nutritional sciences
- Oceanography
- Other agricultural sciences
- Other biological sciences
- Other physical sciences
- Pharmacology, human & animal
- Physics
- Physiology & pathology, human & animal
- Plant sciences
- Science unclassified
- Zoology general

BA - Computer Science
- Computer & information sciences
- Computer programming
- Computer science
- Computer systems analysis
- Data processing
- Information services & systems
- Other computer & information sciences

BA - Engineering
- Aerospace, aeronautical & astronautical eng.
- Agricultural engineering
- Architectural engineering
- Architecture/Environmental Design
- Bioengineering & biomedical engineering
- Chemical engineering
- Civil engineering
- Computer & systems engineering
- Electrical & electronic technologies
- Electrical, electronics & communications eng.
- Engineering sciences, mechanics & physics
- Engineering, general
- Environmental engineering
- Geophysical & geological engineering
- Industrial & manufacturing engineering
- Industrial production technologies
- Materials engineering inc. ceramics & textiles
- Mechanical engineering
- Mechanical engineering-related technologies
- Metallurgical engineering
- Mining & minerals engineering
- Naval architecture & marine engineering
- Nuclear engineering
- Other engineering
- Other engineering-related technologies
- Petroleum engineering

BA - Math
- Actuarial science
- Applied mathematics
- Mathematics General
- Operations research
- Other mathematics
- Statistics

Bachelor's degrees continued:

BA - Social Science
Anthropology & archaeology
Area & Ethnic Studies
Clinical psychology
Counseling psychology
Criminology
Educational psychology
Experimental psychology
General psychology
Geography
Industrial/Organizational psychology
International relations
Other psychology
Other social sciences
Political science & government
Public policy studies
Social psychology
Sociology

BA - Humanities
Dramatic arts
English Language literature
Fine arts, all fields
History of science
History, other
Law/Prelaw/Legal Studies
Liberal Arts/General Studies
Linguistics
Music, all fields
Other foreign languages & literature
Other philosophy, religion, theology
Other visual & performing arts
Philosophy of science

BA - Health, Education, Other
Health
Audiology & speech pathology
Health services administration
Health/medical assistants
Health/medical technologies
Medical preparatory programs
Medicine
Nursing [4 years or longer program]
Other health/medical sciences
Pharmacy
Physical therapy & other rehab services
Public health [environmental health & epidemiology]
Education
Computer teacher education
Counselor education & guidance services
Education administration
Elementary teacher education
Mathematics teacher education
Other education
Physical education & coaching
Pre-school/kindergarten/early childhood educ.
Science teacher education
Secondary teacher education
Social science teacher education
Special education
Other
Business marketing/marketing management
Communications, general
Home Economics
Journalism
Library Science
Marketing
Other communications
Other Fields [Not Listed]
Other natural resources & conservation
Other Non-S&E fields
Other public affairs
Parks, Recreation, Leisure, & Fitness Studies
Public administration
Social Work

Master's degrees:

MA - Business
Accounting
Business administration & management
Business & managerial economics
Business, general
Financial management
Other agricultural business & production
Other business management/administrative svs.

MA - Economics
Agricultural economics
Economics

MA - Science
Animal sciences
Astronomy & astrophysics
Atmospheric sciences & meteorology
Biochemistry & biophysics
Biology, general
Botany
Cell & molecular biology
Chemistry except biochemistry
Earth sciences
Ecology
Environmental science or studies
Food sciences & technology
Forestry sciences
Genetics animal & plant
Geological sciences, other
Geology
Microbiological sciences & immunology
Nutritional sciences
Oceanography
Other agricultural sciences
Other biological sciences
Other physical sciences
Pharmacology, human & animal
Physics
Physiology & pathology, human & animal
Plant sciences
Science unclassified
Zoology general

MA - Computer Science
Computer & information sciences
Computer programming
Computer science
Computer systems analysis
Data processing
Information services & systems
Other computer & information sciences

MA - Engineering
Aerospace, aeronautical & astronautical eng.
Agricultural engineering
Architectural engineering
Architecture/Environmental Design
Bioengineering & biomedical engineering
Chemical engineering
Civil engineering
Computer & systems engineering
Electrical & electronic technologies
Electrical, electronics & communications eng.
Engineering sciences, mechanics & physics
Engineering, general
Environmental engineering
Geophysical & geological engineering
Industrial & manufacturing engineering
Industrial production technologies
Materials engineering incl. ceramics & textiles
Mechanical engineering
Mechanical engineering-related technologies
Metallurgical engineering
Mining & minerals engineering
Naval architecture & marine engineering
Nuclear engineering
Other engineering
Other engineering-related technologies
Petroleum engineering

MA - Math
Actuarial science
Applied mathematics
Mathematics, general
Operations research
Other mathematics
Statistics

Master's degrees continued

MA - Social Science
Anthropology & archaeology
epidemiology]
Area & Ethnic Studies
Clinical psychology
Counseling psychology
Criminology
Educational psychology
Experimental psychology
General psychology
Geography
Industrial/Organizational psychology
International relations
Other psychology
Other social sciences
Political science & government
Public policy studies
Social psychology
Sociology

MA - Humanities
Dramatic arts
English Language literature
Fine arts, all fields
History, other
Law/Prelaw/Legal Studies
Liberal Arts/General Studies
Music, all fields
Other foreign languages & literature
Other philosophy, religion, theology
Other visual & performing arts

MA - Health, Education, Other
Health
Audiology & speech pathology
Health services administration
Health/medical technologies
Medical preparatory programs
Medicine
Nursing [4 years or longer program]
Other health/medical sciences
Pharmacy
Physical therapy & other rehabilitation

MA - Health, Education, Other (continued)
Public health [environmental health &

Education
Computer teacher education
Computer teacher education
Counselor education & guidance services
Education administration
Elementary teacher education
Mathematics teacher education
Mathematics teacher education
Other education
Other health/medical sciences
Physical education & coaching
Pre-school/kindergarten/early childhood educ.
Science teacher education
Secondary teacher education
Social science teacher education
Special education

Other
Business marketing/marketing management
Communications, general
Home Economics
Journalism
Library Science
Marketing research
Other communications
Other Fields [Not Listed]
Other natural resources & conservation
Other public affairs
Parks, Recreation, Leisure, & Fitness Studies
Public administration
Social Work
Other Non-S&E fields

Professional Degrees - Law

Professional Degrees - Medicine & Other
Medicine
Other health/medical sciences
Other philosophy, religion, theology
Pharmacy

Doctorates (PhDs):

PhD - Business & Economics
Business
Business administration & management
Business & managerial economics
Business, general
Financial management
Other agricultural business & production
Economics
Agricultural economics
Economics

PhD - Science
Animal sciences
Astronomy & astrophysics
Atmospheric sciences & meteorology
Biochemistry & biophysics
Biology, general
Botany
Cell & molecular biology
Chemistry except biochemistry
Earth sciences
Ecology
Environmental science or studies
Food sciences & technology
Forestry sciences
Genetics animal & plant
Geological sciences, other
Geology
Microbiological sciences & immunology
Nutritional sciences
Oceanography
Other agricultural sciences
Other biological sciences
Other physical sciences
Pharmacology, human & animal
Physics
Physiology & pathology, human & animal
Plant sciences
Zoology general

PhD - Computer Science & Math
Computer Science
Computer & information sciences
Computer programming
Computer science
Information services & systems
Other computer & information sciences
Math
Applied mathematics
Mathematics, general
Operations research
Other mathematics
Statistics

PhD - Engineering
Aerospace, aeronautical & astronautical eng.
Agricultural engineering
Architecture/Environmental Design
Bioengineering & biomedical engineering
Chemical engineering
Civil engineering
Computer & systems engineering
Electrical & electronic technologies
Electrical, electronics & communications eng.
Engineering sciences, mechanics & physics
Engineering, general
Environmental engineering
Geophysical & geological engineering
Industrial & manufacturing eng.
Industrial production technologies
Materials engineering inc. ceramics & textiles
Mechanical engineering
Mechanical engineering-related technologies
Metallurgical engineering
Mining & minerals engineering
Naval architecture & marine eng.
Nuclear engineering
Other engineering
Other engineering-related technologies
Petroleum engineering

Doctorates (PhDs) continued:

PhD - Social Science
- Anthropology & archaeology
- Clinical psychology
- Counseling psychology
- Criminology
- Educational psychology
- Experimental psychology
- General psychology
- Geography
- Industrial/Organizational psychology
- International relations
- Other psychology
- Other social sciences
- Political science & government
- Public policy studies
- Social psychology
- Sociology

PhD - Humanities, Health, Education, & Other

Humanities
- Dramatic arts
- English Language literature
- Fine arts, all fields
- History, other
- Linguistics
- Other foreign languages & literature
- Other philosophy, religion, theology
- Philosophy of science

Health
- Audiology & speech pathology
- Health services administration
- Health/medical technologies
- Medicine
- Other health/medical sciences
- Pharmacy
- Physical therapy & other rehabilitation/therapeutic svs.
- Public health [environmental health & epidemiology]

Education
- Counselor education & guidance services
- Education administration
- Elementary teacher education
- Other education
- Physical education & coaching
- Science teacher education

Other
- Communications, general
- Home Economics
- Law/Prelaw/Legal Studies
- Library Science
- Other communications
- Public administration
- Social Work

Table 3.1A: Coefficients from Regressions of Authority for Men and Women and Interaction Effects

