The Under-utilization of Women's Talent: Academic Achievement and Future Leadership Positions

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ABSTRACT

Despite high labor force participation, women remain underrepresented in leadership at every level. In this study, we examine whether women and men who show early academic achievement during their adolescence—and arguably signs of future leadership potential—have similar or different pathways to later leadership positions in the workplace. We also examine how leadership patterns by gender and early academic achievement differ according to parenthood status. Using data from the National Longitudinal Survey of Youth 1979, we find that overall, men supervise more people than women at work during their early-to-mid careers, regardless of their grade point averages (GPAs) in high school. In addition, among men and women who are *parents*, early academic achievement is much more strongly associated with future leadership roles for fathers than it is for mothers. Such patterns exacerbate gender gaps in leadership among parents who were top achievers in high school. Indeed, among those who had earned a 4.0 GPA in high school, fathers manage over four times the number of supervisees as mothers do (19 versus 4 supervisees). Additional analyses focusing on parents suggest that gender leadership gaps by GPA are not attributable to differential propensities for taking on leadership roles between the genders but are in part explained by unequal returns to educational attainment by gender and employment-related characteristics. Overall, our results reveal that suppressed leadership prospects apply to even women who show the most promise early on and highlight the vast under-utilization of women's (in particular mothers') talent for organizational leadership.

The Under-utilization of Women's Talent: Academic Achievement and Future Leadership Positions

Scholars have long documented persistent gender inequalities in the labor market, including stark gender gaps in leadership positions. Despite high levels of labor force participation and increases in their educational attainment over the past several decades, women remain underrepresented in leadership at every level (Stainback and Tomaskovic-Devey 2009; Warner, Ellmann, and Boesch 2018). One such outcome of inequalities is a substantive loss of talent: specifically, a loss of intelligent, capable women who have the ability to lead, but lack opportunities to do so. These patterns also mean that men hold most leadership positions and exercise the vast majority of organizational power (Smith 2002; Warner, Ellmann, and Boesch 2018). Whereas social scientists have clearly documented that women remain missing from leadership ranks, they have paid far less attention to understanding gendered pathways to leadership positions. Specifically, it remains unclear whether women and men who show early achievement during their adolescence—and arguably signs of future leadership potential—have similar or different pathways to leadership positions.

A large body of theoretical and empirical work highlights the importance of adolescent experiences and accomplishments for later adulthood outcomes. Characteristics and abilities shown during adolescence are found to predict people's later career success, potentially because they lay a foundation for future behavior, work habits, and ambitions (Daly, Egan, and O'Reilly 2015; French et al. 2015; Rosenbaum 2001; DiPrete and Buchmann 2013). Indeed, Rosenbaum (2001, 185) remarks that "the long-term effects" of achievements and behaviors during adolescence "are remarkable" and that school, in particular, is a "testing ground" for many of the

skills and competencies demanded in society. Academic achievement during adolescence, therefore, may be closely related to later career success, like securing leadership roles.

Scholars and practitioners widely accept students' grade point average (GPA) as a leading marker of success in school (DiPrete and Buchmann 2013). Higher GPAs in high school are positively associated with not only cognitive ability but also a wide range of non-cognitive skills (including self-esteem, self-discipline, achievement orientation, conscientiousness and openness, etc.), and they are highly predictive of college completion (DiPrete and Buchmann 2013). Many of these same characteristics are also associated with leadership potential and later career success (Li, Arvey, and Song 2011; Reichard et al. 2011). Yet little attention has been paid to understanding whether early academic achievement—a likely indicator of competence and work ethic—matters for later attaining different levels of organizational power, depending on gender.

In this study, we use data from the National Longitudinal Survey of Youth 1979 to examine whether high school academic achievement is associated with future organizational leadership roles and how this association differs between men and women. Given well-documented inequalities that mothers face (Correll, Benard, and Paik 2007; England et al. 2016; Ridgeway and Correll 2004), we expect that gender differences in the association between GPA and securing future leadership roles will be especially pronounced among parents. Accordingly, we conduct additional analyses on mothers and fathers and examine what factors might account for gender leadership gaps by GPA in this group.

The current study contributes to the literature in at least three keys ways. First, we identify the link between early signs of success and later leadership roles, and reveal that men consistently attain higher leadership levels than women at nearly every GPA level. In doing so,

we help to highlight the gendered loss of potential talent. Second, we add to a growing but still nascent body of literature that uses longitudinal data to identify gendered pathways to leadership positions (e.g., Li, Arvey, and Song 2011; Reichard et al. 2011). An advantage of our study is that the data used track individuals from adolescence to their working ages, and include verified sources of respondents' academic performance (i.e., high school transcripts), rather than retrospective performance measures that are prone to recall bias and misreporting (Sticca et al. 2017). Third, we identify a critical family-related status, parenthood, that is strongly related to this gendered loss of leadership talent. Sociologists have identified that motherhood is associated with lower income and reduced labor force participation, with the opposite being true for fatherhood (Killewald and Gough 2013; Weeden, Cha, and Bucca 2016); however, less focus has been paid to how parenthood may matter for leadership roles, let alone its connection with early academic achievements. We bring new attention to this area. In doing so, we contribute to – and draw important linkages between – scholarship on gender, leadership, education, and family.

EMPIRICAL FOUNDATIONS: ACADEMIC ACHIEVEMENT AND FUTURE PROFESSIONAL SUCCESS

A significant body of research highlights a strong link between education and later career outcomes (for review, see Hout 2012). Most research in this area has focused on how educational attainment relates to labor market outcomes: For both men and women, completing higher levels of education is positively associated with income, labor force participation, and management positions (Hout 2012). However, far less scholarship has focused on how educational *achievement*, rather than just attainment, matters for subsequent career success. Although educational achievement and attainment are positively correlated (DiPrete and Buchmann 2013), students with similar education levels can vary widely in their talent (e.g., both high and low

performing students may graduate from high school and attain a college degree). Thus, focusing on achievement offers a more distinct way to measure aptitude differences between students than large categories of educational attainment.

Scholars frequently use GPA as a measure of educational achievement because it is thought to capture both cognitive abilities *and* academic effort and productivity (DiPrete and Buchmann 2013; Qian, Buchmann, and Zhang 2018). DiPrete and Buchmann (2013) contend that high school grades reflect not only cognitive skills but also student's non-cognitive characteristics and behaviors (e.g., work ethic and motivation) that tend to persist into college and beyond. Thus, GPA is one of the only measures available in nationally representative surveys that ostensibly constitutes an observable measure of productivity, making it unique in identifying a person's talent.

But are ability and hard work during adolescence indicators of future success in the workplace, above and beyond educational attainment? Evidence suggests that what people do in high school does, indeed, matter for labor market returns (e.g., French et al. 2015; Hall and Farkas 2011). For example, French and colleagues (2015) find that earning a higher GPA in high school is associated with higher personal income for men and women, holding constant an impressive set of controls. This work, however, focuses on income, not leadership.

Leadership positions are critical to study because of the power and authority associated with these roles (Smith 2002; Stainback and Tomaskovic-Devey 2009). Although people can exercise informal leadership at work (e.g., by leading a project), we focus on leadership that is defined by formal power, like having supervisory responsibilities (Li, Arvey, and Song 2011; Daly, Egan, and O'Reilly 2015; Arvey et al. 2007). The supervision of others is an important measure of leadership because supervising others is associated with directing everyday firm

operations, hiring and firing workers, deciding work responsibilities and schedules, evaluating subordinates' performance, and deciding merit raises and promotions (Li, Arvey, and Song 2011). Of course, not all leadership positions entail the same amount of organizational power. Prior studies frequently use the number of people a respondent supervises to indicate the degree of responsibility associated with the position, with a higher number of subordinates signifying a greater degree of authority (e.g., Li, Arvey, and Song 2011; Daly, Egan, and O'Reilly 2015). Given the importance of leadership to the structure of inequality, it is critical to understand whether early signs of achievement are associated with later supervisory roles, depending on gender.

EXPLANATIONS: GENDER LEADERSHIP GAPS AND ACADEMIC ACHIEVEMENT

Despite women's progress in the workplace, women remain underrepresented among leadership roles. Women constitute nearly half of the labor market, but represent only about 40% of all manager positions (as classified by the "management" occupational category; U.S. Bureau of Labor Statistics 2018). Importantly, gender gaps are exacerbated at higher occupational levels, where positions tend to have larger supervisory scope. For example, in S&P companies, women hold only 5% of CEO positions, 19% board seats, and 27% of senior level managerial positions (Warner, Ellmann, and Boesch 2018). But why do these gender disparities in leadership exist and how do they relate to early signs of achievement? Below we detail common theoretical explanations for women's under-representation in leadership roles and how we think they may contribute, or not contribute, to gender gaps in leadership by GPA.

Bias and Discrimination

Scholars have long highlighted the role that gender bias and discrimination play in thwarting women from rising through corporate ranks. Gender stereotypes that depict men as inherently better suited for management roles than women still pervade the workplace ("think manager, think male") (Schein 1978; 2007). In addition, authority and power are still strongly linked to men and masculinity, rather than women and femininity (Rudman et al. 2012). Employers may under-recognize women's abilities or privilege likeability for women rather than talent (Quadlin 2018) and thereby pass up competent women for leadership positions, in favor of either comparable, or less competent, men (Chamorro-Premuzic 2019).

Importantly, gender-related biases may be exacerbated for mothers. Motherhood is a key status characteristic, above and beyond gender, that evokes additional negative evaluations of women's competence, effort, and ability (Ridgeway and Correll 2004). Motherhood may especially negatively impact how employers view the suitability of women for positions of authority (Ridgeway and Correll 2004; Correll, Benard, and Paik 2007). Positions of authority are tightly connected to ideal worker norms that workers are wholly committed to their jobs, work long hours, and are "on-call" at all times (Blair-Loy 2003). These expectations directly conflict with intensive motherhood ideals (Hays 1996). They also conflict with the very real, larger childcare responsibilities that mothers typically take on, compared to fathers (Yavorsky, Kamp Dush, and Schoppe-Sullivan 2015).

In contrast, "ideal" workers and "ideal" fathers share overlapping cultural expectations (Hodges and Budig 2010). A "good" father is one that works hard to financially support his family and by extension is wholly committed to his job and willing to work long hours. He is expected to meet these obligations, in part because he is assumed to have a partner who is the primary caretaker. These cultural assumptions serve to benefit the careers of men with children

(Correll, Benard, and Paik 2007; Hodges and Budig 2010; Killewald 2013). Thus, employers may view fathers as better fits for positions of authority that require dependability, long work hours, loyalty, and potentially travel.

Women who show early signs of promise (via high educational achievement) may be the most likely to go on to supervisory roles, but the barriers associated with stereotypes and discrimination likely cut across competence levels after they have children. If GPA is an indicator of future career potential, as we and other scholars argue (DiPrete and Buchmann 2013; French et al. 2015; Rosenbaum 2001), discrimination and bias may prevent even high-performing women, particularly mothers, from being able to capitalize on this potential. Thus, we expect that GPA is more positively associated with men's leadership at work than women's (*Hypothesis 1*), and the gender difference in the GPA-leadership linkage is particularly salient among parents (*Hypothesis 2*).

Early Leadership Propensities

One potential reason why high-achieving women may lag behind high-achieving men in leadership positions relates to their leadership propensities. Some scholars have proposed that men and women have different values and interests such that women are less eager to lead (e.g., see Kellerman 2003). It could be that men show greater, *and earlier*, interest in leadership roles, suggesting that they may have a higher propensity to pursue leadership roles. If this were true, we should see girls pursuing leadership roles at lower rates than boys even in contexts in which opportunities to lead are likely more equal between the genders, like high school.

