Most Likely to Succeed: Personality and Long-Run Achievement*

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ABSTRACT

We estimate the relationship between college seniors' personality traits and long-run outcomes using a novel data set that merges information from the 1980 – 1984 West Point yearbooks with detailed alumni records. Personality traits were inferred from faculty-conferred distinctions and peer-authored yearbook narratives. West Point alumni from outside the sample characterized each subject as possessing a trait based on their readings of the narratives. Multiple reports were aggregated using a Latent Class Model. We find that students recognized as leaders, determined, or social prove to be more successful in military and civilian careers and economic outcomes 31-35 years after graduation. JEL Codes: J01, J24.

I. Introduction

Recent work in economics has drawn attention to the importance of personality – also referred to as non-cognitive skills, character skills, or soft skills, depending on the context - in the labor market. Autor, Levy, and Murnane (2003) and Deming (2015) emphasize that the technological change of the last several decades has increased the demand for workers with both strong cognitive skills and the non-cognitive skills associated with high-level decision-making and communication. That is, workers who possess certain personality traits are better poised to succeed in an economy undergoing a significant change.[1]

A separate literature considers the role of personality in explaining human capital and labor market outcomes at the individual level. Heckman and co-authors, in their work on the Perry Preschool Project and on the earnings of GED recipients, infer that character skills have effects on outcomes independent of effects of cognitive skills (e.g., Heckman and Rubenstein 2001, Heckman et al. 2010, Heckman, Pinto, and Savelyev 2013). There are also papers that directly estimate the effects of personality traits on outcomes using personality measures derived from standardized inventories, brief interviews or retrospective reports. [2]

We estimate the effects of personality traits on long-run career and economic success. However, unlike other research, our measures of traits are derived from material supplied by individuals – college peers and instructors - who observed subjects over an extended period of time in a natural environment. The data on traits are merged with independently-measured data

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[1] Following Roberts (2009) we use the term "personality" and "traits" more broadly than used in the psychology literature on the Five Factor Model of personality. We discuss this point more in Section III.

[2] Surveys are included in Bowles, Gintis, and Osborne (2001), M. O. Groves (2005), Borghans et al. (Borghans et al. 2008), Brunello and Schlotter (2011), and Lindqvist and Vestman (2011).

on outcomes realized decades later. As a result our exercise more closely approximates the real-world problem of predicting the life course of a young person based on information available by the time of college graduation.

Specifically, we test whether peer-written narratives and faculty-conferred distinctions reported in college yearbooks convey information on the traits associated with long-run career and economic success. The context of our study is the United States Military Academy at West Point, a four-year college where cadets (students) are trained to be Army officers. We combine information from the 1980 – 84 West Point yearbooks with alumni records provided by the West Point Association of Graduates to generate a unique data set with unusually detailed information on college students' traits and their outcomes as of 2015; that is, between 31 and 35 years after graduation.

This paper falls into a literature in economics that exploits institutional features of military academies to answer questions beyond the Academy context. For instance, randomization of cadets to companies or classes at West Point or the Air Force makes it possible to estimate peer effects and teacher effects without concern about selection bias.[3]

West Point setting offers several advantages for our exercise. The first has to do with the relationship between the reporters and the subjects. Students are typically exogenously assigned to cadet companies and roommates for a period of two years and required to interact closely with these peers. In the period we study, cadets were required to have most meals and engage in a

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[3] See Lyle (2007, 2009), Carrell, Malmstrom, and West (2008), Carrell, Fullerton, and West (2009), Carrell, Hoekstra, and West (2011), and Carrell, Sacerdote, and West (2013) on peer effects and Carrell, Page, and West (2010) and Carrell and West (2008) on teacher effects.

variety of extracurricular activities together. Faculty assigned to each company monitor cadets closely. As a result, the faculty and peer reporters know their subjects well.

Second, the trait data can be merged with a rich set of alumni records that allow us to observe military and civilian success more than three decades after graduation. This gives us a rare opportunity to look at long-run effects without concern of recall bias. The data appear to be well-updated and as a result attrition bias is minimal.

Third, economists have noted that workers with both strong cognitive and non-cognitive skills are increasingly rewarded in the new economy (Autor, Levy, and Murnane 2003, Deming 2015). Because our population all has strong cognitive skills, we are able to focus on the value added of various non-cognitive skills

While we consider several traits, we concentrate on the role of leadership. One reason is that we study military academy graduates specifically trained for leadership roles. A second reason is that many of our key outcomes, such as attainment of high military rank or an Executive position in the private sector, are senior leadership positions. Finally, leadership skills are in high demand in the labor market, particularly among individuals such as West Point graduates with strong cognitive skills.

We find that leadership distinctions awarded by faculty, and personality traits derived from peer-written narratives are quantitatively and statistically significant predictors of success in the military and civilian sectors. The three most revealing traits suggested by the narratives are *Leadership*, *Determination,* and *Sociability. Leaders* spend more time in the Army, attain higher ranks overall, and are more likely to reach the very highest ranks in the Army and in the private sector. They achieve greater economic success as measured by home value in their ZIP code of residence. *Determination* is a favorable trait as well. The effect of *Sociability* is non-monotonic:

Social cadets are less likely to become Colonels. However, they are more likely to become Generals and Executives and they live in higher-income and home value ZIP codes.

Section II of the paper describes key features of the West Point context and Section III discusses the related economics literature on personality. Section IV describes the data. The results are presented in Section V, and Section VI concludes.

II. West Point[4]

The United States Military Academy at West Point is a four-year college that trains cadets (students) to be Army officers. New graduates are commissioned as Second Lieutenants in the Army and are committed to five years of service. West Point produces about 15 percent of new Army officers each year, and about 35 percent of Generals currently serving in the Army are West Point Graduates.[5]

Character and leadership are critical traits at the core of the Academy's mission, which is:

> "To educate, train, and inspire the Corps of Cadets so that each graduate is a commissioned leader of character committed to the values of Duty, Honor, Country and prepared for a career of professional excellence and service to the Nation as an officer in the United States Army."

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[4] Portions of Sections 2 and 4 are drawn from Huntington-Klein and Rose (2014).
[5] United States Department of Defense (2011), Table B-30 on new commissions by source; http://www.west-point.org/class/usma1979/old/go.pdf. We use the terms "General" or "General Officer" in the text to refer to the ranks Brigadier General, Major General, Lieutenant General and (full) General.

Entry is highly competitive. In a recent class, 11 percent of new entrants were high school valedictorians or salutatorians, and the average SAT score for the group was in the 87th percentile of all takers.[6] Criteria for admission include athletic and leadership performance as well as academics. Tuition is free and cadets receive a stipend to cover personal expenses. In the period we study, all cadets graduated with a Bachelor of Science in Engineering.

The Corps of Cadets (i.e., the student body) is organized in a command structure similar to the Army. Each cadet is assigned to one of 36 companies composed of about 30 members from each of the four classes, for a total of about 120 cadets per company. Assignment to companies and roommates is essentially random (Lyle 2007, 2009). There are three companies in a Battalion, three Battalions in a Regiment and four Regiments within the Corps.

Plebes (i.e., freshman) begin at the cadet rank of Private. About one quarter attain the maximum rank of Captain by the time of graduation.[7] Each company is assigned a faculty Tactical Officer, a member of the Tactical Department faculty, who guides and evaluates the cadets in military science and leadership. The Tactical Officers assign cadet ranks and appoint those with stronger leadership skills to staff positions. The staff positions we consider are - in increasing order of significance - Battalion, Assistant Brigade, Regimental and Brigade Staff.

The program is physically and academically rigorous and cadets are monitored closely by faculty and more senior cadets. Cadets within a company come to know each other well. In the period we study, they lived together, engaged in various extracurricular activities together, and

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[6] http://www.usma.edu/admissions/SitePages/Class%20Profiles.aspx
[7] There is no direct relationship between cadet rank at West Point and Army rank attained.

ate virtually all meals together.[8] Cadets have far less opportunity to interact with the outside world than do other college students. A pass is required to go off campus and opportunities to entertain visitors are very limited. In the days before email and cell phones, the only means for cadets to contact friends and family elsewhere was through the mail or a pay phone in the hallway.

A variety of formal and informal rules guide cadets' interactions in virtually every aspect of their lives. Cadets are essentially soldiers who are officially required to follow many military regulations. They must wear their uniforms properly, have their rooms in a prescribed order, and salute officers. There are many unofficial rituals as well. Under the "fourth class system" in effect during our study period, there was often severe hazing of Plebes for the entire academic year (Janda 2002; Dwyer 2009; McAleer 2010).[9] The intensity of the experience along with the relative isolation has generated a unique culture and jargon that can only be fully understood by individuals very familiar with West Point.

Our approach to measuring personality traits described in detail in Section IV.E. pays close attention to these features of the West Point context.

II.   Personality and Economics

Economists have been paying increasing attention to the role of personality in explaining socioeconomic outcomes.[10] Although some authors distinguish among the concepts of non-

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[8] The exceptions were Brigade, Assistant Brigade and Regimental Staff, and some athletes on premier intercollegiate sports teams who lived in separate quarters and ate at separate assigned tables at meals.

