Who's the Boss?
The Effect of Strong Leadership on Employee Turnover*

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1. Introduction

Employee turnover costs are a significant challenge for many firms. Studies show that employee turnover can cost around twenty percent of salary in terms of recruiting, training, and lost productivity, although some estimates are much higher.[1] In response to these high costs, firms often design compensation structures to encourage longer employee tenure. Firms also make investments in the work environment and offer nonpecuniary benefits, such as free lunches or access to fitness rooms, to enhance employee work experience.

While firms continue to experiment with innovative ways to improve employee retention, perhaps one of the most enduring aspects of a job that impacts worker satisfaction is the relationship that workers have with their boss. What often differentiates a good boss from a bad one is leadership ability. From motivating and rewarding effort, organizing capital and labor, establishing the work pace, serving as a role model for employees, and setting the overall tone of an organization's work environment, a boss' leadership ability is apt to impact how employees view their job.

Identifying causal effects of a boss' leadership ability on employee retention, however, requires a setting where other potential determinants of job retention are unrelated to the leadership ability of an employee's boss. We argue that the U.S. Army provides ideal conditions for studying this effect. To begin with, the Army determines its employee and boss assignments in response to changing needs of the Army, which are primarily driven by changing national security conditions. As the Army responds to evolving requirements, it adjusts personnel

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[1] Boushey and Glynn (2012), Merhar (2016), and Driving the Bottom Line (2006) are examples of studies that calculate the cost of employee replacement. The replacement cost for those that earn $30,000 or less is around 16% of annual salary. For those earning around $50,000 and up to $75,000, the estimates increase to around 20% of salary. For CEOs earning $100,000, replacement costs could be double the salary (Boushey and Glynn, 2012).

assignments throughout its ranks. Based on changes in open positions across military units over time, two young officers with the same military occupation and reporting to the same Army post merely days apart are frequently assigned to different units and hence different bosses.

Beyond this plausibly exogenous variation, the Army has other features that make it an attractive setting to study these effects. For example, the Army deliberately makes a clear distinction regarding which of its officers possess the highest leadership ability. Additionally, the retention decision we study occurs *before* officers are eligible for any promotions, which would distinguish them from their peers and potentially affect their retention decision. The Army also sets its wages by rank and tenure as opposed to ability. Finally, all military service members are assigned an immediate boss and a senior boss in every assignment. This unique Army setting, coupled with its rich administrative data, allow us to explore how the leadership ability of a boss – both immediate and more senior – impacts junior officer retention.

Our paper directly builds off of Lyle and Smith (2014). They use the random assignment of bosses to study the mentorship effects of a high performer on officer promotion. Although our paper exploits similar exogenous variation as Lyle and Smith (2014), our paper differs from theirs in a number of important respects. First, we study an employee's labor supply decision at various points in a career rather than the firm's decision to promote an employee.[2] Second, we use an entirely different population of officers; we study newly commissioned lieutenants who are at the beginning of their career instead of the more senior captains studied in their paper who have already served a few years in the Army. Third, we investigate the leadership effects of both immediate and senior bosses. Fourth, we explore type-based effects in greater detail. Fifth, we

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[2] Lyle and Smith (2014) find evidence that having a high-performing mentor improves early promotion prospects by 29 percent. The promotion decision studied in the Lyle and Smith paper occurs after the retention decision that we study in this paper.

are able to estimate the impact of the leadership quality of the senior boss on the immediate boss. Finally, our study provides empirical evidence to inform some of the theoretical predictions made in Lazear *et al.* (2015), which presents the first major work on the effect of a high quality boss on technology-based service workers.[3]

In addition to providing a tractable theoretical model, Lazear *et al.* (2015) provide empirical estimates that demonstrate how better bosses relate to employee productivity and reduced employee turnover. We answer a number of questions that they present but are not able to address empirically in their paper. For example, they discuss how challenging it is to identify ability levels of bosses and employees in practice (Lazear *et al*. 2015, p. 827). We are able to characterize the ability level of the each worker in terms of SAT score as well as the ability level of each boss in terms of both leader quality and SAT score. A second item of concern raised by the theoretical framework in Lazear *et al.* (2015) is the coupling of employees to bosses by specific types. For example, the granularity of our data allows us to further investigate the impact of leadership effects on retention when employees and bosses share the same race, similar SAT score, or attendance at the same undergraduate institution. [4] Our study also provides insight into the persistent nature of the boss effect that Lazear *et al.* (2015) identifies. Beyond addressing

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[3] In part, our paper also contributes to the managerial skills literature and the mentorship literature: Bloom *et al.*, 2013, Bertrand and Schoar, 2003, and Bloom and Van Reenen, 2007, Bender *et al.* (2016) and Hoffman and Tadelis (2016). Raabe and Beehr (2003), Roche (1979), Ragins *et al.* (2000), Scandura and Schriesheim (1994), and Tepper (1995) argue that bosses perform mentoring functions. See Laband and Lentz (1998), Holincheck (2006), Mills and Mullins (2008), Bettinger and Baker (2014), Blau *et al.* (2010), and Rodriguez-Planas (2012) for cases where participating in a mentorship program improves retention and productivity.
[4] See Neumark and Gardecki (1998), Hilmer and Hilmer (2007), Carrell *et al.* (2010), Hoffman and Oreopoulos (2009) for empirical papers related to gender matching. See Fairlie *et al.* (2014) and Lusher *et al.* (2015) for papers focused on racial matching. For examples of theoretical research in this area, see Athey *et al.* (2000) and Chung (2000).

empirical questions raised by Lazear *et al.* (2015), we are also able to assess the retention impact that higher level supervisors may have on an employee's retention decision.

We find that having an immediate boss with strong leadership increases retention rates by 2.7 percentage points and having a senior boss with strong leadership increase retention rates by 2.1 percentage points.[5] These findings are amplified when we condition our sample of junior officers based on SAT score. Junior officers with high SAT scores – a group that is less likely to stay in the Army – who have a senior boss with strong leadership abilities are more likely to stay in the Army by 3.3 percentage points.[6] We only find type-based retention effects for officers who graduated from West Point, and we do not find any type-based retention effects for junior officers who served under strong leaders. Our estimates of the positive retention effect of the senior bosses on the immediate bosses at twelve years of service shows that the effect can persist for up to six years after the immediate boss finished working for the senior boss.

2. Background on U.S. Army Officers and Army Leadership

Each year the Army commissions roughly 4,000 new officers as second lieutenants.[7] The Army invests a great deal in its young officers, providing most with a college education, significant leadership training, and both an immediate and a senior boss. In exchange for these investments in human capital, these young officers agree to an eight-year military service obligation. Depending on the source of commission, officers must serve about half of their obligation on active duty and can serve the remainder in a reserve status. Those who attend the

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[5] Retention rates to eight years of service for young officers without a high-performing mentor are approximately 49-50 percent.

[6] We define a "high" SAT score as a composite SAT score in the top 50 percent of the cohort distribution of SAT scores.

[7] The officer rank structure within the U.S. Army is as follows: second lieutenant, first lieutenant, captain, major, lieutenant colonel, colonel, and general.

United States Military Academy have a 5-year active duty obligation, while those who go through ROTC (Reserve Officer Training Corps) or who are commissioned after a shorter training period have 3 or 4 years of active-duty obligation. We will study the likelihood that an officer stays on active-duty through 8 years of service, which represents three to five years after their initial active-duty service obligation. All officers of the same rank and tenure in the Army earn the same base salary, regardless of their source of commission or outside job market opportunities.

The Army organizes most of its formations around ten divisions. Each division typically has three or more brigades, and each brigade has approximately five battalions. Commanders of these battalions have been in the Army for more than 15 years and serve as senior bosses to the young officers in our study. Figure 1 depicts the organizational structure within a battalion that relates each junior officer with his or her immediate or senior boss.

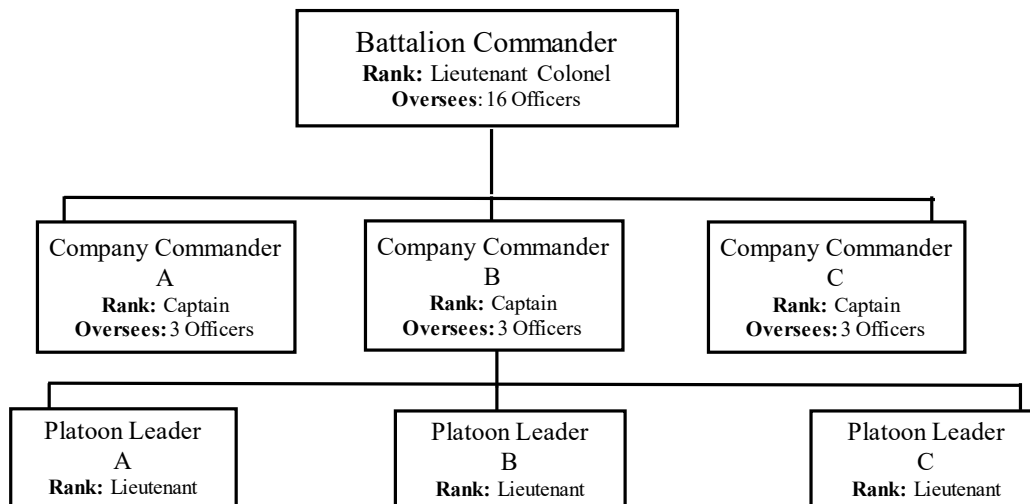Figure 1. Officer Organizational Structure within the Army

Figure Note: Figure 1 depicts the typical command structure in the Army for Lieutenants, Captains, and Lieutenant Colonels.

Within each battalion, there are normally three or four companies, each commanded by a different officer. These company commanders have been in the Army for five or more years and

serve as immediate bosses to newly commissioned officers. The employees in this study are the junior officers who serve as platoon leaders. Junior officers usually interact with their immediate boss on a daily basis during such events as physical training, vehicle maintenance, supply room inventories, and weapons training. Weekly interactions between junior officers and their senior bosses generally involve readiness reporting on items such as vehicle mission capability status, weapons qualification status, and discipline issues. Both immediate and senior bosses provide a formal rating of their junior officers in an annual officer evaluation report.