Prior research, however, shows that girls in high school tend to be more involved in school-based extracurricular activities (e.g., student government, honor societies, theater) that

offer opportunities to lead and cultivate strong leadership skills (Feldman and Matjasko 2007). Not only may this indicate girls' interest in leadership roles, but participation in extracurricular activities is thought to also improve skills that are critical for leadership development, such as independence, communication skills, abilities to work well with others, and work ethic (Hancock, Dyk, and Jones 2012). Accordingly, we anticipate that early leadership propensities (i.e., men showing a greater propensity for leadership roles early on) are likely not a contributing factor to gender leadership gaps that we expect to find by academic achievement (*Hypothesis 3*).

Educational Attainment: Gendered Sorting Processes and Returns

Education is a critical form of human capital. People who complete high school and especially college have more advantageous employment and economic opportunities than those who do not (for review, see Hout 2012). Thus, high school GPA might relate to leadership roles indirectly through individuals' educational attainment. That is, those with a high GPA in high school are more likely than their lower-GPA peers to complete a bachelor's or advanced degree (DiPrete and Buchmann 2013; French et al. 2015). Importantly, boys with high GPAs may be especially encouraged to pursue higher education (Buchmann and DiPrete 2006), due to stereotypical assumptions that these boys are unusually gifted or brilliant—labels rarely assigned to high-performing girls (Musto 2019). Having higher educational attainment could in turn provide greater opportunities for accessing labor market positions with larger supervisory scope, especially in white-collar contexts (Hout 2012).

However, education is not a gender-neutral form of human capital. Gender sorting processes that occur within the educational setting lay the foundation for men and women to reap differential rewards in the labor market. High-achieving women may be encouraged to enter

feminine-typed college majors that have fewer occupational pathways to leadership roles, whereas high-achieving men, or even low-achieving men, are steered into masculine-typed college majors, like STEM or finance fields, that closely align with ample job opportunities to move up the corporate ladder (Bertrand, Goldin, and Katz 2010; Charles and Bradley 2009). These sorting processes can result in men and women having disparate access to and skills for jobs that offer leadership opportunities, despite having similar educational attainment (e.g., college degree, advanced degree).

Even when men and women receive comparable training and work in similar occupational fields, education may give a bigger boost to men's career opportunities and leadership prospects than it does to women's (Quadlin 2018). Women, especially mothers, who enter male-dominated occupations, experience significant barriers to rising through the corporate ranks, especially reaching senior leadership positions (Blair-Loy 2003; Roth 2003; Warner, Ellmann, and Boesch 2018). These advancement barriers starkly contrast men's experiences in female-dominated jobs, where men, particularly white men, can encounter accelerated promotions and greater access to leadership positions, including at the very top (Smith 2012; Williams 1992). These processes are in part shaped by gendered assumptions that high-status men (i.e., white and class privileged fathers) are highly committed to work whereas women (specifically mothers) cannot balance demanding leadership jobs and responsibilities at home (Blair-Loy 2003; Correll, Benard, and Paik 2007).

In sum, men who show higher than average talent and capabilities are likely better-rewarded in the workplace than women (Ridgeway 2011). Men with excellent grades in high school may be more likely than comparable women to pursue a college degree (Buchmann and DiPrete 2006); moreover, they (especially those who are fathers) may receive greater returns in

leadership opportunities from higher education than their female counterparts do. Given the gendered processes and returns associated with education, we expect that educational attainment explains some of the gender leadership gaps by GPA (*Hypothesis 4*).

Employment-related Characteristics

Gender differences in individual-level factors, like employment-related characteristics, may contribute to women's lower representation in leadership. Two types of employment-related characteristics are likely relevant: worker characteristics (work hours, job tenure, etc.) and job attributes (industry, firm size, etc.). First, in terms of worker characteristics, women but particularly mothers, on average, have less work experience and shorter job tenure, work fewer hours, and are less likely to work long hours than comparable men/fathers (Weeden, Cha, and Bucca 2016). These patterns likely hold true across GPA levels, given that high-achieving women also have fewer work hours than comparable men (Bertrand, Goldin, and Katz 2010). Accordingly, gendered changes in employment-related characteristics following childbirth can make it less likely that women, even those who showed significant promise early-on, rise through the corporate ranks.

Second, gender differences in job attributes like firm size, job sector (public/private), and industry may better position men to secure leadership roles. Men are overrepresented among managers in large establishments and more likely than women to work in the private sector (Bertrand and Hallock 2001; Stainback and Tomaskovic-Devey 2009). If larger companies or private sector firms offer greater managerial opportunities, this could contribute to gender leadership gaps. Industry might also matter. Due to occupational segregation, men and women tend to be concentrated in different industries, and different industries could provide different

opportunities for men and women across the GPA spectrum (Huffman 1995; Stainback and Tomaskovic-Devey 2009). Based on this review, we expect that employment-related characteristics will explain part of the gender leadership gap by GPA (*Hypothesis 5*).

Nevertheless, we expect that our models, despite including an impressive set of covariates, will not fully explain gender gaps in leadership across the GPA spectrum. The remaining gaps may reflect bias and discrimination that shape gendered labor market outcomes (for similar statistical approaches, see Budig and England 2001; Weisshaar 2017).

METHOD

Data

We use data from the National Longitudinal Survey of Youth 1979 (NLSY79; https://www.nlsinfo.org/content/cohorts/nlsy79). The NLSY79 is a nationally representative sample of 12,686 people aged 14 to 22 years at the time of their first interviews in 1979. The survey, therefore, has followed a large sample of the late baby boomer cohort born between 1957 and 1964. The NLSY79 is ideal for our study, because it collected high school transcript data, followed adolescents over time, and collected information on whether respondents supervise people at work and if so, how many people they supervise until their middle-age adulthood.

Sample

We restrict our analysis to 9,763 respondents who were followed throughout the survey period, including a representative sample of the U.S. noninstitutionalized civilian population aged 14 to 22 years in 1979 ($N = 6{,}111$) and a supplemental sample of Hispanic and black respondents ($N = 3{,}652$). We then limit our sample to years 1988, 1989, 1996, and 1998 where

questions on leadership roles were consistently asked among employed respondents; and to respondents with complete high school transcript data. Doing so results in a sample of 5,306 individuals with 19,737 person-year observations. We further limit our sample to the 15,281 person-years in which respondents were not enrolled in school and worked for either the government or private companies (including non-profit organizations). After we drop 140 person-year observations with missing data on high school GPA or leadership at work, our final analytic sample consists of 15,141 person-years from 4,936 individuals.

Key Measures

Leadership at work. To create our dependent variable, we use two items from the NLSY79: whether respondents supervised the work of other employees at work and if they did, how many employees they supervised. Following prior research, we collapse the two items to measure the number of employees respondents supervised, with zero indicating that respondents did not hold a supervisory role. By using this measure, we are able to distinguish people who did not hold a supervisory role versus those who did *and* also gauge the scope of respondents' supervisory responsibilities (for further discussion on the advantages of this measure, see Li, Arvey, and Song 2011). The dependent variable is top-coded at the 99th percentile of the sample distribution to avoid unduly influential outliers (Killewald 2013). Note that when discussing results, we use "the number of supervisees" and "supervisory scope" interchangeably.

*Gender. G*ender was measured in 1979, with 1 indicating female and 0 indicating male.

High school GPA. High school GPA is calculated based on the transcript data (https://www.nlsinfo.org/content/cohorts/nlsy79/topical-guide/education/school-transcript-surveys). We take the average of all grades in academic courses (i.e., natural sciences,

mathematics, English, and social studies) and center it at 2.5 in regression analyses to facilitate interpretation. GPA in academic courses is highly correlated with overall GPA (correlation > 0.96) and our results are robust to using overall GPA.

Parental status. We classify each person-year observation as either non-parent or parent. Parents refer to those with at least one biological child, regardless of living situation or child age (Budig and England 2001; England et al. 2016). We experimented with adding child-age controls, but excluded them for parsimony as none of them were significantly related to leadership roles (see Online Appendix Table 1).

Control Variables

Considering that leadership at work might differ by race (Stainback and Tomaskovic-Devey 2009), we control for Hispanic, non-Hispanic black, non-Hispanic/non-black (reference; referred to as white hereafter). In addition, high school GPA might shape leadership at work indirectly through individuals' cognitive and non-cognitive skills (Daly, Egan, and O'Reilly 2015; Li, Arvey, and Song 2011). Cognitive skills are measured through Armed Forces Qualification Test (AFQT) scores that were reported in 1981 (Hall and Farkas 2011). Non-cognitive skills are measured through the Rosenberg Self-Esteem Scale (Li, Arvey, and Song 2011). Note that self-esteem has been identified as a key non-cognitive skill that is associated with later work outcomes (Li, Arvey, and Song 2011). We divide respondents into four quartiles based on their AFQT scores/self-esteem scores (from lowest to highest), with a separate category for respondents with no score. Additionally, we account for students' educational expectations and parental education because both are correlated with their academic performance in high school and later labor market outcomes (French et al. 2015; Qian, Buchmann, and Zhang 2018).

Respondents' educational expectations in 1979 (i.e., the highest grade they thought they would complete) include high school or less (reference), some college, bachelor's degree, advanced degree, and don't know. Parents' highest level of education (surveyed in 1979) are grouped into less than high school (reference), high school, some college or above, and missing.

We further include a series of time-varying control variables. Age is an indicator of seniority and thus may be associated with leadership at work (Li, Arvey, and Song 2011). We therefore control for a continuous measure of age. We do not include a squared term of age because supplementary analysis showed that it was nearly zero and was not significantly related to leadership in any of our models. We also control for marital status (never married, married [reference], and previously married), health limitation in the amount or kind of work respondents could perform (no [reference], yes, missing), region of residence (Northeast [reference], North Central, South, West, missing), and survey year dummies (with 1988 as the reference category; see Killewald 2013 for the inclusion of similar controls).

Variables Used in Explanatory Analyses

We speculate that gender differences in the relationship between high school GPA and leadership at work are more evident among parents than among non-parents. Next, we propose three analyses to help understand *why* gendered GPA-leadership linkages exist among parents.

Leadership in high school. To assess the role of early leadership propensities, we include a measure of leadership in high school (surveyed in 1984): whether respondents participated in student council/government in high school (no [reference], yes, missing).

Educational attainment. Education, a time-varying variable, is measured through a set of dummy variables: high school (reference), some college, and college or above. To account for

gendered returns to education, we include interaction terms between gender and education dummies.

Employment-related characteristics. For labor market experience, we control for hours worked last year and total weeks worked to date (Cheng 2016). To better represent their coefficient sizes in regressions, work hours are measured in 100-hour units, and cumulative weeks worked are measured in 50-week units (approximately one year of labor market experience). Additionally, we control for the duration of respondents' tenure with current employer, measured in 50-week units (i.e., roughly one year). For respondents' job attributes, we consider firm size because it is linked to gender stratification processes (Stainback and Tomaskovic-Devey 2009). To correct for right skewness, we use logged firm size, and before taking the logarithm, we top-code the firm size at the 99th percentile to avoid influential outliers. We also control for whether the employer is the government (= 1) or a private company (= 0) and a series of indicators for industry (13 categories based on the 1980 U.S. Census industry codes as recorded in the NLSY79 and a missing indicator). Note that all the measures of employment-related characteristics are time-varying variables.

Missing data. For our control and explanatory variables, we create a dummy variable and set it equal to one for any observation with missing data on that covariate. We do so based on prior studies that have done the same (Killewald 2013; Killewald and Gough 2013), but our results hold if we use listwise deletion to handle missing data (see Online Appendix Tables 2–3).