[9] This intense hazing was officially banned in 1990 (Hill 1990).

[10] Extensive surveys include Bowles, Gintis, and Osborne (2001), M. O. Groves (2005), Borghans et al. (2008), Brunello and Schlotter (2011), and Lindqvist and Vestman (2011).

cognitive skills, character skills, soft skills and personality, they are similar and usage depends on the context. We follow Roberts (2009) who defines personality broadly as "the relatively enduring patterns of thoughts, feelings, and behaviors that reflect the tendency to respond in certain ways under certain circumstances."

Heckman and Kautz (2014) use the term "character skills" to refer to those skills that cannot be measured using IQ tests or other tests of cognitive ability. In their model, task performance depends on effort, cognitive skills, and character skills. Effort, in turn, depends on incentives. Individuals with more favorable character skills perform better given the same effort and incentives.

Heckman and Kautz apply their model to the study of the Perry Preschool Program. Students in the program were students were divided into a treatment group assigned to an early childhood enrichment program and a control group not assigned to any program. Researchers found that there was little to no effect of the program on IQ. However, the treatment group fared better than the control group in many ways. For instance, they demonstrated greater planning and self-control and were less likely to engage in criminal activity. It is inferred that the better performance must be attributed to the character skills developed in the program (Heckman et al. 2010; Heckman, Pinto, and Savelyev 2013). Chetty et al. (2011) find similar results in the context of Project STAR in Tennessee, as do Carneiro and Ginja (2014) for Head Start, and Baker, Gruber, and Milligan (2015) for universal child care in Quebec.

Do character skills matter in the labor market? Heckman and Rubinstein (2001) suggest that they do. They find that GED recipients fare poorly in terms of many socioeconomic outcomes relative to true high school graduates with similar cognitive ability. That is, having a GED reflects non-cognitive traits unconducive to success.

Other work in economics directly estimates the relationship between outcomes and personality traits as defined by psychologists. The most commonly used taxonomy is the "Five Factor Model" which distills personality into the "Big Five" traits: *Openness to New Experiences, Conscientiousness, Extraversion, Agreeableness and Neuroticism* (John and Srivastata 1999). The traits are measured using standardized inventories sometimes included on socioeconomic surveys. For instance, the German Socioeconomic Panel asks subjects about their degree of agreement/disagreement with statements such as "I describe myself as someone who does a thorough job" (Hahn, Gottschling, and Spinath 2012).[11] While some view the Five Factor model as the gold standard in personality psychology (John, Naumann, and Soto 2008) there are detractors.[12]

The most robust finding from the Big Five studies in labor economics is that career success has a significant positive relationship with *Conscientiousness* and a negative relationship with *Neuroticism*. Otherwise, the results are mixed and depend on context. For instance, Nyhus and Pons (2005) and Heineck and Anger (2010) find that *Agreeableness* is positive for women; Mueller and Plug (2006) find it to be negative. Mueller and Plug report that men who are open to new experiences earn less, while Heineck and Anger find they earn more.

An alternative to the inventory-based approach is an observational study where an observer reports on a subject's behavior at one point in time and that behavior is related to behavior or outcomes many years later (Heckman and Kautz 2014). For instance, Heckman,

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[11] Other taxonomies of personality traits measured through self-reported inventories include the Rotter Scale, Meyers-Briggs, Big 6, and the Big 7.
[12] Block (1995) raises conceptual and methodological concerns about the Five-Factor model. Meta-analyses find the importance of certain traits to be misstated in the literature, in part due to publication bias (Hurtz and Donovan 2000; Kepes et al. 2011). See Almlund et al (2011) for a more extended discussion of the limitations of the Five-Factor model.

Pinto, and Savelyev (2013) show that children's behavior as evaluated by elementary school teachers predicts adult outcomes, Segal (2013) similarly finds that eighth-graders who misbehave fare worse in the labor market even after controlling for education, and Kuhn and Weinberger (2005) find that leadership experience in youth predicts leadership outcomes in careers.

Lindqvist and Vestman (2011) use administrative data on Swedish military personnel to estimate the effects of personality traits on long-run labor market outcomes. Their measures of personality are derived from records of psychologists who interviewed subjects at the time of conscription. Their study is observational in the sense that psychologists' reports were based on 25-minute conversations rather than pre-specified questions. Subjects' persistence, social skills, and emotional stability predict more favorable labor market outcomes.

Our study is also observational and the approach most closely resembles Lindqvist and Vestman. Both use data from a military context. However, our population is a relatively homogeneous group of military academy students with similar backgrounds and cognitive skills, while theirs is a more general population of young men being tracked for roles in the military.

Both papers use methods that avert methodological problems present in other personality studies. First, because personality is observed at a baseline and tracked to independent data sources on long-run outcomes there is no issue of recall bias (R. M. Groves 2004). Second, in both cases traits and outcomes are measured in non-research contexts. This averts certain interviewer, respondent, and questionnaire biases that may arise in certain surveys (R. M. Groves 2004). Third, Vazire and Mehl (2008) and Vazire (2010) find that others' responses to

personality inventories are more accurate than our own, suggesting that external observation such as used in our paper and Lindqvist and Vestlund will be more accurate than self-reports.[13]

In our paper, reporters knew the subjects very well, having interacted with them closely for at least a year. Subjects had no idea that their behavior at West Point and reporters had no idea that their reports would be used in a research study decades later. As a result, our analysis more closely approximates the practical problem of predicting the life course of a young person based on natural interaction over many years.

III.   Data

IV.A. Sources

Our first source of data is the 1980 – 1984 West Point yearbooks, or *Howitzers* (U.S. Military Academy, 1980-1984). In many respects, the *Howitzers* resemble typical college yearbooks. Individual entries for graduating seniors include a picture and a list of extracurricular activities.

The *Howitzers*, however, provide much more data than a typical yearbook. Individual entries report cadet company and cadet rank at graduation. *Howitzer* entries also provide a short narrative describing the cadet, typically about 60 words long and written by the cadet's

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[13] There is still an issue of reporting bias in Lindqvist and Vestlund as draftees may have tried to shape their answers to steer the process to a preferred assignment. The role of subjectivity in our paper is discussed in Section V.E.

roommate. Elsewhere in the yearbook we can identify whether the cadet was awarded the distinction of a staff position.

The second source of data is the *Register of Graduates and Former Cadets* (*Register*) compiled by West Point's Association of Graduates (AOG). The *Register* has an entry for every graduate going back to the first graduating class of two cadets in 1802. Virtually every graduate's military career is tracked in minute detail in his or her entry. Most *Register* entries continue to follow separated graduates' subsequent civilian careers and report contact information. There is also biographical data and an indicator of whether a graduate was a "Star Man" or "Star Woman" who graduated in the top 5% of the class. We will refer to these cadets as *Star*s.

We were provided access to the *Register* data using an online system available to graduates, their families, and researchers (West Point Association of Graduates 2015). The online entries are self-updated to report new information, such as a job change or change of residence. We also consulted the 2010 printed *Register* when testing for attrition bias (West Point Association of Graduates 2010).

We augmented the *Register* data with Department of Defense General Officer Announcements. These notices report all promotions to all levels of General as well as changes in command. We searched through the announcements from the first year any of our subjects could have become a General until June 2015, at which point all our subjects should have either reached the rank of General or left the Army.

We merge data from the *Howitzers*, the *Register,* and the General Officer announcements to generate a data set containing baseline measures of official distinctions, personality traits and

demographics observed at the point of college graduation in 1980 – 1984, and outcomes reported in 2015.

IV.B. Sample Selection and Statistics

It is straightforward to merge the *Register* data with the *Howitzer* data by name and graduating class. A total of 4,656 cadets graduated between 1980 and 1984. We excluded 50 cadets who died in service, 18 who were foreign citizens, and 48 whose descriptive narrative was blank or who were omitted from the *Howitzer*, leaving a final sample of 4,540 graduates over five years.

IV.C. Outcomes

There are three types of outcomes: military career outcomes, civilian career outcomes, and economic outcomes. With the exception of the General Officer announcements described above, all career outcomes were obtained from the *Register*. We merged the *Register* data with Zillow and IRS data to construct measures of home value and income, respectively, by ZIP code.

The military career outcomes include highest rank attained, whether the subject reached the rank of Colonel, whether the subject reached the rank of General Officer, and years of service.[14] The highest rank attained is either rank at separation or current rank. The highest rank

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[14] Army Reserve service was not considered.

attained is virtually always the same as rank at separation because our subjects are all beyond the normal 30-year up-or-out point for promotion to General Officer.[15]

The top panel of Table 1 shows the distribution of highest rank attained over the sample for the 4211 observations for which data on rank at separation or current rank are available.[16] We use the standard abbreviations: Second Lieutenant (2LT), First Lieutenant (1LT), Captain (CPT), Major (MAJ), Lieutenant Colonel (LTC) and Colonel (COL). Four ranks – Brigadier General (BG), Major General (MG), Lieutenant General (LTG) and full General (GEN) - are collapsed into a single category of General Officer (GO).