Immediate and senior bosses also provide critical leadership for young Army officers. Since the labor market for officers is almost exclusively internal, the nation's future security depends in large part on the Army's ability to develop young officers into senior officers capable of effectively leading military units on increasingly complex missions. As such, the Army places significant emphasis on leader development.[8] Like many private sector firms, the Army is particularly interested in retaining high-potential officers. As documented in Wardynski *et al.* (2010) and noted anecdotally in Kane (2013), the Army tends to lose a higher share of its high-potential officers, especially as measured by pre-service performance on the SAT.[9]

Each year the Army reviews the evaluation reports for the cohort of officers eligible for promotion to major (typically between 8 and 10 years of service). The promotion board normally selects between 5-10 percent for promotion prior to the rest of their cohort based on

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[8] The opening statement of the 2013 Army Leader Development Strategy (p.1) states:
> "The U.S. Army builds leaders for our Nation. Developing leaders is a competitive advantage the Army possesses that cannot be replaced by technology or substituted for with advanced weaponry and platforms. If we do not develop leaders well we cannot build quality units, design cogent campaigns, or execute effective operations in theater…Leader development is fundamental to our Army."

[9] Wardynski *et al.* 2010 demonstrate the decline in junior officer retention within the Army over the past 30 years.

their past and potential for future leadership. This distinction of early promotion increases the

likelihood of assignment to competitively selected command positions (battalion commander and

brigade commander) and also increases the likelihood of attaining the rank of general officer.

We, therefore, define a strong leader as either an immediate boss (company commander) who

will be promoted early to the rank of major or the senior boss (battalion commander) who was

previously promoted early to the rank of major. [10]

3. Data

The administrative data for our study come from the Office of Economic and Manpower

Analysis at West Point, New York. Junior officers in our data are male lieutenants commissioned

into the active duty Army between 1994 and 2005 who served as platoon leaders at any time

between fiscal years 1998 and 2008. [11] We link junior officers to their immediate and senior

bosses through annual Army officer evaluation reports. On average, young officers serve in

platoon leader positions for approximately 14 months.

Table 1 contains summary statistics for all junior and senior bosses in the Army during

our sample time period. Using the Army's personnel database, we selected all variables

potentially related to the characteristics of a boss that could affect the junior officer's decision to

stay in the Army: race, SAT score, admissions selectivity of undergraduate institution, and

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[10] For both the junior and senior leaders in our study, this early promotion occurred outside of the time frame of the employee-employer relationships we study. Early promotion to major is highly selective; typically less than 10 percent of an officer cohort is promoted early. Army Regulation 600-8-29 states that those who are promoted early "must be truly outstanding and clearly superior to those who would otherwise be selected from in or above the promotion zone." http://armypubs.army.mil/epubs/DR_pubs/DR_a/pdf/web/r600_8_29.pdf

[11] We limit our sample of junior officers to male officers in one of the 14 military occupations other than Aviation and Medical Services. Aviation and Medical Services have longer initial service obligations; we limit our study to men because women were restricted from serving in some occupations during the timeframe of this study. See Appendix 1 for a list of occupations.

source of commission. [12] We provide summary statistics for the universe of possible immediate and senior bosses at the time of our study in Columns 1 and 3, respectively. Columns 2 and 4 contain summary statistics for the sample of actual officers who serve as immediate and senior bosses in our sample. Comparisons between the full population and our sample reveal very similar underlying distributions, suggesting that the sample of bosses in our study reflects the larger underlying population of potential bosses. In Appendix 1, we lay out our sample in more detail and explain the reasons for missing SAT scores.

[Table 1 Here]

Approximately 10 percent of immediate bosses are deemed strong leaders whereas nearly 30 percent of senior bosses have received this designation. Immediate bosses have not gone through the promotion board process at the time when they serve as first-line bosses, so the 10 percent represents the share of officers who will eventually appear before a promotion board and be selected early for promotion. Meanwhile, senior bosses have already gone through the promotion board. This three-fold increase in the percentage of strong leaders between immediate and senior bosses reflects the increased likelihood of receiving high-ranking positions in which to serve as bosses by virtue of being designated as a strong leader at the promotion board to the rank of major.

Shifting to junior officers, the object of our study, Table 2 contains summary statistics for the young officers who the Army assigns to immediate and senior bosses through the process described above. Columns 1 and 2 are analogous to Table 1 but for junior officers, with Column 1 containing the population of all junior officers and Column 2 containing junior officers who

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[12] Admissions selectivity is characterized by a college's Peterson ranking, taken from Peterson's annual Undergraduate Databases. Appendix 1 provides a complete description of this measure.

could be linked successfully to their bosses using evaluation report data. As with the bosses, our sample is representative of the underlying population of potential junior officers. We will discuss Columns 3-6 in the next section.

[Table 2 Here]

4. Empirical Framework

To test the effect of a boss on junior officer retention, we estimate the following linear probability model.

$$R_i = \lambda + \gamma B_i + X_i\theta + \delta_{(1994-2005)} + \omega_{Branch} + \tau_{SOC} + \kappa_{LOC} + \varepsilon_i \quad (1)$$

The left-hand side variable, R_i, is a binary variable that equals 1 if a junior officer remains in the Army through eight years of service and a 0 otherwise.[13] The estimate of γ on the variable of interest, B_i, represents the boss effect. We use two different measures of this boss effect throughout the paper: 1) ever having a boss designated as a strong leader; 2) the amount of time serving under a strong leader. X_i represents control variables that account for race, marital status, SAT score quartiles, college admissions selectivity, unit type, and cumulative deployment time at three years of service. These variables include all of the information available to the Army's Human Resources Command when making decisions as to where to place individuals, and each of these variables is also a potential determinant of retention behavior. $\delta_{1994-2005}$ represents a set of year group controls to account for any cohort-specific effects, including idiosyncrasies of the promotion boards over time that may affect bosses differentially. ω_{Branch} includes controls for military occupations, accounting for any differences in management of junior officers by occupation; τ_{SOC} are a set of controls for the source of officer commission; and κ_{LOC} includes

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[13] We chose the eight year retention point because after eight years on active duty, all of the junior officers in our sample have completed their initial service obligation.

dummies for assignment locations and indicators for special units. A junior officer's

commissioning year, commissioning source, military occupation, location, and special unit status

are included as controls in all of our specifications.

To interpret γ as identifying the causal effect of having a boss with strong leader

qualities on retention, conditional on observable characteristics, the assignment to a boss with

strong leadership skills must be uncorrelated with other potential determinants of the junior

officer's likelihood of staying in the Army. The assignment convention – described in the

introduction and characterized in official doctrine as "needs of the Army" – supports our

contention that the Army assigns junior officers to units and their associated bosses without

regard for their boss' leadership ability or the retention likelihood of the junior officer. We are

confident that our description of this assignment process is accurate in practice and in our sample

for a number of reasons. At the time of original assignment, the Army has limited information

on its new officers. Beyond their undergraduate education and basic demographic

characteristics, which we control for in X_i, these new officers have not had enough time to

differentiate themselves. Moreover, we have access to all variables that Army Human Resource

managers have to assign officers, and we include them as controls in all of our regressions. On

top of the lack of information on junior officers, immediate bosses in our data are company

commanders who have yet to appear before the critical promotion board when they serve as

immediate bosses to our junior officers. There is, therefore, minimal concern that specific junior

officers are placed under the direction of immediate bosses with strong leadership, as these

immediate bosses do not even have the designation as promoted early at the time of assignment.

To further bolster our claim that junior officers are not assigned to strong leaders based

on characteristics that are related to their retention likelihood, we show that even our observable

characteristics are not related to assignment decisions. Returning to our discussion on the estimates in Table 2, columns 3 and 4 divide the junior officers by whether they ever had an immediate boss who was a strong leader. Columns 5 and 6 contain the same statistics for having a senior boss who was a strong leader or not. Comparisons between the columns show similar summary statistics across all of the potential determinants of retention behavior that are available in Army administrative data. The similarity across samples reinforces our claim that the Army assigns junior officers to their bosses without regard for other observable potential determinants of junior officer retention.

While the individual characteristics are similar for those with and without a boss possessive of strong leadership skills, there is still the chance that these observable variables are correlated with other potential determinants of our outcome. We therefore provide additional evidence in Table 3 to study whether the assignment of a junior officer to his or her bosses is plausibly random, conditional on observable characteristics. The specifications in Columns 1, 3, and 5 are regressions of boss's leadership rating (1 equals a junior officer who is assigned to a boss with strong leadership ability) on our structural controls: commissioning year, commission source, location, and military occupation. These basic structural controls account for about three to eight percent of the variation in boss' leader quality, depending on the definition of leader quality as defined in the panel headings. Columns 2, 4, and 6 contain estimates from a regression of boss' leadership on both structural and observable demographic controls. These additional observable controls, which human resource managers could possibly use to assign junior officers to their bosses, explain less than one percent of the total variation in boss' leader quality, as seen by the change in the R^2. Further, only deployment duration and missing Peterson Ranking are statistically significant across all three specifications. The Missing Peterson's Ranking is only

statistically significant for Senior Bosses, which suggests that it may just be a spurious correlation. The Deployment Duration is only two tenths of a percent, which is inconsequential. Moreover, deployments cannot occur until after the assignment is made, which also suggests that this is not part of some assignment mechanism. The p-value from the F-test for added variables is reported in the last row and is not statistically significant.

[Table 3 Here]

Overall, our evidence implies that observable characteristics do not explain assignments to bosses with strong leadership, which suggests that unobservable characteristics are also unrelated to assignment. Even if it was a concern, as already mentioned, we include all available data that the Army could use to make junior officer assignments in the full retention specifications. In keeping with the approach described in Altonji *et al.* (2005) and Oster (Forthcoming), we will also evaluate the stability of our estimate of γ along with changes in R^2 as we sequentially add additional controls for our main specifications in Table 4.