Analytic Strategies

We use multilevel negative binomial regression models to estimate the log-counts of the number of employees men and women supervise, because in our sample, person-years are nested

within individuals and our dependent variable follows an over-dispersed count distribution (i.e., variance > mean; Long 1997). In supplementary analysis, we replicated our analyses by using multilevel logistic regression models to estimate the log-odds of holding a supervisory role; and then separately, using multilevel linear models to estimate the logged number of supervisees among supervisors. Our findings held across all models (Online Appendix Tables 4–7), which suggests that gender leaderships gaps by GPA shown below are applicable to both processes of leadership role occupancy and supervisory responsibility scope (among supervisors).

We fit random-effects negative binomial models. We use random-effects models instead of fixed-effects models, because random-effects models allow inclusion of time-invariant variables, a feature not shared by fixed-effects models (Allison 2009). Because our key independent variables—high school GPA and gender—are both person-level, time-invariant variables, they would be automatically dropped if fixed-effects models were estimated.

Our model can be expressed as two equations. At Level 1, the log-count of the expected number of employees that individual *i* supervised in year *t* (μ_{ti}) is a function of individual-specific intercept (β_{0i}) and *K* variables that are measured at the person-year level (X_{ti}):

$$\log \mu_{ti} = \beta_{0i} + \sum_{k=1}^{K} \beta_{ki} X_{kti} \quad (1)$$

At Level 2, each individual intercept (β_{0i}) is estimated as a function of a general intercept (γ_{00}), respondent's gender, high school GPA, the interaction term between the two, a set of individual-level control variables (IND_{qi}), and an error term (u_{0i}):

$$\beta_{0i} = \gamma_{00} + \gamma_{01} Female_i + \gamma_{02} HS\ GPA_i + \gamma_{03}(Female_i \times HS\ GPA_i) + \sum_{q=4}^{Q} \gamma_{0q} IND_{qi} + u_{0i} \quad (2)$$

When building our models, we first include respondent's gender, high school GPA, and the interaction between the two to examine the raw gender difference in the relationship between high school GPA and leadership at work. Next, we add basic control variables. In this stage of

the analysis, we run models both by pooling all person-years and separately for parents and non-parents to examine variation by parental status.

To explore potential explanations for the gender leadership gaps by GPA among parents, we limit our analytic sample to parental person-years (i.e., the year respondents became a parent and subsequent survey years). We progressively add variables that measure 1) leadership in high school, 2) educational attainment (education dummies and their interactions with gender), and 3) employment-related characteristics. We examine how gender leadership gaps by GPA change with the addition of these variables. All of our analyses are weighted.

RESULTS

Gender Differences in the Relationship between High School GPA and Leadership at Work

Descriptive results. Table 1 presents the weighted descriptive statistics for variables at the individual and person-year levels, for all and by parental status. In terms of our key independent variables, women account for 51% of all individuals (47% of non-parents and 53% of parents); the average high school GPA in academic courses is 2.46, with non-parents having slightly higher GPA in high school than parents (2.52 vs. 2.44).1[endnote] As for the dependent variable, the number of employees that respondents supervise (across all person-years) has a mean of 3.76 in the overall sample, 3.81 in the non-parent sample, and 3.73 in the parent sample.

(Table 1 about here)

Multilevel negative binomial models. Table 2 presents results from the multilevel negative binomial regression models, pooling all person-years and separately by parental status. To test Hypothesis 1, we first examine results from all person-years. In Model 1 without any

control variables, we find that women with a high school GPA of 2.5 (recall that we center GPA at 2.5 as described in the Key Measures section) on average supervise fewer people at work than their male counterparts ($b = –0.82$, $p < .001$). We also find that GPA is associated with supervising more workers for men ($b = 0.30$) and women ($b = 0.30–0.11 = 0.19$). Importantly, the key to this study is the interaction term between female and high school GPA, which indicates gender differences in the relationship between high school GPA and leadership at work. To facilitate interpretation of interaction effects in nonlinear models, in Figure 1, we follow Mize's (2019) advice to present the predicted number of supervisees by gender and high school GPA based on Models 1, 3, and 5.

(Table 2 about here)

Panel A (Figure 1) shows the predicted number of supervisees for *all* respondents. Without controlling for any variables, when high school GPA increases from 0 to 4.0, men's predicted number of supervisees increases more than that of women (men: 4.0 to 13.3; women: 2.3 to 5.0). Men clearly supervise more employees than women, regardless of high school GPA, but notably, the gender gap in leadership at work is more pronounced at higher GPA levels. It is also remarkable that a woman with a 4.0 GPA in high school supervises about the same number of employees at work as a man with a 1.0 GPA (5.0 vs. 5.4).

Although Panel A in Figure 1 plainly shows that high school GPA is more strongly associated with supervisory scope for men than women, the interaction term is not significant in Model 1 (Table 2; $b = –0.11$, $p > .05$). Nevertheless, the coefficient for the interaction between gender and high school GPA is in the expected direction (i.e., negative), which suggests that high school GPA is less positively associated with women's than men's leadership at work and provides support (though weak) for Hypothesis 1. In fact, results are non-significant possibly

because the analysis includes *all* respondents, masking strong relationships between GPA and leadership roles for some groups over others, like parents over non-parents.

(Figure 1 about here)

Next, we test our Hypothesis 2 using Model 3 (non-parents) and Model 5 (parents) in Table 2. Although for both non-parents and parents, women supervise fewer employees than men and GPA is positively associated with leadership roles, a clear difference emerges between parents and nonparents when gender and GPA interact: the gender-GPA interaction is not significant for nonparents ($b = 0.01$, $p > .05$), but it *is* significant for parents ($b = –0.27$, $p < .05$).

Panel B in Figure 1 graphically shows the results by parenthood. Among non-parents, the line for men and that for women are largely parallel, indicating that the relationship between high school GPA and the number of supervisees at work is similar between men and women (consistent with the interaction term of 0.01 that is nearly zero and insignificant). In contrast, there are stark gender differences in the relationship between high school GPA and leadership at work among parents. As high school GPA increases from 0 to 4.0, the predicted number of supervisees increases from 4.0 to 18.8 for fathers but changes only slightly from 2.6 to 4.0 for mothers. Thus, early academic achievement is more weakly related to leadership at work for mothers than for fathers (corresponding to an interaction term of –0.27, $p < .05$).

Does adding the control variables change the patterns we have found? Figure 2 presents the predicted number of supervisees by gender and high school GPA based on Models 2 (all respondents), 4 (non-parents), and 6 (parents) of Table 2, with all the control variables set at their means. Controlling for race, AFQT, self-esteem, educational expectations, parental education, age, marital status, health limitation, region, and survey year, men on average still supervise more people than women across the GPA spectrum; however, high school GPA does not appear

to be significantly associated with leadership at work in the overall sample (Panel A). That is, the lines indicating the relationship between high school GPA and leadership at work becomes more or less flat for both genders. Similarly, for non-parents (Panel B), although the gender leadership gap is still present and largely consistent across GPA (hence the non-significant interaction term $b = 0.04$, $p > .05$; M4 of Table 2), people with higher GPA do not manage more people than their low GPA peers. Recall that in Figure 1, the relationship between GPA and leadership roles is positive, particularly for men, in the full sample (Panel A) and non-parent sample (Panel B). Supplementary analysis indicated the positive relationship is mainly explained by high performing individuals having high levels of cognitive skills and greater educational aspirations; therefore, after controlling for these two characteristics, the positive GPA-leadership relationship disappears for the full sample and non-parents in Figure 2.

(Figure 2 about here)

However, for parents, we find that the interaction term between gender and high school GPA remains significant with the inclusion of the control variables. Both the negative interaction term ($b = –0.29$, $p < .05$; M6 of Table 2) and the graph for parents (Panel B of Figure 2) suggest that high school GPA is less positively associated with mothers' than fathers' leadership at work. Holding control variables constant, as high school GPA increases from 0 to 4.0, fathers' predicted number of supervisees increases from 6.5 to 9.6, whereas mothers' predicted number of supervisees actually decreases from 5.1 to 2.3. Thus, the gender gap is more pronounced at higher GPA levels: mothers lag behind fathers in the number of supervisees by 1.4 ($p = .433$) when high school GPA is 0 but this gender gap widens to 7.2 ($p < .001$) at the 4.0 GPA level.

Taken together, we find supportive evidence for our Hypothesis 2. Specifically, the relationship between high school GPA and leadership at work is more positive for men than for

women, but this gender difference in the GPA-leadership linkage exists among parents only.2[endnote]

What Explains the Gender Differences in Workplace Leadership Outcomes among Parents?

Descriptive results. Next, we explore what factors may account for the gender differences in workplace leadership outcomes among parents. Before we turn to multilevel models, in Table 3, we present the weighted descriptive statistics for explanatory variables by gender and high school GPA among parents. For illustrative purpose, we divide high school GPA into four categories: 1.0 or less, greater than 1.0 but no more than 2.0, greater than 2.0 but no more than 3.0, greater than 3.0.

(Table 3 about here)

Table 3 suggests that mothers are more (or at least equally) likely than fathers to have participated in student government in high school, regardless of GPA levels. Additionally, for both fathers and mothers, higher GPA in high school is associated with higher educational attainment, but this association is more pronounced for *fathers* than for mothers. For example, of the person-year data in Table 3, only 1% of fathers and 2% of mothers with a high school GPA of 0–1.0 have a college education or above, whereas the respective figures are 66% and 46% for fathers and mothers with a GPA of over 3.0 in high school.

In terms of worker characteristics, on average, mothers work fewer hours per year, have accumulated fewer weeks in their total work history, and have shorter job tenure than fathers. Also, high school GPA appears to be more positively associated with work hours for fathers than for mothers. For example, on average, fathers with a high school GPA of 0–1.0 worked 2,264 hours last year and those with a GPA of 3.0–4.0 worked 2,467 hours, whereas mothers worked

about 1,600 hours, regardless of GPA levels. As for job attributes, few gender differences exist in firm size; more mothers work in governmental jobs than fathers, especially among those with mid to high GPAs; and mothers and fathers tend to work in slightly different industries.

Explanatory analyses using multilevel negative binomial regression models, parents. Table 4 presents multilevel negative binomial regression models among parents. To facilitate our interpretation of results from these models, we present the predicted number of supervisees by gender and high school GPA in Figure 3, with other covariates set at their means (Mize 2019).

(Table 4 & Figure 3 about here)

In Figure 3, the baseline model is the same as shown in Figure 2 (Panel B) for parents. As discussed, clear gender differences exist in workplace leadership outcomes among parents, especially at higher levels of high school GPA. In Model 2 (Figure 3), we add participation in student government in high school as an indicator of leadership in high school, but the gendered patterns of leadership at work barely change. This is also evident in Model 2 of Table 4 where we add the measure of leadership in high school and the interaction coefficient does not change relative to that in Model 1 (in both models, $b = –0.29$, $p < .05$). This makes sense given that at all GPA levels, mothers are more (or equally) likely than fathers to have participated in student government while in high school (Table 3) and participation in student government is positively associated with future leadership roles (Table 4). These results suggest that participation in student government is, indeed, a good indicator of propensity for taking on leadership roles and that the disadvantage in leadership at work for women does not originate in high school (supporting Hypothesis 3).

As shown in Figure 3, after we add education dummies and their interactions with gender, the gender leadership gap becomes smaller, mostly because the positive relationship

between high school GPA and leadership is much attenuated for fathers. Specifically, among fathers, before we add variables relating to educational attainment, as high school GPA increases from 0 to 4.0, the predicted number of supervisees increases from 6.8 to 9.3, whereas after we add education-related variables, the change in the predicted number of supervisees is from 8.8 to 7.3 (non-significant, $p = .662$). For mothers, as high school GPA increases from 0 to 4.0, the predicted number of supervisees slightly decreases from 4.4 to 2.4 (non-significant, $p = .210$).