Nearly 55 percent of our sample left the Army as Captains – the usual rank at the end of the graduates' 5-year commitment. The other concentration is at Lieutenant Colonel – a common rank for officers to be at when they reach 20 years of service and become eligible for retirement benefits and status. In addition to the ordinal Rank variable indicating highest rank attained our outcomes include having attained *at least* the rank of Colonel and having attained the rank of General Officer. Only about 14 percent of subjects became Colonels and 2 percent became Generals.

Statistics for the other outcomes are also reported in the second panel of Table 1. Graduates spent an average of 12.6 years in the Army. About 19 percent of the sample attained an Executive position in the private sector. These are graduates whose *Register* entries included

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[15] To our knowledge the only exception to this up-or-out rule is becoming an Academy Professor at West Point. We identified five of our subjects as Academy Professors from the West Point faculty listings. Another subject was in the Army at a rank lower than General at the end of our study period as he left the Army and returned. We accounted for these cases in our data.
[16] When rank at separation was missing and years of service was available, the missing rank variables were replaced by median rank by years of service, and vice versa. Since promotions occur within a designated time window this introduces only a small amount of noise into the rank at separation variable. 329 observations with no information on either separation rank or year of separation were excluded from most of the military career outcome analyses.

the terms (or abbreviations of) Chairman, Director, President, CEO, COO, CFO, CIO, or VP. We validated these entries to ensure that the terms were being used in the context of a leadership position in the private sector. We did not distinguish by size or prominence of the private sector employer. The attainment of an Executive position may be interpreted as reaching a significant leadership position rather than as an indicator of economic success.

Economic success is measured as average income and average home value within each graduate's ZIP code as of the most recent *Register* entry. Average income by ZIP code is based on the IRS estimate of mean adjusted gross income in 2011 and 2012. Average home value by ZIP code is taken from Zillow Real Estate Research (Zillow Real Estate Research 2015). We use the mean home value for the ZIP code from third quarter 2010 to second quarter 2015. The mean over the sample of mean income and home value within subjects' ZIP codes are $87,877 and $316,351, respectively.

Income data are available for the ZIP codes in which 4,232 of the graduates live. 149 graduates did not report a ZIP code, and a further 159 live outside the country or in ZIP codes not covered by the IRS data. Zillow reports home values for ZIP codes in which 3,295 of the graduates live.[17]

IV.D. Formal Distinctions and Demographics

Formal measures of leadership ability are based on distinctions awarded by Tactical Department faculty. As shown in the third panel of Table 1, 22 percent of cadets were *Cadet*

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[17] Zillow does not report data on ZIP codes where data are unreliable or unavailable due to small samples or public disclosure rules.

*Captain*s, the highest possible cadet rank, at the time of graduation. Most of the rest were Lieutenants. About one-third of the cadets were assigned to a staff position either in their graduating year or in the prior year, with only one percent of graduates serving on the most elite *Brigade Staff.* We identified 7.1 percent of the graduates as female and 93.3 percent as white from the *Howitzer* photographs.

IV.E. Personality Traits Implied by Narratives

Personality traits were inferred from the narratives of about 60 words attached to each graduate's *Howitzer* entry. The narratives were typically written by a roommate or another peer who knew the cadet well.[18]

Because the West Point culture and jargon are unique, many of the narratives can only be interpreted by individuals very familiar with the Academy. For instance, a graduate who was "helpful to Plebes in learning about the true meaning of the fourth class system" may not have been truly helpful. He was probably an enthusiastic hazer. The word "juice" means electrical engineering, "poop" is knowledge, and a "hive" is a very studious cadet. Other West Point graduates are ideally suited for interpreting the narratives.

We recruited alumni volunteer evaluators by sending out a notice through the West Point Society of DC which then propagated throughout West Point alumni networks. The notice included a brief explanation of the goals of the project and an estimate of the time commitment

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[18] We have been told by numerous graduates of the period that, as far as they knew, all the narratives were written by a roommate, or, for staff members, a prior roommate in the home company. There are rare exceptions and we address the implications of author choice for the interpretation of our results in Section V.E.

entailed in evaluating a full year of narratives. Several dozen alumni responded to the notice and 31 signed up through our enlistment page. The enlistees were then provided with the information necessary to proceed. They were not assigned to evaluate their own classmates.

We refer to the evaluators as our "Old Grads," or simply "Grads."[19] The Grads were provided with a list of five traits we will describe shortly along with brief guidelines suggesting the dimensions of the traits we sought to capture. They were told to use their own judgment. Specifically, the guidelines stated:

> "We have listed terms and expressions illustrating the dimensions of the traits we are aiming to capture. *Do not restrict yourself to these terms.* We can't possibly anticipate every keyword and narratives need to be interpreted in the context of West Point. This is why we need your expertise to recognize the traits implied by the narratives."

The evaluations were submitted through an online form we termed the "Old Grads Module." Narratives were presented in batches of 20. The form listed each narrative and a binary "Yes" or "No" choice for each trait. No other information about the cadet was provided. The Grads were told to "indicate whether the narrative suggests whether the cadet possessed any of the traits." They were allowed to enter no trait or multiple traits.

The specific traits we chose were *Leadership, Determination, Social/Fun, Helpful/Caring,* and *Disagreeable.* These traits were suggested to have been important to success – or lack thereof – at West Point in historical research describing West Point during our study period (Atkinson 2009; Janda 2002), in memoirs of graduates the period (Dwyer 2009; McAleer

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[19] "Old Grads" is a term West Point graduates use to refer to alumni.

2010), journalists' accounts (Lipsky 2003) and in conversations with many West Point alumni and faculty.

Leadership is the most obvious trait to include as the mission of West Point is to develop "leaders of character." All our sources spoke of the *Determination* necessary to survive the grueling program. *Helpful/Caring,* or *Helpful*, reflects the willingness of cadets to contribute to the larger group. This is expected to be associated with success at the Academy as cadets are advised to "cooperate and graduate." *Social/Fun*, or *Social,* cadets were described as being less serious than the typical cadet. We suggested terms such as "partier," "prankster," and "lived for weekends" to reflect the dimension of *Social* we aimed to capture. We attempted to characterize cadets who interacted negatively with the group as *Disagreeable.* These were described as discipline problems or enthusiastic hazers.[20]

There are a number of reasons we did not attempt to replicate the Five Factor taxonomy or methodology. First, some of the Big Five traits do not apply to the context of our West Point data. For instance, there would likely be little variation in *Conscientiousness* within the population of soon-to-be West Point graduates and few if any cadets' narratives suggest *Neuroticism* as intended by the Five Factor taxonomy. Second, the Big Five traits do not correspond directly to traits such as *Leadership* that are particularly valued among the West Point cadets and that we seek to study.

We only used data for full years completed by a Grad. By the time the module closed as of April 21, 2015, eleven Grads completed a total of 21 full years of evaluations: two completed

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[20] After completing the module one Grad advised us that he expected this particular trait to be unreliable as it referred to two different populations. The discipline problems – those with demerits for misconduct – were often admired as "folk heroes" for their risk-taking behavior and the hazers were often high-ranking cadets who stuck to the rules. As he predicted, very few cadets were viewed by Grads as disagreeable based on their readings of the narratives.

a full set of five years, two completed two years each, and a further seven completed one year each.[21,22] This provided between three and six evaluations per cadet.

IV.F. Adjusting for Inter-Rater Variability

The Old Grads module yielded multiple reports for each cadet. As expected, given the subjectivity of the exercise, they often differ. Over all traits measured and all pairs of Old Grads reporting on the same cadets, the average correlation between reports is .350, and the average Cohen's kappa is .311. In order to minimize noise and maximize consistency of the measures of the traits we use in the analysis we aggregate the multiple reports using a Latent Class Model (LCM).

The LCM is commonly used in biostatistics to predict the likelihood someone has a medical condition based on the patterns of symptoms, and a related model is used in discrete choice to uncover heterogeneous preference patterns (Greene and Hensher 2003). In our case, we predict the likelihood each cadet within our sample possesses a trait based on the patterns of Grads' reports. The LCM enables us to better estimate the "true" value of a trait by reducing the errors that result from inaccurate coding.

Formally, our objective is to estimate the probability that grad j reports that cadet i possesses a trait:

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[21] One set of evaluations was done by a co-author along with her husband who is a West Point graduate from a non-sample year. They jointly recognized 6 graduates from the narratives. The analysis was done omitting these 6 observations and the results were virtually identical.