5. Empirical Results

Table 4 contains estimates from our main retention specifications.[14] Panel A reports estimates for ever serving under an immediate or senior boss with strong leadership, and Panel B reports results for the time spent under either. About 15 percent of our sample of junior officers served under an immediate boss with strong leadership, 43 percent served under a senior boss with strong leadership, and 7 percent served under both.

[Table 4 Here]

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[14] Appendix Table 1 confirms these results by estimating the retention specifications using a probit model. Probit marginal effects are almost identical to the linear probability model coefficients reported in Table 4.

In Panel A, the variable of interest B_i is a dichotomous variable where a 1 designates a junior officer who had a boss with strong leadership skills and a 0 designates a boss who the Army has not deemed as being a strong leader. Columns 1-3 and 4-6 reflect a gradual inclusion of control variables as noted below each estimate. The stability across our estimate of having a strong leader with the inclusion of additional controls provides further evidence for our identification assumption, suggesting that there are likely few unobservable variables that are both correlated with boss quality and retention behavior of young officers.[15] Note that the stability holds in Column 7, when both the immediate boss and senior boss are included in the same regression.

Estimates in Panel B, Columns 1 and 3 are from a separate regression where B_i is a measure of boss duration: months spent serving under a boss with strong leadership. Finally, Panel B Columns 2 and 4 allow the impact of boss duration to vary nonlinearly and include indicators for time served under a boss with strong leadership (1-6 months, 6-12 months, and greater than 12 months are the included categories, with 0 months as the excluded category).

Our estimates in the first row of panel A indicate that young officers who have ever served under an immediate boss with strong leadership are around 2.7 percentage points (5.4 percent) more likely to remain in the Army through eight years of service relative to a young officer who never served under an immediate boss with strong leadership. For junior officers who have ever served under an immediate boss with strong leadership, the average duration of

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[15] We also conduct a test to consider coefficient stability as outlined in Oster (Forthcoming), which accounts for how much of the unobservable variation is explained by the observable characteristics using conservative estimates of the max R^2 of 1, 0.5, and 0.10. For each of these max R^2 thresholds, we get greater bounded coefficients than reported for having an immediate boss who is a strong leader or having both an immediate and senior boss who is a strong leader. The bounded coefficients are smaller for senior bosses, but remain positive.

this immediate boss relationship is approximately 10.5 months. Panel B Column 1 shows that an additional year spent with an immediate boss who is a strong leader increases the likelihood the junior officer remains on active duty through 8 years of service by 2.4 percentage points (0.002*12 months). Results reported in Panel B Column 2 suggest that there is not much additional impact of spending over a year, versus 6-12 months, under an immediate boss with strong leadership.

Although the stability in the estimates from Columns 1 to 3 in Panel A supports our description of the conditional random assignment mechanism, one concern about interpreting the estimates of interest in Columns 1 to 3 as causal is that the Army does not designate the immediate boss as a strong leader until well after the junior officer has served under his leadership. While this helps in our argument that the Army cannot possibly be assigning junior officers to immediate bosses based on their leadership quality, it does introduce the concern that the immediate boss' leadership quality may be jointly determined with the junior officer's retention decision. In other words, the Army could base an immediate boss's evaluation report, which would impact the future "strong leader" designation, on the retention decision of his or her junior officers.

One piece of evidence that weighs heavily against this concern is that junior officers do not make retention decisions until well after they have finished serving under the immediate boss. Therefore, it is not possible for the Army to give higher evaluation marks to the immediate boss based on the retention decision of his or her junior subordinates. Another way to evaluate this concern is to compare the strong leader effect of the immediate boss with that of the senior boss. Senior bosses were designated well in advance of junior officer assignments, and therefore cannot be jointly determined. Finding similar effects from immediate and senior bosses would

further bolster our claim that the designation of an immediate boss as a strong leader is not jointly determined with junior officer retention decisions.

Estimates in Panel A Columns 4-6 show that indeed the effect of having a senior boss with strong leadership is similar to that of an immediate boss. Junior officers who have ever had a senior boss with strong leadership are 2.1 percentage points (4.4 percent) more likely to remain through 8 years of service. Months spent with a senior boss with strong leadership (Panel B Column 3) also have a similar effect: an additional year with such a senior boss increases the likelihood of remaining through 8 years of service by roughly 2 percentage points. Similar to the results for the immediate boss, estimates in Panel B Column 4 show that there does not seem to be much of an additional retention lift from spending more than 12 months with a senior boss who is a strong leader.[16]

Panel A Columns 7 and 8 focus on junior officers who have experienced both immediate and senior bosses with strong leadership. Recall that only about 7 percent of junior officers have access to strong leadership at both immediate and senior levels. When we include both variables in the regression (Col. 7), the coefficients remain consistent and statistically significant: the effects of having access to an immediate boss with strong leadership is still 2.6 percentage points, and the effect of a senior boss with strong leadership is 2.1 percentage points. In Column 8 we further include the interaction of having both an immediate and senior boss with strong leadership. The coefficient on having both is positive (2.7 percentage points), but not statistically significant.

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[16]The average duration of junior officers who serve under senior bosses that are strong leaders is approximately 12 months. For the period of our assignment, officers will likely have at most 2 distinct first line bosses and 2 distinct senior bosses.

We report robust standard errors throughout our analysis. To account for the fact that individuals with the same bosses share similar experiences, we cluster our standard errors at the boss level. To do this, we create unique combinations of immediate bosses, senior bosses, and immediate and senior bosses for each of our estimation strategies. Appendix 1 contains a complete description of our construction of these unique boss clusters. Clustered errors in Appendix Table 2, are only slightly larger than the previous reported standard errors from Table 4 and do not change the significance of any of the results.

To better understand which types of officers are most likely influenced by bosses with strong leadership, Tables 5 and 6 focus on junior officers by race and pre-service achievement as measured by the SAT score. We again run our regressions for junior officers that have an immediate boss with strong leadership (Panel A) or a senior boss with strong leadership (Panel B). Columns 2 – 4 condition the sample on each group (race in Table 5 and SAT group in Table 6). Column 5 contains an interacted specification for the full sample where the only interaction effects are listed by the row header. Column 6 contains a fully interacted specification for the full sample where all variables are interacted with race in Table 5 and SAT group in Table 6. Column 1 includes our main results from Table 4 for comparison.

[Table 5 Here]

[Table 6 Here]

Estimates in Table 5 Columns 3 and 4 for black and other non-white junior officers are not statistically significant at the 5% level. Although the estimate for black junior officers is significant at the 10% level, we cannot reject that the coefficients are different than those for white junior officers in Column 2 which are statistically significant and of similar magnitude to the main results. To further check whether results are different by race, in Column 5 we interact

having a strong leader with either being black or non-white/non-black. Neither interaction coefficients are statistically significant, further confirming that blacks or non-white/non-blacks are not experiencing a differential retention bump from serving under a boss with strong leadership. As a basis for comparison and to address any potential confusion, Column 6 contains the fully interacted specification. Estimates in this specification are directly comparable to the conditional sample estimates in columns 3 and 4.

In Table 6 we divide the sample by SAT score (above and below median) with Column 1 showing our main results and Column 2 displaying results when estimating the same specification but dropping officers with a missing SAT score.[17] When splitting the sample by junior officer SAT score, junior officers in the top half of the SAT distribution exhibit a differential retention effect from serving under a senior boss with strong leadership (panel B Column 4). Junior officers with SAT scores in the top half are 3.3 percentage points more likely to stay in the Army when they serve under a senior boss with strong leadership. The same is not true for junior officers in the lower half of the SAT distribution, although we cannot rule out that this result is statistically different from those in the lower half of the SAT distribution. This is further evident from the estimates in Column 5 where we interact the SAT variable with serving under a strong leader. Again, Column 6 contains a fully interacted specification with the SAT grouping. It is directly comparable to the estimates from the conditional sample in Column 4. This result, nonetheless, suggests that for young officers with high SAT scores (a group that has lower retention rates), pairing with strong leaders may be especially important.

Given the multiple hypotheses tested in Tables 5 and 6 for heterogeneity, we investigate the likelihood of picking up a statistically significant result by chance. Using the Bonferroni

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[17] In our main results, we include indicators if a junior officer has a missing SAT score.

correction, which is a conservative method, we cannot rule out that we are just picking up an effect by chance. Splitting our race in three categories (white, black, non-white/non-black) reduces the threshold for statistical significance of 5% to a p-value less than .017. The p-value for whites with junior bosses of high leadership is 0.033, which does not pass the Bonferroni threshold. For whites with senior bosses, the p-value is 0.018, which is just above the Bonferroni 5% cut-off. For Table 6, which is a different sample, we split by two groups, so our p-values would need to be less than 0.025. The p-value for Table 6, Panel B, Column 4, is 0.014, which still passes this threshold.[18]

We next turn to type-based effects to determine if individuals who have bosses who are "like them" in the organization may be more likely to stay and perform well because they see it is possible for someone "like them" to succeed. Tables 7 (immediate boss) and 8 (senior boss) contain estimates where we interact race with the boss's race (Column 1: Jr. Officer is White x Boss is White), West Point Graduate serving under a Boss who was also a West Point Graduate (Column 3: Jr. Officer is a West Point Grad x Boss is West Point Grad), and having a high SAT score interacted with a boss having a high SAT (Column 5: Jr. Officer has above Median SAT Score x Boss has above Median SAT Score).[19] We include two sets of p-values from tests of joint significance in each column of Tables 7 and 8. The first set of p-values reflect the test of joint significance for all variables with estimates that are displayed in each column. For example, in Column 1 of Table 7, the first p-value tests the hypothesis that white junior officers, white bosses, and white junior officers assigned to white bosses is jointly significant. The second

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[18] If we take an even more conservative approach and correct for both race and SAT percentile, it changes the critical value of our p-value where none of our heterogeneous effects are significant.
[19] We do not have enough observations of minority officers serving under minority bosses to estimate minority effects with any confidence in estimates, which is why we can only estimate the type-based effects for white officers.

p-value tests the hypothesis that white bosses and white junior officers assigned to white bosses is jointly significant.