	Supervisory Authority				Managerial Authority			
Independent Variables	All	Women	Men	Interaction	All	Women	Men	Interaction
gender (female=1)	-0.036			0.003	-0.119			0.105
BA - business	0.363***	0.272	0.396**	0.401**	0.647***	0.595*	0.686***	0.705***
MA - business	0.751***	0.704***	0.772***	0.778***	0.989***	0.890**	1.033***	1.036***
BA - economics	0.382*	-0.318	0.512*	0.535*	0.748**	0.635	0.815**	0.828**
MA - economics	0.509	0.354	0.519	0.545	0.324	-1.163	0.554	0.498
PhD - business and economics	-0.150	-1.172	0.001	0.020	1.175	0.838	1.298	1.298
BA - science	0.035	-0.187	0.143	0.142	0.401*	0.578	0.346	0.364
MA - science	0.244	-0.060	0.363	0.365	0.126	-0.592	0.257	0.288
PhD - science	0.691***	0.853*	0.600***	0.630***	0.389	0.277	0.415	0.432
BA - computer science	-0.044	-0.074	-0.019	-0.039	0.337	-0.467	0.517	0.539
MA - computer science	0.159	-0.037	0.237	0.232	0.646**	0.407	0.726**	0.757**
PhD - computer science/math	-0.431	-0.253	-0.440	-0.450	-0.04	0.864	-0.126	-0.113
BA - engineering	0.284**	0.179	0.294*	0.306*	0.430*	0.467	0.460*	0.487*
MA - engineering	0.331**	0.089	0.368**	0.377**	0.318	-0.125	0.374	0.405
PhD - engineering	0.316*	1.242*	0.203	0.247	0.591*	1.379	0.448	0.489
BA - math	0.034	0.085	0.014	0.025	0.121	0.264	0.067	0.104
MA - math	-0.083	-0.050	-0.089	-0.061	0.200	-0.395	0.410	0.451
BA - social science	0.297*	0.386*	0.222	0.236	0.285	-0.026	0.392	0.400
MA - social science	0.265	-0.058	0.507	0.508	1.127***	-1.345	1.607***	1.625***
PhD - social science	0.994*	1.727**	0.044	0.022	0.919	1.272	0.576	0.590
BA - health, education, other	0.204*	0.215	0.184	0.171	0.103	-0.182	0.209	0.225
MA - health, education, other	0.181	0.091	0.223	0.221	0.566**	0.142	0.741**	0.740**
MA - humanities	0.417	0.967*	0.118	0.101	-0.139	0.191	-0.222	-0.240
PhD - humanities, health, education, other	0.326	0.281	0.339	0.330	0.429	0.278	0.437	0.449
professional degree - law	0.578***	0.672**	0.530**	0.513**	-1.216***	-1.358*	-1.170**	-1.188**
professional degree - medical/other	0.106	0.288	0.053	0.031	-1.847***	-1.655*	-1.869***	-1.887***
black	-0.305***	-0.394**	-0.238*	-0.300***	-0.422**	-0.433	-0.399*	-0.424**
asian	-0.433***	-0.549***	-0.326***	-0.422***	-0.474***	-1.082***	-0.296*	-0.465***
other race	0.005	0.223	-0.145	-0.0002	-0.268	0.235	-0.469	-0.266
parent's education - BA	0.053	0.044	0.063	0.052	0.066	0.200	0.035	0.066
parent's education - MA+	0.088	0.132	0.072	0.087	0.046	0.381*	-0.054	0.044
preferences - authority (index)	0.132***	0.132***	0.132***	0.132***	0.195***	0.114**	0.211***	0.195***
preferences - salary	-0.08	-0.012	-0.099	-0.08	-0.102	0.003	-0.125	-0.103
preferences - benefits	0.013	0.017	0.001	0.011	-0.130	-0.142	-0.133	-0.133*
preferences - security	-0.094*	-0.041	-0.110*	-0.094*	-0.103	-0.167	-0.097	-0.103
preferences - social importance	-0.086**	-0.172**	-0.057	-0.087**	-0.137**	-0.005	-0.165**	-0.134**
preferences - location	-0.116***	-0.132*	-0.110**	-0.116***	-0.012	0.026	-0.018	-0.016
firm size (ln)	-0.034***	-0.044***	-0.031***	-0.034***	0.003	0.009	.001	0.002
new firm	-0.001	-0.093	0.024	-0.004	0.153	0.003	0.159	0.147
northeast	0.024	0.135	-0.036	0.023	0.085	0.343	0.027	0.087
midwest	-0.044	-0.007	-0.062	-0.047	0.044	0.194	0.023	0.051
west	0.027	-0.026	0.047	0.024	0.134	0.328	0.084	0.128
agriculture, fishing, forestry, mining	0.127	-0.027	0.137	0.126	-0.419	-1.535	-0.297	-0.422
construction	0.572***	0.398	0.600***	0.577***	0.487**	0.300	0.500**	0.484**
transportation, communication, utilities	-0.217*	-0.384	-0.149	-0.212*	-0.252	-0.318	-0.235	-0.257
wholesale	-0.107	0.009	-0.128	-0.099	-0.151	0.172	-0.207	-0.155
retail	0.480***	0.846***	0.338**	0.479***	-0.357*	-0.489	-0.348*	-0.366*
FIRE	-0.071	-0.051	-0.039	-0.068	-0.397***	-0.375	-0.403***	-0.400***
business, personal, social services	0.057	0.362	-0.064	0.057	-0.083	0.077	-0.147	-0.088
entertainment	0.709***	0.539*	0.863***	0.720***	0.153	0.176	0.157	0.163
professional services	0.216***	0.382***	0.167*	0.217***	-0.422***	-0.471*	-0.403***	-0.424***
information services	-0.085	0.029	-0.130	-0.089	-0.145	-0.332	-0.087	-0.146
not working in 2001	-0.533***	-0.485**	-0.540***	-0.540***	-0.596**	-0.812*	-0.543*	-0.594**
different job, same employer 2001	-0.148	-0.301	-0.053	-0.147	0.109	0.210	0.068	0.094
same job, different employer 2001	-0.421***	-0.409**	-0.420***	-0.419***	-0.656***	-0.324	-0.743***	-0.658***
different job, different employer 2001	-0.712***	-0.810***	-0.686***	-0.722***	-0.543***	-0.273	-0.616***	-0.550***
promoted in 2001	0.540***	0.689***	0.492***	0.542***	0.410***	0.361	0.446**	0.416***
working hours (ln)	0.748***	0.675***	0.800***	0.751***	1.180***	1.372***	1.124***	1.178***
firm-specific work experience	0.024***	0.048***	0.017***	0.024***	-0.013**	0.007	-0.017***	-0.013**
general work experience	0.037***	0.048**	0.035***	0.037***	0.066***	0.046	0.070***	0.066***
general work experience squared	-0.001***	-0.002***	-0.001**	-0.001***	-0.001*	-0.001	-0.001*	-0.001*
single	-0.169*	-0.146	-0.162	-0.167*	-0.299*	-0.473*	-0.218	-0.291*
unemployed spouse	-0.021	0.006	-0.025	-0.021	0.395***	0.359	0.429***	0.403***
spouse working part-time	0.110	0.025	0.132	0.106	0.229*	-0.475	0.284**	0.229*
spouse's job requires a BA	-0.035	0.033	-0.052	-0.033	0.068	-0.032	0.096	0.069
children	0.172***	0.156*	0.171**	0.171***	0.085	-0.014	0.119	0.082

Table 3.1A: continued

	Supervisory Authority				Managerial Authority			
Independent Variables	All	Women	Men	Interaction	All	Women	Men	Interaction
BA - business*female				-0.119				-0.159
MA - business*female				-0.094				-0.076
BA - economics*female				-0.840*				-0.332
MA - economics*female				-0.146				-1.530
PhD - business and economics*female				-1.343				-0.621
BA - science*female				-0.349				0.237
MA - science*female				-0.418				-0.904
PhD - science*female				0.292				-0.056
BA - computer science*female				-0.003				-1.029
MA - computer science*female				-0.286				-0.447
PhD - computer science/math*female				0.167				0.891
BA - engineering*female				-0.145				-0.010
MA - engineering*female				-0.330				-0.462
PhD - engineering*female				0.835				1.003
BA - math*female				0.063				0.176
MA - math*female				-0.061				-0.836
BA - social science*female				0.152				-0.394
MA - social science*female				-0.549				-2.882***
PhD - social science*female				1.738*				0.642
BA - health, education, other*female				0.065				-0.399
MA - health, education, other*female				-0.094				-0.547
MA - humanities*female				0.878				0.393
PhD - humanities, health, education, other*female				-0.016				-0.041
professional degree - law*female				0.215				-0.025
professional degree - medical/other*female				0.299				0.367
constant	-2.705***	-2.865***	-2.767***	-2.721***	-7.316***	-7.309***	-7.291***	-7.367***
chi squared	20.889	7.676	14.070	15.730	17.467	5.001	13.135	13.055

Notes: * p<0.05; ** p<0.01; *** p<0.001.