[22] In appreciation of their assistance, donations were made to each Grads' veterans' organization of choice. The organizations were: the Fisher House Foundation, Jewish War Veterans, National Military Family Association, Women's Memorial Foundation, and Wounded Warrior Project.

$$\Pr(trait_{ij} = s) = \pi_{j1}^{s} * I(trait_{i}^{*} = 1) + \pi_{j0}^{s} * I(trait_{i}^{*} = 0) \tag{1}$$

where π_{jt}^{s} is the probability that Old Grad j reports $trait_{ij} = s$ conditional on the cadet's

underlying true value being $trait_{i}^{*} = t$. The outcomes s and t are binary.[23]

The π's reflect the Grads' accuracy in reporting. "Over-reporters" have lower standards

of evidence relative to others. Over-reporters will have high true positive rates π_{j1}^{1} but will also

have high false positive rates π_{j0}^{1}. Similarly, "under-reporters" have high π_{j0}^{0} and π_{j1}^{0}. "Noisy"

reporters have greater difficulty interpreting the intention of the narratives or are less attentive to

the task. These coders will have both high false positive π_{j0}^{1} and false negative π_{j1}^{0} rates.

Following from Equation 1, given a set of observed reports $trait_{ij}$ for cadets $i \in$

$\{1, \dots, N\}$ and Old Grads $j \in \{1, \dots, J\}$, we calculate the probability of observing that data

conditional on the underlying true trait being $trait_{i}^{*} = 1$ or $trait_{i}^{*} = 0$. This is the joint

probability of each Old Grad giving the observed report conditional on the truth. The likelihood

function is:

$$L(X|\pi, \rho) = \prod_{i=1}^{N} \left[\rho \prod_{j=1}^{J} \prod_{s=0}^{1} \left(\pi_{j1}^{s}\right)^{I(trait_{ij}=s)} + (1 - \rho) \prod_{j=1}^{J} \prod_{s=0}^{1} \left(\pi_{j0}^{s}\right)^{I(trait_{ij}=s)} \right] \tag{2}$$

where $\rho = \frac{1}{N}\sum_{i=1}^{N} I(trait_{i}^{*} = 1)$, the underlying true prevalence of the trait over all cadets, is an

estimated parameter. The parameter for the underlying true prevalence allows us to make

inferences about Old Grad accuracy parameters, π, knowing the proportion of time that a report

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[23] These probabilities are estimated separately by year and trait. We estimate separately by year because different sets of coders are used for each year. We control for year in analysis.

of $trait_{ij} = 1$ should be taken as a true positive or a false positive. An Old Grad's accuracy

parameters partially depend on the relationship between his coding pattern and others'.

The model is estimated under maximum likelihood using the expectation-maximization

algorithm described in Linzer and Lewis (2011). Parameter estimates are then used to calculate

the probability that each cadet i possesses the trait:

$\widehat{\Pr}(trait_i^* = 1)$

$$= \frac{\widehat{\rho} \prod_{j=1}^{J} \prod_{s=0}^{1} (\widehat{\pi_{j1}^s})^{I(trait_{ij}=s)}}{(1 - \widehat{\rho}) \prod_{j=1}^{J} \prod_{s=0}^{1} (\widehat{\pi_{j0}^s})^{I(trait_{ij}=s)} + \widehat{\rho} \prod_{j=1}^{J} \prod_{s=0}^{1} (\widehat{\pi_{j1}^s})^{I(trait_{ij}=s)}} \tag{3}$$

where the π's and ρ are estimated for each Old Grad from (2). $\widehat{\Pr}(trait_i^* = 1)$ enters the

empirical analysis as the probability that cadet i possesses the trait. The means of the estimated

probabilities are reported in the first column of the bottom panel of Table 1.

IV.   Results

Results are presented in five subsections. Section V.A addresses the relationship between

the distinctions and the outcomes. The LCM-adjusted measures of personality traits derived from

the Old Grads' interpretations of the narratives are introduced in Section V.B. In Section V.C we

contrast our results with those obtained from mechanical analysis of the narrative text. Section

V.D considers the potential for attrition bias, which we find to be minimal. Section V.E remarks

on the results taken as a whole.

V.A. Formal Distinctions

We examine the relationship between the distinctions and the outcomes in two ways. First, there is a descriptive analysis that shows the differences in mean or median of each outcome by distinction. Second, there is a set of regression models in which we include all measures of the distinctions and demographics in order to identify independent effects. The descriptive analysis and the regression results are reported in Tables 2 and 3, respectively.

It is clear that cadets identified by faculty as the most promising leaders have more successful military careers. According to the first row of Table 2, *Cadet Captains*, the highest ranking cadets, achieve more in terms of virtually all military outcomes. They spend an average of 1.6 more years in the Army than non-*Captains*. They are nearly 12 percentage points more likely to become Colonels or above and 2 percentage points more likely to become Generals.

The next four rows refer to the four staff positions. The most elite group of cadets – *Brigade Staff* members – also prove to be more successful in the Army. Relative to all other cadets, *Brigade Staff* members spend nearly 3 more years in the Army. They are 33 percentage points more likely to become Colonels and 18 percentage points more likely to transition from Colonel to General.

The relationships are less consistent when it comes to the other Staff groups. Members of *Regimental Staff* spend more time in the Army and are more likely to become Colonels. They are *less* likely to progress from Colonel to General – this may be because the conditioning sample of Colonels is itself highly positively selected. Otherwise, there is no evidence of a relationship between *Staff* membership and military outcomes.

It is not obvious that military leadership skills evident at West Point would carry over to the civilian sector. We find that they do. For instance, *Cadet Captains* and *Brigade Staff* are 6 and 16 percentage points, respectively, more likely to become Executives. *Captains* live in areas

where earnings are 5.4 percent higher and homes are worth 8.5 percent more than non-*Captains.*
Brigade Staff members live in areas with homes worth about 17 percent more than non-*Brigade*
Staff members. The relationships between Staff membership and the non-military outcomes are
perhaps clearer than we saw in terms of the military outcomes. *Assistant Brigade Staff* and
Regimental Staff members are more likely to become Executives, and *Battalion Staff* members
live in higher home value ZIP codes.

Academic performance at West Point also predicts success virtually across the board.
Stars spend nearly two more years in the Army. They are more likely to become Colonels,
Generals and Executives, and they earn more and live in higher home-value neighborhoods than
non-*Stars.* We find no significant relationship with respect to progression from Colonel to
General; again, this may be because Colonels themselves are a highly positively selected group.

Table 3 presents results of regression models that isolate the independent effects of the
distinction variables controlling for race, sex and year of graduation. Column (1) reports the
results of a Cox proportional hazard model of duration from graduation to separation from the
Army; Column (2) reports ordered logit model estimates of highest rank attained; Columns (3)
through (6) report logit marginal effects on the outcomes attained at least the rank of Colonel,
attained the rank of General, progressed from Colonel to General, and attained an Executive
position in the private sector, respectively, and Columns (7) and (8) report OLS estimates of the
log income and log home value equations.

Cadet Captains continue to stand out. Even controlling for academic success and
background, we find that the effects of *Cadet Captain* are quantitatively and statistically
significant for virtually all outcomes. The effects of the *Staff* variables are weaker in the
regression models relative to the mean comparisons. *Brigade Staff* members perform better in

terms of most of the military outcomes and *Assistant Brigade Staff* are more likely to become Executives.

At first glance the coefficients on the other *Staff* variables in both the conditional and unconditional General equations in columns (4) and (5) are surprising. There is no apparent effect of *Brigade Staff* on becoming a General, and the coefficient estimates for the other *Staff* variables are significantly *negative*. This is not, however, because assignment to these three staff positions is a negative signal. It is the result of a structural relationship between the *Staff* assignment and cadet rank. There are five potential roles for *Cadet Captains*: they can belong to one of the four staff groups or they can be Captain in their home company. The latter is a significant responsibility, and apparently a more significant reflection of ability than membership on *Staff* groups other than *Brigade Staff*

Stars are higher achievers in terms of all outcomes other than General, and the magnitudes of the marginal effects of *Star* are similar to those suggested by the mean comparisons. That is, the cognitive skills suggested by *Star* and the leadership skills reflected by *Cadet Captain* are both important predictors of success in the military and civilian world and their effects are largely independent. The combined effect is large: Cadets who were both *Captains* and *Stars* earn 16.6 percent more than the lower-ranking non-*Stars* and they live in areas with 18.5 percent higher home values.

V.B. Personality Traits Implied by the Narratives

In this section we ask whether peer-authored narratives contain information that is useful in predicting success. In Table 4 we introduce the LCM-adjusted personality measures derived

from the Old Grads' reports. Panel 1 refers to a parsimonious specification that includes only the traits and dummies corresponding to year of graduation, and Panel 2 refers to a full specification including all the distinctions and controls.

Leadership and *Determination* are important. According to the parsimonious specification results, a cadet with a 100% probability of being perceived as a *Leader is* 3.8 percentage points more likely to become a Colonel or above, 8.2 percentage points more likely to become a General and 3.8 percentage points more likely to become an Executive, than a cadet with a 0% probability. *Leaders* also live in neighborhoods with 6.5 percent higher home values. *Determined* cadets are more likely to become Generals and Executives and they live in higher home-value neighborhoods.