Across each of these type-based specifications in both Table 7 for immediate bosses and Table 8 for senior bosses, the only interaction effect that is statistically significant both singularly and jointly is West Point Graduates. West Point graduates are more likely to remain in the Army by 5.2 percentage points when they serve under immediate bosses who are also West Point graduates. We conduct the same Bonferroni correction for Tables 7 and 8 as we did in Tables 5 and 6. Our Bonferroni p-value threshold given the three type-based hypotheses that we text for each sample is .0167. The p-value on our only statistically significant type-based effect (West Point affiliation) is .007, so it still passes the conservative Bonferroni threshold.

To our knowledge, our paper is the first to study type-based job retention effects with regard to race, SAT, and undergraduate institution affiliation. There is a growing literature on type-based (gender and race) effects for education outcomes. For example, Lusher, Campbell, and Carrell (2018) study the race of teaching assistants (TAs) and their students. Students that had TAs with the same race scored 7.7% of a standard deviation above their fellow students who did not share the same race as the TA. Fairlie, Hoffman, and Oreopoulos (2014) find that minority students at a community college perform better in classes when instructors are the same race. They also report that increasing the share of minority instructors by one standard deviation increases the college retention rate by 2.5 percentage points. This finding is the closest to ours in terms of a retention outcome. Although we are not able to detect type-based race-related job retention effects, our type-based undergraduate affiliation finding of a 5 percentage point job retention lift is comparable to the Fairlie *et al.* (2014) race-based college retention finding.

[Table 7 Here]

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[Table 8 Here]

We next interact these type-based variables with having a Boss who is a Strong Leader (Columns 2, 4, and 6) to determine whether being assigned to a boss with a similar characteristic who is also a strong leader has a differential effect. None of these results are statistically significant.

Finally, we estimate boss effects for a group of longer-serving officers who might also be positively affected by the leadership of their boss. The nature of the Army's hierarchical structure means that what we have been referring to as the immediate boss is also an employee of the senior boss. For this part of the analysis, therefore, we designate what we have been calling the immediate boss as the employee and we designate what we have been calling the senior boss as the immediate boss's first-line supervisor. The employees (company commanders in this sample) interact with their immediate boss (battalion commanders) frequently and are evaluated annually by this same individual. We again measure the effect of having a boss with strong leadership on retention in the Army, although we look at the effect on retention at 12 years of service, rather than eight.[20]

In Appendix Table 3, we report summary statistics for these company commanders we now designate as employees. Columns 1 and 2 include all company commanders who were in the previous analysis, with summary statistics reported separately by whether they served under a boss (battalion commander) with strong leadership. In Columns 3 and 4, we drop those company commanders for whom we are missing retention to 12 years of service. We also condition our sample of company commanders to include only those who had four to eight years of Army

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[20] Recall that to be in the original immediate boss sample, captains had to remain in the Army long enough to be considered for early promotion to major.

service when they appeared in our original sample and served as immediate bosses to the junior officers. In Columns 5 and 6, we further restrict the sample to only male company commanders. Across all three samples, individual characteristics are very similar, although those who serve under strong leaders are more likely to have been promoted early to major and be in divisional units. In unreported results, we also run a similar covariate regression as done in Table 3. The p-value on the F-statistic measuring the joint significance of the non-structural control variables was 0.33 for the sample of captains and 0.35 when we restrict to only male captains, suggesting that observable characteristics (race, SAT, school competitiveness, and unit type) do not predict whether a company commander was assigned a boss with strong leadership.

Table 9, Panel A reports the effect of having a boss with strong leadership on longer term retention of officers, analogous to our results in Table 4. In Column 1, we include only our structural controls: commissioning source, commissioning year, location, special unit dummies, and military occupation. In Column 2, we add in demographic, undergraduate college selectivity, and unit controls. In Column 3, we include a dummy for whether the captain (the employee in this sample) was promoted early to the rank of major. We do the same in Columns 4 through 6, but we restrict the company commander sample to men only, as we did in the previous analysis. All these results together consistently show that having a boss with strong leadership skills– even for more experienced employees – improves retention through 12 years of service by around 2.4 to 2.2 percentage points (2.5 to 2.7 percent).

[Table 9 Here]

Panels B and C restricts the sample by race and SAT categories, as done in Tables 5 and 6. Once again, there is a differential long-term retention effect of strong leadership on employees with high SAT scores: a statistically significant 3.9 percentage point increase in retention

compared to a 1.1 percentage point increase for low SAT male employees. These results again show that assigning an individual to a strong leader, regardless of initial tenure in the Army, leads to increased retention rates.

6. Conclusion

Immediate bosses with strong leadership increase retention rates by 2.7 percentage points and senior bosses with strong leadership increase retention rates by 2.1 percentage points. We also find consistent results across the study that indicate junior officers with high SAT scores experience even stronger retention effects. The only type-based retention effect that we find is for officers who graduated from West Point, and we are not able to detect any type-based retention effects for junior officers who served under strong leaders. Unlike some of the recent literature on type-matched by race in college continuation and academic performance, we do not find convincing evidence of type-matched effects by race impacting officer retention.[21] We do not, however, interpret our race-based findings as ruling out what has been found in the growing literature. Rather, the very few minority officers who served under minority bosses limits our ability to draw firm conclusions.

Beyond the main findings presented above, this study also sheds light on the length of time required for an employee to serve under a boss with strong leadership skills. Junior officers received a retention lift of 2.2 percentage points (4.5 percent) when paired with a senior boss who was a strong leader for six to twelve months. The result is only slightly higher (2.78 percentage points or 5.7 percent) when that relationship lasts for more than a year. Firms that move employees between bosses on a routine basis, like the U.S. Army, may find this result particularly informative. Such firms may benefit more broadly by reassigning their strong bosses

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[21] See Fairlie *et al.* (2014) and Lusher *et al.* 2018.

every six to twelve months to maximize retention across their entire work force. This effect may operate differently, however, in firms that assign employees to bosses for longer periods of time. Furthermore, there are also costs associated with increasing boss churn, such as the potential for changing work assignments as well as increasing uncertainty over future boss assignments. Moreover, stable employee-boss relationships may have productive outcomes that exceed the impacts measured in this study.

One practical shortcoming of this study is that we are not able to disentangle whether it is the high performing bosses that are encouraging officers to stay or the low performing bosses that are driving junior officers out of the Army. We are only able to tell the differential retention effect between junior officers assigned to high performing bosses and all other junior officers. This is an area where we hope to explore in future studies.

Although it is important to interpret our findings within the unique context of the Army's officer corps, private firms confront similar retention issues. In general, the results from this study provide credible evidence that the leadership quality of bosses matters when it comes to employee turnover. Pairing employees with strong leaders may be a fruitful way to incentivize retention for individuals, particularly those with high potential.

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Figure 1. Officer Organizational Structure within the Army

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                    ┌─────────────────────────────┐
                    │     Battalion Commander     │
                    │ Rank: Lieutenant Colonel    │
                    │ Oversees: 16 Officers       │
                    └─────────────────────────────┘
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Company Commander A	Company Commander B	Company Commander C
Rank: Captain	**Rank:** Captain	**Rank:** Captain
Oversees: 3 Officers	**Oversees:** 3 Officers	**Oversees:** 3 Officers

Platoon Leader A	Platoon Leader B	Platoon Leader C
Rank: Lieutenant	**Rank:** Lieutenant	**Rank:** Lieutenant
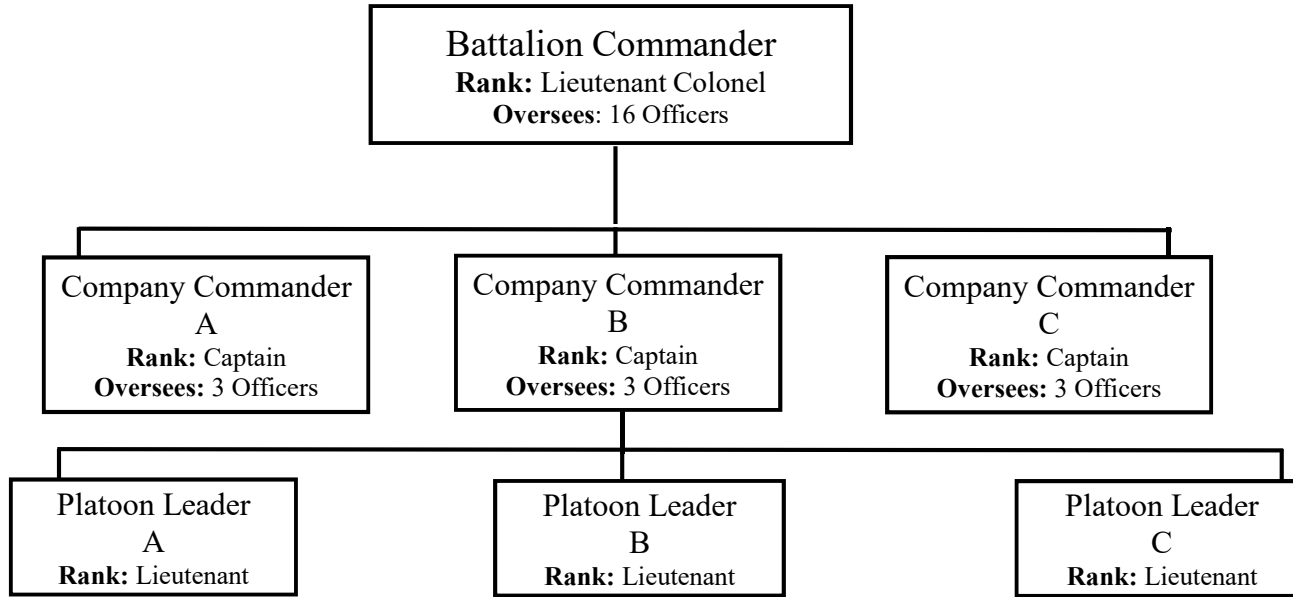
Table 1: Summary Statistics of Bosses

	All Possible Immediate Bosses	Sample of Immediate Bosses	All Possible Senior Bosses	Sample of Senior Bosses
	(1)	(2)	(3)	(4)
Strong Leader (Early Promotion)	9.7	10.2	27.6	31.2
White	78.3	78.2	84.3	84.2
Black	11.2	11.5	10.9	11.0
Non-White / Non-Black	10.5	10.3	4.8	4.8
SAT	1121.0 (175.8)	1115.5 (177.6)	1135.8 (209.3)	1151.6 (214.9)
Missing SAT	38.9	33.3	70.7	67.7
Non-Selective Undergrad	4.5	4.4	5.0	4.6
Minimally Selective Undergrad	8.4	9.0	9.2	9.3
Moderately Selective Undergrad	53.7	53.9	50.4	49.9
Very/Most Selective Undergrad	30.4	30.3	31.3	34.1
Missing Undergrad Selectiveness	3.0	2.4	4.1	2.2
United States Military Academy	20.6	20.6	21.0	24.3
ROTC scholar	36.9	34.9	36.5	35.6
ROTC non-scholar	30.0	32.0	31.0	30.6
Other Source of Commission	12.5	12.6	11.5	9.5
N	13,455	7,868	3,673	2,455

NOTE. – This table reports mean values for immediate (Columns 1 and 2) and senior (Columns 3 and 4) bosses who served as company and battalion commanders in the Army between 1998 and 2008. Columns 1 and 3 include the full universe of bosses while Columns 2 and 4 include those in our sample. We define a strong leader as one who was promoted early to the rank of major. Refer to Appendix 1 for a complete discussion of missing SAT, Peterson Rankings, and other variable descriptions. All variables are percentages except SAT. Standard deviations of SAT scores are in parentheses.