Table 3.2A: All Coefficients from Regressions of Total Span of Control and Financial Returns to Authority for Men and Women and Interaction Effects

	Supervisor's Span of Control				Supervisors' Salaries				Managers' Salaries			
Independent Variables	All	Women	Men	Interaction	All	Women	Men	Interaction	All	Women	Men	Interaction
gender (female=1)	-0.155*			-0.247	-0.128***			0.044	-0.096***			-0.153
BA - business	0.592***	0.304	0.657***	0.620**	0.071	-0.120	0.155***	0.149**	0.042	0.011	0.043	0.038
MA - business	0.798***	0.526*	0.883***	0.806***	0.287***	0.106	0.364***	0.353***	0.199***	0.209*	0.185**	0.176**
BA - economics	0.693**	2.059**	0.492*	0.474*	0.102	-0.164	0.175*	0.177*	0.083	0.011	0.075	0.077
MA - economics	1.406**	-2.527***	1.619**	1.546**	0.214*	0.204*	0.274*	0.273*	0.241*	0.119	0.233	0.236*
PhD - business and economics	1.144	-1.521***	1.183*	1.195*	0.399***	0.150	0.477***	0.472***	0.114	0.349*	0.066	0.067
BA - science	0.534**	0.495	0.527*	0.525*	-0.009	-0.070	0.035	0.027	-0.068	0.048	-0.109	-0.115
MA - science	0.250	0.147	0.269	0.222	0.015	-0.081	0.064	0.053	-0.093	0.642***	-0.191	-0.186
PhD - science	-0.208	-0.736***	-0.043	-0.181	0.407***	0.198*	0.508***	0.492***	0.350***	0.355*	0.358***	0.356***
BA - computer science	0.143	0.178	0.176	0.092	0.170***	-0.031	0.261***	0.241***	-0.002	-0.007	-0.011	-0.026
MA - computer science	0.119	-0.137	0.215	0.128	0.212***	0.180*	0.258***	0.235**	0.228*	0.184	0.221	0.210
PhD - computer science/math	-0.200	-0.135	-0.110	-0.223	0.622***	0.368**	0.686***	0.676***	0.729	0.303	0.776	0.788
BA - engineering	0.393**	0.435	0.397*	0.358	0.093*	-0.064	0.169***	0.157***	0.041	0.114	0.023	0.019
MA - engineering	0.203	-0.592**	0.317	0.223	0.199***	0.119	0.277***	0.256***	0.193**	0.081	0.188**	0.180*
PhD - engineering	1.033	3.025***	0.153	0.039	0.401***	0.313*	0.469***	0.454***	0.309***	0.128	0.306***	0.294***
BA - math	0.517*	1.603**	0.346	0.277	0.090	0.076	0.118	0.115	0.054	0.124	0.044	0.046
MA - math	0.064	0.446	-0.200	-0.240	0.289***	0.201	0.290***	0.274***	0.138	0.179	0.115	0.097
BA - social science	0.509**	0.587*	0.447*	0.436	0.019	-0.284**	0.167**	0.159**	-0.004	-0.063	-0.022	-0.019
MA - social science	1.568**	-0.162	1.897***	1.890**	0.171*	-0.077	0.300***	0.286**	0.031	0.114	0.020	0.014
PhD - social science	0.644	0.767	0.340	0.186	0.269**	0.190	0.245*	0.252*	-0.008	0.321*	-0.343*	-0.320*
BA - health, education, other	0.611***	0.649***	0.490*	0.451*	0.003	-0.104	0.052	0.051	-0.017	0.093	-0.036	-0.039
MA - health, education, other	0.794***	0.387	1.014***	0.903**	0.086	-0.104	0.202***	0.198***	0.082	0.238*	0.050	0.043
MA - humanities	0.227	-0.126	0.470	0.284	-0.074	-0.440*	0.139	0.159	0.147	0.107	0.147	0.190
PhD - humanities, health, education, other	0.690*	1.130**	-0.007	-0.103	0.276***	0.058	0.369***	0.377***	0.054	0.282*	-0.034	-0.021
professional degree - law	0.081	-0.345	0.267	0.199	0.548***	0.511***	0.586***	0.586***	0.455**	0.324*	0.495**	0.497**
professional degree - medical/other	0.355	0.050	0.451	0.324	0.615***	0.606***	0.638***	0.648***	0.233*	0.449	0.210	0.189
span of control (direct + indirect reports)					0.001***	0.001***	0.001***	0.001***	0.0003***	0.0004***	0.0003***	0.0003***
black	0.126	0.381	-0.057	0.169	-0.098**	-0.052	-0.108**	-0.099**	-0.029	-0.050	-0.017	-0.031
asian	-0.453***	-0.296*	-0.439***	-0.426***	-0.039	0.026	-0.055*	-0.038	-0.024	-0.064	-0.019	-0.023
other race	0.427	0.478	0.563	0.370	-0.08	0.061	-0.146	-0.072	-0.034	-0.034	-0.033	-0.036
parent's education - BA	-0.167*	-0.301**	-0.089	-0.168*	0.094***	0.093*	0.091***	0.092***	0.055*	-0.074	0.070*	0.052*
parent's education - MA+	-0.166*	-0.209	-0.190*	-0.183*	0.114***	0.132***	0.110***	0.114***	0.085**	0.00003	0.109***	0.084**
preferences - authority (index)	0.101***	0.146***	0.086***	0.104***	0.027***	0.013	0.030***	0.028***	0.027***	0.032*	0.025**	0.027***
preferences - salary	-0.051	-0.295*	0.019	-0.041	0.080***	0.032	0.091***	0.078***	0.060*	0.073	0.053*	0.061**
preferences - benefits	-0.104	-0.239	-0.021	-0.106	-0.033	0.019	-0.050*	-0.032	-0.021	-0.005	-0.020	-0.022
preferences - security	-0.061	-0.073	-0.066	-0.075	-0.049***	-0.046	-0.045**	-0.049***	-0.100***	-0.185***	-0.080***	-0.100***
preferences - social importance	0.017	0.167*	0.0003	0.027	-0.028*	-0.043	-0.019	-0.028*	-0.027	-0.083*	-0.017	-0.029
preferences - location	-0.066	-0.100	-0.071	-0.062	0.011	0.024	0.007	0.011	0.024	0.022	0.022	0.022
firm size (ln)	0.142***	0.109***	0.139***	0.136***	0.026***	0.041***	0.021***	0.026***	0.019***	0.041***	0.015***	0.019***
new firm	-0.257**	-0.308	-0.317**	-0.305**	0.059	-0.061	0.082*	0.059	0.095*	0.143	0.081	0.094*
northeast	-0.012	-0.023	-0.014	-0.020	0.072***	0.074	0.078***	0.075***	0.071*	0.058	0.079*	0.074*
midwest	0.035	0.101	0.033	0.032	0.003	0.018	0.006	0.005	0.021	0.109	0.005	0.023
west	-0.042	-0.172	-0.034	-0.074	0.063**	0.061	0.067**	0.065***	0.038	0.067	0.036	0.038
agriculture, fishing, forestry, mining	-0.478*	0.418	-0.606**	-0.428*	-0.051	-0.082	-0.045	-0.045	0.006	0.050	0.003	0.007
construction	0.193	0.167	0.196	0.198	0.032	-0.068	0.035	0.028	0.011	-0.027	0.007	0.007
transportation, communication, utilities	-0.171	0.074	-0.176	-0.148	-0.067*	-0.054	-0.072*	-0.069*	-0.088*	-0.101	-0.090	-0.095*
wholesale	-0.246	0.049	-0.291*	-0.227	0.026	-0.020	0.032	0.023	0.030	0.142	0.004	0.031
retail	-0.117	0.238	-0.224	-0.098	-0.210***	-0.366***	-0.154***	-0.210***	-0.129**	-0.166*	-0.116*	-0.129**
FIRE	-0.416***	-0.433**	-0.345**	-0.406***	0.096***	0.034	0.113***	0.098***	0.112**	-0.082	0.155***	0.110**
business, personal, social services	0.182	-0.010	0.296	0.166	-0.162***	-0.152	-0.165***	-0.158***	0.019	0.001	-0.002	0.014
entertainment	0.403**	0.423	0.519***	0.419**	-0.342***	-0.298***	-0.334***	-0.329***	-0.198***	-0.185	-0.208***	-0.197***
profcssional scrviccs	-0.356***	-0.230	-0.373***	-0.351***	0.100***	0.048	0.102***	0.096***	0.126***	0.059	0.152***	0.127***
information services	-0.291*	-0.194	-0.299*	-0.292*	0.027	-0.072	0.063	0.028	0.061	-0.043	0.070	0.065
not working in 2001	-0.482***	-0.410*	-0.415**	-0.469***	-0.072	-0.181	-0.032	-0.076	0.008	0.050	0.011	0.0002
different job, same employer 2001	-0.008	-0.084	0.154	0.004	-0.070*	-0.278***	-0.003	-0.073*	-0.069	-0.032	-0.066	-0.071
same job, different employer 2001	-0.226	-0.092	-0.215	-0.224	-0.009	-0.048	0.012	-0.008	0.048	0.017	0.056	0.046
different job, different employer 2001	-0.318*	-0.155	-0.358*	-0.370**	-0.128***	-0.254**	-0.075*	-0.123***	0.014	0.040	0.015	0.011
promoted in 2001	0.255*	0.444*	0.095	0.275*	0.051	0.218**	-0.0002	0.054	0.032	-0.039	0.039	0.032
working hours (ln)	0.523***	0.564***	0.502***	0.516***	0.185***	0.155***	0.191***	0.181***	0.186***	0.148***	0.198***	0.186***
firm-specific work experience	-0.001	0.009	-0.003	-0.002	0.003*	-0.003	0.005***	0.003*	0.005**	0.002	0.006***	0.005**
general work experience	0.058***	0.031	0.066***	0.056***	0.021***	0.031***	0.020***	0.022***	0.024***	0.017	0.024***	0.024***
general work experience squared	-0.001*	-0.001	-0.001*	-0.001*	-0.0003***	-0.001***	-0.0002*	-0.0003***	-0.0003*	-0.0002	-0.0003	-0.0003*

