The Effect of Same-Gender or Same-Race Role Models on Occupation Choice

Evidence from Randomly Assigned Mentors at West Point

Michael S. Kofoed
Elizabeth mcGovney

ABSTRACT

We use random assignment of role models to cadets at the United States Military Academy at West Point to investigate the effect of same-gender or same-race mentors on occupation choice in the United States Army. Women and racial minorities have traditionally been underrepresented in certain occupations in the Army, and these disparities seem to persist over time. We find that when a female cadet is assigned a female mentor, the cadet is 4.60 and 18.1 percentage points more likely to pick her officer's branch as her first or among her top three occupational preferences, respectively, than if she had interacted with a male mentor. These results are robust to controlling for a limited choice set for females and a host of alternative specifications. We find that black cadets paired with black officers are 6.1 percentage points more likely to pick their role model's branch than if the black cadet had worked with a white officer. These results show that having a same-gender or same-race mentor may influence the occupation choice of women or racial minorities.

Michael Kofoed is an Assistant Professor at the United States Military Academy, 607 Cullum Road, West Point, NY 10996 (michael.kofoed@westpoint.edu). Elizabeth mcGovney is an officer in the United States Army. *The authors thank the Office of Economic and Manpower Analysis for providing the data and helpful feedback. The authors also thank Richard Patterson, David Lyle, William Skimmyhorn, Susan Carter, Kyle Greenberg, Todd Jones, Ian McDonough, Ian Schmutte, Ronald Warren, Mark Showalter, and Devon Gorry for helpful comments. They thank the participants of seminars and conferences at Utah State University, Baylor University, John Hopkins SAIS, the Association for Education Finance and Policy, Econometric Society European Meetings, Western Economic Association International, and the Southern Economic Association. The views expressed herein are those of the authors and do not reflect the position of the United States Military Academy, the Department of the Army, or the Department of Defense. The data used in this article can be obtained by contacting the Office of Economic and Manpower Analysis (OEMA) located at West Point, New York. The authors are willing to provide guidance on how to acquire it (michael.kofoed@westpoint.edu).*
[Submitted April 2016; accepted September 2017]; doi: 10.3368/jhr.54.2.0416.7838R1
JEL Classification: J16, J24, and H56
ISSN 0022-166X E-ISSN 1548-8004
Supplementary materials are freely available online at: http://uwpress.wisc.edu/journals/journals/jhr-supplementary.html

"Young girls need to see role models in whatever careers they may choose, just so they can picture themselves doing those jobs someday. You can't be what you can't see."

—Sally Ride, first American woman in space

I. Introduction

Differences in occupation choice among females and racial minorities have been an important topic for public policy and understanding differences in labor supply, wages, and promotion rates. Of particular concern is the disproportionately small number of females and minorities in high paying fields such as science, engineering, and business (Zafar 2013; Ginther and Kahn 2004). One potential explanation for this disparity could be a lack of preparation in secondary schooling for women and minorities. However, Turner and Bowen (1999) find that the preparation gap for women is closing, but Arcidiacono, Aucejo, and Hotz (2016) find that the skills gap for racial minorities has persisted over time. Occupation and major choice have large explanatory power for a continuing wage gap. Weinberger (1999) finds 8 percent of the male–female wage gap is explained by women choosing a less technical college major. In a similar study, Hirsch and Macpherson (2004) find that black workers also tend to sort into lower paying occupations, which leads to a lack of wage parity with white workers.

In addition to major choice, researchers have identified some alternative explanations for differences in how men and women select their occupations. DeLeire and Levy (2004) and Grazier and Sloane (2008) show that women tend to pick jobs that are less risky and thus may pay less. Goldin (2014) and Blau and Kahn (2017) show that women may have preferences for jobs with shorter hours and more flexibility with family concerns. Gneezy, Leonard, and List (2009) also find that females may show less competitive behavior. All of these results seem to point to a compensating wage differential for jobs that require longer hours, less flexibility, and certain personality traits that favor men.

An alternative reason why women and racial minorities are underrepresented in certain occupations is that these jobs lack same-gender or same-race mentors to help prospective employees in their careers (Humlum, Kleinjans, and Nielsen 2012). In the classroom setting, there is a robust literature that shows that having a teacher of the same gender or race can benefit students and influence their decision-making on a variety of short- and medium-run outcomes. For example, Carrell, Page, and West (2010) use the randomization of cadets at the United States Air Force Academy to professors and find that female students are more likely to major in STEM fields if taught by a female professor.[1] Lavy and Sand (2015) use random assignment of middle school students in Tel-Aviv, Israel to teachers and find that if teachers discriminate against female students,

1. Canes and Rosen (1995) examine data from three universities and find that there is no evidence that more female faculty members lead to an increase in female majors. However, these results cannot be interpreted causally since there is no random assignment of student to professor.

female students are less likely to take advanced STEM fields and select STEM occupations. Other studies use quasi-experimental methods to find that role models are influential in the classroom and affect a variety of outcomes, including grades (Griffith 2014; Bettinger and Long 2005; Hoffmann and Oreopoulos 2009; Ouazad 2011; Fairlie, Hoffmann, and Oreopoulos 2014; Lim and Meer 2017), a teacher's subjective evaluation of the student (Ehrenberg, Goldhaber, and Brewer 1995), and preventing student misbehavior (Dee 2005, 2007).

Regarding occupation choice (a long-run outcome), the literature is a bit more sparse. Macpherson and Hirsch (1995) find that women tend to select into occupations with a higher number of female colleagues. Neumark and Gardecki (1998) and Hilmer and Hilmer (2007) find similar results for women holding a Ph.D. on the academic job market. Hellerstein and Neumark (2008) show that there is considerable sorting of workers by race into certain occupations and jobs within a workplace. Independent of a gender or racial match, mentorship does seem to matter for number of outcomes, including probability and time to promotion (Karaca-Mandic, Maestas, and Powell 2013; Lyle and Smith 2014; Carter et al. 2016) and retention (Lyle 2007). Previous literature regarding the influence of having a same-gender or -race mentor on occupation choice is limited in two ways. First, it is very difficult to identify a causal effect of homophily on occupation choice because young professionals choose their mentors; thus, any estimates would suffer from endogeneity. Second, there are thousands of possible occupations that a potential college student could choose from, so interpreting any estimated effect is very difficult.