Educational attainment appears to play a key role in explaining the positive GPA-leadership linkage for fathers. Recall that fathers with a high school GPA of 3.0–4.0 GPA are more likely than their female counterparts to earn a college degree or higher (Table 3). Additionally, in Model 3 of Table 4, we find that having a college education or above is significantly associated with supervising more employees at work for fathers ($b = 0.58$, $p < .01$), compared with having only a high school education. However, for mothers, the leadership returns to a college education are much smaller and insignificant ($b = 0.58–0.69 = –0.11$, $p = .57$). These findings suggest that fathers with higher GPA in high school are more likely to attain higher educational levels, and higher educational attainment is associated with greater leadership positions at work (supporting Hypothesis 4).

Finally, after we add employment-related characteristics in Model 4 (Figure 3), the line for fathers and that for mothers become largely parallel, indicating that the relationship between high school GPA and leadership at work becomes similar for fathers and mothers (supporting Hypothesis 5). This result corresponds to the near-zero interaction term in Model 4 of Table 4 ($b = –0.02$, $p > .05$). In addition, after we add employment-related characteristics, the gender gap in leadership at work is further attenuated at all GPA levels. Supplementary analysis indicated that gender differences in workplace leadership outcomes were largely explained by workers' labor

market experience, rather than their job attributes. Note that even after we include all the covariates, fathers still supervise more employees than mothers, and the gender leadership gap is significant ($p < .10$) almost at all levels of high school GPA (except when high school GPA equals zero, $p = .184$).

DISCUSSION

Overall, our findings suggest that compared with women, men's early achievement is more positively associated with their leadership roles at work and that these patterns exist primarily among parents. Certainly, men tend to supervise more employees than women for both nonparents and parents, but these disparities are exacerbated at particular GPA levels for parents only. Indeed, the gender leadership gaps by GPA are stark among parents who were top achievers in high school. Among those who earned a 4.0 GPA, fathers manage over four times the number of supervisees as mothers do, regardless of exclusion or inclusion of other control variables (without controls: 18.8 vs. 4.0; with controls: 9.6 vs. 2.3). Also, strikingly, fathers with very low academic achievement (i.e., failing grades in academic courses) have on average similar leadership prospects as mothers who earned straight As in high school (Panel B of Figures 1 and 2), despite that high school GPA is similarly indicative of fathers' and mothers' cognitive and non-cognitive skills.3[endnote] These results underscore that suppressed leadership prospects apply to even women who show the most promise early on.

We conducted supplementary analyses to examine whether selection processes (e.g., men/women who become parents are more/less ambitious or talented) are driving the stark gender leadership gaps by GPA among parents (and thus why results differ from those of non-parents), or if it is more likely that the transition into parenthood mainly explains our results (as

described in the Online Appendix, Supplementary Analyses). Notably, when we examined the childless years *before* people became parents, high school GPA was similarly associated with leadership at work for both men and women, like we found for respondents who never became parents during our observational period (Online Appendix Table 9). However, the years *after* parenthood is when the gender disparities in leadership by GPA emerged, with men pulling farther away from women at the top of the GPA distribution. Such analysis clearly identifies the transition to parenthood likely as the primary source of change in men's and women's opportunities for leadership positions.

Clearly, parenthood is associated with changes in men's and women's opportunities for leadership positions. But what exactly explains intensifying gender leadership gaps as GPA increases? Contrary to the perspective suggesting that men might show a greater, and earlier, propensity for leading than women (e.g., see Kellerman 2003), we find that women's participation in leadership roles in high school is similar to, if not more than, that of men. Indeed, leadership in high school explains little of the gender leadership gaps across the GPA spectrum.

A factor that explains much of the gender leadership gaps by GPA among parents relates to educational attainment. We find that men with higher GPAs are more likely to complete higher education and this higher education is associated with a significant boost to men's leadership prospects. Although high school GPA is positively associated with higher educational attainment for women too, women in this cohort with high GPA (between 3.0 to 4.0 GPAs) are less likely than men to later earn a college degree (or higher). Even when women do earn higher educational levels, they appear to benefit little from this attainment in terms of leadership positions. Another factor that further explains gender leadership gaps by high school GPA is employment characteristics, particularly those related to labor market experience. That is,

fathers' advantage in leadership positions is partly because they work more hours, have longer work histories, and have greater job tenure than mothers. Note that in additional analyses for *non-parents*, we find that educational attainment is not associated with a higher boost for men's leadership than for women's leadership, and men and women across GPAs have similar job tenure and work experience. Thus, it seems that the mechanisms that contribute to gender leadership gaps by GPA among parents are not present for non-parents.

Nevertheless, our models that include early propensities for leadership, educational attainment, and employment-related characteristics do not fully explain leadership gaps between mothers and fathers that exist at nearly every GPA level. Consistent with prior research and previous case studies, remaining gaps may be suggestive of bias and discrimination that limit women's abilities to secure leadership roles (Budig and England 2001; Castilla 2012).

Importantly, even if we can "explain" the different leadership outcomes between mothers and fathers, it does not mean that gender inequality processes are absent. For example, multiple gendered processes likely contribute to differences in fathers' and mothers' leadership returns from higher education and help explain why GPA appears to largely operate through college completion, particularly for fathers. First, high-achieving women/men (including those who become parents) may be steered by cultural processes, peers, parents, teachers, etc. toward female-/male-typed college majors that offer fewer/greater avenues for advancement (Cech 2013; Charles and Bradley 2009; Ridgeway 2011). As a result of gender sorting processes in education, high-potential women might leverage educational credentials to enter occupations that offer fewer opportunities to rise through the ranks, like becoming a teacher or nurse, whereas high-potential men tend to enter occupations that have long career ladders, like STEM or finance (Stainback and Tomaskovic-Devey 2009). Second, men, particularly high-achieving fathers, may

reap greater returns from their education, regardless of their occupational field. As described earlier in the article, stereotypes that depict fathers as more committed and competent than mothers mean that fathers' abilities are more likely to be rewarded with leadership opportunities and this likely holds true across male-dominated, female-dominated, and mixed-gender jobs (Correll, Benard, and Paik 2007; Ridgeway and Correll 2004).

On top of differences in leadership returns to educational attainment, gendered processes may encourage more academically-successful men (than women) to pursue higher education in the first place. For instance, parents may be more likely to save for son's college tuition and are willing to take on higher levels of debt for sons than daughters (T. Rowe Price 2019), potentially suppressing high-performing women's abilities to pursue college. Additionally, parents and school officials (teachers, counselors) may perceive a boy's good GPA as an indicator of brilliance, whereas a comparable GPA for a girl merely signals that she works hard (Musto 2019). These contrasting interpretations may lead influential adults to encourage boys with high GPAs to pursue college at higher rates than girls.

The differences in labor market experience between men and women (that explain part of the gender leadership gap by GPA) also have deep gendered roots. Women, particularly mothers, continue to shoulder the majority of unpaid labor in households (Yavorsky, Kamp Dush, and Schoppe-Sullivan 2015), and they may be unable to negotiate for their partner to make couple-level decisions that would better position them for leadership roles, like lessened workloads at home. Additionally, in decisions regarding leadership roles, employers may prioritize employee face-time and long work hours over actual productivity and commitment to their jobs; whereas women and men may differ in the former, there is little evidence that men and women who both work full-time differ on the latter (Castilla 2012; Gorman and Kmec 2007).

Although our study has many strengths, it also has limitations. First, due to data availability, we examine men and women from the late baby boomer cohort and their leadership roles at work between 1988 and 1998. When more recent data become available, future research should investigate recent change, if any, in gender leadership gaps by academic achievement. Given that trends toward gender equality in various dimensions have stalled or slowed since the mid-1990s (England, Levine, and Mishel 2020), we suspect that our results of gendered pathways to leadership may still apply to younger cohorts.

Second, the data available for our research questions span only ten years; thus, we are unable to map out gender leadership gaps by GPA across people's full careers. Considering the importance of the life course for work outcomes, we did experiment with estimating random slopes on age and adding the three-way interaction between gender, high school GPA, and age to evaluate whether gender leadership gaps by GPA changed with age. However, we found that the three-way interaction was *not* significant for either parents or non-parents (Online Appendix Table 10). This result is especially noteworthy for parents because it implies that following parenthood, women appear to lag behind men in leadership (particularly among high academic achievers) and find it difficult to catch up with men, at least over the ten-year period studied. Future work, when such longitudinal data become available, should examine whether these patterns hold true, or change, later in life.

Broader Implications and Conclusions

High school GPA offers a useful measure for capturing an individual's cognitive abilities, work ethic, and competence, especially given the strong links between skills and competencies shown in adolescence and those in adulthood (DiPrete and Buchmann 2013; French et al. 2015;

Rosenbaum 2001). Overall, our findings highlight the *vast under-utilization of women's talent, and especially mothers' talent,* for organizational leadership. Although high-achieving women may be applying their talents in fields with fewer leadership opportunities (e.g., law, academia, medical fields, etc.), it is likely that organizations that rely on supervisory positions to run their businesses are not tapping into the full talent available.

Scholars have long focused on the challenges that exist for women securing leadership roles (e.g., Huffman 1995; Smith 2002; Stainback and Tomaskovic-Devey 2009). Our research pushes future work to also consider the *lack of barriers* that may exist for men to secure organizational power (also see Chamorro-Premuzic 2019), given that even men who were very low performers in high school manage a similar number of people as women who were top performers. Of course, low grades in high school may not reflect people's true capabilities, as people may better apply themselves in their future jobs. Nevertheless, it is reasonable to expect that some of these men truly are lower performers later on at work, but rise to leadership anyways.

In conclusion, our findings highlight key gender differences in the ways that educational achievement matters for future leadership prospects. Our study also highlights the critical role that parenthood plays in creating gendered pathways to leadership, in part due to gender differences in leadership returns to education and employment trajectories after parenthood. More broadly, this research underscores a significant gendered loss of talent. To better utilize women's (especially mothers') abilities in organizational leadership, U.S. federal and state governments need to establish more robust family-work policies that encourage mothers' employment and importantly fathers' caregiving (Ruppanner 2020). Also, work organizations need to implement evaluative systems that reduce biases in hiring and promotion and to provide

pathways for leadership advancement from female-dominated occupations (Bohnet 2016). Lastly, educational systems should establish an anti-sexist curriculum that actively works to reduce gender stereotypes and provide programs for male and female students to build interest and gain confidence in areas typically associated with one gender over the other (DiPrete and Buchmann 2013). Until multiple institutions prioritize practices and policies aimed at utilizing the capabilities of both fathers and mothers, leadership will continue to unequally reflect the talent—and potentially interests—of one gender.

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FOOTNOTES

1. We examined the distribution of high school GPA by gender (Online Appendix Figures 1–2). Boys had lower average GPAs than girls (means: 2.30 vs. 2.61), but the range and variability of GPA were similar between boys and girls (range: 0.07–4.0 vs. 0.14–4.0; standard deviation: 0.78 vs. 0.74).

2. On average, the parent sample is older than the nonparent sample (33 versus 30). However, sensitivity analysis showed that our results did not change if we limited the sample to person-year observations when respondents were 25–34 years of age (mean age = 29 for non-parents and 30 for parents; see Online Appendix Table 8). Thus, different results between nonparents and parents are unlikely due to age differences of the samples.

3. We found that GPA appeared to capture similar aspects for boys and girls in high school. For example, girls who earned a higher GPA had higher self-esteem, internal control, and educational expectations, just like boys.