Table 2: Summary Statistics of Junior Officers

	All Possible Junior Officers	Sample of Junior Officers	Jr. Officers **without** a "Strong" Immediate Boss	Jr. Officers **with** a "Strong" Immediate Boss	Jr. Officers **without** a "Strong" Senior Boss	Jr. Officers **with** a "Strong" Senior Boss
	(1)	(2)	(3)	(4)	(5)	(6)
Retention at 8 YOS (%)	49.9	49.9	49.42	52.72	48.6	51.7
White (%)	77.9	78.3	77.9	80.4	77.4	79.5
Black (%)	9.2	9.1	9.3	8.0	9.7	8.3
Non-White / Non-Black (%)	12.9	12.6	12.7	11.5	12.8	12.2
Ever Married at 3 Years of Service	44.5	44.5	44.7	43.4	44.9	43.9
SAT	1168.3 (158.9)	1168.1 (159.6)	1166.4 (160.3)	1177.3 (155.1)	1167.3 (159.1)	1169.1 (160.2)
Missing SAT (%)	27.8	27.3	27.5	26.3	28.8	25.4
Non-Selective Undergrad (%)	3.0	2.9	3.0	2.5	3.2	2.5
Minimally Selective Undergrad (%)	5.0	4.8	4.9	4.1	4.9	4.7
Moderately Selective Undergrad (%)	51.6	51.5	51.6	51.3	52.1	50.7
Very/Most Selective Undergrad (%)	38.7	39.1	38.8	40.7	37.9	40.7
Missing Undergrad Selectiveness (%)	1.6	1.6	1.7	1.3	1.8	1.3
USMA (%)	25.9	26.2	25.9	28.2	24.6	28.4
ROTC 3-4 Year Scholar (%)	30.2	29.7	29.6	30.4	30.9	28.1
ROTC 2 Year Scholar (%)	18.7	19.1	19.3	18.1	18.8	19.5
ROTC Non-Scholar (%)	25.1	24.9	25.1	23.2	25.5	24.0
Months Deployed up to 3 Years of Service	4.9 (5.3)	4.6 (5.2)	4.5 (5.2)	5.3 (5.3)	4.8 (5.3)	4.3 (5.0)
Divisional Unit (%)	67.0	69.1	68.7	71.7	65.7	73.8
Combat Non-Divisional Unit (%)	11.7	11.7	11.3	14.1	11.1	12.6
Other Unit (%)	20.3	19.1	20.0	14.2	23.2	13.7
N	19,774	14,760	12,556	2,204	8,443	6,317

NOTE. – This table reports means for all male junior officers commissioned into the Army through USMA or ROTC between 1994 and 2005 and who served as platoon leaders at any time between 1998 and 2008. See Appendix 1 for variable descriptions and sample selection. Columns 3 and 4 split the sample by whether the junior officer ever served under a immediate boss with strong leadership and Columns 5 and 6 do the same for senior bosses. Standard deviations of continuous variables are in parentheses.

Table 3: Covariate Regression of Strong Leaders on Observable Characteristics of Junior Officers

	DV: Strong Leader as Immediate Boss		DV: Strong Leader as Senior Boss		DV: Immediate and Sr. Bosses are both Strong Leaders	
	(1)	(2)	(3)	(4)	(5)	(6)
Black		-0.008		-0.012		-0.005
		(0.010)		(0.014)		(0.007)
Non-White / Non-Black		-0.012		0.012		-0.000
		(0.009)		(0.012)		(0.006)
Ever Married at 3 YOS		-0.002		-0.002		-0.003
		(0.006)		(0.008)		(0.004)
SAT Quartile 1		0.004		0.010		0.003
		(0.012)		(0.016)		(0.009)
SAT Quartile 2		0.004		0.004		0.003
		(0.011)		(0.015)		(0.008)
SAT Quartile 3		0.004		0.018		0.008
		(0.010)		(0.014)		(0.007)
Missing SAT		0.006		-0.015		0.001
		(0.010)		(0.014)		(0.008)
Peterson Non-Selective		-0.014		-0.027		0.000
		(0.016)		(0.023)		(0.012)
Peterson Minimumally Selective		-0.012		0.013		-0.003
		(0.014)		(0.019)		(0.010)
Peterson Most/Very Selective		-0.003		-0.018		-0.004
		(0.009)		(0.013)		(0.007)
Peterson Ranking Missing		-0.022		-0.067**		-0.010
		(0.021)		(0.031)		(0.015)
Deployment Duration at 3 YOS		0.002***		0.002*		0.002***
		(0.001)		(0.001)		(0.001)
Other Unit		-0.044		-0.070		0.005
		(0.056)		(0.062)		(0.035)
Non-Divisional Combat Unit		-0.002		0.025		0.036
		(0.056)		(0.062)		(0.035)
Location Controls	YES	YES	YES	YES	YES	YES
Special Unit Controls	YES	YES	YES	YES	YES	YES
Military Occupation Controls	YES	YES	YES	YES	YES	YES
Commissioning Source Controls	YES	YES	YES	YES	YES	YES
Commissioning Year Controls	YES	YES	YES	YES	YES	YES
Observations	14,760	14,760	14,760	14,760	14,760	14,760
R-Squared	0.028	0.030	0.078	0.081	0.028	0.030
F-Test p-value		0.202		0.151		0.248

NOTE. – This table tests whether characteristics of junior officers that are observable to the Army are related to the likelihood that they served under a strong leader. Columns 1, 3, and 5 estimate a linear probability model in which the dependent variable is an indicator for ever serving under a strong leader (immediate boss, senior boss, or both), and the explanatory variables are structural controls: controls for military occupation, commissioning source, location, special units, and commissioning year. Columns 2, 4, and 6 add all the characteristics of the junior officer observable to the Army (demographics, pre-service achievement, college admissions selectivity, deployment time, and unit type). Omitted categories are: Whites, SAT Quartile 4, Peterson Ranking Moderate, Divisional Units. The p-value from a F-Test of all the individual characteristics listed, excluding Unit Type, is reported on the last row. Robust standard errors are reported in parentheses. See Appendix 1 for a complete description of the selected sample and included variables. *Statistically significant at the .10 level; ** at the .05 level; *** at the .01 level.

Table 4: Junior Officer Retention at 8 Years of Service

	Panel A. Ever Had Strong Leader							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Control Mean	0.494	0.494	0.494	0.494	0.494	0.494	0.494	0.494
Immediate Boss	0.026**	0.028**	0.027**				0.026**	0.013
	(0.011)	(0.011)	(0.011)				(0.011)	(0.016)
Senior Boss				0.022**	0.023***	0.021**	0.021**	0.017*
				(0.008)	(0.008)	(0.008)	(0.008)	(0.009)
Immediate and Senior Boss								0.027
								(0.023)
Demographic and College Admissions Selectivity	NO	YES	YES	NO	YES	YES	YES	YES
Deployment Time and Unit Controls	NO	NO	YES	NO	NO	YES	YES	YES
Observations	14,760	14,760	14,760	14,760	14,760	14,760	14,760	14,760
R-squared	0.049	0.072	0.073	0.049	0.072	0.073	0.073	0.073

	Panel B. Time with Strong Leader				
	Immediate Boss			Senior Boss	
	(1)	(2)		(3)	(4)
Control Mean	0.494			0.486	
Months with Strong Leader	0.002**			0.002***	
	(0.001)			(0.001)	
1-6 Months with Strong Leader		0.020			0.003
		(0.025)			(0.017)
6-12 Months with Strong Leader		0.027*			0.022**
		(0.014)			(0.010)
12+ Months with Strong Leader		0.031			0.028**
		(0.022)			(0.012)
Demographic and College Admissions Selectivity	YES	YES		YES	YES
Deployment Time and Unit Controls	YES	YES		YES	YES
Observations	14,760	14,760		14,760	14,760
R-squared	0.072	0.073		0.073	0.073

NOTE. – This table reports coefficient estimates of officer retention at 8 years of service on serving under a strong leader (either immediate, senior, or both). See Equation 1. All regressions include a constant and controls for military occupation, source of commissioning, location, special units, and year of commissioning. Additional controls are added to the specifications as follows: Panel A Columns 2 and 5 add race, marriage at 3 years of service, SAT quartile, undergraduate selectiveness; Panel A Columns 3 and 6 add deployment at 3 years of service and unit type. Panel A Columns 7 and 8 and all columns in Panel B include all controls. See Appendix 1 for a complete description of sample selection and variables. The first row of each panel reports the control mean retention rates for those who did not have a strong leader (either immediate, senior, or both) as a boss. Robust standard errors are in parentheses. *Statistically significant at the .10 level; ** at the .05 level; *** at the .01 level.