To overcome both of these obstacles, we use a unique natural experiment where the United States Military Academy at West Point randomly assigns cadets to a tactical officer who supervises all of their academic, physical, and military development in addition to serving as a resource to cadets of what to expect during their active duty military service. Tactical officers serve as the primary military supervisors for the cadets at West Point. West Point randomly assigns each cadet at the beginning of their freshman year and then reassigns the cadet at the beginning of the sophomore year. Also, officers move when their three-year tours expire. Thus, cadets can potentially work with between two and four officers. We combine cadet–officer match data with the ex post occupational preferences (solicited at the beginning of the senior year) of each cadet to study the effects of same-gender and same-race mentors on job choice. The random assignment of mentor combined with few distinct occupational lanes allows us to estimate a causal effect of a gender or racial match on occupation choice within the Army. We find that when female cadets work with female officers, the probability that the female cadet selects her officer's occupational branch as her first choice or among her top three choices increases by 5.2 and 16.6 percentage points, respectively. We also find that if a black cadet is paired with a black officer, then the cadet is 6.2 percentage points more likely to choose his officer's branch as his first branch. We find no effect for Hispanic cadets.

The rest of this paper proceeds as follows: Section II describes cadet companies and the branching process at West Point. Section III describes the data. Section IV will discuss our empirical methods. Section V reports results, and Section VI employs various robustness checks. Finally, Section VII concludes the paper.

II. Cadet Companies and Branching at West Point

One concern for the future of the United States Army is the underrepresentation of women and racial minorities in the active duty officer corps, particularly when compared to the enlisted ranks (Sönmez 2013; Lim et al. 2009; Baldwin 1996). For example, in 2014, fewer than 10 percent of the Army's officers were black compared to 18 percent of the Army's enlisted soldiers (Brook 2014). Also, many black officers do not choose "combat arms"[2] branches, among other reasons, because of past discrimination and segregation (Kirby, Harrell, and Sloan 2000; Briscoe 2013). In addition to racial disparities among Army officers, the Department of Defense previously did not allow women to enter select combat roles, including infantry and armor branches. Women were allowed in some combat arms branches, such as field artillery and aviation, but they are still very underrepresented. However, in 2016, the Army opened all combat positions to women (Lopez and Henning 2013), and, in 2015, the first class of women entered the elite Army Ranger School (Price 2015). Many argue that the integration of women and continued recruitment of black and Hispanic officers in the combat arms is not only important to competing for talent with the civilian labor market, but for the promotion and retention of females and racial minorities because the vast majority of general officers and senior leaders belong to these branches (Brook 2014; Escobar 2013).

The United States Corps of Cadets (West Point's student body) has a unique organizational structure supervised by tactical officers. These officers are captains or majors who have completed company command in the regular Army, but who do not teach academic classes at West Point. Tactical officers "train, lead, coach, and mentor cadets, with a continual focus on leader development" (United States Military Academy 2015a). They serve as role models, counselors, and disciplinarians[3] within their assigned cadet companies, exerting significant influence. Anecdotally, some cadets even keep close contact with their tactical officers after graduation, with the tactical officers potentially serving as mentors throughout their careers. This continued influence is particularly strong if the cadet and mentor belong to the same branch.

There are more than 4,000 cadets enrolled at West Point at any given time, with roughly 1,000 per class. These cadets are overseen by the Brigade Tactical Officer (BTO), a colonel who is likely to hail from the Combat Arms. The Corps is divided into four regiments; each regiment is led by a Regimental Tactical Officer (RTO) at the rank of lieutenant colonel. Regiments are further divided into three battalions, with each battalion consisting of three companies. There are a total of 36 companies, each containing approximately 130 cadets, mentored and led by their assigned tactical officer. Before 2012, the Corps had only 32 companies. As the Army directed West Point to

2. Combat arms branches include infantry, armor, aviation, field artillery, air defense artillery, and engineers. See Table 1 for a list of all possible choices of Army occupational branch for West Point cadets.

3. A tactical officer is the "legal commander" of each cadet company. When a cadet violates a regulation within West Point's standard operating procedure, it is the primary responsibility of the tactical officer to determine punishment and/or loss of privileges. However, tactical officers do give rewards or extra privileges for good behavior or academic performance. Also, a cadet's tactical officer will assign them a military grade at the end of each semester. This grade counts towards 30 percent of their final class ranking, which determines the cadet's assigned branch and first duty location.

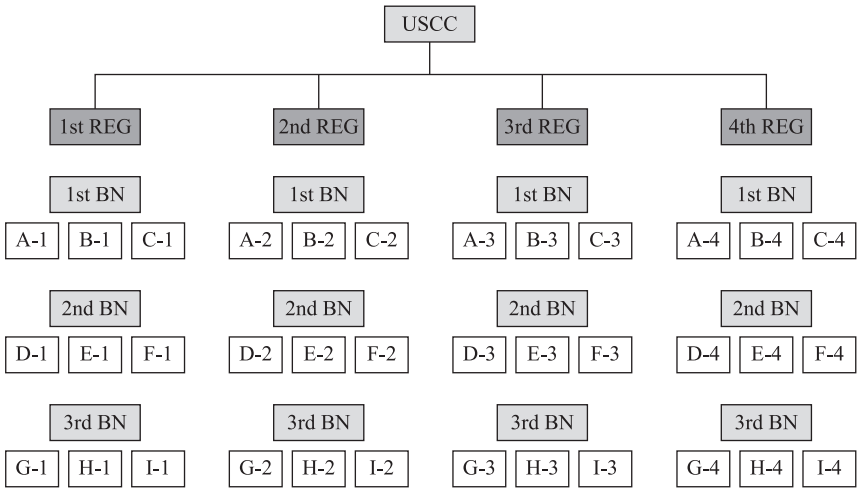

Figure 1

Structure of the Corps of Cadets

Notes: The United States Corps of Cadets (USCC) comprises four regiments (REG), and within each regiment there are three battalions (BN). Companies are labeled with the company letter (A–I) and the regimental number (hence, A-1, A-2, etc.). The academy assigns each cadet company a tactical officer to serve as a supervisor and mentor.

increase its output of commissioned lieutenants, West Point increased the number of cadet companies accordingly. Figure 1 displays an organizational chart showing how West Point organized cadets after the expansion.