Table 3.2A: Continued

	Supervisor's Span of Control				Supervisors' Salaries				Managers' Salaries			
Independent Variables	All	Women	Men	Interaction	All	Women	Men	Interaction	All	Women	Men	Interaction
single	0.161	0.356**	0.058	0.180	-0.019	-0.049	-0.002	-0.026	0.005	-0.060	0.029	0.001
unemployed spouse	0.619***	0.599***	0.534***	0.616***	0.223***	0.083	0.253***	0.224***	0.160***	0.125	0.169***	0.161***
spouse working part-time	0.032	0.462	-0.027	0.055	0.123***	0.068	0.139***	0.123***	0.049	-0.014	0.062	0.048
spouse's job requires a BA	0.045	0.219	-0.044	0.044	0.065***	0.068	0.066**	0.062**	0.034	0.010	0.019	0.030
children	0.102	0.137	0.089	0.084	0.037*	0.045	0.032	0.035*	0.022	0.064	0.004	0.017
BA - science*female				0.057				-0.051				0.177
BA - computer science*female				0.203				-0.194*				0.120
BA - engineering*female				0.264				-0.151				0.150
BA - math*female				0.849				0.001				0.017
BA - business*female				-0.144				-0.226**				-0.009
BA - economics*female				1.304				-0.278				-0.112
BA - social science*female				0.214				-0.378***				0.052
BA - health, education, other*female				0.373				-0.134				0.077
MA - science*female				0.129				-0.050				0.872***
MA - computer science*female				-0.084				0.032				0.052
MA - engineering*female				-0.574				-0.073				-0.008
MA - math*female				0.728				0.046				0.159
MA - business*female				-0.030				-0.170*				0.087
MA - economics*female				-3.703***				-0.135				-0.244
MA - social science*female				-1.633*				-0.324				0.034
MA - health, education, other*female				-0.263				-0.279**				0.135
MA - humanities*female				-0.187				-0.605**				-0.135
professional degree - law*female				-0.398				-0.068				-0.215
professional degree - medical/other*female				0.061				-0.029				0.176
PhD - science*female				-0.188				-0.259*				-0.091
PhD - computer science/math*female				0.131				-0.072				-0.388
PhD - engineering*female				2.976***				-0.080				0.053
PhD - business and economics*female				-2.495***				-0.295*				0.334*
PhD - social science*female				0.685				-0.038				0.642***
PhD - humanities, health, education, other*female				1.670**				-0.287*				0.277
constant	-1.155**	-0.624	-1.330**	-1.075**	9.697***	9.916***	9.553***	9.643***	10.119***	10.460***	10.052***	10.139***
chi squared					0.288	0.245	0.288	0.293	0.314	0.443	0.298	0.320
lnalpha	1.498***	1.437***	1.407***	1.462***								

Notes: * p<0.05; ** p<0.01; *** p<0.001.

Chapter 4 Appendix

Figure 4.1A: Distribution of Working Hours for all Workers, Supervisors and Managers

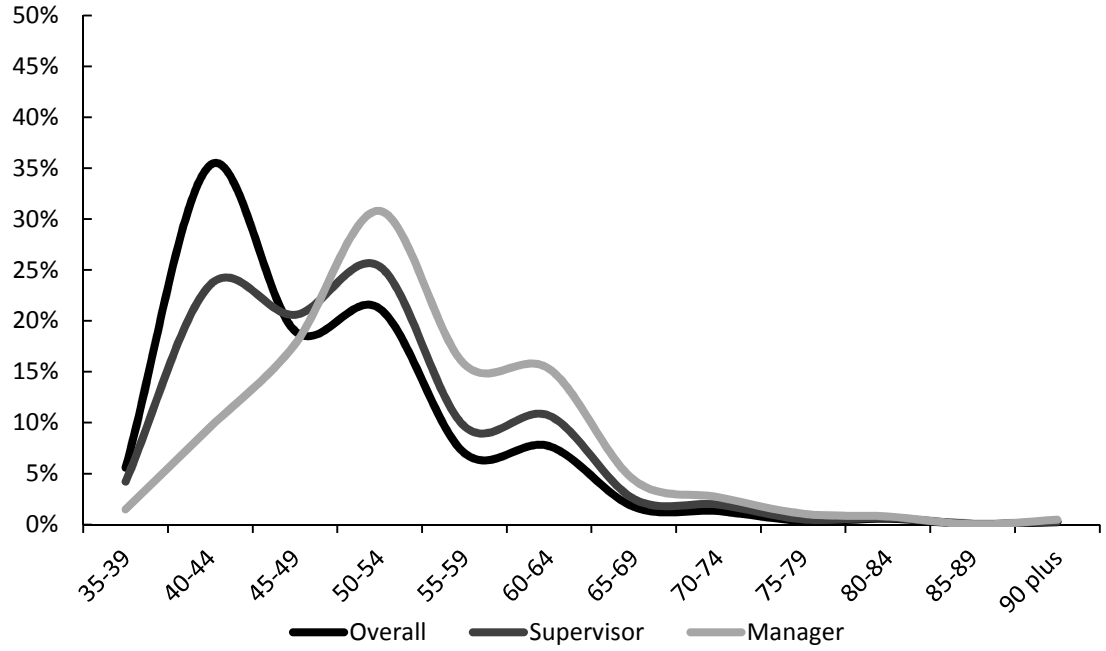

Figure 4.2A: Distribution of Working Hours for all Workers, Supervisors and Managers by Gender