Table 5: Retention at 8 Years of Service, by Race

	Panel A. Immediate Boss					
	All	White	Black	Non-White/ Non-Black	All	All
	(1)	(2)	(3)	(4)	(5)	(6)
Control Mean	0.49	0.47	0.62	0.54	0.49	0.49
Strong Leader	0.027**	0.027**	0.069*	-0.004	0.030**	0.027**
	(0.011)	(0.013)	(0.038)	(0.034)	(0.013)	(0.013)
Black					0.099***	0.043
					(0.016)	(0.365)
Non-White / Non-Black					0.045***	0.474
					(0.013)	(0.433)
Strong Leader * Black					0.021	0.042
					(0.039)	(0.039)
Strong Leader * Non-White / Non-Black					-0.046	-0.031
					(0.035)	(0.036)
Observations	14,760	11,560	1,347	1,853	14,760	14,760
R-squared	0.073	0.064	0.127	0.106	0.073	0.082
	Panel B. Senior Boss					
	All	White	Black	Non-White/ Non-Black	All	All
	(1)	(2)	(3)	(4)	(5)	(6)
Control Mean	0.49	0.46	0.63	0.53	0.49	0.442
Strong Leader	0.021**	0.022**	-0.009	0.026	0.023**	0.022**
	(0.008)	(0.009)	(0.028)	(0.024)	(0.009)	(0.010)
Black					0.113***	0.016
					(0.018)	(0.363)
Non-White / Non-Black					0.037**	0.447
					(0.016)	(0.438)
Strong Leader * Black					-0.027	-0.031
					(0.028)	(0.029)
Strong Leader * Non-White / Non-Black					0.003	0.004
					(0.025)	(0.026)
Observations	14,760	11,560	1,347	1,853	14,760	14,760
R-squared	0.073	0.064	0.125	0.107	0.073	0.082

NOTE. – This table reports coefficient estimates of junior officer retention at 8 years of service on serving under a strong leader (either immediate or senior) when conditioning on demographic subgroups, as denoted in the column titles. All regressions include a constant and controls for military occupation, source of commissioning, location, and year of commissioning, as well as officer demographics: SAT score, college admissions selectivity, cumulative months deployed at 3 years of service, and unit controls. Column 6 includes interations between all variables and both black and non-white/non-black. See Appendix 1 for a complete description of sample selection and variables. The first row of each panel reports the control mean retention rates for those who did not have a strong leader (either immediate or senior) as a boss. Robust standard errors are in parentheses. *Statistically significant at the .10 level; ** at the .05 level; *** at the .01 level.

Table 6. Retention at 8 Years of Service, by SAT Score

Panel A. Immediate Boss

	All	All, Not Missing SAT	SAT 0-50 Percentile	SAT 50-100 Percentile	All, Not Missing SAT	
	(1)	(2)	(3)	(4)	(5)	(6)
Control Mean	0.494	0.455	0.493	0.420	0.455	0.455
Strong Leader	0.027**	0.022*	0.022	0.022	0.017	0.021
	(0.011)	(0.013)	(0.020)	(0.018)	(0.020)	(0.020)
SAT 50-100 Percentile					0.002	0.517*
					(0.012)	(0.264)
SAT 50-100 Percentile x Strong Leader					0.010	-0.000
					(0.026)	(0.027)
Observations	14,760	10,725	5,102	5,623	10,725	10,725
R-squared	0.073	0.070	0.074	0.075	0.069	0.078

Panel B. Senior Boss

	All	All, Not Missing SAT	SAT 0-50 Percentile	SAT 50-100 Percentile	All, Not Missing SAT	
	(1)	(2)	(3)	(4)	(5)	(6)
Control Mean	0.486	0.442	0.486	0.402	0.442	0.442
Strong Leader	0.021**	0.026***	0.018	0.033**	0.008	0.018
	(0.008)	(0.010)	(0.014)	(0.014)	(0.014)	(0.014)
SAT 50-100 Percentile					-0.011	0.513*
					(0.014)	(0.263)
SAT 50-100 Percentile x Strong Leader					0.033*	0.015
					(0.019)	(0.020)
Observations	14,760	10,725	5,102	5,623	10,725	10,725
R-squared	0.073	0.071	0.074	0.076	0.070	0.078

NOTE. – This table reports coefficient estimates of junior officer retention at 8 years of service on serving under a strong leader (either immediate or senior) when conditioning on demographic subgroups, as denoted in the column titles. All regressions include a constant and controls for military occupation, source of commissioning, location, and year of commissioning, as well as officer demographics: SAT score, college admissions selectivity, cumulative months deployed at 3 years of service, and unit controls. Column 6 includes interactions with all variables and being in the top half of the SAT percentile. See Appendix 1 for a complete description of sample selection and variables. The first row of each panel reports the control mean retention rates for those who did not have a strong leader (either immediate or senior) as a boss. Robust standard errors are in parentheses. *Statistically significant at the .10 level; ** at the .05 level; *** at the .01 level.

Table 7. Interactions with Type and Strong Leader for Immediate Bosses

	All				All, Not Missing SAT	
	(1)	(2)	(3)	(4)	(5)	(6)
		0.499				0.499
Jr. Officer is White	-0.079***	-0.080***				
	(0.025)	(0.026)				
Boss is White	-0.002	-0.005				
	(0.023)	(0.024)				
Boss is Strong Leader		-0.015				
		(0.062)				
Jr. Officer is White x Boss is White	0.018	0.017				
	(0.027)	(0.028)				
Jr. Officer is White x Boss is Strong Leader		0.019				
		(0.068)				
Boss is White x Boss is Strong Leader		0.032				
		(0.067)				
Jr. Officer is White x Boss is White x Boss is a Strong Leader		-0.002				
		(0.074)				
Jr. Officer is West Point Grad			-0.005	-0.011		
			(0.011)	(0.012)		
Boss is West Point Grad			-0.058	-0.054		
			(0.124)	(0.123)		
Boss is Strong Leader				0.023		
				(0.016)		
Jr. Officer is WP Grad x Boss is WP Grad			0.052***	0.047**		
			(0.019)	(0.021)		
Jr. Officer is WP Grad x Boss is Strong Leader				-0.037		
				(0.031)		
Boss is WP Grad x Boss is Strong Leader				0.025		
				(0.028)		
Jr. Officer is WP Grad x Boss is WP Grad x Boss is a Strong Leader				0.046		
				(0.051)		
Jr. Officer has Above Median SAT Score					-0.003	-0.000
					(0.017)	(0.017)
Boss has Above Median SAT Score					0.008	0.002
					(0.012)	(0.013)
Boss is Strong Leader						0.001
						(0.024)
Jr. Officer has Above Median SAT Score x Boss has Above Median SAT Score					0.011	0.002
					(0.019)	(0.020)
Jr. Officer has Above Median SAT Score x Boss is Strong Leader						0.042
						(0.031)
Boss has Above Median SAT Score x Boss is Strong Leader						-0.019
						(0.038)
Jr. Officer has Above Median SAT Score x Boss has Above Median SAT Score x Boss is a Strong Leader						0.061
						(0.049)
Observations	14,760	14,760	14,760	14,760	11,270	11,270
R-squared	0.072	0.072	0.072	0.072	0.077	0.079
F-Test 1	13.38	6.64	2.79	2.53	0.68	2.58
p-value	0.00	0.00	0.04	0.01	0.56	0.01
F-Test 2	0.82	1.38	4.15	2.94	0.97	3.00
p-value	0.44	0.22	0.02	0.01	0.38	0.01

NOTE. – This table reports coefficient estimates of junior officer retention at 8 years of service on serving under an immediate boss with various characteristics. All regressions include a constant and controls for military occupation, source of commissioning, location, and year of commissioning, as well as officer demographics: SAT score, college admissions selectivity, cumulative months deployed at 3 years of service, and unit controls. The first row of each panel reports the mean retention rates. Robust standard errors are in parentheses. F-Test 1 represents an F-Test of all of the variables with coefficients in the rows above. F-Test 2 represents an F-Test for all variables with coefficients shown except the first one (Jr. Officer is White, Jr. Officer is West Point Grad, or Jr. Officer has Above Median SAT score, respectively). *Statistically significant at the .10 level; ** at the .05 level; *** at the .01 level.

Table 8. Interactions with Type and Strong Leader for Senior Bosses

	All				All, Not Missing SAT	
	(1)	(2)	(3)	(4)	(5)	(6)
		0.499				0.503
Jr. Officer is White	-0.047	-0.062**				
	(0.029)	(0.032)				
Boss is White	0.009	-0.014				
	(0.028)	(0.031)				
Boss is Strong Leader		-0.071				
		(0.049)				
Jr. Officer is White x Boss is White	-0.019	-0.006				
	(0.031)	(0.034)				
Jr. Officer is White x Boss is Strong Leader		0.076				
		(0.054)				
Boss is White x Boss is Strong Leader		0.093*				
		(0.051)				
Jr. Officer is White x Boss is White x Boss is a Strong Leader		-0.070				
		(0.057)				
Jr. Officer is West Point Grad			-0.003	-0.010		
			(0.011)	(0.014)		
Boss is West Point Grad			-0.045	-0.060		
			(0.122)	(0.123)		
Boss is Strong Leader				0.007		
				(0.012)		
Jr. Officer is WP Grad x Boss is WP Grad			0.015	0.002		
			(0.019)	(0.024)		
Jr. Officer is WP Grad x Boss is Strong Leader				0.030		
				(0.022)		
Boss is WP Grad x Boss is Strong Leader				0.015		
				(0.020)		
Jr. Officer is WP Grad x Boss is WP Grad x Boss is a Strong Leader				0.017		
				(0.036)		
Jr. Officer has Above Median SAT Score					-0.049**	-0.084***
					(0.024)	(0.028)
Boss has Above Median SAT Score					0.016	0.004
					(0.018)	(0.023)
Boss is Strong Leader						-0.004
						(0.025)
Jr. Officer has Above Median SAT Score x Boss has Above Median SAT Score					0.022	0.037
					(0.027)	(0.033)
Jr. Officer has Above Median SAT Score x Boss is Strong Leader						0.073**
						(0.036)
Boss has Above Median SAT Score x Boss is Strong Leader						0.028
						(0.031)
Jr. Officer has Above Median SAT Score x Boss has Above Median SAT Score x Boss is a Strong Leader						-0.039
						(0.046)
Observations	14,760	14,760	14,760	14,760	5,765	5,765
R-squared	0.071	0.072	0.071	0.072	0.079	0.08
F-Test 1	13.36	7.17	0.27	1.66	2.51	2.64
p-value	0.00	0.00	0.85	0.11	0.06	0.01
F-Test 2	0.27	1.76	0.35	1.90	1.88	2.33
p-value	0.76	0.10	0.71	0.08	0.15	0.03

NOTE. – This table reports coefficient estimates of junior officer retention at 8 years of service on serving under a senior boss with various characteristics. All regressions include a constant and controls for military occupation, source of commissioning, location, and year of commissioning, as well as officer demographics: SAT score, college admissions selectivity, cumulative months deployed at 3 years of service, and unit controls. The first row of each panel reports the mean retention rates. Robust standard errors are in parentheses. F-Test 1 represents an F-Test of all of the variables with coefficients in the rows above. F-Test 2 represents an F-Test for all variables with coefficients shown except the first one (Jr. Officer is White, Jr. Officer is West Point Grad, or Jr. Officer has Above Median SAT score, respectively). *Statistically significant at the .10 level; ** at the .05 level; *** at the .01 level.