West Point conditionally randomizes[4] freshman into each company at the beginning of each academic year and then randomly assigns each company a tactical officer to serve as supervisor. At the beginning of their sophomore year, cadets are randomly assigned again into a new company, where they remain for the rest of their time at West Point. This second random assignment, informally called "scrambling," has happened at various points for different classes. For the classes of 2010, 2011, and 2015, scrambling occurred between the freshman and sophomore years. West Point "scrambled" the classes of 2012 and 2013 between the sophomore and junior years. The class of 2014 did not scramble.[5] In our sample, cadets, on average, work under 2.88 distinct tactical officers during their time at West Point. Officers assigned as tactical officers usually stay with a particular company for two years, typically moving on to a position at the battalion or regiment level for their third year of assignment to West Point. These assignments place tactical officers at the forefront of cadet interaction. Tactical

4. Lyle (2007) shows that West Point strives to equalize companies with regards to gender, race, recruited athlete, high school academic performance, and entrance exam scores.

5. The timing of the scramble is determined by the Commandant of the Corps of Cadets, a one star general, who is primarily responsible for military training at West Point.

Table 1
Branches Available to Cadets

Cadet Branches		
Combat Arms	Combat Support	Combat Service Support
Infantry[a]	Signal	Medical corps
Armor[a]	Military police	Ordnance
Field artillery	Military intelligence	Adjutant general corps
Air defense artillery	Chemical corps	Quartermaster
Aviation		Transportation
Engineer		Finance corps

Notes: The Army divides its occupational branches into three groups: combat arms, combat support, and combat service support. This table shows all the branches available to cadets upon graduation.
[a]A branch that the Department of Defense previously did not allow women to join. As of 2016, all branches are available to women. However, our sample was drawn before the policy change.

officers serve as mentors to cadets and transmit wisdom gained from experience serving in the Army. As cadets approach commissioning, these connections can prove critical to the branch selection process.

Cadets submit their branch preferences during the third week of the fall semester of their senior year. Cadets rank each branch, in order of preference, using a web-based application form. The Army assigns branches in order of class rank—if the valedictorian chooses infantry branch, and there were originally 200 infantry slots, only 199 such slots remain. After all the slots for a particular branch are taken, then a cadet receives his second choice. The process continues until the cadet at the bottom of the class receives the last available slot.[6] The Army notifies cadets of their branch assignments a few weeks after the cadets submit their preferences. Table 1 shows the branches available to cadets.

III. Data

A. Summary Statistics

The data for this project come from the Office of Economic and Manpower Analysis (OEMA) housed at the United States Military Academy. Before gaining access to these data, OEMA removed all potential individual identifiers to keep the identities of the cadets and officers confidential. These data contain the ranked branch preferences from

6. The Army does place a number of constraints on this process. For example, there are certain academic qualifications to branch medical services and vision requirements for aviation. Also some years, the Army requires a certain percentage of cadets to branch in the combat arms. These complications do not apply to our results because we are primarily interested in branch preference, not final assignment.

each of the 6,254 cadets who graduated in the classes of 2010–2015 and a number of important variables including the initial company (before scramble), the graduation company (after scramble), the cadet's sex, race, ethnicity, SAT scores, fitness score, leadership score, academic GPA, and whether a cadet is a recruited NCAA athlete.

We then matched the cadet data to the tactical officer that West Point assigned the cadet for each academic year. The tactical officer data contain the tactical officer's sex, race, and branch. We then reshape the data to create a panel where we observe each cadet four times. Thus, the unit of analysis is the match each year between the gender/race of the cadet and the assigned tactical officer. We then create a dichotomous variable for whether the cadet chose the branch of that particular officer as part of their binding, senior year branch preferences.

While West Point is different from the typical university because of its emphasis on military instruction and affiliation with the Army, it is similar to many elite colleges and universities, particularly those with an emphasis on STEM majors or other technical subjects such as economics or operations research. Students are required to take a heavy load of technical subjects in their first two years, including two semesters of calculus, physics, chemistry, economics, composition, and engineering, in addition to military training and physical education. The median SAT math score in this sample is a 640, which is similar to institutions such as Case Western University, Georgia Institute of Technology, and Virginia Tech.[7] The 25th percentile SAT score was 600, and the 75th percentile score was 690. Students in our sample have an average verbal SAT score of 636. West Point is also very selective. The class of 2015, the last year in our sample, had an acceptance rate of 9.04 percent (United States Military Academy 2015b).

Panel A of Table 2 shows summary statistics from the graduating classes of 2010–2015. One distinct difference between West Point and other elite colleges or universities is that women are underrepresented. In our sample, only 15.6 percent of students are female, while 6.6 percent are black, and 8.9 percent are Hispanic. The admission committee scores applicants along three criteria: academics, fitness, and leadership. These aptitudes are measured by SAT/ACT scores,[8] high school GPA, candidate's leadership admission score (CLS), and candidate's fitness assessment (CFA). Both the CLS and CFA have a maximum of 800 points.

Panel B of Table 2 shows the summary statistics for the gender and race for the tactical officers that served at West Point from 2007 to 2015.[9] In our sample, 12.6 percent of the tactical officers were female, while 6.5 percent were black, and 2 percent were Hispanic. Panel C shows how often the gender or race of the cadet is the same as the officer assigned. Of the cadet–officer matches in our data, 4.8 percent of the matches are when a female cadet works with a female officer, 1.2 percent of the matches occur when a black cadet works with a black officer, and 0.5 percent of the matches is when a Hispanic cadet works with a Hispanic officer.

7. Carrell, Page, and West (2010) include a more comprehensive table comparing the Air Force Academy to comparable institutions with an engineering focus. While our sample has a lower SAT math score than their sample, West Point cadets are still comparable to the sample of USAFA cadets that Carrell, Page, and West (2010) study.

8. ACT scores were converted to SAT scores using a formula provided by the College Board.

9. 2007 would have been the freshman year for the class of 2010. We use the tactical officer data from 2007 to 2015, so we can construct the entire set of tactical officers that a given cadet had during their time at West Point.