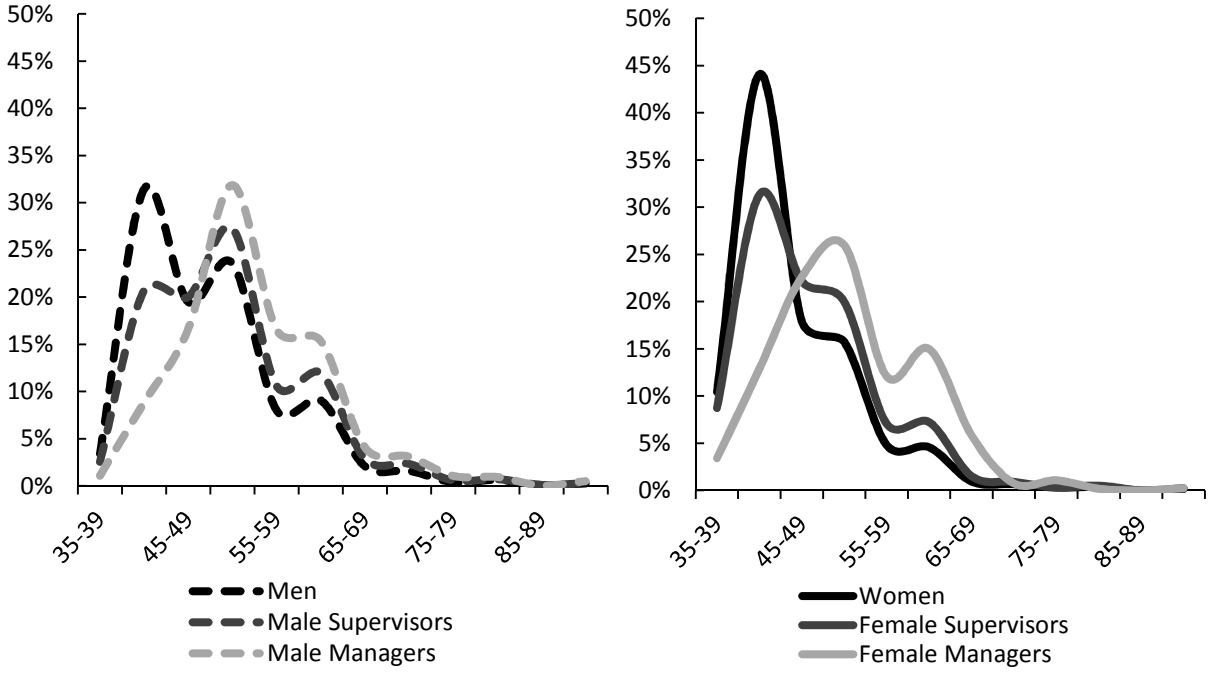

Table 4.1A: Coefficients from Regressions of Management

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	
gender (female=1)	-0.762***	-0.637***	-0.379***	-0.637***	-0.541***	-0.547***	-0.427***	-0.140	-0.135	**Men**	**Women**
black		-0.592***	-0.551***	-0.592***	-0.555***	-0.554***	-0.474***	-0.434**	-0.442**	-0.407*	-0.520*
asian		-0.614***	-0.456***	-0.614***	-0.577***	-0.586***	-0.612***	-0.432***	-0.440***	-0.280*	-0.999***
other race		-0.35	-0.376	-0.35	-0.296	-0.29	-0.295	-0.265	-0.266	-0.463	0.244
parent's ed - BA		0.08	0.041	0.080	0.113	0.108	0.100	0.078	0.079	0.049	0.203
parent's ed - MA+		0.067	-0.008	0.067	0.115	0.112	0.089	0.055	0.056	-0.046	0.395*
preferences - authority (index)		0.243***	0.184***	0.243***	0.255***	0.255***	0.242***	0.195***	0.196***	0.211***	0.118**
preferences - salary		-0.092	-0.100	-0.092	-0.088	-0.092	-0.099	-0.099	-0.103	-0.13	0.006
preferences - benefits		-0.116	-0.095	-0.116	-0.126*	-0.124	-0.135*	-0.125	-0.123	-0.126	-0.131
preferences - security		-0.223***	-0.146*	-0.223***	-0.197***	-0.193***	-0.206***	-0.111	-0.115*	-0.109	-0.184
preferences - social importance		-0.126**	-0.121*	-0.126**	-0.136**	-0.136**	-0.139**	-0.139**	-0.142**	-0.169**	-0.023
preferences - location		-0.04	0.029	-0.040	-0.074	-0.070	-0.052	-0.009	-0.008	-0.012	0.015
firm size (ln)		0.004	-0.003	0.004	0.009	0.010	0.003	0.001	0.001	-0.001	0.01
new firm		0.267*	0.176	0.267*	0.281*	0.238	0.283*	0.158	0.154	0.159	0.058
agriculture, fishing, forestry, mining		-0.158	-0.374	-0.158	-0.211	-0.208	-0.181	-0.428	-0.425	-0.287	-1.519
construction		0.491**	0.499**	0.491**	0.457**	0.449**	0.521***	0.489**	0.488**	0.503**	0.226
transportation, communication, utilities		-0.262	-0.259	-0.262	-0.307*	-0.291	-0.251	-0.261	-0.258	-0.232	-0.379
wholesale		-0.061	-0.139	-0.061	-0.09	-0.095	-0.056	-0.157	-0.151	-0.207	0.145
retail		-0.314*	-0.357*	-0.314*	-0.349*	-0.356*	-0.274	-0.350*	-0.348*	-0.332*	-0.51
FIRE		-0.457***	-0.382***	-0.457***	-0.487***	-0.490***	-0.433***	-0.387***	-0.387***	-0.396***	-0.376
business, personal, social services		-0.207	-0.138	-0.207	-0.188	-0.200	-0.162	-0.098	-0.090	-0.140	0.006
entertainment		0.223	0.072	0.223	0.229	0.216	0.313	0.133	0.137	0.142	0.098
professional services		-0.480***	-0.440***	-0.480***	-0.464***	-0.472***	-0.472***	-0.437***	-0.429***	-0.402***	-0.512*
information services		-0.279*	-0.182	-0.279*	-0.261*	-0.264*	-0.240	-0.154	-0.148	-0.088	-0.357
BA - business		0.754***	0.666***	0.754***	0.773***	0.778***	0.709***	0.651***	0.641***	0.700***	0.546
BA - engineering		0.627***	0.513**	0.627***	0.620***	0.627***	0.522**	0.431*	0.423*	0.471*	0.466
BA - science		0.518**	0.484*	0.518**	0.477*	0.487*	0.453*	0.405*	0.394	0.353	0.549
BA - math/computer science		0.289	0.266	0.289	0.346	0.351	0.242	0.277	0.264	0.394	-0.232
BA - social science		0.576**	0.457*	0.576**	0.575**	0.571**	0.578**	0.448*	0.436*	0.567*	0.042
BA - other		0.192	0.156	0.192	0.169	0.170	0.149	0.104	0.097	0.218	-0.214
MA - business		1.068***	0.837***	1.068***	1.318***	1.329***	0.961***	0.965***	0.953***	1.012***	0.845**
MA - engineering		0.305	0.275	0.305	0.425*	0.439*	0.198	0.306	0.296	0.367	-0.15
MA - science		0.119	0.139	0.119	0.161	0.175	0.020	0.111	0.114	0.262	-0.636
MA - math/computer science		0.468*	0.463*	0.468*	0.664**	0.669**	0.350	0.537*	0.517*	0.647*	0.08
MA - social science		1.027***	0.822**	1.027***	1.140***	1.138***	0.960***	0.885**	0.884**	1.267***	-1.217
MA - arts and humanities		-0.176	-0.182	-0.176	-0.124	-0.104	-0.224	-0.184	-0.165	-0.226	0.119
MA - other		0.589**	0.451*	0.589**	0.745***	0.747***	0.533**	0.544**	0.544**	0.738**	0.085
professional degree - law		-0.823**	-1.233***	-0.823**	-0.766*	-0.746*	-0.914**	-1.207***	-1.218***	-1.158**	-1.367*
professional degree - medical/other		-0.895*	-1.552***	-0.895*	-0.851*	-0.831*	-1.041**	-1.559***	-1.579***	-1.511***	-1.686*
doctorate - non-STEM		0.825*	0.601	0.825*	0.926**	0.944**	0.738*	0.652	0.652	0.597	0.733
doctorate - STEM		0.540*	0.375	0.540*	0.695**	0.703**	0.436	0.429	0.420	0.377	0.727
not working in 2001		-0.738***	-0.656***	-0.738***	-0.639***	-0.704***	-0.671***	-0.600**	-0.597**	-0.545*	-0.785
different job, same employer 2001		0.118	0.128	0.118	0.155	0.107	0.122	0.108	0.106	0.067	0.231
same job, different employer 2001		-0.607***	-0.590***	-0.607***	-0.570***	-0.655***	-0.608***	-0.650***	-0.650***	-0.732***	-0.335
different job, different employer 2001		-0.633***	-0.522***	-0.633***	-0.559***	-0.647***	-0.607***	-0.547***	-0.549***	-0.618***	-0.252
promoted in 2001		0.443***	0.329**	0.443***	0.532***	0.531***	0.456***	0.403***	0.405***	0.441**	0.343
children under 6		-0.214**	-0.225**	-0.214**	0.037	0.033	-0.420***	-0.194*	-0.263**	-0.248**	-0.328
spouse's job requires a BA		0.001	0.002	0.001	-0.011	-0.009	0.101	0.081	0.083	0.106	-0.015
working hours (ln)			1.219***					1.173***	1.175***	1.119***	1.362***
firm-specific work experience				0.0001		-0.012**		-0.013**	-0.013**	-0.018***	0.007
general work experience					0.090***	0.092***		0.064***	0.058***	0.061***	0.042
general work experience squared					-0.001***	-0.001***		-0.001*	-0.001*	-0.001	-0.001
single							-0.462***	-0.363**	-0.303*	-0.228	-0.473*
unemployed spouse							0.576***	0.451***	0.444***	0.472***	0.390
spouse working part-time							0.347***	0.259**	0.237*	0.292**	-0.484
children									0.167*	0.191*	0.105
constant	-1.839***	-3.447***	-6.220***	-3.447***	-4.840***	-4.778***	-3.444***	-7.063***	-7.088***	-7.084***	-6.947***
chi2	108.609	749.232	1019.739	749.602	804.25	804.015	857.667	1141.745	1144.024	845.13	308.44

Notes: * p<0.05; ** p<0.01; *** p<0.001.

Table 4.2A: Coefficients from Regressions of Managers' Salaries

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9		
gender (female=1)	-0.203***	-0.194***	-0.172***	-0.190***	-0.154***	-0.154***	-0.143***	-0.095***	-0.094***	**Men**	**Women**
span of control		0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
black		-0.092	-0.081	-0.102*	-0.068	-0.076	-0.054	-0.036	-0.038	-0.019	-0.063
asian		-0.058	-0.052	-0.048	-0.029	-0.025	-0.054	-0.018	-0.018	-0.014	-0.052
other race		-0.073	-0.083	-0.056	-0.045	-0.034	-0.059	-0.042	-0.044	-0.045	-0.052
parent's ed - BA		0.038	0.049	0.048	0.042	0.047	0.035	0.057*	0.057*	0.074*	-0.073
parent's ed - MA+		0.063*	0.060*	0.068*	0.078**	0.079**	0.073*	0.084**	0.084**	0.107**	-0.016
preferences - authority (index)		0.033***	0.027***	0.032***	0.033***	0.033***	0.034***	0.027***	0.027***	0.026***	0.028*
preferences - salary		0.062*	0.067**	0.063*	0.063**	0.063**	0.054*	0.062**	0.062**	0.057*	0.066
preferences - benefits		-0.011	-0.012	-0.009	-0.015	-0.014	-0.021	-0.023	-0.023	-0.023	-0.016
preferences - security		-0.120***	-0.106***	-0.122***	-0.118***	-0.120***	-0.113***	-0.101***	-0.101***	-0.081***	-0.188***
preferences - social importance		-0.018	-0.02	-0.023	-0.019	-0.021	-0.021	-0.027	-0.028	-0.019	-0.071*
preferences - location		0.021	0.031	0.020	0.017	0.016	0.017	0.023	0.023	0.022	0.021
firm size (ln)		0.017***	0.014***	0.018***	0.019***	0.019***	0.019***	0.017***	0.017***	0.014**	0.040***
new firm		0.072	0.075	0.107*	0.064	0.086	0.071	0.086*	0.086*	0.070	0.111
agriculture, fishing, forestry, mining		0.021	0.016	0.033	-0.003	0.005	-0.009	-0.019	-0.019	-0.023	0.015
construction		-0.025	-0.014	-0.025	-0.018	-0.019	-0.006	0.004	0.004	0.004	-0.027
transportation, communication, utilities		-0.089	-0.084	-0.092	-0.088*	-0.090*	-0.093	-0.088	-0.085	-0.089	-0.106
wholesale		0.065	0.058	0.060	0.037	0.036	0.069	0.033	0.035	0.012	0.131
retail		-0.106*	-0.118**	-0.108**	-0.126**	-0.127**	-0.091*	-0.123**	-0.123**	-0.107*	-0.172*
FIRE		0.108**	0.129**	0.107*	0.099*	0.099*	0.105*	0.118**	0.118**	0.163***	-0.064
business, personal, social services		-0.049	-0.021	-0.048	-0.020	-0.022	-0.040	0.007	0.008	-0.008	0.0002
entertainment		-0.236***	-0.249***	-0.233***	-0.199***	-0.200***	-0.216***	-0.200***	-0.200***	-0.207***	-0.169
professional services		0.096**	0.116***	0.100**	0.097**	0.099**	0.102**	0.122***	0.124***	0.152***	0.055
information services		0.036	0.065	0.034	0.040	0.038	0.035	0.062	0.064	0.076	-0.027
BA - business		0.073	0.054	0.059	0.074	0.064	0.056	0.037	0.035	0.031	-0.001
BA - engineering		0.098	0.086	0.086	0.076	0.070	0.067	0.039	0.035	0.014	0.106
BA - science		-0.008	-0.016	-0.022	-0.044	-0.052	-0.032	-0.073	-0.075	-0.120	0.035
BA - math/computer science		0.004	0.010	-0.009	0.012	0.001	-0.007	0.008	0.003	-0.018	0.065
BA - social science		0.058	0.026	0.057	0.068	0.065	0.052	0.032	0.029	0.014	-0.042
BA - other		0.028	0.006	0.018	0.015	0.010	0.009	-0.023	-0.026	-0.053	0.084
MA - business		0.163**	0.140*	0.162**	0.255***	0.248***	0.135*	0.200***	0.197***	0.178**	0.211*
MA - engineering		0.198**	0.192**	0.197**	0.226***	0.223***	0.159*	0.187**	0.184**	0.174*	0.055
MA - science		-0.031	-0.074	-0.043	-0.041	-0.047	-0.044	-0.103	-0.101	-0.200	0.646***
MA - math/computer science		0.192*	0.187*	0.184*	0.265**	0.256**	0.154	0.220*	0.216*	0.206	0.185
MA - social science		0.069	0.028	0.086	0.103	0.110	0.070	0.077	0.078	0.063	0.030
MA - arts and humanities		0.133	0.154	0.056	0.167	0.118	0.151	0.150	0.150	0.160	0.093
MA - other		0.083	0.057	0.075	0.122	0.114	0.063	0.074	0.073	0.039	0.221*
professional degree - law		0.482**	0.456**	0.497***	0.485**	0.493***	0.461**	0.453**	0.450**	0.484**	0.337**
professional degree - medical/other		0.372***	0.313**	0.357***	0.323**	0.315**	0.340**	0.240*	0.235*	0.214	0.455
doctorate - non-STEM		0.078	0.051	0.076	0.101	0.097	0.046	0.047	0.042	-0.095	0.299**
doctorate - STEM		0.434***	0.378***	0.439***	0.451***	0.452***	0.388***	0.366***	0.363***	0.363***	0.237
not working in 2001		-0.047	-0.033	-0.019	-0.033	-0.017	-0.038	0.001	0.002	0.009	0.008
different job, same employer 2001		-0.140**	-0.129**	-0.109*	-0.107*	-0.091	-0.136**	-0.080	-0.078	-0.077	-0.081
same job, different employer 2001		-0.008	-0.020	0.051	0.018	0.053	-0.005	0.039	0.040	0.048	-0.018
different job, different employer 2001		-0.058	-0.055	-0.001	-0.033	-0.033	-0.049	0.008	0.008	0.009	0.022
promoted in 2001		0.045	0.026	0.052	0.061	0.065	0.037	0.042	0.041	0.048	0.004
children under 6		-0.047	-0.053	-0.034	0.057*	0.057*	-0.097***	0.012	0.005	-0.015	0.090
spouse's job requires a BA		-0.040	-0.033	-0.042	-0.042	-0.044*	0.038	0.037	0.039	0.027	0.014
working hours (ln)			0.188***					0.186***	0.186***	0.198***	0.149***
firm-specific work experience				0.008***		0.005**		0.005**	0.005**	0.006**	0.002
general work experience					0.031***	0.031***		0.025***	0.024***	0.025***	0.019*
general work experience squared					-0.0004**	-0.0001**		-0.0003*	-0.0003*	-.0002	-.0002
single							-0.045	0.004	0.013	0.040	-0.053
unemployed spouse							0.190***	0.163***	0.162***	0.175***	0.137
spouse working part-time							0.057	0.054	0.051	0.064	-0.012
children									0.021	0.009	0.045
constant	11.618***	11.106***	10.614***	11.053***	10.643***	10.631***	11.071***	10.152***	10.150***	10.080***	10.601***
r2	0.026	0.204	0.241	0.216	0.253	0.257	0.227	0.309	0.309	0.291	0.438