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TABLES

Table 1. Descriptive Statistics for Variables at the Individual and Person-Year Levels

	Mean/%		
	All	Non-parents	Parents
Dependent Variable			
Number of supervisees	3.76	3.81	3.73
	(9.72)	(9.77)	(9.68)
Independent Variables			
Female	50.96%	46.80%	53.45%
High school GPA	2.46	2.52	2.44
	(0.77)	(0.78)	(0.77)
Level-2 (Individual-level) Controls			
Race			
Hispanic	4.38%	3.90%	4.56%
Black	11.98%	8.88%	13.20%
White	83.63%	87.22%	82.25%
AFQT quartile			
1st quartile	24.10%	21.01%	25.38%
2nd quartile	23.46%	22.70%	23.76%
3rd quartile	23.80%	24.72%	23.57%
4th quartile	25.24%	28.62%	23.91%
Missing	3.40%	2.94%	3.38%
Self-esteem quartile			
1st quartile	30.29%	30.63%	30.34%
2nd quartile	23.42%	23.13%	23.70%
3rd quartile	21.34%	21.78%	20.50%
4th quartile	22.11%	21.74%	22.54%
Missing	2.84%	2.71%	2.92%
Educational expectation			
High school or less	32.91%	27.20%	35.40%
Some college	19.49%	17.28%	20.38%
Bachelor's degree	32.53%	37.93%	30.32%
Advanced degrees	14.73%	17.39%	13.56%
Don't know	0.33%	0.20%	0.34%
Parental education			
Less than high school	15.95%	11.88%	17.80%
High school	43.21%	40.32%	44.26%
Some college or above	39.78%	47.04%	36.65%
Missing	1.06%	0.76%	1.29%

Level-1 (Person-year-level) Controls			
Age	31.78	29.94	33.16
	(4.82)	(4.59)	(4.52)
Marital status			
Never married	26.76%	53.26%	6.85%
Married	60.83%	38.08%	77.92%
Previously married	12.41%	8.66%	15.23%
Health limitation			
No	95.05%	95.23%	94.91%
Yes	3.75%	3.89%	3.65%
Missing	1.20%	0.88%	1.44%
Region			
Northeast	18.60%	21.67%	16.29%
North Central	30.53%	28.74%	31.88%
South	34.04%	31.51%	35.95%
West	16.38%	17.62%	15.44%
Missing	0.45%	0.46%	0.44%
Year			
1988	25.05%	34.30%	18.09%
1989	25.41%	32.76%	19.90%
1996	25.00%	17.73%	30.46%
1998	24.54%	15.21%	31.54%

Note: *N* (individuals) = 4,936 for all, 2,527 for non-parents, and 3,425 for parents. *N* (person-years) = 15,141 for all, 6106 for non-parents, and 9,035 for parents. All sample statistics are weighted.

Table 2. Multilevel Negative Binomial Regression Models Predicting Log-Counts of the Number of Supervisees

	All		Non-parents		Parents	
	M1	M2	M3	M4	M5	M6
Female	-0.82***	-0.68***	-0.44***	-0.33**	-1.13***	-0.98***
	(0.07)	(0.08)	(0.11)	(0.11)	(0.10)	(0.10)
High school GPA[a]	0.30***	-0.00	0.26**	-0.08	0.39***	0.10
	(0.06)	(0.07)	(0.09)	(0.10)	(0.08)	(0.09)
Female * High school GPA	-0.11	-0.12	0.01	0.04	-0.27*	-0.29*
	(0.10)	(0.09)	(0.14)	(0.14)	(0.12)	(0.12)
Control Variables (Level 2)						
Race (ref. = White)						
Hispanic		-0.00		0.03		-0.00
		(0.11)		(0.16)		(0.15)
Black		-0.26*		-0.03		-0.27
		(0.11)		(0.16)		(0.14)
AFQT quartile (ref. = 1st quartile)						
2nd quartile		0.31**		0.22		0.31*
		(0.12)		(0.18)		(0.15)
3rd quartile		0.44***		0.52**		0.31
		(0.13)		(0.19)		(0.17)
4th quartile		0.48**		0.46*		0.54**
		(0.15)		(0.21)		(0.19)
Missing		0.16		0.18		0.23
		(0.22)		(0.34)		(0.28)
Self-esteem quartile (ref. = 1st quartile)						
2nd quartile		0.27**		0.05		0.33*
		(0.10)		(0.15)		(0.13)
3rd quartile		0.36***		0.27		0.40**
		(0.11)		(0.15)		(0.14)
4th quartile		0.40***		0.20		0.45**
		(0.10)		(0.14)		(0.14)
Missing		0.08		-0.10		0.14
		(0.28)		(0.42)		(0.34)
Educational expectation (ref. = High school or less)						
Some college		0.27*		0.46**		0.18
		(0.11)		(0.17)		(0.14)
Bachelor's degree		0.53***		0.61***		0.49***

		(0.10)		(0.15)		(0.13)
Advanced degrees		0.60***		0.90***		0.35*
		(0.13)		(0.18)		(0.17)
Don't know		-0.62		-1.36		-0.61
		(0.84)		(0.94)		(1.07)
Parental education (ref. = Less than high school)						
High school		0.15		0.41*		0.06
		(0.11)		(0.17)		(0.13)
Some college or above		0.16		0.24		0.11
		(0.12)		(0.18)		(0.15)
Missing		-0.52		0.13		-0.88*
		(0.33)		(0.50)		(0.43)
Control Variables (Level 1)						
Age		0.01		0.01		0.01
		(0.02)		(0.03)		(0.02)
Marital status (ref. = Married)						
Never married		-0.08		0.02		-0.32
		(0.08)		(0.10)		(0.17)
Previously married		0.10		0.03		0.13
		(0.09)		(0.15)		(0.11)
Health limitation (ref. = No)						
Yes		-0.27*		-0.60**		0.06
		(0.14)		(0.21)		(0.19)
Missing		-0.16		-1.22**		0.29
		(0.22)		(0.44)		(0.27)
Constant	0.53***	-0.68	0.26**	-1.43*	0.63***	-0.41
	(0.06)	(0.47)	(0.08)	(0.70)	(0.07)	(0.62)
lnalpha[b]	0.84***	0.83***	0.69***	0.69***	0.80***	0.80***
	(0.04)	(0.04)	(0.07)	(0.07)	(0.06)	(0.06)

Note: [a]High school GPA is centered at 2.5. [b]The over-dispersion parameter alpha is greater than zero and highly significant (as indicated by the positive value of lnalpha [the log of alpha] and $p < 0.001$ in all models), which suggests that the negative binomial model was more appropriate than a Poisson model (Long 1997). *N* (individuals) = 4,936 for all, 2,527 for non-parents, and 3,425 for parents. *N* (person-years) = 15,141 for all, 6106 for non-parents, and 9,035 for parents. ref. = reference category. Standard errors are in parentheses. Models also control for region dummies and survey year indicators at Level 1; to save space, we do not present their coefficients here but full models are available upon request.
*$p < .05$, **$p < .01$, ***$p < .001$.

Table 3. Descriptive Statistics for Explanatory Variables by Gender and High School GPA, Parents

	Mean/%							
	Men				Women			
	GPA=[0, 1]	GPA=(1, 2]	GPA=(2, 3]	GPA=(3, 4]	GPA=[0, 1]	GPA=(1, 2]	GPA=(2, 3]	GPA=(3, 4]
Level 2: Individuals								
Leadership in high school								
Participation in student government								
No	87.69%	89.41%	82.35%	71.68%	85.00%	86.79%	79.62%	71.91%
Yes	7.02%	7.31%	14.88%	26.98%	11.83%	10.84%	17.32%	26.25%
Missing	5.29%	3.28%	2.76%	1.34%	3.18%	2.38%	3.06%	1.85%
Level 1: Person-years								
Educational attainment								
High school	77.99%	73.70%	44.90%	18.38%	72.22%	67.37%	53.29%	27.81%
Some college	20.91%	18.96%	27.88%	15.99%	25.54%	25.51%	29.06%	26.26%
College or above	1.10%	7.33%	27.22%	65.63%	2.24%	7.12%	17.65%	45.93%
Employment-related characteristics								
Hours worked last year[a] [per 100 hours]	22.64	22.69	23.09	24.67	16.40	16.09	16.46	16.17
	(7.84)	(7.68)	(5.86)	(6.99)	(7.83)	(8.40)	(8.15)	(7.59)
Weeks worked to date [in years]	13.25	13.46	14.29	14.42	11.47	11.03	12.21	12.81
	(4.91)	(4.71)	(4.53)	(4.40)	(5.20)	(5.11)	(4.90)	(4.74)
Job tenure[a] [in years]	4.92	5.64	6.35	5.77	4.26	3.96	4.53	5.53
	(4.98)	(5.30)	(5.43)	(4.92)	(4.95)	(4.30)	(4.73)	(5.08)
Logged firm size[a]	3.72	4.09	4.23	4.48	3.99	4.11	4.01	3.93
	(1.87)	(2.13)	(2.08)	(2.31)	(2.19)	(2.03)	(2.11)	(2.19)
Government	17.47%	13.14%	11.01%	12.74%	18.51%	13.27%	15.82%	19.68%
Industry								
Agriculture	4.23%	2.39%	1.69%	2.16%	0.34%	0.41%	0.57%	0.72%
Mining	2.88%	1.49%	1.01%	0.30%	0.00%	0.00%	0.83%	0.13%

Construction	11.06%	13.78%	6.92%	6.20%	1.74%	1.12%	1.55%	1.55%
Manufacturing	9.95%	30.55%	31.87%	26.06%	11.87%	18.04%	12.77%	10.65%
Public utilities	14.83%	12.70%	10.75%	4.62%	1.30%	5.91%	4.42%	4.83%
Wholesale	6.54%	4.35%	5.08%	3.36%	3.87%	1.80%	1.89%	2.07%
Retail	22.21%	10.76%	11.52%	9.62%	17.14%	24.33%	18.58%	11.68%
Finance	6.61%	1.39%	6.38%	8.28%	11.96%	6.36%	10.16%	8.10%
Business	4.02%	5.87%	6.99%	7.17%	6.52%	5.62%	5.17%	3.57%
Personal services	5.69%	1.18%	0.82%	1.01%	6.21%	4.50%	3.91%	2.18%
Recreation services	0.17%	1.01%	1.09%	0.39%	1.47%	1.57%	1.32%	1.21%
Professional	3.10%	6.45%	8.35%	24.19%	29.36%	25.37%	32.38%	47.20%
Public administration	8.73%	7.72%	7.18%	6.29%	6.65%	4.62%	5.96%	5.76%
Missing	0.00%	0.37%	0.34%	0.35%	1.57%	0.35%	0.49%	0.36%

Note: *N* (individuals) = 3,425. *N* (person-years) = 9,035. Standard deviations are in parentheses. [a]Means and standard deviations here are calculated among non-missing values only; for each measure, we have created a dummy variable set equal to one if data are missing for that variable in the current year (see Killewald 2013 for similar strategies).