Table 2
Summary Statistics for Cadets and Tactical Officers

Variable	Mean	SD	Min.	Max.	*N*
Panel A: Cadets, Graduating Classes 2010–2015					
Female	0.156	0.363	0	1	6,254
Hispanic	0.089	0.285	0	1	6,254
Black	0.066	0.248	0	1	6,254
GPA	3.020	0.510	1.762	4.278	6,254
SAT math	650.82	67.33	390	800	6,254
SAT verbal	638.56	71.73	420	800	6,254
Leadership score	618.24	48.69	434	747	6,254
Fitness aptitude	574.86	70.97	366	788	6,254
NCAA athlete	0.179	0.384	0	1	6,254
Panel B: Tactical Officers, 2007–2015					
Female	0.126	0.333	0	1	293
Black	0.065	0.247	0	1	293
Hispanic	0.020	0.142	0	1	293
Panel C: Gender and Race Matches					
Female officer–female cadet	0.048	0.213	0	1	6,254
Black officer–black cadet	0.012	0.108	0	1	6,254
Hispanic officer–Hispanic cadet	0.005	0.068	0	1	6,254
Panel D: Years with Officer					
Freshman officer	1.25	0.435	1	2	6,254
Sophomore officer	1.68	0.617	1	3	6,254
Junior officer	1.85	0.488	1	3	6,254
Senior officer	1.54	0.600	1	3	6,254

Notes: Panels A and B shows summary statistics for cadets and tactical officers, respectively. Panel C shows the percentage of same gender and race/ethnicity matches between cadets and tactical officers.

Panel D of Table 2 summarizes the variation in how long a cadet works with their officer. On average, cadets stay with their freshman company officer for 1.25 years (mostly because the Class of 2014 stayed in the same company for all four years). After the sophomore year, cadets are generally scrambled into new companies, so they could potentially stay with their officer for longer. Cadets stay with their officer assigned in their sophomore year for 1.68 years, their junior year officer for 1.85 years, and their senior year officer for 1.54 years.

Table 3 displays summary statistics for cadets by gender and race/ethnicity and the intersection between gender and race. In this table, we divide the data into two groups,

Table 3
Summary Statistics for Cadets by Gender and Race/Ethnicity

	Male				Female			
Variables	All	White	Black	Hispanic	All	White	Black	Hispanic
Matched first preference	0.261	0.269	0.197	0.266	0.112	0.115	0.079	0.142
	(0.439)	(0.444)	(0.399)	(0.442)	(0.315)	(0.319)	(0.271)	(0.350)
Matched top three	0.592	0.609	0.511	0.579	0.320	0.321	0.277	0.358
	(0.492)	(0.488)	(0.495)	(0.494)	(0.467)	(0.467)	(0.450)	(0.482)
Same-gender officer	0.838	0.838	0.834	0.833	0.126	0.134	0.095	0.113
	(0.368)	(0.369)	(0.372)	(0.373)	(0.332)	(0.341)	(0.294)	(0.317)
Same-race officer	0.640	0.833	0.069	0.015	0.569	0.835	0.054	0.022
	(0.480)	(0.373)	(0.253)	(0.121)	(0.495)	(0.371)	(0.227)	(0.146)
Same-gender and same-race mentor	0.575	0.751	0.038	0.014	0.058	0.084	0.012	0.000
	(0.494)	(0.432)	(0.191)	(0.112)	(0.233)	(0.277)	(0.111)	(0.000)
SAT math	654.06	658.70	656.31	627.28	633.23	641.66	572.18	604.34
	(66.28)	(63.07)	(63.73)	(59.86)	(70.29)	(65.80)	(59.86)	(58.49)
SAT verbal	638.78	646.04	646.23	610.49	637.37	647.40	590.99	607.08
	(70.79)	(68.61)	(69.39)	(69.39)	(76.65)	(74.05)	(59.86)	(70.64)
Cadet leadership score	618.87	623.12	595.17	608.24	614.84	617.87	604.99	609.37
	(48.76)	(46.71)	(46.63)	(52.13)	(48.20)	(45.96)	(53.33)	(51.43)
Cadet fitness score	578.70	580.27	563.55	570.05	554.10	558.83	542.14	540.93
	(70.73)	(69.95)	(68.74)	(74.89)	(68.65)	(66.96)	(78.27)	(64.54)
Recruited athlete	0.166	0.174	0.262	0.09	0.253	0.298	0.158	0.160
	(0.372)	(0.380)	(0.441)	(0.288)	(0.435)	(0.458)	(0.367)	(0.369)
Observations	5,279	4,023	309	415	974	655	101	106

Notes: This table displays summary statistics for cadets by gender and race/ethnicity. Matched first preference refers to when a cadet's first branch preference matches the branch of the tactical officer. Notable differences are probability of selecting an officer's occupational branch, SAT scores, and recruited athlete. Standard deviations are in parentheses.

male and female, and then divide each gender group into columns representing the three racial groups we use in our analysis: white, black, and Hispanic. The first row presents mean values for whether a cadet selected their officer's branch as their top or one of their top three choices. Male cadets are much more likely to select their officer's branch as both their first choice (26.1 percent compared to 11.2 percent) and top three choices (59.2 percent versus 32.0 percent) than female cadets. This large difference is a function of the high concentration of tactical officers from combat arms branches. White, male cadets are also much more likely to pick their officer's branch as their first choice than black, male cadets (26.9 percent versus 19.7 percent), while white, male and Hispanic, male cadets are similar (26.1 percent versus 26.6 percent). Conditional on being female, racial effects are quite similar. White, female cadets choose their officer's branch more than black, female cadets (11.2 percent versus 7.9 percent). However, white, female cadets choose their officer's branch at lesser rates than Hispanic, female cadets (11.5 percent versus 14.2 percent). We find similar trends for indicating a cadet selecting one of their officer's branches among their top three preferences.

Next, we summarize the number of same-gender or same-race matches between cadets and tactical officers that occur in our data. Not surprisingly, of the cadet–officer matches, the vast majority are male cadets matched with male officers. Nearly 83.8 percent of male cadets, in any given year, are matched with male officers. However, of the cadet–officer matches, 12.6 percent of female cadets work with a female officer. This summary statistic shows that while women comprise a small fraction of cadets and officers, there exist enough matches to drive our analysis. However, same-race matches, for black and Hispanic cadets, are not as common. In a given academic year, 83.3 percent of white, male cadets work with a white officer, but only 6.9 percent of black, male cadets are matched with black officers. Hispanic, male cadets are matched with a Hispanic officer only 1.5 percent of the time. The summary statistics for females are similar. These numbers show that we may have enough power for black cadets matched with black officers, but this is doubtful for Hispanic cadets. However, we do conduct and report the analysis for Hispanic cadets for completeness. Finally, we examine the number of instances where a cadet is matched with an officer of both the same gender *and* race. We find that for black and Hispanic, female cadets, this situation rarely happens. Black, female cadets are only matched with black, female officers in 1.2 percent of our yearly matches, and Hispanic, female cadets are never matched with a Hispanic, female officer.