Table 9. Retention at 12 Years of Service for Immediate Bosses

	Panel A. Senior Boss						
	All				Men Only		
	(1)	(2)	(3)		(4)	(5)	(6)
Control Mean		0.876				0.882	
Strong Leader	0.024***	0.024***	0.023***		0.022***	0.021**	0.021**
	(0.008)	(0.008)	(0.008)		(0.008)	(0.008)	(0.008)
Demographic, College Admissions Selectivity, Unit, and Location Controls	NO	YES	YES		NO	YES	YES
Designated as Strong Leader	NO	NO	YES		NO	NO	YES
Observations	6,872	6,872	6,872		6,385	6,385	6,385
R-squared	0.018	0.022	0.025		0.019	0.022	0.025

	Panel B. All						
	All	White	Black	Non-White/ Non-Black	All, Not Missing SAT	SAT 0-50 Percentile	SAT 50-100 Percentile
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Control Mean	0.876	0.873	0.902	0.873	0.869	0.877	0.861
Strong Leader	0.023***	0.024***	0.014	0.012	0.028***	0.017	0.039***
	(0.008)	(0.009)	(0.024)	(0.029)	(0.010)	(0.014)	(0.014)
Demographic, College Admissions Selectivity, Unit, and Location Controls	YES	YES	YES	YES	YES	YES	YES
Designated as Strong Leader	YES	YES	YES	YES	YES	YES	YES
Observations	6,872	5,356	794	722	4,709	2,338	2,371
R-squared	0.025	0.029	0.092	0.115	0.034	0.048	0.055

	Panel C. Only Men						
	All	White	Black	Non-White/ Non-Black	All, Not Missing SAT	SAT 0-50 Percentile	SAT 50-100 Percentile
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Control Mean	0.882	0.878	0.908	0.884	0.873	0.884	0.861
Strong Leader	0.021**	0.023**	0.014	0.010	0.024**	0.011	0.039***
	(0.008)	(0.009)	(0.027)	(0.030)	(0.010)	(0.015)	(0.014)
Demographic, College Admissions Selectivity, Unit, and Location Controls	YES	YES	YES	YES	YES	YES	YES
Designated as Strong Leader	YES	YES	YES	YES	YES	YES	YES
Observations	6,385	5,068	658	659	4,389	2,145	2,244
R-squared	0.025	0.031	0.092	0.115	0.036	0.052	0.057

NOTE. – Table reports coefficient estimates of retention based on serving under a boss who is a strong leader where the employee is now the immediate bosses from Tables 3-6. Coefficients are estimated from the main regression specification (Equation 1) where the outcome of interest is now retention at 12 years of service. All regressions include a constant and controls for military occupation, source of commissioning, location, and year of commissioning. Additional controls are included as noted. In Panel A, Columns 1 through 3 report the impact of ever having a strong leader as a boss for our sample, while columns 4-6 report the same estimates for the subsample of just males. Panel B reports the same results by demographic. Panel C replicates the specifications in Panel B, but for males only. See Appendix 1 for a complete description of sample selection and variables. The first row of each panel reports the control mean retention rates for those who did not have a boss who was a strong leader. Robust standard errors are in parentheses. *Statistically significant at the .10 level; ** at the .05 level; *** at the .01 level.

Appendix Table 1: Junior Officer Retention at 8 Years of Service using Probit Analysis

	Panel A. Ever Had Strong Leader							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Control Mean	0.494	0.494	0.494	0.486	0.486	0.486	0.483	0.495
Immediate Boss	0.025** (0.011)	0.028** (0.011)	0.026** (0.011)				0.025** (0.011)	0.012 (0.016)
Senior Boss				0.022** (0.008)	0.023*** (0.008)	0.021** (0.008)	0.020** (0.008)	0.016* (0.009)
Immediate and Senior Boss								0.027 (0.023)
Demographic and College Admissions Selectivity	NO	YES	YES	NO	YES	YES	YES	YES
Deployment Time and Unit Controls	NO	NO	YES	NO	NO	YES	YES	YES
Observations	14,753	14,753	14,753	14,753	14,753	14,753	14,753	14,753

	Panel B. Time with Strong Leader			
	Immediate Boss		Senior Boss	
	(1)	(2)	(3)	(4)
Control Mean	0.494		0.486	
Months with Strong Leader	0.002** (0.001)		0.002*** (0.001)	
1-6 Months with Strong Leader		0.019 (0.025)		0.003 (0.017)
6-12 Months with Strong Leader		0.027* (0.014)		0.022** (0.010)
12+ Months with Strong Leader		0.031 (0.022)		0.028** (0.012)
Demographic and College Admissions Selectivity	YES	YES	YES	YES
Deployment Time and Unit Controls	YES	YES	YES	YES
Observations	14,753	14,753	14,753	14,753

NOTE. – This table reports coefficient estimates of officer retention at 8 years of service on serving under a strong leader (either immediate, senior, or both) using Probit Analysis. All regressions include a constant and controls for military occupation, source of commissioning, location, special units, and year of commissioning. Additional controls are added to the specifications as follows: Panel A Columns 2 and 5 add race, marriage at 3 years of service, SAT quartile, undergraduate selectiveness; Panel A Columns 3 and 6 add deployment at 3 years of service and unit type. Panel A Columns 7 and 8 and all columns in Panel B include all controls. See Appendix 1 for a complete description of sample selection and variables. The first row of each panel reports the control mean retention rates for those who did not have a strong leader (either immediate, senior, or both) as a boss. Robust standard errors are in parentheses. *Statistically significant at the .10 level; ** at the .05 level; *** at the .01 level.

Appendix Table 2: Junior Officer Retention at 8 Years of Service, Clustering on Bosses

Panel A. Ever Had Strong Leader

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Control Mean	0.494	0.494	0.494	0.486	0.486	0.486	0.483	0.495
Immediate Boss	0.026**	0.028**	0.027**				0.026**	0.013
	(0.012)	(0.011)	(0.012)				(0.011)	(0.016)
Senior Boss				0.022**	0.023**	0.021**	0.021**	0.017*
				(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Immediate and Senior Boss								0.027
								(0.023)
Demographic and College Admissions Selectivity	NO	YES	YES	NO	YES	YES	YES	YES
Deployment Time and Unit Controls	NO	NO	YES	NO	NO	YES	YES	YES
Observations	14,760	14,760	14,760	14,760	14,760	14,760	14,760	14,760
R-squared	0.049	0.072	0.073	0.049	0.072	0.073	0.073	0.073
Number of Clusters	10,314	10,314	10,314	4,294	4,294	4,294	11,316	11,316

Panel B. Time with Strong Leader

	Immediate Boss		Senior Boss	
	(1)	(2)	(3)	(4)
Control Mean	0.494		0.486	
Months with Strong Leader	0.002**		0.002**	
	(0.001)		(0.001)	
1-6 Months with Strong Leader		0.020		0.003
		(0.026)		(0.017)
6-12 Months with Strong Leader		0.027*		0.022**
		(0.014)		(0.011)
12+ Months with Strong Leader		0.031		0.028**
		(0.023)		(0.013)
Demographic and College Admissions Selectivity	YES	YES	YES	YES
Deployment Time and Unit Controls	YES	YES	YES	YES
Observations	14,760	14,760	14,760	14,760
R-squared	0.072	0.073	0.073	0.073
Number of Clusters	10,314	10,314	4,294	4,294

NOTE. – This table reports coefficient estimates of officer retention at 8 years of service on serving under a strong leader (either immediate, senior, or both) while clustering for unique boss groups. All regressions include a constant and controls for military occupation, source of commissioning, location, special units, and year of commissioning. Additional controls are added to the specifications as follows: Panel A Columns 2 and 5 add race, marriage at 3 years of service, SAT quartile, undergraduate selectiveness; Panel A Columns 3 and 6 add deployment at 3 years of service and unit type. Panel A Columns 7 and 8 and all columns in Panel B include all controls. See Appendix 1 for a complete description of sample selection, variables, and clustering method. The first row of each panel reports the control mean retention rates for those who did not have a strong leader (either immediate, senior, or both) as a boss. Clustered standard errors are in parentheses. *Statistically significant at the .10 level; ** at the .05 level; *** at the .01 level.