Social matters for all three types of outcomes. In terms of military outcomes, the effect is non-monotonic. A change from 0% to 100% probability of being perceived as *Social* is associated with a 4.5% decrease in the probability of making Colonel, but, having made Colonel, an 11.6 % increase in the probability of becoming a General. This suggests that there are two competing effects of *Social* on advancement in the Army. First, an Army career may be too highly structured for someone seen as "*Social/Fun*" which suggests that *Social* officers would be less likely to proceed at some levels. Second, we note from reading the narratives that the *Social* cadets were often informal leaders who, for example, organized pizza parties or led off-campus weekend activities. On net, the structure effect dominates for ranks up to Colonel but the informal leadership effect dominates for advancement to General. This may relate to differences in promotion processes at different ranks. Up to Colonel, candidates are evaluated by promotion boards, and appointment to General Officer is at the discretion of the President or his designee.

In Panel 2 we include all the variables from Table 3 to determine the value added from the peer reports beyond what is observed through the distinctions and controls. The *Leader* and *Determined* effects are severely attenuated. The only effect of *Leader* or *Determined* that continues to be significant after we control for the distinctions is the effect of *Leader* on the transition from Colonel to General. According to Appendix Table A1.3 it is the *Cadet Captain* variable that captures much of the variation otherwise explained by *Leader* and *Determined.*

There are two reasons that the reports may have far less of an independent impact on the outcomes when *Captain* is included. First, it may be that peer reporters directly factor in known cadet distinctions when describing subjects in the narratives (although a direct mention in the narrative that the cadet was a *Captain* was rare). Second, peers may observe the same traits that lead faculty to promote a cadet to *Captain*. This does not diminish the value of the peer reports: in many real-world situations, such as when using peer review or letters of recommendation, data on official distinctions are not available. Peer descriptions would capture the *Leadership* and *Determination* associated with success.

Overall, the positive effects of *Social* on civilian career and economic outcomes are quantitatively significant. *Social* cadets are 4 percentage points more likely to become Executives and they live in areas where household income is 4.3 percent greater than the other cadets. Unlike *Leader* and *Determined*, the *Social* results are robust to introduction of the distinction and control variables. That is, the effects of the dimensions of personality reflected in the peer reports of *Social* and those reflected by the official distinctions are independent.[24]

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[24] We do not believe that missing home price and income data affects the results significantly. As reported in Appendix A1, the military and Executive results are generally very similar when using subsamples with non-missing income or home value data.

V.C. Traits as Measured Through Mechanical Search

Our second approach to the interpretation of the yearbook narratives uses word searches of the textual data. In this section we see how automated approaches to personality coding compare to the Old Grads' human judgment.

For our first mechanical search we generated a list of keywords associated with each trait, and then searched the narratives. If a word was found in a cadet's narrative, then that cadet was coded as having the associated trait. The full list of keywords is in Appendix A2. The second column of the last panel of Table 1 reports the means of each of these variables over the sample.

As shown in Table 5, the word search measures don't capture traits as strongly associated with the outcomes as do the Old Grads' measures. The only word search measure that consistently shows up as statistically significant is *Leader.* The word search *Leader* only predicts military outcomes and does not carry over into civilian career and economic outcomes. However, unlike the baseline Old Grads model, the word search *Leader* remains significant for military outcomes when distinctions and controls are included. The word search appears to be picking up some aspect of leadership that is less collinear with the Cadet Captain variable and that the human coders did not see.

The keyword search imposes some measure of subjectivity since the list of search terms is predefined. We take another, more general, text mining approach, similar to that used by Gentzkow and Shapiro (2010). Text mining is a data-driven approach that allows each word to enter as a separate predictor of outcomes (Feinerer, Hornik, and Meyer 2008). We then predict outcomes based on the presence or absence of each word using random forests (Varian 2014).

The random forest algorithm chooses a random subset of the word presence variables generated by text mining and predicts outcomes by segmenting the data based on the presence or absence of those words, targeting minimal prediction error. This procedure is bootstrapped to produce an overall prediction for each observation.[25]

Unsurprisingly, the text mining approach improves on the human coding in terms of predictive power, cutting root mean squared error by about half compared to the main model without controls. RMSE is smaller for text mining relative to the Old Grads main model for becoming a Colonel (.180 vs. .445), becoming a General (.235 vs. .479), becoming an Executive (.163 vs. .392), log average home value (.260 vs. .553) and log income (.225 vs. .470).[26]

The value of the text mining approach here is to show that there is some predictive information in the narratives that is not captured by the human readers or the keyword search. It also provides an approximate upper bound on the amount of information that can be gleaned from narratives. The disadvantage of this approach is that it does not provide useful coefficient estimates. We calculate how important each word is for prediction: "always," "will," "friend," and "one" are at the top of the list.[27] We can speculate about theoretical interpretations of these words but ultimately these results are only predictive.

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[25] For text mining, we generate an indicator variable for each word that appears in a narrative, and keep words that are not standard English stopwords (like "the" or "and") and appear in at least five percent of narratives. We take stems from these words (so "leading" and "leader" both become "lead"). This is what is typically referred to as the "bag of words" approach. Our random forest models are run growing 500 trees each time, using regression or classification trees as appropriate.

[26] We do not compare years of service because it is not straightforward to calculate root mean squared error for the survival model in the main analysis.

[27] Importance is determined by the decrease in mean squared error for regression or the decrease in the Gini coefficient for classification, comparing the actual data to data in which the variable in question is permuted. Importance does not necessarily mean that these words are positively associated with outcomes.

V.D. Attrition

The question of attrition arises in any study that spans a period of several decades. In our case, as all explanatory variables were determined at the outset of the study, attrition is due to censoring of outcome variables for subjects who stopped updating their *Register* entries. In this section we consider whether attrition bias due to censoring of outcomes is a serious concern for our results.

Censoring of military career outcome variables in our data is rare. We are able, with adjustments described earlier, to determine date of and rank at separation for 93 percent of the sample. There is no censoring of the outcome General as Department of Defense data were used to identify Generals

Civilian career and economic outcomes are more likely to be censored. We do not always know the date of the most recent entry but we can set bounds. Entries reporting career changes such as new employer or position, for instance, indicate the date of the change. No date is reported for a change of address but we assume that address is up to date at least at the time of the last career change entry.

Beyond this, we cannot definitively distinguish sample-leavers who experienced a change in circumstances but did not update their entries from sample-stayers with a lack of new information to report since last entry. We can, however, gauge the extent of censoring by comparing the on-line *Register of Graduates* entries as of 2015 with entries in the 2010 printed *Registe*r. Even within the past five years, 46 percent of graduates updated their entries. We

expect that many of the remaining 54 percent are sample-stayers who had no new information to report, as mobility of (mainly) men in their 50s is relatively low.

We can also illustrate how attrition might bias estimates in terms of the log average adjusted gross income equation:

$$\ln(Income_i) = \alpha + X_i'\beta + u_i \qquad (4)$$

where α is an intercept, X_i is a vector including the LCM estimates of the personality traits, the distinctions, and the controls for subject i, β is the vector of coefficients, and u_i is the error term.

The error term is decomposed as:

$$u_i = \mu A_i + \varepsilon_i \qquad (5)$$

where the unobservable A_i is equal to one if the subject left the sample and ε_i is an iid error term. Since earnings generally increase from age 22 through age 55, average income will be lower at younger ages, implying $\mu < 0$. Further, if A_i is correlated with any regressors, then the coefficients on these regressors will be subject to omitted variable bias. A similar argument applies to the regressions with log average home value or Executive as outcomes.

To test whether attrition is an issue in interpreting our results, we augment equation (4) with the variable *Years Since Last Update* as a proxy for A_i. The year of the last update is the most recent year listed for any reason (such as a change of address or new job) in a graduate's *Register* entry. If the ZIP code, but no other information, changed between the printed 2010 *Register* and the 2015 online data, we record the last known update as 2012.

The results of the augmented specification are reported in Table 6. As expected, the coefficient on *Years Since Last Update* is negative. The other coefficients are similar to the coefficients from the comparable Table 4 models. The main difference is that the effect of *Leader* on the probability of becoming an Executive becomes insignificant and falls slightly.

Any bias due to attrition is minimal, either because actual attrition is rare, or because the propensity to leave the sample is not correlated with our personality measures.

V.E. Discussion

Our key results are that the *Cadet Captain* and *Staff* leadership distinctions, academic achievement as indicated by *Star*, and the narrative-implied traits *Leadership, Determination,* and *Social* predict many favorable outcomes.

There are some points to bear in mind when interpreting these results. First, even with the LCM adjustment, the personality measures derived from the Old Grads' reports are noisy as some Grads may not have been able to discern the intention of the author. Many narratives had a jocular tone and inside jokes or sarcasm may have been misconstrued. To the extent this measurement error is random, our estimates will tend to be biased towards zero and standard errors will be high. Another source of measurement error relates to the reliability of the author. While all narrative authors knew their subjects well, some may have been more accurate than others in describing them. Measurement error will be random to the extent that there is no systematic relationship between a subject's traits and their author's misreport. Our finding that traits matter is more remarkable given that random measurement error tends to bias coefficients towards zero.