Regarding our controls, we find that male cadets tend to have higher SAT scores than females, along with whites compared to blacks and Hispanics. However, male and female cadets have nearly equal scores on the cadet leadership score (CLS). While males have higher scores on the cadet fitness aptitude (CFA), a higher percentage of females are recruited NCAA athletes, along with a higher number of black cadet athletes compared to whites. These controls are important to test for covariate balance to show conditional random assignment. Next we summarize branch choices of cadets and the officers presiding over them.

B. Summary of Branch Choices

Each year, seniors submit their branch preference among 16 branch choices to the Army. The cadet's decision, in large part, will determine the rest of her career in the Army since

Table 4
Number of Cadets Receiving Branch by Preference Order

Order of Preference	Number Received Branch	Percentage
First	4,813	76.96
Second	741	11.85
Third	277	4.43
Fourth	112	1.79
Fifth	62	0.99
Sixth	30	0.48
Seventh	24	0.38
Eighth	16	0.26
Ninth	16	0.26
Tenth	12	0.19
Eleventh	8	0.13
Twelfth	15	0.24
Thirteenth	14	0.22
Fourteenth	27	0.43
Fifteenth	20	0.32
Sixteenth	16	0.26

Notes: The Army does not guarantee that a cadet will get their top branch preference. Thus, cadets express their preference by ranking each branch from first choice to sixteenth choice. These summary statistics show that the vast majority of cadets in our sample receive at least their top three choices.

there are very high switching costs. We estimate a model where the dependent variables are whether a cadet selects the branch of one of her tactical officers as her top choice or one of her top three choices. One concern about this choice of dependent variable is whether the cadet has an incentive to reveal their true preferences during the branching process. Sönmez and Switzer (2013) show that, with a few exceptions, West Point's current mechanism of branch preferences is strategy-proof. Table 4 shows the percentage of cadets who received their first choice to sixteenth choice. We find that 76.96 percent of cadets receive their first preference, 11.85 percent receive their second preference, and 4.43 percent receive their third preference. These results show 93.8 percent of cadets receive at least one of their top three preferences. By using both the top and the top three preferences as a dependent variable, we account for any strategic behavior.

Table 5 shows the number of cadets who expressed each branch as their first preference. Column 1 shows the entire sample of cadets, while Columns 2 and 3 separate branch preferences by gender. The most popular choices for male cadets are the combat arms branches, including infantry, aviation, and armor. However, females are currently not allowed to select infantry or armor branches. The most popular branches for female cadets are military intelligence, engineering, and medical service corps. In fact, 148 of the 307 cadets (or 48.2 percent) who selected medical service corps were female.

Table 5
Top Branch Preference by Gender

	Male and Female		Male		Female	
Branch	Number	% of Total	Number	% of Total	Number	% of Total
Infantry	1,427	23.00	1,427	27.24	N/A	N/A
Aviation	897	14.46	787	15.02	110	11.40
Engineers	761	12.27	633	12.08	128	13.26
Military intelligence	687	11.07	520	9.93	167	17.31
Armor	521	8.40	521	9.95	N/A	N/A
Field artillery	420	6.77	398	7.60	22	2.28
Medical services	307	4.95	159	3.04	148	15.34
Signal corps	239	3.85	211	4.03	27	2.80
Air defense artillery	197	3.18	175	3.34	22	2.28
Adjutant general	150	2.42	33	0.63	117	12.12
Quartermaster	140	2.26	81	1.55	59	6.11
Ordnance	129	2.08	93	1.78	36	3.73
Military police	125	2.01	58	1.11	67	6.94
Transportation corps	97	1.56	61	1.16	36	3.73
Finance corps	91	1.47	73	1.39	18	1.87
Chemical corps	16	0.26	8	0.15	8	0.83

Notes: This table shows the number of cadets that choose each branch as their top choice by gender. While female cadets cannot select infantry or armor, they are overrepresented in some branches, such military police, military intelligence, and adjutant general. Branches are sorted by total popularity.

Table 6 is analogous to Table 5, but splits the sample by race/ethnicity. Column 1 shows the entire sample, while Columns 2, 3, and 4 show the number of cadets who selected a certain branch conditional on being white, black, or Hispanic. The most popular branches for white cadets are infantry (25.45 percent), aviation (15.72 percent), and engineering (12.49 percent). The most popular branches for black cadets are military intelligence (11.06 percent), infantry (9.09 percent), and quartermaster (8.85 percent). The top branches for Hispanics cadets are infantry at a similar rate to whites (19.86 percent), engineering (12.64 percent), and aviation (12.09 percent). While Hispanics cadets' branch preferences are similar to whites, black cadets seem to be underrepresented in some branches (such as infantry and engineering), but overrepresented in other branches (such as signal corps, quartermaster, and air defense artillery).