Table 4. Explanatory Analyses Using Multilevel Negative Binomial Regression Models to Predict Log-Counts of the Number of Supervisees, Parents

	M1	M2	M3	M4
Female	-0.98***	-0.99***	-0.72***	-0.29
	(0.10)	(0.10)	(0.16)	(0.16)
High school GPA[a]	0.10	0.08	-0.05	-0.15
	(0.09)	(0.10)	(0.10)	(0.10)
Female * High school GPA	-0.29*	-0.29*	-0.11	-0.02
	(0.12)	(0.12)	(0.14)	(0.13)
Leadership in high school				
Participation in student government (ref. = No)				
Yes		0.27*	0.26*	0.25*
		(0.12)	(0.12)	(0.12)
Missing		-0.05	-0.03	-0.02
		(0.34)	(0.34)	(0.31)
Educational attainment				
Main effects (ref. = High school)				
Some college			0.28	0.35*
			(0.18)	(0.17)
College or above			0.58**	0.63**
			(0.20)	(0.20)
Interactions				
Some college * Female			-0.22	-0.18
			(0.23)	(0.22)
College or above * Female			-0.69**	-0.63**
			(0.26)	(0.24)
Employment-related characteristics				
Hours worked last year [per 100 hours]				0.06***
				(0.01)
Missing: hours worked last year				0.35
				(0.29)
Weeks worked to date [in years]				0.04*
				(0.02)
Job tenure [in years]				0.06***
				(0.01)
Missing: job tenure				0.66*
				(0.30)
Logged firm size				0.03
				(0.02)

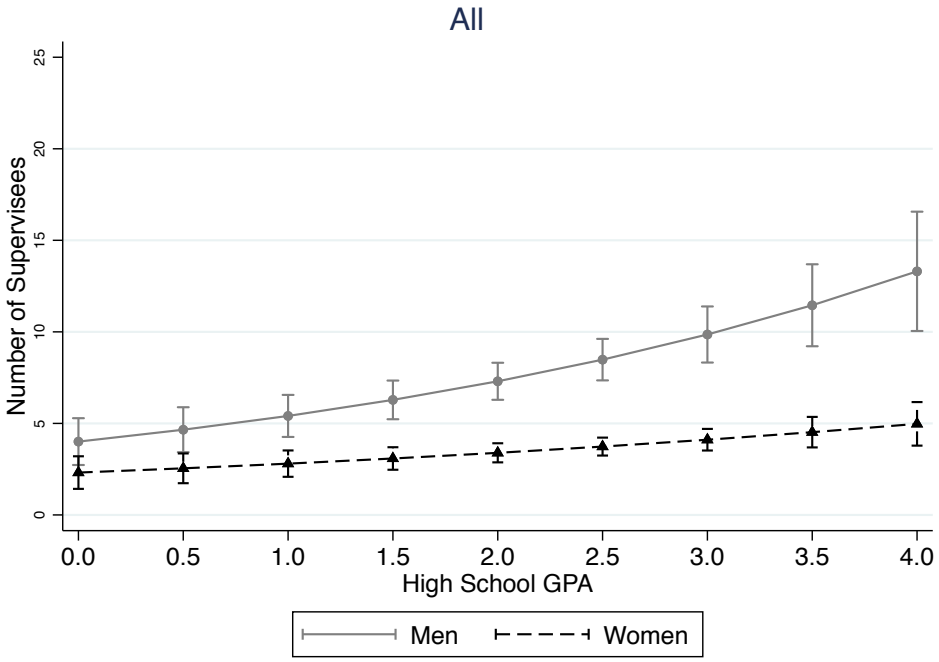
Missing: firm size				-0.23
				(0.22)
Government (ref. = Private)				-0.46**
				(0.14)
Industry (ref. = Professional)				
Agriculture				-0.05
				(0.27)
Mining				-1.23
				(0.73)
Construction				0.09
				(0.20)
Manufacturing				-0.21
				(0.14)
Public utilities				-0.27
				(0.19)
Wholesale				-0.20
				(0.24)
Retail				0.98***
				(0.14)
Finance				-0.07
				(0.18)
Business				0.19
				(0.17)
Personal services				-0.17
				(0.33)
Recreation services				-0.06
				(0.39)
Public administration				-0.02
				(0.19)
Missing				-0.12
				(0.64)
Constant	-0.41	-0.49	-0.68	-1.99**
	(0.62)	(0.62)	(0.63)	(0.62)
lnalpha[b]	0.80***	0.80***	0.80***	0.72***
	(0.06)	(0.06)	(0.06)	(0.06)

Note: [a]High school GPA is centered at 2.5. [b]The over-dispersion parameter alpha is greater than zero and highly significant (as indicated by the positive value of lnalpha [the log of alpha] and $p < 0.001$ in all models), which suggests that the negative binomial model was more appropriate than a Poisson model (Long 1997). *N* (individuals) = 3,425. *N* (person-years) = 9,035. Standard errors are in parentheses. ref. = reference category. All models include the control variables in Table 2; to save space, we do not present their coefficients here but full models are available upon request.
*$p < .05$, **$p < .01$, ***$p < .001$

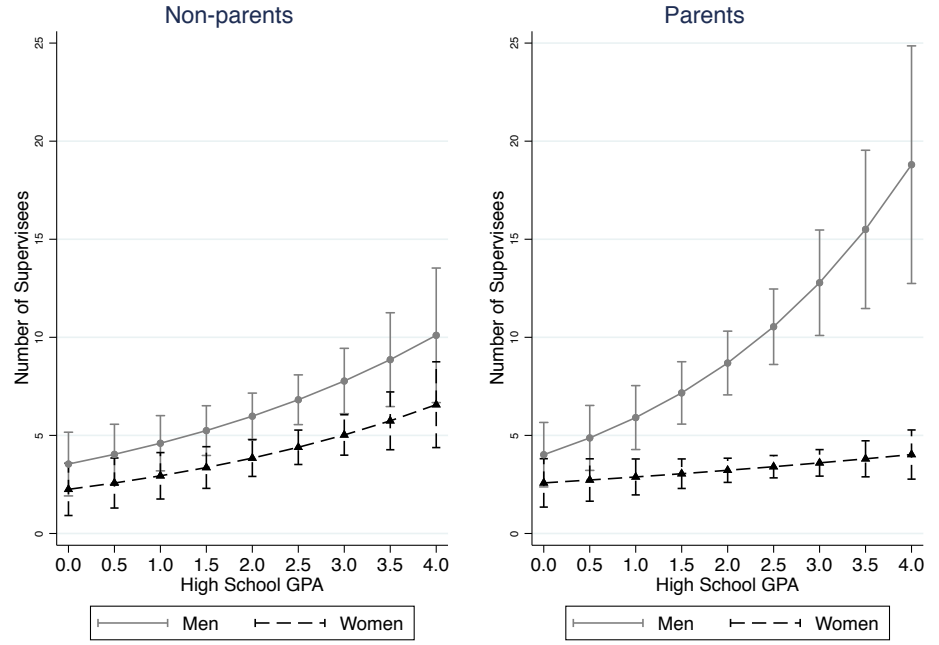
FIGURES

Figure 1. The Predicted Number of Supervisees, by Gender and High School GPA, for All and by Parental Status, Without Any Control Variables

Panel A: For All



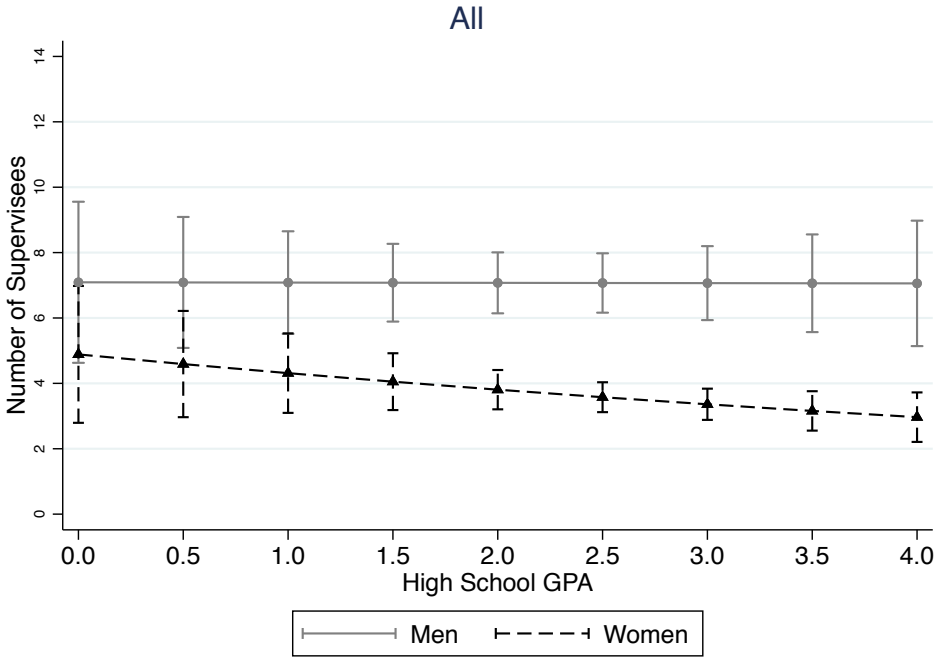
Panel B: By Parental Status



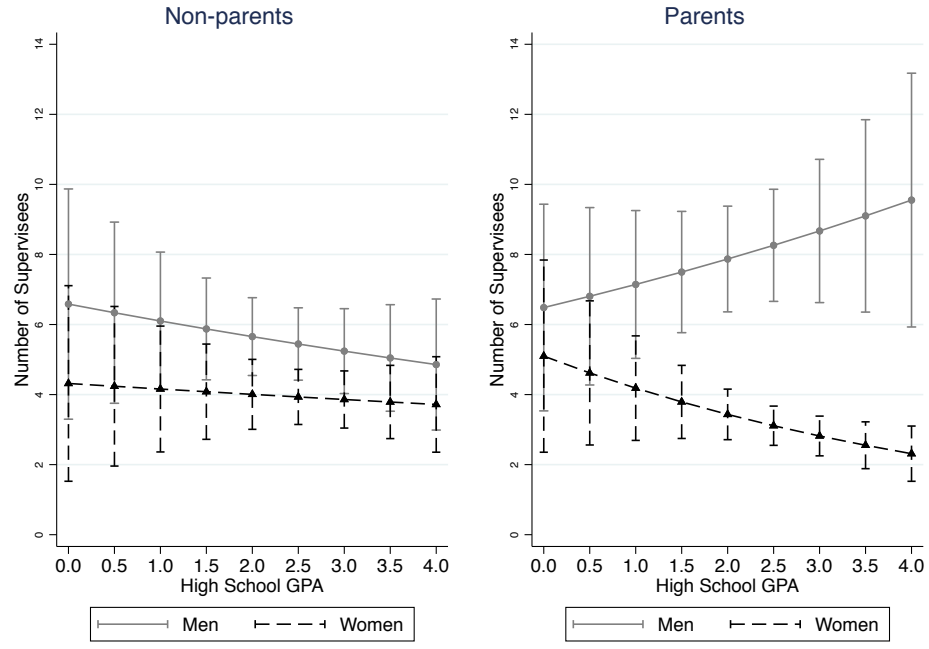
Note: The number of supervisees is predicted based on Models 1, 3, and 5 in Table 2.