Second, the vast majority of graduates we talked to reported that, to their knowledge, narratives were composed by randomly assigned roommates. There was, however, scope for the subjects to choose the authors and there were exceptions. Brigade, Assistant Brigade and Regimental Staff members may have asked friends from their home companies to write their

narratives. We are also told there are cases where the narratives were self-authored. We believe these are very rare, and as such is unlikely to significantly affect the results.

Still, we can speculate about a potential effect of author choice on the results. If the propensity to choose an author other than an assigned roommate is uncorrelated with any of the regressors then the coefficients will not be biased. If the propensity is correlated with a regressor, then in general the respective coefficient will not reflect the effect of the trait per se, but the combined effect of the trait and the characteristics that determine author choice. For example, if those who become Executives were more likely to choose authors who will overstate their leadership skills, then the coefficient on *Leader* will overstate the effect of actual leadership ability. It will reflect both true leadership and the traits associated with propensity to choose a favorable reporter. While over-reporting of the trait *Leader* is plausible as leadership is a particularly valued trait at West Point, we find it unlikely that cadets choose reporters likely to inaptly describe them as *Social* (or not). Therefore, we expect any measurement error bias due to author choice with respect to this particular variable to be minimal. In any event, we can still interpret the findings as predicting outcomes based on narrative data.

Third, there are other factors working against detecting the clear relationship between personality and outcomes using our approach beyond the matter of random measurement error. Personality is malleable (Heckman and Kautz 2014) and there is a greater than three decade gap between the time the narratives were written and the outcomes were realized. Still, the measured traits have predictive power. This means either that some part of personality is persistent over the life-cycle, or that, regardless of whether personality changes, favorable traits present at the time of college graduation place young people on a path to success.

V.   Conclusion

This paper uses data from West Point to show how peer and faculty impressions of personality traits observed at the time of college graduation relate to long-run career and economic outcomes. Data were obtained from two independent sources: college yearbook entries that suggest traits of new college graduates, and alumni records with-to-date information outcomes.

We find that faculty-conferred distinctions and yearbook narratives reported at the time of graduation predict career and academic outcomes realized more than three decades later. The most striking result is that students who impressed their peers as *Leaders, Determined* and *Social* proved to be more successful in a variety of respects. The effects of *Leadership* and *Determination* attenuate when controls for formal distinctions are introduced – meaning that the traits are viewed similarly by faculty promoting cadets and the peers who know them well. Conversely, the effect of *Social* is not attenuated by introduction of the distinction variables. *Social* cadets bring with them a non-cognitive skill that is not reflected in faculty evaluations.

The non-representativeness of the population carries with it both benefits and limitations. On one hand, the estimates may not be generalizable to the population as a whole. On the other, the entire group has strong cognitive skills. This allows us to focus on the value added of the various non-cognitive skills on success among a group with strong cognitive skills

Our measures of success are narrow. They do not include success in arenas such as academics, politics, or in other civilian careers that are well-paid, well-respected, or influential but are not Executive positions. Our outcomes also don't capture success in terms of personal

outcomes such as marriage, parenthood, friendships, and happiness. The task of addressing these matters is beyond the scope of this paper.

Still, the results have implications for interpretation of empirical models explaining labor market outcomes. While our explanatory variables don't explain a large amount of variation in outcomes they do suggest that what are usually viewed as "unobservables" in a standard earnings equation can be identified in part with suitable data.

Labor economists typically view unobserved personality traits conducive to success as positively correlated with schooling. As a result, OLS estimates of the returns to schooling are predicted to be biased upward. This seems consistent with our results on the traits *Leadership* and *Determination* as well as the faculty-conferred distinctions and academic achievement. However, we find that *Social* is positively associated with achievement at the highest levels in the military and civilian sector as well as economic success. If individuals with high levels of schooling are more likely to be serious rather than *Social/Fun* as evaluated by the Old Grads, this trait may introduce a negative component of omitted variable bias on OLS estimates of the returns to schooling.

There is an important substantive implication to be drawn as well. Our evolving economy increasingly values workers possessing strong cognitive and non-cognitive skills. In the population we study, where all subjects have strong cognitive skills, it is possible to identify character traits of the young people most likely to succeed.

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Tables

Table 1: Summary Statistics

Rank	Percent Separated at Rank	Percent Attaining at Least Rank	Number of Observations
2nd Lieutenant (2LT)	0.4%	100%	4,211
1st Lieutenant (1LT)	3.3%	99.6%	
Captain (CPT)	55.0%	96.3%	
Major (MAJ)	10.4%	41.3%	
Lt. Colonel (LTC)	16.8%	30.9%	
Colonel (COL)	12.3%	14.1%	
General Officer (GO) (BG +MG+LTG+GEN)	1.8%	1.8%	

Non-Rank Outcomes		Mean	Number of Observations
Years in Army		12.6	4,211
Executive		19.1%	4,540
Adjusted Gross Taxable Income in ZIP code		$87,877	4,232
Home Value in ZIP code		$316,351	3,295

Formal Distinctions and Demographics		Mean	Number of Observations
Cadet Captain		22.1%	4,540
Brigade Staff		0.9%	
Regimental Staff		9.2%	
Assistant Brigade Staff		4.7%	
Battalion Staff		19.0%	
Star		5.5%	
Female		7.1%	
White		93.3%	

Personality Traits Based on Narratives	Old Grads with LCM Aggregation	Word Search	Number of Observations
Leader	11.3%	18.1 %	4,540
Determined	25.3 %	14.2 %	
Social/Fun	23.1 %	15.0 %	
Helpful/Caring	27.5 %	29.6 %	
Disagreeable	3.7 %	7.6%	

Table 2: Differences in Mean or Median Outcome by Distinction

	(1) Years in Army (Mean)	(2) Highest Rank[a] (Median)	(3) Colonel Or Above (Mean)	(4) General (Uncond.) (Mean)	(5) General (Cond.) (Mean)	(6) Executive (Mean)	(7) Log Avg. Income (Mean)	(8) Log Avg. Home Value (Mean)
Cadet Captain	1.619*** (0.300)	0	0.118*** (0.013)	0.018*** (0.005)	0.019 (0.028)	0.061*** (0.014)	0.054*** (0.017)	0.085*** (0.024)
Brigade Staff	2.715** (1.278)	2	0.327*** (0.053)	0.124*** (0.020)	0.178** (0.076)	0.160*** (0.060)	0.039 (0.073)	0.173* (0.102)
Regimental Staff	1.327*** (0.433)	0	0.056*** (0.018)	-0.008 (0.007)	-0.086** (0.041)	0.044** (0.020)	-0.007 (0.025)	-0.003 (0.034)
Asst. Brigade Staff	0.531 (0.590)	0	0.020 (0.025)	-0.008 (0.009)	-0.069 (0.061)	0.074*** (0.027)	0.013 (0.034)	0.053 (0.046)
Battalion Staff	0.226 (0.319)	0	0.001 (0.014)	-0.005 (0.005)	-0.039 (0.035)	0.001 (0.015)	0.030 (0.018)	0.044* (0.025)
Star	1.988*** (0.543)	1	0.134*** (0.023)	0.025*** (0.008)	0.032 (0.044)	0.088*** (0.026)	0.138*** (0.032)	0.134*** (0.043)
N	4,193	4,211	4,211	4,540	594	4,540	4,232	3,295

Notes: Standard error of differences in parentheses. */**/*** indicates statistical significance at the 10%/5%/1% level. [a]Final Rank column indicates differences in median final rank by number of separating ranks. We did not conduct significance tests for this outcome.

Table 3: Effects of Official Distinctions

	(1) Duration to Separation (Hazard)	(2) Highest Rank	(3) Colonel of Above	(4) General (Uncond.)	(5) General (Cond.)	(6) Executive	(7) Log Avg. Income	(8) Log Avg. Home Value
Cadet Captain	0.896**	0.436***	0.096***	0.017***	0.034	0.036**	0.044**	0.073***
	(0.039)	(0.081)	(0.016)	(0.006)	(0.033)	(0.016)	(0.020)	(0.026)
Brigade Staff	0.717*	1.031**	0.174**	0.030	0.080	0.119	-0.024	0.087
	(0.144)	(0.444)	(0.073)	(0.022)	(0.087)	(0.074)	(0.097)	(0.127)
Regimental Staff	0.987	0.133	0.005	-0.011***	-0.096***	0.029	-0.036	-0.041
	(0.060)	(0.113)	(0.019)	(0.003)	(0.026)	(0.023)	(0.025)	(0.036)
Asst. Brigade Staff	1.067	-0.019	-0.009	-0.009**	-0.083**	0.065**	-0.007	0.027
	(0.079)	(0.137)	(0.022)	(0.004)	(0.033)	(0.031)	(0.035)	(0.046)
Battalion Staff	0.979	0.026	-0.002	-0.006*	-0.049*	0.008	0.022	0.036
	(0.042)	(0.080)	(0.014)	(0.003)	(0.028)	(0.016)	(0.019)	(0.026)
Star	0.823**	0.438***	0.070***	0.013	0.035	0.049*	0.122***	0.112**
	(0.064)	(0.139)	(0.026)	(0.010)	(0.050)	(0.027)	(0.041)	(0.053)
Race and Gender	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	4,211	4,211	4,211	4,540	594	4,540	4,232	3,295

Notes: Robust standard errors in parentheses. */**/*** indicates statistical significance at the 10%/5%/1% level. Column 1: Odds ratios from Cox proportional hazard model. Column 2: Ordered logit coefficients. Columns 3-6: marginal effects from binary logit model. Columns 7-8: OLS coefficients. All specifications include graduation year fixed effects.