Figure 2 also shows these summary statistics in graphical form except that we split the data into three groups: total, females, and black males. We sort the branches according to total popularity and summarize the percentage within a certain group that chooses a certain branch as their first preference. We find that females are overrepresented in engineers, military intelligence, medical services, adjutant general, but they

Table 6
Top Branch Preference by Race

	All Races		White		Black		Hispanic	
Branch	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total
Infantry	1,427	23.00	1,180	25.45	37	9.09	110	19.86
Aviation	897	14.46	729	15.72	32	7.86	67	12.09
Engineers	761	12.27	579	12.49	38	9.34	70	12.64
Military intelligence	687	11.07	496	10.70	45	11.06	56	10.11
Armor	521	8.40	396	8.54	33	8.11	50	9.03
Field artillery	420	6.77	329	7.10	24	5.90	30	5.42
Medical services	307	4.95	200	4.31	33	8.11	33	5.96
Signal corps	239	3.85	129	2.78	33	8.11	28	5.05
Air defense artillery	197	3.18	123	2.65	27	6.63	20	3.61
Adjutant general	150	2.42	86	1.85	21	5.16	26	4.69
Quartermaster	140	2.26	75	1.62	36	8.85	19	3.43
Ordnance	129	2.08	94	2.03	11	2.70	11	1.99
Military police	125	2.01	80	1.73	12	2.95	18	3.25
Transportation corps	97	1.56	69	1.49	13	3.19	6	1.08
Finance corps	91	1.47	61	1.32	12	2.95	6	1.08
Chemical corps	16	0.26	11	0.24	0	0	4	0.72

Notes: This table shows the number of cadets who choose each branch as their top choice by race/ethnicity. Hispanic cadets tend to have preferences similar to whites, but blacks are underrepresented in infantry and engineering while being overrepresented in the signal corps, quartermaster, and air defense artillery branches compared to whites. Branches are sorted by total popularity.

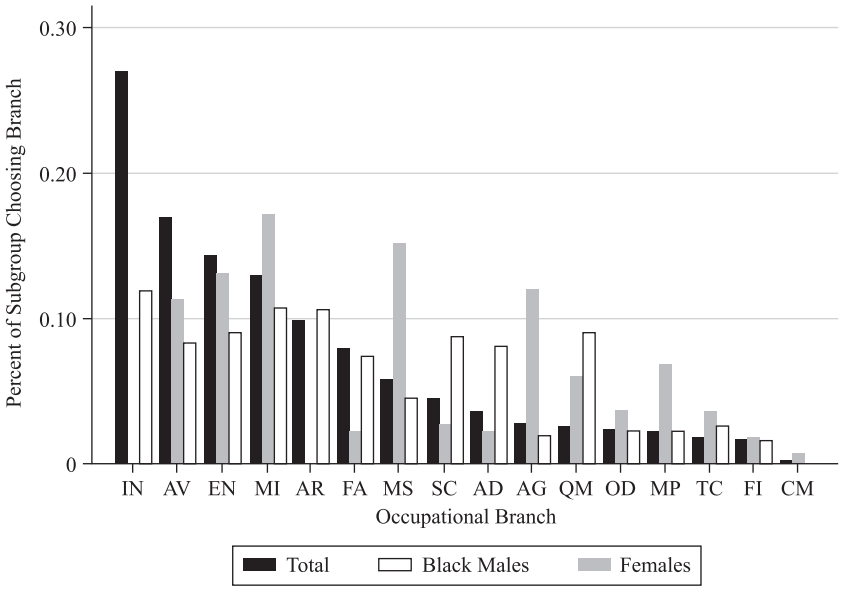

Figure 2

Cadet Branch Selections

This figure shows the within-subgroup percentage of cadets who selected each branch as their preference with the full sample, female, and black male subsamples. It is important to note the concentration of cadets in certain branches by gender and race. Also note that prior to 2016, the Department of Defense did not allow women to choose the infantry or armor branches. IN, infantry; AV, aviation; EN, engineering; MI, military intelligence; AR, armor; FA, field artillery; MS, medical corps; SC, signal; AD, air defense artillery; AG, adjutant general corps; QM, quartermaster; OD, ordnance; MP, military police; TC, transportation; FI, finance; CM, chemical corps.

are underrepresented in field artillery, signal corps, and aviation. Black males are overrepresented in armor, signal corps, air defense artillery, and quartermaster.

It is also important to note the representation among the branches of officers both as a full sample and as gender/racial subsamples. Figure 3 shows the number of officers per branch. Again, we split our sample into total, females, and black males. In our sample, each of the 16 branches that cadets can choose were represented except for chemical corps and medical services. Also, two branches that cadets cannot choose until later in their Army careers were present in our sample—psychological operations (PO) and special forces (SF). We also note that in our gender/racial subsamples, there are some branches that are not represented. For example, there are no female infantry or armor officers because of a previous policy banning women from these branches. Because of the relatively few black and Hispanic officers, we observe no black officers in eight branches and only Hispanic officers belonging to engineering, infantry, and quartermaster.

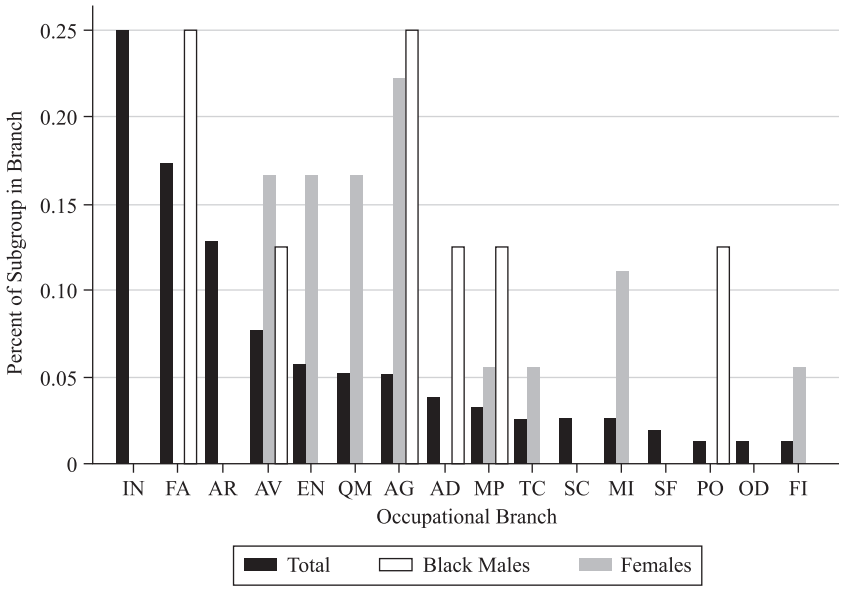

Figure 3

Officer Branch Selections

This figure shows the within-subgroup percentage of officers who selected each branch as their preference with the full sample, female, and black male subsamples. It is important to note the concentration of officers in certain branches by gender and race. These figures also show that there is not complete representation of all branches by women and minorities, and thus the dummy for females, blacks, and Hispanics in the regression models will be negative.