Appendix Table 3. Summary Statistics of Company Commanders

	Previous Sample		New Sample		New Sample, Men Only	
	Officers **without** a "Strong" Boss	Officers **with** a "Strong" Boss	Officers **without** a "Strong" Boss	Officers **with** a "Strong" Boss	Officers **without** a "Strong" Boss	Officers **with** a "Strong" Boss
	(1)	(2)	(3)	(4)	(5)	(6)
Female (%)	8.2	5.0	8.5	5.2	0.0	0.0
Retain at 12 (%)	87.5	89.7	87.5	90.1	88.1	90.2
Missing Retain at 12 (%)	1.3	1.6	0.0	0.0	0.0	0.0
Strong Leader (%)	9.3	11.4	9.9	11.7	10.2	11.7
White (%)	76.7	80.2	76.2	80.3	77.9	81.3
Black (%)	12.7	9.9	12.9	9.8	11.3	9.0
Non-White / Non-Black (%)	10.6	9.9	10.9	9.9	10.7	9.8
SAT	1108.25 (177.80)	1124.30 (174.47)	1113.69 (176.45)	1130.78 (173.89)	1116.60 (175.77)	1132.96 (173.85)
Missing SAT (%)	34.6	31.5	32.8	29.6	32.5	29.6
Peterson Non-Selective (%)	4.7	4.0	4.5	3.6	4.5	3.6
Peterson Minimally Selective (%)	9.3	8.7	9.0	8.3	8.7	8.3
Peterson Moderately Selective (%)	55.1	52.2	54.1	51.2	54.3	51.3
Peterson Most/Very Selective (%)	28.3	33.0	29.6	34.7	29.7	34.8
Peterson Missing (%)	2.6	2.1	2.7	2.1	2.7	2.0
USMA (%)	18.8	23.0	19.9	24.8	20.1	25.0
ROTC Scholar (%)	36.0	33.4	36.4	33.4	35.8	33.0
ROTC Non-Scholar (%)	32.0	31.9	30.1	30.0	30.8	30.0
Other SOC (%)	13.3	11.6	13.6	11.8	13.3	12.0
Division Unit (%)	58.6	70.6	59.2	71.8	62.0	74.0
Combat Non-Division (%)	11.8	13.0	11.7	12.5	11.7	12.1
Other Unit (%)	29.6	16.4	29.0	15.7	26.3	13.9
N	4,540	3,328	3,964	2,908	3,627	2,758

NOTE. – This table reports mean characteristics of the immediate bosses in our sample who did and did not have strong leaders as their boss. In Columns 1 and 2, we show the sample of captains that were immediate bosses in Tables 3-6. In Columns 3 and 4 we drop individuals where we are missing retention information and further condition on being in the Army for 4 to 8 years at the time of being the boss. In Columns 5 and 6, we further restrict to only men. Explations of the variables can be found in Appendix 1. Standard deviations of continuous variables are in parentheses.

Appendix 1

Sample Qualification Rules

The Army commissions officers from a number of different sources. Between 1994 and 2005, the United States Military Academy (USMA) produced roughly 17 percent of officers commissioned into the active duty Army. The Reserve Officer Training Corps (ROTC) offered programs at more than 270 colleges and universities and produced another 56 percent. Some ROTC cadets receive no scholarship support from the Army and are referred to as ROTC non-scholars. All other ROTC cadets receive scholarships covering from 2 to 4 years, with 4-year scholarships being the most competitive. The remaining 27 percent of active duty officers commissioned into the Army from the following sources: Officer Candidate School (OCS), roughly 11.5 percent; direct commissions, roughly 7 percent; or other sources, 8.5 percent. Officers commissioned through OCS are disproportionately former enlisted personnel with 10 or more years of active duty service, so they are typically older and have lower educational attainment than officers from other commissioning sources. Officers receiving direct commissions are health care professionals, lawyers, and chaplains; they enter the Army with advanced rank (first lieutenant or captain) and are subject to different active duty service obligations and promotion timetables. As a result, we drop all OCS, direct commission and other source of commission officers from our sample of junior officers.

Within the combat arms branches, women were restricted from serving in certain occupations and positions. As a result, we restrict our sample of junior officers to include only male officers.

Officers in the Army initially serve in one of sixteen occupational branches: Air Defense Artillery, Adjutant General, Armor, Aviation, Chemical Corps, Engineers, Field Artillery,

Finance, Infantry, Military Intelligence, Military Police, Medical Services, Ordnance, Quartermaster, Signal Corps, and Transportation Corps. We exclude officers in the Aviation and Medical Services branches from our analysis as they have longer initial active duty service obligations.

We further condition our sample on officers who have complete information on both time serving as a platoon leader and junior and senior boss quality. Column 1 of Table 2 reports summary statistics for the 19,774 male officers who were commissioned from USMA or ROTC. For roughly 25 percent of our Column 1 officers, we have incomplete information on an individual's unit (198 observations); are unable to link platoon leader junior officers to their company commander (immediate) and battalion commander (senior) boss (1,043 observations); are missing the race of the boss (33); or we are missing boss' high-performance indicator (early promotion to major) (3,740). For 1,842 of these observations, the performance indicator is missing because the immediate boss did not remain in the Army long enough to be considered for early promotion to major. Our final sample consists of 14,760 lieutenants who served as platoon leaders and could be linked to their company and battalion commanders. As Columns 1 and 2 of Table 2 demonstrate, our selected sample of lieutenant junior officers is comparable to the pool of lieutenants from which it is drawn on all observables.

Control Variable Descriptions

Married: We coded Lieutenants (junior officers) as married if they were ever married during their first three years in service.

SAT: We include SAT quartiles in the regressions as controls. As shown in Tables 1 and 2, a large percentage of officers have missing SAT scores. While SAT scores are recorded for all individuals attending the United States Military Academy and most with ROTC 3-4 year

scholarships, they are not always recorded for other sources of commission, 2 year ROTC scholars and ROTC non-scholars. Officers who reported ACT scores have this score converted to an SAT score using a concordance table. (Schneider and Dorans 1999)

Undergraduate Admissions Selectivity: We use *Peterson's Annual Guides to Undergraduate Study: Four-Year Colleges* from 1983-1984 to 2004-2005 to control for the admissions selectivity of the college from which an officer graduated. Those bosses commissioned prior to 1984 are assigned the 1983-1984 Peterson ranking. The admissions selectivity categories are defined as follows: Noncompetitive (virtually all accepted), Minimally Difficult (95% or more accepted), Moderately Difficult (85% or fewer applicants accepted), Very Difficult (60% or fewer applicants accepted), and Most Difficult (30% or fewer applicants accepted). USMA graduates are in the Most Difficult category.

Source of Commission: In each regression we include controls for those who graduate from USMA, those with a 3-4 year ROTC scholarship, those with a 2 year ROTC scholarship, and those with no scholarship but who participated in the ROTC commissioning program (ROTC non-scholars).

Deployment Time: Months deployed is calculated at 3 years of service and measures the cumulative time officers have served in a combat zone since receiving their commission.

Commissioning Year: Since the Army manages officers by cohort, we include controls for the year in which a lieutenant was commissioned. Lieutenants in our sample were commissioned in the calendar years 1994 through 2005 and served as platoon leaders at some time between fiscal years 1998 and 2008.

Military Occupation: We include branch controls as listed in the Sample Qualification section.
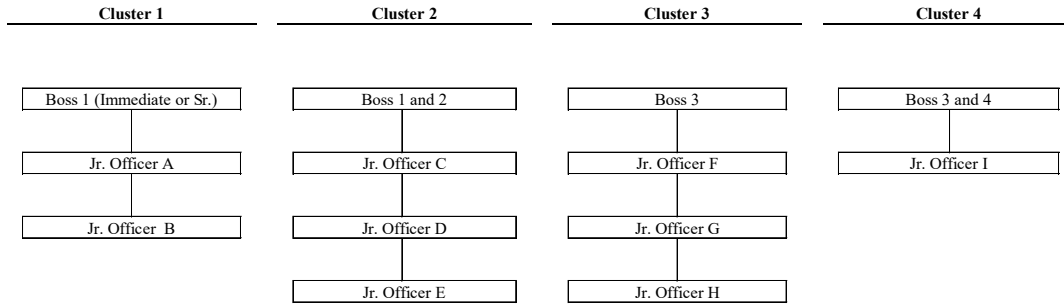
Unit: Our unit controls are based on 5-digit Troop Program Sequence Numbers (TPSNs), from which we construct indicators for divisional units (e.g. First Armored Division, Fourth Infantry Division) and non-divisional combat units (e.g. 173rd Airborne Brigade, 3rd Armored Cavalry Regiment).[22] Lieutenants who are about to become platoon leaders are assigned to a particular post, and then assigned to a unit at that post. Within that unit, they are assigned to a brigade, battalion, and company, and then placed in charge of a particular platoon.

Correcting Standard Errors for Clustering by Boss

Junior officers could share the same set of junior and senior boss, so we may be concerned about correlated shocks across junior officers which robust standard errors would not correct. In Appendix Table 2 we report results where we cluster standard errors at the junior, senior, and junior and senior levels. For example: if two junior officers each had the same two junior boss (regardless of duration spent with each), they would be in the same cluster; if a junior officer only had one junior boss, then he/she would only be in a cluster with those who also only had that same junior boss; and so on. The same would be true for senior boss. We depict this relationship in Figure A1. For panel C, we create clusters for unique junior and senior combinations. Again, we ignore duration spent with each boss, but cluster based on common boss groups. We depict this relationship in Figure A2.

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[22] For further information on Troop Program Sequence Numbers, see Army Regulation 25-70 (2000).

Appendix Figure 1: Clustering Groups for Junior or Senior Boss

Cluster 1	Cluster 2	Cluster 3	Cluster 4
Boss 1 (Immediate or Sr.)	Boss 1 and 2	Boss 3	Boss 3 and 4
Jr. Officer A	Jr. Officer C	Jr. Officer F	Jr. Officer I
Jr. Officer B	Jr. Officer D	Jr. Officer G	
	Jr. Officer E	Jr. Officer H	

Appendix Figure 2: Clustering Groups for Junior and Senior Boss

Cluster 1	Cluster 2	Cluster 3	Cluster 4
Senior Boss 1	Senior Bosses 1 and 2	Senior Boss 2	Senior Boss 3
Immediate Boss 1	Immediate Bosses 1 and 2	Immediate Bosses 1 and 2	Immediate Boss 3
Jr. Officer A	Jr. Officer C	Jr. Officer E	Jr. Officer F
Jr. Officer B	Jr. Officer D		Jr. Officer G
			Jr. Officer H