Notes: * p<0.05; ** p<0.01; *** p<0.001.

Table 4.3A: Coefficients from Regressions of Supervisory Authority

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9		
gender (female=1)	-0.372***	-0.286***	-0.095*	-0.265***	-0.260***	-0.252***	-0.217***	-0.031	-0.035	**Men**	**Women**
black		-0.356***	-0.319***	-0.359***	-0.351***	-0.359***	-0.313***	-0.297***	-0.305***	-0.236*	-0.399**
asian		-0.552***	-0.449***	-0.535***	-0.535***	-0.519***	-0.547***	-0.416***	-0.424***	-0.311***	-0.576***
other race		-0.025	0.004	-0.029	-0.008	-0.017	-0.009	0.017	0.011	-0.133	0.227
parent's ed - BA		0.063	0.035	0.080	0.067	0.076	0.068	0.052	0.054	0.064	0.042
parent's ed - MA+		0.114*	0.067	0.131**	0.120*	0.128*	0.124*	0.088	0.090	0.073	0.131
preferences - authority (index)		0.162***	0.126***	0.166***	0.165***	0.167***	0.163***	0.132***	0.132***	0.133***	0.131***
preferences - salary		-0.082	-0.079	-0.075	-0.080	-0.075	-0.084	-0.074	-0.077	-0.098	-0.009
preferences - benefits		0.013	0.020	0.007	0.013	0.008	0.006	0.011	0.012	-0.003	0.019
preferences - security		-0.121**	-0.085*	-0.126***	-0.116**	-0.124**	-0.117**	-0.089*	-0.093*	-0.110*	-0.039
preferences - social importance		-0.088**	-0.079*	-0.093**	-0.087**	-0.090**	-0.091**	-0.082**	-0.085**	-0.055	-0.177**
preferences - location		-0.125***	-0.093**	-0.138***	-0.141***	-0.148***	-0.131***	-0.116***	-0.116***	-0.106**	-0.128
firm size (ln)		-0.026***	-0.035***	-0.027***	-0.024***	-0.026***	-0.026***	-0.035***	-0.034***	-0.031***	-0.043***
new firm		0.004	-0.065	0.072	0.004	0.066	0.007	0.003	-.0001	0.028	-0.100
agriculture, fishing, forestry, mining		0.243	0.150	0.219	0.229	0.210	0.258	0.134	0.134	0.156	-0.058
construction		0.518***	0.542***	0.539***	0.511***	0.539***	0.526***	0.573***	0.574***	0.600***	0.391
transportation, communication, utilities		-0.193*	-0.177	-0.230*	-0.203*	-0.234*	-0.187	-0.214*	-0.213*	-0.143	-0.382
wholesale		-0.091	-0.128	-0.076	-0.095	-0.079	-0.088	-0.109	-0.107	-0.136	0.009
retail		0.373***	0.452***	0.390***	0.368***	0.387***	0.390***	0.479***	0.483***	0.341***	0.858***
FIRE		-0.157*	-0.081	-0.150*	-0.164*	-0.154*	-0.148*	-0.070	-0.067	-0.040	-0.047
business, personal, social services		-0.085	-0.003	-0.052	-0.068	-0.040	-0.066	0.053	0.058	-0.063	0.373
entertainment		0.624***	0.656***	0.655***	0.623***	0.650***	0.659***	0.710***	0.710***	0.862***	0.537*
professional services		0.099	0.177**	0.123*	0.117*	0.135*	0.110*	0.216***	0.221***	0.166*	0.396***
information services		-0.201*	-0.120	-0.185*	-0.200*	-0.190*	-0.180*	-0.093	-0.086	-0.137	0.037
BA - business		0.443***	0.387***	0.445***	0.442***	0.438***	0.424***	0.369***	0.363***	0.408**	0.259
BA - engineering		0.388***	0.316**	0.383***	0.380***	0.375***	0.358***	0.289**	0.286**	0.309*	0.160
BA - science		0.105	0.073	0.088	0.089	0.078	0.082	0.038	0.036	0.155	-0.198
BA - math/computer science		0.035	0.013	0.036	0.034	0.024	0.017	-0.012	-0.020	0.008	-0.045
BA - social science		0.364**	0.321**	0.369***	0.359**	0.365**	0.359**	0.322**	0.319**	0.339*	0.259
BA - other		0.211*	0.228*	0.208*	0.198*	0.197*	0.196*	0.206*	0.202*	0.194	0.199
MA - business		0.862***	0.713***	0.880***	0.983***	0.968***	0.830***	0.769***	0.756***	0.788***	0.703***
MA - engineering		0.366***	0.338**	0.367***	0.424***	0.407***	0.334**	0.345**	0.339**	0.390**	0.089
MA - science		0.256	0.270	0.243	0.289	0.269	0.222	0.252	0.252	0.382*	-0.051
MA - math/computer science		0.145	0.089	0.163	0.238	0.230	0.112	0.130	0.118	0.201	-0.034
MA - social science		0.366*	0.277	0.389*	0.415*	0.418*	0.347*	0.306	0.307	0.505*	-0.012
MA - arts and humanities		0.349	0.440	0.332	0.407	0.382	0.344	0.463*	0.464*	0.172	1.013**
MA - other		0.223	0.159	0.241*	0.298*	0.295*	0.206	0.204	0.203	0.275	0.087
professional degree - law		0.836***	0.569***	0.830***	0.891***	0.872***	0.816***	0.582***	0.582***	0.542**	0.663**
professional degree - medical/other		0.418**	0.102	0.400**	0.447**	0.420**	0.385**	0.081	0.070	0.028	0.265
doctorate - non-STEM		0.593**	0.471*	0.593**	0.666**	0.646**	0.563**	0.487*	0.482*	0.223	0.854*
doctorate - STEM		0.514***	0.431***	0.528***	0.591***	0.585***	0.488***	0.470***	0.461***	0.370*	0.854**
not working in 2001		-0.712***	-0.699***	-0.583***	-0.657***	-0.545***	-0.690***	-0.525***	-0.526***	-0.532***	-0.475**
different job, same employer 2001		-0.191*	-0.241**	-0.098	-0.189*	-0.105	-0.192*	-0.148	-0.149	-0.055	-0.299
same job, different employer 2001		-0.564***	-0.595***	-0.398***	-0.549***	-0.399***	-0.559***	-0.418***	-0.418***	-0.417***	-0.411**
different job, different employer 2001		-0.940***	-0.912***	-0.764***	-0.910***	-0.752***	-0.926***	-0.713***	-0.713***	-0.684***	-0.804***
promoted in 2001		0.575***	0.516***	0.589***	0.606***	0.608***	0.577***	0.541***	0.540***	0.492***	0.685***
children under 6		0.100*	0.117*	0.147**	0.163***	0.173***	0.034	0.128*	0.055	0.087	-0.003
spouse's job requires a BA		0.058	0.053	0.054	0.049	0.046	-0.001	-0.039	-0.038	-0.058	0.025
working hours (ln)			0.757***					0.747***	0.748***	0.799***	0.676***
firm-specific work experience				0.024***		0.023***		0.024***	0.024***	0.017***	0.048***
general work experience					0.062***	0.059***		0.045***	0.039***	0.038***	0.048**
general work experience squared					-0.001***	-0.001***		-0.001***	-0.001***	-0.001**	-0.002***
single							-0.232***	-0.214***	-0.165*	-0.162	-0.148
unemployed spouse							0.083	-0.019	-0.026	-0.039	-0.0003
spouse working part-time							0.209***	0.129*	0.110	0.127	0.025
children									0.151**	0.139*	0.157
constant	0.298***	-0.695**	-2.233***	-0.940***	-1.341***	-1.458***	-0.644**	-2.747***	-2.760***	-2.856***	-2.846***
chi2	82.638	872.592	1252.979	935.116	912.65	964.92	895.254	1331.55	1344.672	877.745	482.9

Notes: * p<0.05; ** p<0.01; *** p<0.001.