IN, infantry; FA, field artillery; AR, armor; AV, aviation; EN, engineering; QM, quartermaster; AG, adjutant general corps; AD, air defense artillery; MP, military police; TC, transportation; SC, signal; MI, military intelligence; SF, special forces; PO, psychological operations; OD, ordnance; FI, finance.

IV. Methods

A. Check for Conditional Random Assignment

We use the conditional random assignment[10] of cadets to tactical officer as an identification strategy to show the "role model" effect of having a same-race or same-gender role model on occupation choice in the United States Army for West Point cadets. For this identification strategy to be valid, West Point must truly be randomizing the cadet–tactical officer match. To test this random assignment, we regress the cadet's gender,

10. One institutional difference between West Point and its sister institution, The United States Air Force Academy, is that West Point conditionally assigns cadets to companies and strives to have an equal distribution of academic talent in each academy. At Air Force, cadets are unconditionally assigned to squadrons (Carrell, Page, and West 2010). While this difference is important to note, it is not a threat to our identification strategy because it does not affect the probability that a female cadet is initially assigned to a female officer compared to being assigned to a male officer.

Table 7
Check for Randomization of Cadet to Officer

	Female Officer		Black Officer		Hispanic Officer	
Variables	Full Sample (1)	Females (2)	Full Sample (3)	Black (4)	Full Sample (5)	Hispanic (6)
Female cadet	–0.004	NA	–0.001	–0.026	–0.001	0.005
	(0.004)		(0.003)	(0.003)	(0.001)	(0.005)
Black	–0.008	–0.033	0.006	NA	0.005	NA
	(0.010)	(0.020)	(0.005)		(0.003)	
Hispanic	0.005	–0.017	–0.002	NA	–0.004	NA
	(0.006)	(0.019)	(0.002)		(0.004)	
GPA	0.006	–0.019	0.008**	–0.030	0.000	0.008*
	(0.007)	(0.020)	(0.004)	(0.018)	(0.002)	(0.004)
SAT math	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.015)	(0.000)	(0.000)
SAT verbal	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CLS	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CFA	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
NCAA athlete	0.003	0.008	0.009*	0.016	0.000	–0.005
	(0.008)	(0.014)	(0.005)	(0.017)	(0.001)	(0.003)
Observations	23,966	3,745	23,966	1,568	23,966	2,151
R^2	0.001	0.002	0.001	0.008	0.000	0.004

Notes: This table shows results from regressing the gender or race of the assigned tactical officer on various cadet attributes as a check for conditional random assignment. Odd columns show the analysis completed on the full sample. Even columns estimate the same analysis conditional on the attribute in question. Standard errors clustered at the tactical officer level. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

race, and other characteristics on a dummy variable indicating whether the cadet had a female or minority tactical officer during their time at West Point. One threat to our identification strategy is that either female/minority students could choose to scramble into a cadet company with a female/minority officer (against regulation and very unlikely to happen) or that being female or a racial minority increases the probability that the Academy will assign a particular cadet a tactical officer of the same gender or race.

Table 7 shows results of a regression of cadet characteristics on whether a cadet works with a female, black, or Hispanic officer. We also include results after restricting subsamples of female, black, or Hispanic cadets only to test, conditional on being female or

a racial minority, that other characteristics such as test scores and grades are still conditionally random. Nearly all of the results are not statistically significant, meaning that there is no evidence of systematic assignment of female, black, or Hispanic cadets to officers of the same gender or race. The only coefficient that is statistically significant is the effect of a Hispanic cadet's GPA on receiving a Hispanic officer as a role model. We find that a one standard deviation increase in GPA increases the probability of being matched with a same-race officer by 0.004, an economically insignificant amount. Also, there are many coefficients contained in this table, and we would expect (at a five percent confidence level) that at least one coefficient might be randomly statistically significant. These results support the claim that West Point randomly assigns cadets to tactical officers.

Another possible threat to our identification strategy would be if West Point assigned cadets who expressed interest in a certain branch to a tactical officer of that branch. If this behavior exists, then branches of tactical officers would no longer be determined by random assignment and would suffer from the same selection bias as other studies with endogenously determined role models. To show that this is not the case, we use the fact that generally cadets are scrambled into new companies at some point in their time at West Point. For the class of 2015,[11] West Point collected branch preferences of cadets for each year with only their senior year preferences being binding. To ensure that the tactical officer's branch is also random, we regress the cadet's prescramble branch preferences on whether the cadet's next tactical officer is of the same branch as the cadet's top choice.

Table 8 shows results for the check to ensure that the branch of the tactical officer is randomly assigned. For female cadets, we estimated the model only with female cadets who were not assigned a tactical officer who was infantry or armor. Also, there were branches that no black or Hispanic cadet indicated as their top preference. We omitted these branches in Columns 5 and 6, where we estimated the model for blacks and Hispanics only. We find that indicating a certain branch as a cadet's top preference does not affect the probability that West Point assigns that cadet to an officer from that branch.

Next, we use simulation methods to show evidence of both random assignment of cadets and tactical officers to companies. Carrell and West (2010) and Carrell, Hoekstra, and West (2016) use simulation methods to show random assignment of Air Force Academy cadets, professors, and roommates to class sections and squadrons. Lim and Meer (2017) use similar techniques to show random assignment of South Korean school children and teachers to classrooms, respectively.

This technique, first developed by Lehmann and Romano (2005) and Good (2006), uses the sorting algorithm that, in our case, places cadets into companies to create placebo companies. For each company–year observation, we replicate West Point's algorithm to draw 10,000 synthetic companies of the same size of the company in question. We then calculate the number of female cadets in each of the placebo companies and obtain an empirical p-value for the proportion of placebo companies that contained less females than the actual company. We then repeat this process for every company–year observation in our data for black and Hispanic cadets.