Figure 2. The Predicted Number of Supervisees, by Gender and High School GPA, for All and by Parental Status, With Control Variables

Panel A: For All

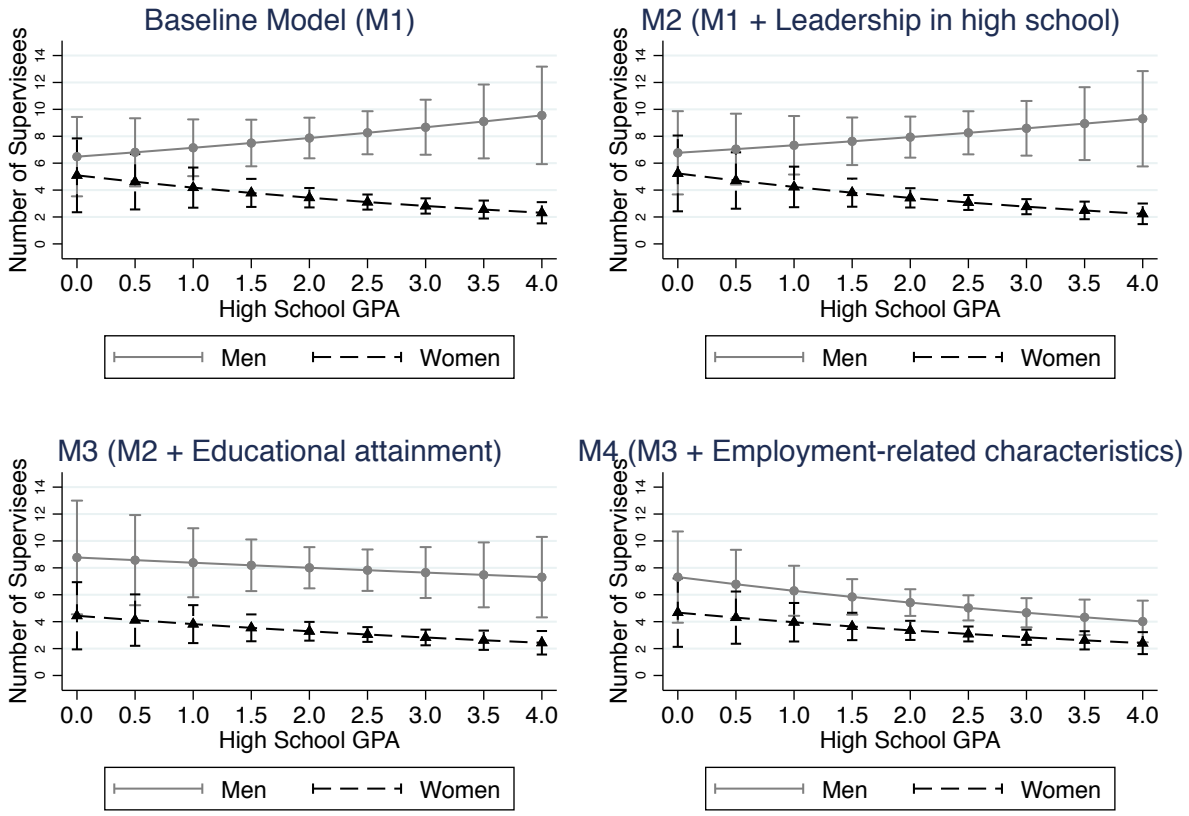


Panel B: By Parental Status



Note: The number of supervisees is predicted based on Models 2, 4, and 6 in Table 2, with all the control variables set at their means

Figure 3. The Predicted Number of Supervisees, by Gender and High School GPA, Parents



Note: The number of supervisees is predicted based on Models 1 through 4 of Table 4, with all the other covariates set at their means. Specifically: The upper left graph is based on Model 1 of Table 4 which includes race, AFQT, self-esteem, educational expectations, parental education, age, marital status, health limitation, region, and survey year as covariates. The upper right graph is based on Model 2 of Table 4, with the variables measuring *leadership in high school* added to Model 1. The bottom left graph is based on Model 3 of Table 4, with *educational attainment* and its interaction with gender added to Model 2. The bottom right graph is based on Model 4 of Table 4, with the variables measuring *employment-related characteristics* added to Model 3.

ONLINE APPENDIX

Supplementary Analyses

In this section, we discuss additional analyses that we have done to further explore mechanisms surrounding the gender leadership gap. Specifically, we examine whether selection processes (e.g., men/women who become parents are more/less ambitious or talented) are driving the stark gender leadership gaps by GPA among parents (and thus why results differ from those of non-parents), or if it is more likely that the transition into parenthood mainly explains our results.

To assess the role of selection processes, we examine gender leadership gaps by GPA for two sub-groups in our sample that both have childless person-years but vary in eventual parenthood status during our observational time period: 1) childless person-years from 1,511 respondents who never became parents and 2) childless person-years from 1,016 respondents who transitioned into parenthood. If there were pronounced selection into parenthood, gender leadership gaps by GPA would be different between these two groups. However, in both groups, the interaction term between female and high school GPA is small in magnitude and statistically insignificant (see Appendix Table 9 below). In other words, results based on the childless person-years from people who later became parents were very similar to results from people who remained childless, which would suggest little (if any) selectivity into parenthood. This supplementary analysis thus implies that becoming parents (as opposed to the types of people who become parents) may be related to more/less supervisory opportunities for fathers/mothers.

In addition to the analysis above, we conducted two other robustness checks to address selectivity concerns regarding parenthood. We examined whether high school GPA was associated with parenthood. We found that high school GPA was negatively associated with parenthood, for men and women alike. Therefore, men and women did not seem to differentially

select into parenthood based on their high school GPA. We also used hybrid models to further test our results (Schunck and Perales 2017). The within-person effect of parenthood is unbiased by person-level unobserved heterogeneity and captures the effect of transitioning into parenthood on change in supervisory scope. We found that the transition into parenthood was associated with increased leadership for men but not for women (men: $b = 0.36$, $p = .002$; women: $b = -0.21$, $p = .160$), suggesting that this transition (rather than selection processes) contributed to gender leadership gaps.

References:

Schunck, R., & Perales, F. (2017). Within-and between-cluster effects in generalized linear mixed models: A discussion of approaches and the xthybrid command. *The Stata Journal*, *17*(1), 89-115.

ONLINE APPENDIX

Appendix Table 1. Explanatory Analyses Using Multilevel Negative Binomial Regression Models to Predict Log-Counts of the Number of Supervisees, Parents, Controlling for Age of Children

	M1	M2	M3	M4	M5
Female	-0.98***	-1.00***	-1.01***	-0.75***	-0.31*
	(0.10)	(0.10)	(0.10)	(0.16)	(0.16)
High school GPA[a]	0.10	0.09	0.08	-0.05	-0.15
	(0.09)	(0.10)	(0.10)	(0.10)	(0.10)
Female * High school GPA	-0.29*	-0.28*	-0.28*	-0.10	-0.01
	(0.12)	(0.12)	(0.12)	(0.14)	(0.13)
Presence of children aged 0-5		-0.01	-0.01	-0.02	-0.02
		(0.09)	(0.09)	(0.09)	(0.08)
Presence of children aged 6-12		0.05	0.05	0.05	0.03
		(0.08)	(0.08)	(0.08)	(0.07)
Presence of children aged 13-17		0.16	0.16	0.16	0.13
		(0.11)	(0.11)	(0.11)	(0.10)
Controls	Yes	Yes	Yes	Yes	Yes
Leadership in high school			Yes	Yes	Yes
Educational attainment				Yes	Yes
Employment-related characteristics					Yes

Note: [a]High school GPA is centered at 2.5. *N* (parents) = 9,035 person-years nested within 3,425 individuals.

*$p < .05$, **$p < .01$, ***$p < .001$

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Appendix Table 2. Multilevel Negative Binomial Regression Models Predicting Log-Counts of the Number of Supervisees, Listwise Deletion for Missing Data

	All		Non-parents		Parents	
	M1	M2	M3	M4	M5	M6
Female	-0.82***	-0.67***	-0.42***	-0.31**	-1.17***	-0.98***
	(0.08)	(0.08)	(0.11)	(0.11)	(0.10)	(0.11)
High school GPA[a]	0.29***	-0.02	0.24*	-0.09	0.40***	0.08
	(0.07)	(0.08)	(0.09)	(0.11)	(0.09)	(0.10)
Female * High school GPA	-0.10	-0.12	0.03	0.05	-0.29*	-0.31*
	(0.10)	(0.10)	(0.14)	(0.14)	(0.13)	(0.13)
Controls		Yes		Yes		Yes

Note: [a]High school GPA is centered at 2.5. Models 2, 4, and 6 include the control variables in Table 2 of our manuscript; to save space, we do not present their coefficients here but full models are available upon request. *N* (individuals) = 4,478 for all, 2,365 for non-parents, and 3,022 for parents. *N* (person-years) = 13,189 for all, 5,682 for non-parents, and 7,507 for parents. *$p < .05$, **$p < .01$, ***$p < .001$

Appendix Table 3. Explanatory Analyses Using Multilevel Negative Binomial Regression Models to Predict Log-Counts of the Number of Supervisees, Parents, Listwise Deletion for Missing Data

	M1	M3	M4	M5
Female	-0.98***	-1.00***	-0.66***	-0.27
	(0.11)	(0.11)	(0.17)	(0.17)
High school GPA[a]	0.08	0.06	-0.10	-0.19
	(0.10)	(0.10)	(0.11)	(0.10)
Female * High school GPA	-0.31*	-0.30*	-0.06	0.02
	(0.13)	(0.13)	(0.15)	(0.14)
Controls	Yes	Yes	Yes	Yes
Leadership in high school		Yes	Yes	Yes
Educational attainment			Yes	Yes
Employment-related characteristics				Yes

Note: [a]High school GPA is centered at 2.5. *N* (individuals) = 3,022. *N* (person-years) = 7,507. *$p < .05$, **$p < .01$, ***$p < .001$

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Appendix Table 4. Multilevel Logistic Regression Models Predicting Log-Odds of Occupying a Leadership Role

	All		Non-parents		Parents	
	M1	M2	M3	M4	M5	M6
Female	-0.83***	-0.68***	-0.42***	-0.30*	-1.25***	-1.07***
	(0.08)	(0.08)	(0.13)	(0.13)	(0.12)	(0.12)
High school GPA[a]	0.43***	0.06	0.39***	-0.04	0.56***	0.19
	(0.08)	(0.09)	(0.11)	(0.13)	(0.11)	(0.12)
Female * High school GPA	-0.08	-0.08	0.07	0.11	-0.30*	-0.29*
	(0.11)	(0.11)	(0.17)	(0.17)	(0.14)	(0.14)
Controls		Yes		Yes		Yes

Note: [a]High school GPA is centered at 2.5. Models 2, 4, and 6 include the control variables in Table 2 of our manuscript; to save space, we do not present their coefficients here but full models are available upon request. *N* (non-parents) = 6,106 person-years nested within 2,527 individuals. *N* (parents) = 9,035 person-years nested within 3,425 individuals.
*$p < .05$, **$p < .01$, ***$p < .001$

Appendix Table 5. Multilevel Linear Regression Models Predicting the Number of Supervisees (logged), Among Those Who Are Supervisors

	All		Non-parents		Parents	
	M1	M2	M3	M4	M5	M6
Female	-0.25***	-0.23***	-0.17**	-0.16*	-0.32***	-0.30***
	(0.04)	(0.04)	(0.06)	(0.06)	(0.05)	(0.06)
High school GPA[a]	0.00	-0.02	-0.02	-0.04	0.02	-0.01
	(0.03)	(0.04)	(0.05)	(0.06)	(0.04)	(0.05)
Female * High school GPA	-0.07	-0.07	-0.01	-0.03	-0.10	-0.12+
	(0.05)	(0.05)	(0.08)	(0.08)	(0.07)	(0.06)
Controls		Yes		Yes		Yes

Note: [a]High school GPA is centered at 2.5. Models 2, 4, and 6 include the control variables in Table 2 of our manuscript; to save space, we do not present their coefficients here but full models are available upon request. *N* (non-parents) = 2,463 person-years nested within 1,439 individuals. *N* (parents) = 3,324 person-years nested within 1,837 individuals. When we limit the sample to supervisors only, sample size becomes much smaller. Therefore, we include the significance level of 0.1 to denote statistical significance.
+$p < 0.1$, *$p < .05$, **$p < .01$, ***$p < .001$

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Appendix Table 6. Explanatory Analyses Using Multilevel Logistic Regression Models to Predict Log-Odds of Occupying a Leadership Role, Parents

	M1	M2	M3	M4
Female	-1.07***	-1.08***	-0.83***	-0.34
	(0.12)	(0.12)	(0.18)	(0.18)
High school GPA[a]	0.19	0.17	0.03	-0.08
	(0.12)	(0.12)	(0.13)	(0.13)
Female * High school GPA	-0.29*	-0.29*	-0.11	-0.05
	(0.14)	(0.14)	(0.16)	(0.16)
Controls	Yes	Yes	Yes	Yes
Leadership in high school		Yes	Yes	Yes
Educational attainment			Yes	Yes
Employment-related characteristics				Yes