Table 4: Effects of Old Grad-Derived Personality Traits

Outcome:	(1) Duration to Separation (Hazard)	(2) Highest Rank Attained	(3) Colonel Or Above	(4) General (Uncond.)	(5) General (Cond.)	(6) Executive	(7) Log Avg. Income	(8) Log Avg. Home Value
	Panel 1: Excluding Distinctions and Demographics							
Leader	0.901*	0.267**	0.038**	0.014***	0.082**	0.038*	0.032	0.065*
	(0.053)	(0.105)	(0.017)	(0.005)	(0.036)	(0.020)	(0.025)	(0.035)
Determined	1.023	0.037	-0.001	0.007*	0.059*	0.029*	0.021	0.044*
	(0.044)	(0.077)	(0.014)	(0.004)	(0.032)	(0.015)	(0.019)	(0.026)
Social	1.080	-0.080	-0.045***	0.009*	0.116***	0.040**	0.041*	-0.012
	(0.053)	(0.087)	(0.017)	(0.005)	(0.037)	(0.017)	(0.021)	(0.028)
Helpful	1.009	0.034	0.008	0.005	0.042	-0.000	0.008	0.005
	(0.040)	(0.072)	(0.012)	(0.004)	(0.029)	(0.014)	(0.017)	(0.023)
Disagreeable	0.928	0.097	0.009	-0.012	-0.093	0.054*	0.053	-0.000
	(0.090)	(0.160)	(0.029)	(0.014)	(0.108)	(0.031)	(0.048)	(0.059)
N	4,211	4,211	4,211	4,540	594	4,540	4,232	3,295
	Panel 2: Including Distinctions and Demographics							
Leader	0.966	0.062	-0.006	0.006	0.067**	0.016	0.012	0.039
	(0.058)	(0.107)	(0.018)	(0.004)	(0.034)	(0.021)	(0.026)	(0.036)
Determined	1.032	-0.009	-0.011	0.005	0.049	0.024	0.016	0.030
	(0.045)	(0.078)	(0.014)	(0.003)	(0.030)	(0.015)	(0.019)	(0.026)
Social	1.077	-0.073	-0.041**	0.009**	0.107***	0.040**	0.043**	-0.006
	(0.053)	(0.089)	(0.017)	(0.004)	(0.036)	(0.017)	(0.021)	(0.028)
Helpful	1.011	0.017	0.004	0.004	0.042	-0.002	0.006	0.001
	(0.040)	(0.072)	(0.012)	(0.003)	(0.028)	(0.014)	(0.017)	(0.023)
Disagreeable	0.929	0.105	0.013	-0.010	-0.092	0.053*	0.052	0.009
	(0.091)	(0.164)	(0.028)	(0.012)	(0.099)	(0.030)	(0.047)	(0.059)
N	4,211	4,211	4,211	4,540	594	4,540	4,232	3,295

Notes: Robust standard errors in parentheses. */**/*** indicates statistical significance at the 10%/5%/1% level. Column 1: Odds ratios from Cox proportional hazard model. Column 2: Ordered logit coefficients. Columns 3-6: marginal effects from binary logit model. Columns 7-8: OLS coefficients. All specifications include graduation year fixed effects.

Table 5: Effects of Keyword Search Derived Personality Traits

	(1) Duration to Separation (Hazard)	(2) Highest Rank Attained	(3) Colonel Or Above	(4) General (Uncond.)	(5) General (Cond.)	(6) Executive	(7) Log Avg. Income	(8) Log Avg. Home Value
	Panel 1: Excluding Distinctions and Demographics							
Leader	0.917**	0.221***	0.048***	0.012**	0.043	0.006	0.017	0.027
	(0.039)	(0.079)	(0.015)	(0.006)	(0.034)	(0.015)	(0.019)	(0.026)
Determined	1.027	0.018	-0.000	-0.005	-0.041	0.014	0.017	0.029
	(0.048)	(0.083)	(0.015)	(0.004)	(0.034)	(0.017)	(0.021)	(0.028)
Social	0.991	0.054	-0.001	0.009	0.069	0.011	0.018	-0.023
	(0.046)	(0.082)	(0.015)	(0.006)	(0.043)	(0.017)	(0.020)	(0.027)
Helpful	1.005	0.055	0.013	0.004	0.016	-0.005	-0.006	0.013
	(0.036)	(0.066)	(0.012)	(0.004)	(0.030)	(0.013)	(0.015)	(0.021)
Disagreeable	1.008	-0.056	-0.013	-0.005	-0.034	-0.031	-0.003	0.014
	(0.062)	(0.108)	(0.019)	(0.005)	(0.046)	(0.021)	(0.027)	(0.036)
N	4,211	4,211	4,211	4,540	594	4,540	4,232	3,295
	Panel 2: Including Distinctions and Demographics							
Leader	0.942	0.152*	0.030**	0.007	0.030	-0.004	0.012	0.017
	(0.041)	(0.080)	(0.014)	(0.004)	(0.031)	(0.015)	(0.019)	(0.026)
Determined	1.033	-0.004	-0.004	-0.004	-0.036	0.011	0.017	0.021
	(0.048)	(0.083)	(0.014)	(0.004)	(0.033)	(0.017)	(0.021)	(0.028)
Social	0.984	0.077	0.003	0.009*	0.071	0.011	0.017	-0.017
	(0.046)	(0.084)	(0.014)	(0.005)	(0.044)	(0.017)	(0.020)	(0.027)
Helpful	1.004	0.056	0.011	0.003	0.015	-0.006	-0.007	0.011
	(0.036)	(0.066)	(0.011)	(0.003)	(0.029)	(0.013)	(0.015)	(0.021)
Disagreeable	1.005	-0.057	-0.013	-0.005	-0.026	-0.029	-0.003	0.015
	(0.062)	(0.109)	(0.019)	(0.005)	(0.047)	(0.021)	(0.027)	(0.036)
N	4,211	4,211	4,211	4,540	594	4,540	4,232	3,295

Notes: Robust standard errors in parentheses. */**/*** indicates statistical significance at the 10%/5%/1% level. Column 1: Odds ratios from Cox proportional hazard model. Column 2: Ordered logit coefficients. Columns 3-6: marginal effects from binary logit model. Columns 7-8: OLS coefficients. All specifications include graduation year fixed effects.

Table 6: Effects of Old Grad-Derived Personality Traits with Attrition Adjustment

	(1) Executive	(2) Log Avg. Income	(3) Log Avg. Home Value
Leader	0.022	0.028	0.060*
	(0.019)	(0.026)	(0.035)
Determined	0.017	0.019	0.041
	(0.014)	(0.019)	(0.026)
Social	0.032**	0.039*	-0.012
	(0.016)	(0.021)	(0.028)
Helpful	-0.006	0.007	0.005(l
	(0.013)	(0.017)	(0.023)
Disagreeable	0.048*	0.053	-0.000
	(0.028)	(0.048)	(0.059)
Years Since Last	-0.011***	-0.003***	-0.003***
Update	(0.000)	(0.001)	(0.001)
Distinctions & Controls	No	No	No
N	4,540	4,232	3,295
Leader	0.009	0.009	0.009
	(0.020)	(0.020)	(0.020)
Determined	0.015	0.015	0.015
	(0.014)	(0.014)	(0.014)
Social	0.033**	0.033**	0.033**
	(0.016)	(0.016)	(0.016)
Helpful	-0.007	-0.007	-0.007
	(0.013)	(0.013)	(0.013)
Disagreeable	0.047*	0.047*	0.047*
	(0.028)	(0.028)	(0.028)
Years Since Last	-0.011***	-0.002***	-0.003***
Update	(0.000)	(0.001)	(0.001)
Distinctions & Controls	Yes	Yes	Yes
N	4,540	4,232	3,295

Notes: Robust standard errors in parentheses. */**/*** indicates statistical significance at the 10%/5%/1% level. Column 1: marginal effects from binary logit model. Columns 2-3: OLS coefficients. All specifications include graduation year fixed effects