Table 4.4A: Coefficients from Regressions of Total Span of Control among Supervisors

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9		
gender (female=1)	-0.522***	-0.450***	-0.330***	-0.447***	-0.358***	-0.358***	-0.284**	-0.142	-0.140	**Men**	**Women**
black		-0.037	0.003	-0.042	0.002	0.004	0.092	0.141	0.108	-0.044	0.352
asian		-0.564***	-0.503***	-0.562***	-0.537***	-0.537***	-0.546***	-0.467***	-0.475***	-0.450***	-0.314*
other race		0.399	0.381	0.407	0.378	0.377	0.373	0.403	0.419	0.582	0.397
parent's ed - BA		-0.114	-0.138	-0.109	-0.121	-0.121	-0.13	-0.151*	-0.160*	-0.074	-0.254*
parent's ed - MA+		-0.120	-0.183*	-0.117	-0.113	-0.113	-0.091	-0.149	-0.148	-0.176*	-0.157
preferences - authority (index)		0.134***	0.109***	0.134***	0.126***	0.126***	0.131***	0.099***	0.100***	0.080***	0.127***
preferences - salary		-0.028	-0.013	-0.027	-0.038	-0.038	-0.075	-0.058	-0.057	0.004	-0.302*
preferences - benefits		-0.150	-0.118	-0.153	-0.125	-0.125	-0.158	-0.099	-0.098	-0.014	-0.222
preferences - security		-0.148*	-0.070	-0.150*	-0.126*	-0.126*	-0.117	-0.041	-0.046	-0.065	-0.057
preferences - social importance		0.065	0.052	0.060	0.049	0.049	0.034	0.019	0.020	0.014	0.186*
preferences - location		-0.046	-0.052	-0.052	-0.062	-0.061	-0.053	-0.069	-0.070	-0.065	-0.157
firm size (ln)		0.182***	0.147***	0.183***	0.182***	0.182***	0.174***	0.143***	0.143***	0.136***	0.119***
new firm		-0.125	-0.188	-0.096	-0.147	-0.151	-0.116	-0.202	-0.207	-0.313**	-0.081
agriculture, fishing, forestry, mining		-0.385	-0.513*	-0.400	-0.427	-0.425	-0.385	-0.514**	-0.505**	-0.605**	0.327
construction		0.167	0.124	0.175	0.184	0.183	0.225	0.189	0.192	0.204	0.156
transportation, communication, utilities		-0.201	-0.188	-0.195	-0.265	-0.267	-0.186	-0.213	-0.201	-0.164	.0004
wholesale		-0.210	-0.255	-0.207	-0.235	-0.236	-0.212	-0.271*	-0.254	-0.278	0.012
retail		-0.267	-0.239	-0.267	-0.230	-0.230	-0.193	-0.134	-0.121	-0.202	0.143
FIRE		-0.495***	-0.393**	-0.501***	-0.543***	-0.543***	-0.496***	-0.428***	-0.420***	-0.319*	-0.442*
business, personal, social services		-0.139	0.050	-0.128	-0.069	-0.070	-0.064	0.148	0.161	0.305	-0.097
entertainment		0.335*	0.302*	0.338*	0.371*	0.371*	0.407**	0.386**	0.382**	0.522***	0.299
professional services		-0.557***	-0.407***	-0.552***	-0.525***	-0.526***	-0.555***	-0.396***	-0.383***	-0.357**	-0.284
information services		-0.515**	-0.338*	-0.524**	-0.480**	-0.478**	-0.537***	-0.316*	-0.306*	-0.290	-0.058
BA - business		0.572**	0.597**	0.564**	0.606***	0.608***	0.591***	0.612***	0.585***	0.619**	0.341
BA - engineering		0.544**	0.432*	0.528**	0.551**	0.553**	0.531**	0.413**	0.389*	0.364	0.418
BA - science		0.526*	0.515*	0.509*	0.520*	0.523*	0.584**	0.535**	0.517*	0.488*	0.534
BA - math/computer science		0.246	0.195	0.238	0.280	0.282	0.365	0.294	0.264	0.196	0.743*
BA - social science		0.473*	0.478*	0.472*	0.536**	0.537**	0.548**	0.561***	0.541**	0.412*	0.801***
BA - other		0.601**	0.547**	0.601**	0.665***	0.665***	0.660***	0.629***	0.603***	0.437*	0.704***
MA - business		0.808***	0.688***	0.805***	1.014***	1.016***	0.777***	0.802***	0.774***	0.815***	0.514*
MA - engineering		0.194	0.175	0.197	0.368	0.369	0.173	0.230	0.196	0.252	-0.589**
MA - science		0.423	0.233	0.409	0.395	0.396	0.512	0.256	0.240	0.240	0.158
MA - math/computer science		-0.148	-0.072	-0.141	0.077	0.078	-0.128	0.105	0.075	0.067	0.138
MA - social science		1.645***	1.438**	1.672***	1.683***	1.681***	1.763***	1.530***	1.534***	1.785***	-0.228
MA - arts and humanities		0.007	0.053	-0.034	0.120	0.127	0.144	0.242	0.213	0.391	-0.075
MA - other		0.770**	0.631**	0.757**	0.925***	0.928***	0.828***	0.819***	0.782***	0.963**	0.424
professional degree - law		0.168	-0.026	0.159	0.398	0.400	0.141	0.085	0.032	0.143	-0.362
professional degree - medical/other		0.499*	0.335	0.493*	0.590**	0.592**	0.469*	0.364	0.332	0.341	0.122
doctorate - non-STEM		0.597*	0.560*	0.597*	0.835**	0.837**	0.617**	0.714**	0.681**	0.228	0.981**
doctorate - STEM		0.600	0.376	0.589	0.560	0.561	0.575	0.340	0.308	-0.037	0.891
not working in 2001		-0.630***	-0.598***	-0.607***	-0.560***	-0.562***	-0.546***	-0.475***	-0.466***	-0.391**	-0.421*
different job, same employer 2001		-0.055	-0.05	-0.036	-0.023	-0.026	0.004	0.002	0.016	0.156	-0.127
same job, different employer 2001		-0.21	-0.266*	-0.155	-0.142	-0.148	-0.194	-0.218	-0.206	-0.217	-0.177
different job, different employer 2001		-0.396**	-0.370**	-0.346*	-0.301*	-0.307*	-0.332*	-0.252	-0.252	-0.358*	-0.094
promoted in 2001		0.241	0.185	0.254	0.300*	0.298*	0.200	0.231	0.223	0.101	0.444*
children under 6		-0.152	-0.178*	-0.142	0.073	0.073	-0.265**	-0.094	-0.163	-0.291**	0.261
spouse's job requires a BA		-0.233***	-0.243***	-0.236***	-0.224***	-0.223***	0.051	0.057	0.062	-0.027	0.216
working hours (ln)			0.539***					0.524***	0.527***	0.511***	0.601***
firm-specific work experience				0.007		-0.001		0.0002	-0.0003	-0.002	0.011
general work experience					0.074***	0.074***		0.060***	0.055***	0.054**	0.038
general work experience squared					-0.001**	-0.001**		-0.001**	-0.001*	-0.001*	-0.001
single							0.024	0.104	0.145	0.052	0.356**
unemployed spouse							0.713***	0.654***	0.637***	0.570***	0.659**
spouse working part-time							0.145	0.043	0.022	-0.035	0.458
children									0.160*	0.189*	0.070
constant	2.466***	0.797*	-0.340	0.747	-0.171	-0.167	0.756*	-1.129**	-1.158**	-1.111**	-0.689
lnalpha	2.672***	1.797***	1.608***	1.794***	1.728***	1.728***	1.722***	1.507***	1.503***	1.399***	1.508***

Notes: * p<0.05; ** p<0.01; *** p<0.001.