Note: [a]High school GPA is centered at 2.5. *N* (parents) = 9,035 person-years nested within 3,425 individuals.
*$p < .05$, **$p < .01$, ***$p < .001$

Appendix Table 7. Explanatory Analyses Using Multilevel Linear Models to Predict the Number of Supervisees (logged), Among Parents Who Are Supervisors

	M1	M2	M3	M4
Female	-0.30***	-0.30***	-0.19*	-0.06
	(0.06)	(0.06)	(0.09)	(0.08)
High school GPA[a]	-0.01	-0.02	-0.04	-0.09
	(0.05)	(0.05)	(0.06)	(0.05)
Female * High school GPA	-0.12+	-0.12+	-0.05	0.01
	(0.06)	(0.06)	(0.08)	(0.07)
Controls	Yes	Yes	Yes	Yes
Leadership in high school		Yes	Yes	Yes
Educational attainment			Yes	Yes
Employment-related characteristics				Yes

Note: [a]High school GPA is centered at 2.5. *N* (parents) = 3,324 person-years nested within 1,837 individuals. When we limit the sample to supervisors only, sample size becomes much smaller. Therefore, we include the significance level of 0.1 to denote statistical significance.
+$p < 0.1$, *$p < .05$, **$p < .01$, ***$p < .001$

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Appendix Table 8: Multilevel Negative Binomial Regression Models Predicting Log-Counts of the Number of Supervisees, Between 25 and 34 Years Old

	Non-parents		Parents	
	M1	M2	M3	M4
Female	-0.46***	-0.34**	-1.03***	-0.89***
	(0.12)	(0.12)	(0.12)	(0.12)
High school GPA[a]	0.30**	0.01	0.44***	0.13
	(0.09)	(0.11)	(0.10)	(0.12)
Female * High school GPA	0.10	0.12	-0.30*	-0.33*
	(0.15)	(0.15)	(0.15)	(0.15)
Controls		Yes		Yes

Note: [a]High school GPA is centered at 2.5. The average age across person-year observations is 29 years for the non-parent sample and 30 years for the parent sample. Models 2 and 4 include the control variables in Table 2 of our manuscript; to save space, we do not present their coefficients here but full models are available upon request. *N* (non-parents) = 4,346 person-years nested within 2,362 individuals. *N* (parents) = 4,985 person-years nested within 2,679 individuals.
*$p < .05$, **$p < .01$, ***$p < .001$

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Appendix Table 9: Multilevel Negative Binomial Regression Models Predicting Log-Counts of the Number of Supervisees, Non-parents

	All Non-parents	Never Parents	Childless Years Before Parenthood	All Non-parents	Never Parents	Childless Years Before Parenthood
	M1	M2	M3	M4	M5	M6
Female	-0.44***	-0.40**	-0.49**	-0.33**	-0.30*	-0.42*
	(0.11)	(0.14)	(0.17)	(0.11)	(0.14)	(0.17)
High school GPA[a]	0.26**	0.26*	0.28*	-0.08	-0.10	0.03
	(0.09)	(0.12)	(0.14)	(0.10)	(0.13)	(0.16)
Female * High school GPA	0.01	0.02	-0.03	0.04	-0.01	0.09
	(0.14)	(0.18)	(0.21)	(0.14)	(0.18)	(0.20)
Controls	No	No	No	Yes	Yes	Yes

Note: [a]High school GPA is centered at 2.5. Models 4 through 6 include the control variables in Table 2 of our manuscript; to save space, we do not present their coefficients here but full models are available upon request. M1 and M4 (All Non-parents) are estimated based on the pooled non-parent sample (6,106 person-years from 2,527 respondents). M2 and M5 (Never Parents) are estimated based on 4,319 childless person-years from 1,511 respondents who never became parents during our observational time period. M3 and M6 (Childless Years Before Parenthood) are estimated based on 1,787 childless person-years from 1,016 respondents who transitioned into parenthood during our observational time period.

*$p < .05$, **$p < .01$, ***$p < .001$.

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Appendix Table 10: Multilevel Negative Binomial Regression Models Predicting Log-Counts of the Number of Supervisees, Adding the Three-Way Interaction Between Age, Gender, and High School GPA

	All		Non-parents		Parents	
	M1	M2	M3	M4	M5	M6
Female	-0.62***	-0.50***	-0.39**	-0.28*	-1.01***	-0.88***
	(0.10)	(0.10)	(0.13)	(0.12)	(0.15)	(0.15)
High school GPA[a]	0.26**	-0.05	0.34**	0.02	0.30*	0.00
	(0.08)	(0.09)	(0.10)	(0.12)	(0.13)	(0.14)
Female * High school GPA	-0.06	-0.08	-0.11	-0.08	-0.20	-0.23
	(0.12)	(0.12)	(0.16)	(0.15)	(0.19)	(0.19)
Age[b]	-0.02*	0.02	-0.04*	0.02	-0.02	-0.00
	(0.01)	(0.02)	(0.02)	(0.03)	(0.01)	(0.03)
Age * Female	-0.04***	-0.04**	-0.02	-0.02	-0.02	-0.02
	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)
Age * High school GPA	0.01	0.02	-0.02	-0.01	0.02	0.02
	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)
Age * Female * High school GPA	-0.01	-0.01	0.05	0.05	-0.01	-0.01
	(0.02)	(0.02)	(0.03)	(0.03)	(0.02)	(0.02)
Control Variables (Level 2)						
Race (ref. = White)						
Hispanic		0.06		0.05		0.04
		(0.12)		(0.17)		(0.15)
Black		-0.25*		-0.01		-0.30*
		(0.11)		(0.16)		(0.14)
AFQT quartile (ref. = 1st quartile)						
2nd quartile		0.38**		0.26		0.38*
		(0.12)		(0.18)		(0.15)
3rd quartile		0.47***		0.50*		0.35*
		(0.14)		(0.20)		(0.17)
4th quartile		0.47**		0.42		0.55**
		(0.16)		(0.22)		(0.20)
Missing		0.17		0.15		0.27
		(0.23)		(0.34)		(0.29)
Self-esteem quartile (ref. = 1st quartile)						
2nd quartile		0.19		-0.12		0.34*
		(0.11)		(0.15)		(0.14)
3rd quartile		0.30**		0.19		0.39**
		(0.11)		(0.16)		(0.15)
4th quartile		0.30**		0.09		0.43**

		(0.11)		(0.15)		(0.14)
Missing		0.01		-0.21		0.10
		(0.30)		(0.43)		(0.36)
Educational expectation (ref. = High school or less)						
Some college		0.28*		0.48**		0.16
		(0.12)		(0.18)		(0.14)
Bachelor's degree		0.54***		0.60***		0.51***
		(0.11)		(0.15)		(0.13)
Advanced degrees		0.66***		0.89***		0.38*
		(0.14)		(0.19)		(0.18)
Don't know		-0.74		-1.94*		-0.64
		(0.89)		(0.86)		(1.14)
Parental education (ref. = Less than high school)						
High school		0.17		0.43*		0.05
		(0.12)		(0.17)		(0.14)
Some college or above		0.19		0.30		0.14
		(0.13)		(0.18)		(0.16)
Missing		-0.43		0.18		-0.80
		(0.35)		(0.52)		(0.44)
Control Variables (Level 1)						
Marital status (ref. = Married)						
Never married		-0.06		0.05		-0.28
		(0.08)		(0.10)		(0.17)
Previously married		0.09		0.11		0.12
		(0.09)		(0.15)		(0.11)
Health limitation (ref. = No)						
Yes		-0.24		-0.62**		0.10
		(0.14)		(0.19)		(0.19)
Missing		-0.11		-1.24**		0.36
		(0.25)		(0.45)		(0.29)
Constant	0.29***	-0.70***	0.11	-1.18***	0.51***	-0.20
	(0.08)	(0.19)	(0.10)	(0.27)	(0.12)	(0.25)
lnalpha[c]	0.43***	0.42***	0.26*	0.21*	0.52***	0.52***
	(0.07)	(0.07)	(0.10)	(0.10)	(0.09)	(0.09)
Variance Components						
var(age)	0.03***	0.03***	0.04***	0.05***	0.02***	0.02***
	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)
var(constant)	3.01***	2.82***	3.24***	3.00***	3.00***	2.78***
	(0.17)	(0.16)	(0.25)	(0.23)	(0.25)	(0.24)

Note: [a]High school GPA is centered at 2.5. [b]Age is centered at 26. [c]The over-dispersion parameter alpha is greater than zero (as indicated by the positive value of lnalpha [the log of alpha]) and significant, which suggests that the negative binomial model was more appropriate than a Poisson model (Long 1997).
N (individuals) = 4,936 for all, 2,527 for non-parents, and 3,425 for parents. *N* (person-years) = 15,141 for all, 6106 for non-parents, and 9,035 for parents. ref. = reference category. Standard errors are in parentheses. Models also control for region dummies and survey year indicators at Level 1; to save space, we do not present their coefficients here but full models are available upon request.
**p* < .05, ***p* < .01, ****p* < .001

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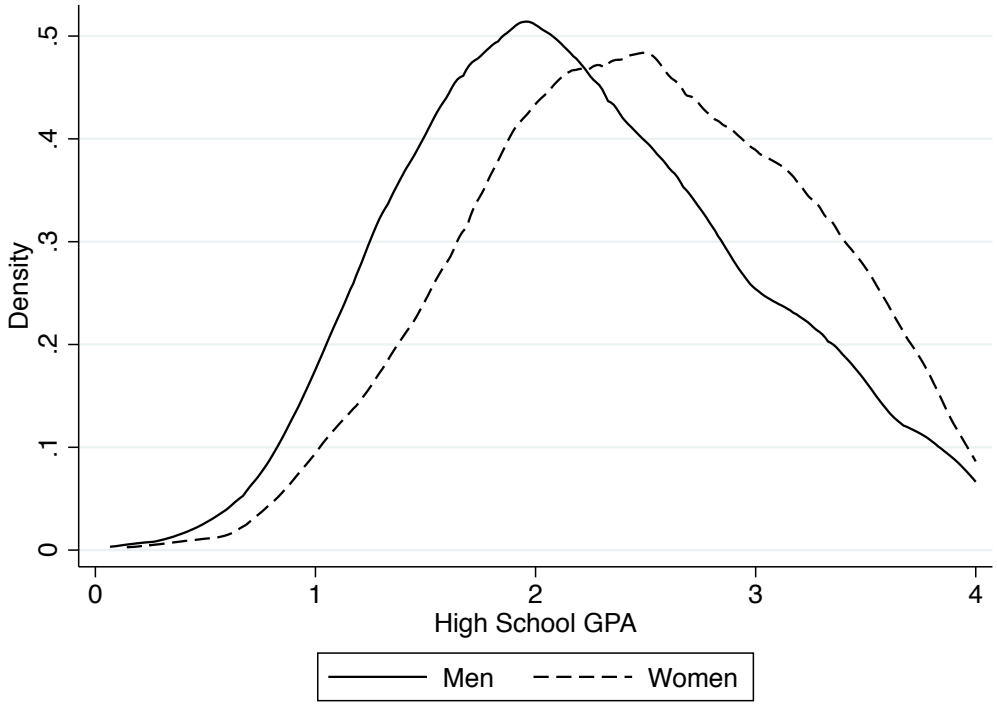
Appendix Figure 1: Kernel Density Plot of High School GPA, By Gender



Appendix Figure 2: Box Plot of High School GPA, By Gender