Appendix A1 Sample Restriction Results

Table A1.1: Analysis on Subsample with Nonmissing Income Data

Outcome:	(1) Duration to Separation (Hazard)	(2) Final Rank	(3) Colonel or Above	(4) General (Uncond.)	(5) General (Cond.)	(7) Executive
Panel 1: Excluding Distinctions and Demographics						
Leader	0.900*	0.277**	0.037**	0.015***	0.085**	0.043**
	(0.055)	(0.108)	(0.018)	(0.005)	(0.035)	(0.021)
Determined	1.035	0.043	-0.005	0.006	0.051	0.029*
	(0.046)	(0.079)	(0.014)	(0.004)	(0.031)	(0.016)
Social			-			
	1.068	-0.063	0.038**	0.011**	0.122***	0.035**
	(0.054)	(0.091)	(0.017)	(0.005)	(0.035)	(0.017)
Helpful	1.024	-0.001	0.005	0.005	0.043	-0.003
	(0.041)	(0.074)	(0.013)	(0.004)	(0.029)	(0.015)
Disagreeable	0.893	0.170	0.018	-0.011	-0.082	0.064**
	(0.092)	(0.169)	(0.029)	(0.016)	(0.114)	(0.032)
N	3,934	3,934	3,934	4,232	542	4,232
Panel 2: Including Distinctions and Demographics						
Leader	0.962	0.076	-0.006	0.007*	0.066**	0.019
	(0.060)	(0.110)	(0.018)	(0.004)	(0.033)	(0.021)
Determined	1.044	-0.006	-0.016	0.004	0.038	0.025
	(0.047)	(0.081)	(0.014)	(0.004)	(0.030)	(0.016)
Social			-			
	1.067	-0.057	0.034**	0.011***	0.113***	0.034**
	(0.055)	(0.092)	(0.017)	(0.004)	(0.036)	(0.017)
Helpful	1.029	-0.022	-0.000	0.005	0.041	-0.005
	(0.042)	(0.075)	(0.012)	(0.003)	(0.028)	(0.015)
Disagreeable	0.890	0.195	0.025	-0.009	-0.081	0.062*
	(0.092)	(0.171)	(0.029)	(0.014)	(0.105)	(0.032)
N	3,934	3,934	3,934	4,232	542	4,232

Notes: */**/*** indicates statistical significance at the 10%/5%/1% level. Column 1: Odds ratios from Cox proportional hazard model. Column 2: Ordered logit coefficients. Columns 3-6: marginal effects from binary logit model. All columns limited to the subsample with non-missing average income by ZIP code. All models include graduate year fixed effects.

Table A1.2: Analysis on Subsample with Nonmissing Home Value Data

Outcome:	(1) Duration to Separation (Hazard)	(2) Final Rank	(3) Colonel or Above	(4) General (Uncond.)	(5) General (Cond.)	(7) Executive	(8) Log Avg. Income
Panel 1: Excluding Distinctions and Demographics							
Leader	0.914	0.254**	0.032	0.013***	0.100***	0.057**	0.039
	(0.063)	(0.125)	(0.020)	(0.003)	(0.027)	(0.024)	(0.028)
Determined	1.025	0.058	-0.003	0.000	-0.002	0.039**	0.036*
	(0.052)	(0.091)	(0.016)	(0.003)	(0.029)	(0.018)	(0.021)
Social			-				
	1.129**	-0.200*	0.056***	0.001	0.035	0.028	0.033
	(0.065)	(0.103)	(0.019)	(0.005)	(0.037)	(0.020)	(0.023)
Helpful	0.973	0.073	0.010	0.006**	0.052**	-0.015	-0.005
	(0.045)	(0.083)	(0.014)	(0.003)	(0.024)	(0.017)	(0.019)
Disagreeable	0.849	0.225	0.024	0.000	0.003	0.066*	0.022
	(0.101)	(0.194)	(0.032)	(0.008)	(0.066)	(0.036)	(0.051)
N	3,061	3,061	3,061	3,295	417	3,295	3,290
Panel 2: Including Distinctions and Demographics							
Leader	0.966	0.075	-0.007	0.006**	0.062**	0.036	0.016
	(0.068)	(0.127)	(0.021)	(0.003)	(0.030)	(0.024)	(0.029)
Determined	1.024	0.017	-0.012	-0.001	-0.015	0.034*	0.029
	(0.052)	(0.092)	(0.016)	(0.003)	(0.029)	(0.018)	(0.021)
Social			-				
	1.137**	-0.201*	0.053***	0.001	0.034	0.029	0.035
	(0.066)	(0.104)	(0.019)	(0.004)	(0.035)	(0.020)	(0.023)
Helpful	0.974	0.063	0.007	0.005***	0.050**	-0.018	-0.006
	(0.045)	(0.084)	(0.014)	(0.002)	(0.022)	(0.017)	(0.019)
Disagreeable	0.853	0.241	0.031	0.000	-0.002	0.064*	0.023
	(0.102)	(0.194)	(0.031)	(0.007)	(0.061)	(0.036)	(0.050)
N	3,061	3,061	3,061	3,139	394	3,295	3,290

Notes: */**/*** indicates statistical significance at the 10%/5%/1% level. Column 1: Odds ratios from Cox proportional hazard model. Column 2: Ordered logit coefficients. Columns 3-6: marginal effects from binary logit model. All columns limited to the subsample with non-missing average home value by ZIP code. All models include graduate year fixed effects. Some observations missing from General analyses with controls due to perfect prediction.

Table A1.3: Effects of Old Grad-Derived Personality Traits Without Cadet Captain Control

Outcome:	(1) Duration to Separation (Hazard)	(2) Highest Rank Attained	(3) Colonel	(4) General (Uncond.)	(5) General (Cond.)	(6) Executive	(7) Log Avg. Income	(8) Log Avg. Home Value
Leader	0.942	0.173*	0.017	0.010**	0.072**	0.025	0.023	0.057
	(0.056)	(0.104)	(0.017)	(0.004)	(0.035)	(0.020)	(0.026)	(0.035)
Determined	1.028	0.003	-0.008	0.006	0.051*	0.026*	0.018	0.034
	(0.045)	(0.078)	(0.014)	(0.004)	(0.031)	(0.015)	(0.019)	(0.026)
Social	1.080	-0.074	-0.042**	0.009**	0.105***	0.040**	0.043**	-0.007
	(0.053)	(0.088)	(0.017)	(0.004)	(0.036)	(0.017)	(0.021)	(0.028)
Helpful	1.009	0.026	0.006	0.005	0.042	-0.001	0.007	0.003
	(0.040)	(0.072)	(0.012)	(0.003)	(0.028)	(0.014)	(0.017)	(0.023)
Disagreeable	0.934	0.093	0.010	-0.011	-0.097	0.052*	0.050	0.007
	(0.091)	(0.161)	(0.028)	(0.013)	(0.100)	(0.031)	(0.048)	(0.059)
N	4,211	4,211	4,211	4,540	594	4,540	4,232	3,295

Notes: Robust standard errors in parentheses. */**/*** indicates statistical significance at the 10%/5%/1% level. Column 1: Odds ratios from Cox proportional hazard model. Column 2: Ordered logit coefficients. Columns 3-6: marginal effects from binary logit model. Columns 7-8: OLS coefficients. All specifications include graduation year fixed effects.

Appendix A2. Word Search Terms

In this section we list all search terms used for the word search analysis in Section 5.3.

Words used as evidence of the *leader* trait are "lead," "leader," "leading," "leads," "admire," "integrity," "honor," "honorable," "respect," "respectable," "respected," "hard right," "harder right," "beacon," "follow," "Captain," "General," "stripe," "striper," "inspire," "inspired," "inspires," "inspiring," "principle," "principled," "principles," "judgment," "judge," "charisma," "charismatic," "standards," "example," "command," "president," "fine officer," "XO," and "ideal."

Words used as evidence of the *determined* trait are "determined," "competitive," "competitor," "dedicated," "battle," "persevere," "perseverance," "strive," "strived," "striver," "achieve," "achieved," "ambition," "ambitious," "goal," "accomplish," "accomplished," "motivated," "fierce," "fiercely," "committed," "relentless," "hardnosed," "conquer," "conquered," "obstacles," "hard-charging," "fearless," "intense," "intensity," "single-minded," "attain," "attained," "challenge," "challenged," "hardcore," "uncompromising," "tenacious," "ferocious," and "ferocity."

Words used as evidence of the *social* trait are "fun," "party," "partier," "prank," "prankster," "antic," "carouse," "wine," "beer," "finer things," "good time," "escapade," "entertain," "entertained," "joke," "wit," "witty," "beer," "funny," "lived for the weekend," and "lived for weekends."

Words used as evidence of the *helpful* trait are "help," "helped," "helpful," "care," "cared," "caring," "generous," "generosity," "door always open," "helpful," "heart," "love,"

"considerate," "cooperate," "ear," "big heart," "friend to all," "concern," "concerned," "compassion," "compassionate," "lend a hand," "hospitable," "shirt off his back," "counted on," "count on," "kind," "favor," "conquer," "willing to help," "cooperate," "cooperative," "open door," and "door open."

Words used as evidence of the *disagreeable* trait are "haze," "plebe," "bean," "quill," "dicked," "fourth class," "4th class," "century," "area," "apathetic," "stubborn," "arrogant," "uncooperative," "tactless," "opinionated," "century," and "walked the area."