Table 4.5A: Coefficients from Regressions of Supervisors' Salaries

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9		
gender (female=1)	-0.308***	-0.267***	-0.219***	-0.262***	-0.227***	-0.227***	-0.193***	-0.127***	-0.127***	**Men**	**Women**
span of control		0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***
black		-0.146***	-0.149***	-0.148***	-0.128***	-0.129***	-0.110**	-0.107**	-0.108**	-0.117***	-0.061
asian		-0.066**	-0.039	-0.060**	-0.056*	-0.054*	-0.060**	-0.026	-0.027	-0.045	0.040
other race		-0.131*	-0.101	-0.128*	-0.107	-0.107	-0.118	-0.072	-0.072	-0.143	0.078
parent's ed - BA		0.097***	0.086***	0.101***	0.106***	0.107***	0.097***	0.095***	0.096***	0.093***	0.095*
parent's ed - MA+		0.113***	0.096***	0.117***	0.129***	0.129***	0.115***	0.113***	0.114***	0.112***	0.129***
preferences - authority (index)		0.036***	0.026***	0.037***	0.039***	0.039***	0.035***	0.028***	0.028***	0.031***	0.014
preferences - salary		0.080***	0.082***	0.082***	0.079***	0.079***	0.078***	0.081***	0.080***	0.092***	0.032
preferences - benefits		-0.033	-0.027	-0.035	-0.035	-0.035	-0.037	-0.034	-0.033	-0.050*	0.013
preferences - security		-0.081***	-0.068***	-0.081***	-0.068***	-0.068***	-0.075***	-0.052***	-0.053***	-0.049**	-0.046
preferences - social importance		-0.022	-0.020	-0.024*	-0.028*	-0.028*	-0.026*	-0.029**	-0.030**	-0.021	-0.045
preferences - location		0.021	0.027*	0.016	0.008	0.007	0.017	0.012	0.012	0.007	0.024
firm size (ln)		0.027***	0.024***	0.027***	0.029***	0.029***	0.027***	0.025***	0.025***	0.020***	0.040***
new firm		0.072*	0.046	0.096**	0.073*	0.082*	0.072*	0.059	0.059	0.083*	-0.065
agriculture, fishing, forestry, mining		-0.011	-0.045	-0.021	-0.037	-0.040	-0.002	-0.062	-0.061	-0.057	-0.098
construction		0.034	0.030	0.037	0.030	0.031	0.039	0.031	0.031	0.035	-0.071
transportation, communication, utilities		-0.064*	-0.056*	-0.076**	-0.077**	-0.081**	-0.056*	-0.066*	-0.065*	-0.068*	-0.056
wholesale		0.045	0.030	0.047	0.042	0.043	0.040	0.025	0.026	0.034	-0.021
retail		-0.232***	-0.225***	-0.231***	-0.228***	-0.228***	-0.216***	-0.208***	-0.207***	-0.151***	-0.367***
FIRE		0.088***	0.107***	0.087***	0.081**	0.081**	0.088***	0.100***	0.100***	0.116***	0.038
business, personal, social services		-0.206***	-0.197***	-0.199***	-0.175***	-0.174***	-0.192***	-0.160***	-0.159***	-0.161***	-0.142
entertainment		-0.351***	-0.380***	-0.341***	-0.337***	-0.335***	-0.327***	-0.344***	-0.343***	-0.335***	-0.302***
professional services		0.069***	0.084***	0.073***	0.085***	0.086***	0.071***	0.099***	0.100***	0.106***	0.044
information services		0.003	0.023	0.007	0.009	0.010	0.004	0.028	0.029	0.067	-0.073
BA - business		0.087*	0.069	0.087*	0.093*	0.092*	0.068	0.060	0.058	0.140**	-0.130
BA - engineering		0.137**	0.118**	0.138**	0.137**	0.137**	0.097*	0.086*	0.084*	0.158***	-0.070
BA - science		0.023	0.016	0.017	0.008	0.006	0.001	-0.015	-0.018	0.024	-0.080
BA - math/computer science		0.139**	0.137**	0.141**	0.153***	0.153***	0.124**	0.137**	0.134**	0.203***	-0.011
BA - social science		0.036	0.026	0.039	0.039	0.040	0.037	0.032	0.030	0.156**	-0.289**
BA - other		0.003	0.011	0.004	-0.007	-0.006	-0.009	-0.007	-0.010	0.037	-0.116
MA - business		0.266***	0.231***	0.271***	0.367***	0.365***	0.228***	0.285***	0.282***	0.355***	0.105
MA - engineering		0.191***	0.185***	0.194***	0.254***	0.253***	0.141***	0.196***	0.194***	0.268***	0.118
MA - science		0.028	0.025	0.024	0.051	0.049	-0.014	0.009	0.009	0.052	-0.067
MA - math/computer science		0.199***	0.196***	0.206***	0.279***	0.279***	0.153**	0.228***	0.223***	0.255***	0.190*
MA - social science		0.188*	0.160*	0.199**	0.229**	0.231**	0.167*	0.182**	0.182**	0.288***	-0.021
MA - arts and humanities		-0.120	-0.100	-0.131	-0.088	-0.092	-0.118	-0.079	-0.081	0.125	-0.443*
MA - other		0.063	0.049	0.069	0.123*	0.123*	0.041	0.083	0.081	0.194**	-0.103
professional degree - law		0.595***	0.529***	0.590***	0.632***	0.629***	0.572***	0.543***	0.542***	0.575***	0.511***
professional degree - medical/other		0.650***	0.596***	0.648***	0.684***	0.681***	0.609***	0.592***	0.588***	0.602***	0.592***
doctorate - non-STEM		0.300***	0.266***	0.303***	0.357***	0.355***	0.262***	0.283***	0.281***	0.344***	0.145
doctorate - STEM		0.421***	0.405***	0.427***	0.487***	0.487***	0.378***	0.426***	0.423***	0.504***	0.246**
not working in 2001		-0.130**	-0.122**	-0.095*	-0.104*	-0.092	-0.103*	-0.067	-0.066	-0.026	-0.181
different job, same employer 2001		-0.082*	-0.097**	-0.052	-0.072*	-0.062	-0.078*	-0.072*	-0.072*	-0.009	-0.273**
same job, different employer 2001		-0.047	-0.053	0.007	-0.020	-0.002	-0.042	-0.007	-0.007	0.012	-0.046
different job, different employer 2001		-0.194***	-0.187***	-0.139***	-0.158***	-0.139***	-0.186***	-0.130***	-0.130***	-0.080*	-0.250**
promoted in 2001		0.036	0.026	0.038	0.067*	0.067*	0.034	0.051	0.051	0.002	0.214**
children under 6		0.000	0.003	0.015	0.094***	0.095***	-0.067***	0.032	0.018	-0.006	0.076
spouse's job requires a BA		-0.004	-0.001	-0.005	-0.009	-0.009	0.067***	0.063**	0.063***	0.065**	0.061
working hours (ln)			0.196***					0.184***	0.184***	0.190***	0.158***
firm-specific work experience				0.007***		0.003		0.003*	0.003*	0.004***	-0.003
general work experience					0.029***	0.029***		0.023***	0.022***	0.020***	0.033***
general work experience squared					-0.0004***	-0.0004***		-0.0003***	-0.0003***	-0.0002**	-0.001***
single							-0.058*	-0.024	-0.015	0.005	-0.043
unemployed spouse							0.261***	0.224***	0.222***	0.256***	0.085
spouse working part-time							0.156***	0.130***	0.126***	0.143***	0.071
children									0.030	0.033	0.018
constant	11.340***	10.586***	10.157***	10.507***	10.125***	10.110***	10.540***	9.731***	9.730***	9.599***	9.950***
r2	0.041	0.208	0.242	0.213	0.236	0.237	0.233	0.285	0.285	0.284	0.244

Notes: * p<0.05; ** p<0.01; *** p<0.001.

Table 4.6A: Coefficients from Regressions of Working Hours for Men and Women

	Model 1	Model 2	Model 3	Model 4
	Men	Women	Men	Women
span of control	0.001***	0.001***	0.001***	0.001***
black	-0.047	-0.077*	-0.048	-0.077*
asian	-0.176***	-0.100**	-0.177***	-0.099**
other race	-0.022	-0.014	-0.022	-0.023
parent's ed - BA	0.032	0.059	0.032	0.060
parent's ed - MA+	0.075***	0.068*	0.076***	0.069*
preferences - authority (index)	0.057***	0.050***	0.057***	0.051***
preferences - salary	-0.001	-0.012	-0.0001	-0.013
preferences - benefits	-0.029	0.029	-0.028	0.028
preferences - security	-0.049***	-0.032	-0.050***	-0.033
preferences - social importance	-0.023*	0.001	-0.023*	0.002
preferences - location	-0.054***	-0.046*	-0.054***	-0.045*
firm size (ln)	0.001	0.027***	0.001	0.027***
new firm	0.070*	0.150**	0.071*	0.149**
agriculture, fishing, forestry, mining	0.173***	0.009	0.172***	0.007
construction	-0.017	-0.016	-0.017	-0.028
transportation, communication, utilities	-0.014	-0.076	-0.013	-0.081
wholesale	0.067*	-0.052	0.067*	-0.060
retail	-0.070*	-0.100	-0.069*	-0.101
FIRE	-0.099***	-0.131***	-0.099***	-0.132***
business, personal, social services	-0.105*	-0.131*	-0.105*	-0.131*
entertainment	0.123*	-0.162	0.124*	-0.160
professional services	-0.062**	-0.132***	-0.061**	-0.131***
information services	-0.106***	-0.137*	-0.106***	-0.139**
BA - business	0.156***	0.027	0.156***	0.030
BA - engineering	0.155***	0.162*	0.154***	0.164**
BA - science	0.104*	-0.021	0.104*	-0.016
BA - math/computer science	0.046	0.077	0.046	0.082
BA - social science	0.171**	-0.053	0.171**	-0.056
BA - other	0.089*	-0.141**	0.089*	-0.139**
MA - business	0.307***	0.185**	0.307***	0.187**
MA - engineering	0.113*	0.073	0.112*	0.076
MA - science	0.051	-0.039	0.052	-0.035
MA - math/computer science	0.088	0.229***	0.088	0.236***
MA - social science	0.221*	0.013	0.222*	0.019
MA - arts and humanities	0.088	-0.295*	0.086	-0.296*
MA - other	0.153*	0.035	0.152*	0.039
professional degree - law	0.397***	0.447***	0.398***	0.447***
professional degree - medical/other	0.487***	0.334**	0.487***	0.324**
doctorate - non-STEM	0.259***	0.141	0.258***	0.131
doctorate - STEM	0.220***	0.0560	0.218***	0.057
not working in 2001	-0.060	0.0240	-0.061	0.022
different job, same employer 2001	0.005	0.123*	0.006	0.126**
same job, different employer 2001	-0.021	0.085	-0.021	0.084
different job, different employer 2001	-0.087**	-0.046	-0.087**	-0.044
promoted in 2001	0.122***	0.088*	0.122***	0.087*
children under 6	0.003	-0.080*	0.003	-0.074
spouse's job requires a BA	0.024	0.050	0.023	0.049
firm-specific work experience	-0.001	-0.001	-0.001	-0.001
general work experience	0.013***	0.024***	0.013***	0.024***
general work experience squared	-0.000***	-0.001***	-0.000***	-0.001***
single	-0.060*	0.037	-0.043	0.009
unemployed spouse	0.084***	0.001	0.115***	-0.168*
spouse working part-time	0.051*	0.136*	0.074	0.105
children	0.025	-0.112***	0.046	-0.155***
children*single			-0.052	0.048
children*unemployed spouse			-0.045	0.304**
children*spouse working part-time			-0.034	0.050
constant	1.880***	1.310***	1.868***	1.332***
r2	0.099	0.117	0.099	0.120

Notes: * p<0.05; ** p<0.01; *** p<0.001.