If the way that West Point assigns cadets to companies is in accordance with random assignment, then any empirical p-value should occur with equal probability, and thus the

11. For the class of 2015, the scramble occurred in between the freshman and sophomore years.

Table 8
Check for Randomization of Cadet to Officer: Prescramble Branch Choice

		Gender		Race		
Variables	Full Sample (1)	Males (2)	Female (3)	White (4)	Black (5)	Hispanic (6)
Adjutant general	–0.012	–0.057	–0.029	–0.050	0.121	–0.049
	(0.043)	(0.049)	(0.042)	(0.071)	(0.109)	(0.056)
Armor	0.037	0.034		0.017	0.064	0.229
	(0.061)	(0.065)		(0.090)	(0.118)	(0.234)
Aviation	0.006	0.003	0.017	–0.012	0.071	–0.011
	(0.040)	(0.044)	(0.032)	(0.066)	(0.087)	(0.033)
Chemical corps	–0.018	–0.082	–0.014	–0.056	0.141	
	(0.056)	(0.058)	(0.038)	(0.088)	(0.110)	
Engineering	0.044	0.048	0.149	–0.013	0.182	0.344*
	(0.061)	(0.069)	(0.142)	(0.089)	(0.134)	(0.198)
Field artillery	0.026	0.027	–0.022	–0.003	0.087	–0.019
	(0.063)	(0.066)	(0.042)	(0.088)	(0.072)	(0.033)
Finance	0.028	0.028	0.228	–0.005	0.039	–0.100
	(0.065)	(0.073)	(0.214)	(0.100)	(0.048)	(0.064)
Infantry	0.060	0.057		0.036	0.183	–0.016
	(0.054)	(0.058)		(0.082)	(0.156)	(0.028)
Military intelligence	0.025	0.031	–0.023	0.007	0.220*	–0.028
	(0.048)	(0.056)	(0.036)	(0.077)	(0.118)	(0.035)
Military police	0.014	0.012	–0.044	–0.001	0.089	0.001
	(0.064)	(0.082)	(0.066)	(0.094)	(0.107)	(0.055)
Medical service	0.005	–0.002	–0.035	–0.036	0.186	–0.016
	(0.038)	(0.041)	(0.046)	(0.060)	(0.117)	(0.055)
Ordnance	–0.031	–0.076	0.027	–0.050		
	(0.044)	(0.053)	(0.032)	(0.069)		
Quartermaster	–0.039	–0.065	–0.062	–0.103	0.150	
	(0.049)	(0.052)	(0.072)	(0.078)	(0.109)	
Signal	–0.026	–0.058	–0.116	–0.115	0.170	0.011
	(0.050)	(0.059)	(0.127)	(0.080)	(0.108)	(0.049)
Transportation	–0.052	–0.076	0.001	–0.065		
	(0.052)	(0.054)	(0.032)	(0.075)		
Observations	938	779	122	675	89	86
R^2	0.031	0.017	0.161	0.030	0.180	0.340

Notes: The dependent variable is assignment to an officer after scramble of same branch as cadet indicated before scramble. Air defense artillery is an omitted category. Independent variables are whether a cadet chose a given branch as their first preference before the scramble. Standard errors clustered at the tactical officer level. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table 9
Empirical p-value Check for Random Assignment to Peers and Tactical Officer

	Female Cadet (1)	Black Cadet (2)	Hispanic Cadet (3)
Panel A: Tests for Random Assignment of Cadets to Companies			
Empirical *p*-values (mean and SD)	0.450 (0.194)	0.434 (0.233)	0.437 (0.219)
Kolmogorov–Smirnov test (No. failed/ total tests)	0/8	0/8	0/8
χ^2 goodness of fit test (No. failed/ total tests)	0/8	0/8	0/8
Panel B: Tests for Random Assignment of Officers to Companies			
Female officer	–0.044 (0.047)	–0.034 (0.051)	0.043 (0.062)
Black officer	0.067 0.071	0.113 (0.077)	–0.061 (0.037)
Hispanic officer	0.045 (0.092)	0.084 (0.109)	–0.127 (0.108)
F-test for branch FEs	0.90	0.69	0.60

Notes: Each column represents a different check for random assignment of a certain demographic group to both cadet company and tactical officer. The dependent variable is the empirical *p*-value described in Section IV.A. The Kolmogorov–Smirnov test and Pearson χ^2 tests ensure that the empirical *p*-value is distributed uniformly. In Panel B, regressions include company and year fixed effects. We cluster standard errors at the company level. Finally, we regress whether a cadet is female, black, or Hispanic on officer branch fixed effects and report the *F*-statistic for joint significance.

p-values for the synthetic companies should be distributed uniformly. We follow the cited literature by testing whether the empirical *p*-values for females, blacks, and Hispanics are distributed uniformly by using the Kolmogorov–Smirnov[12] and Pearson χ^2 goodness-of-fit tests used by Ammermueller and Pischke (2009). Panel A of Table 9 shows the results from these tests. Given the eight years of data that we have, we find that we cannot reject the null hypothesis of uniform distribution using both test statistics. These tests are evidence that West Point does randomly assign cadets to companies.

We can also use these simulation methods to find evidence that the gender and race of the tactical officer cannot predict the gender and racial composition of the companies they

12. The Kolmogorov–Smirnov test statistic is $sup_x|F_n(x)-F(x)|$, where $F_n(x)$ is the empirical cumulative distribution and $F(x)$ is the theoretical cumulative distribution:

$$\chi^2 = \sum_{i=1}^{k} \frac{(n_i - \eta_i)^2}{\eta_i},$$

where n_i is the observed frequency in bin i, and η_i is the expected frequency in bin i.

supervise. We regress the empirical *p*-value for the gender or racial composition of the company on the gender and race of the tactical officer assigned to the company. Panel B of Table 9 displays the results for this exercise. We find no evidence that the race or gender of the tactical officer predicts the *p*-value of the company's demographic composition.

Finally, if West Point systematically assigns female, black, or Hispanic cadets to companies with officers from certain branches, then our identification strategy would be invalid. To address this concern, we regress dummy variables for whether a cadet is female, black, or Hispanic on officer branch fixed effects and calculate an *F*-statistic to test joint significance of the branch fixed effects. The *F*-statistics are very small (0.90 for females, 0.69 for blacks, and 0.60 for Hispanics); thus, we cannot reject the null hypothesis that the branch of the tactical officer cannot predict whether West Point assigns the officer a female, black, or Hispanic cadet.

B. Econometric Models

In our data, we observe every cadet four times: once for every year that they attended West Point. The unit of analysis is the cadet–year matched with the assigned tactical officer for the cadet company. As a dependent variable, we use an indicator for whether the cadet chooses the branch associated with the officer in the cadet–year–officer matching as either the top or among the top three when binding preferences are selected in the senior year. To estimate the effect of a female having a female tactical officer, we estimate the following empirical model:

$$(1) \quad y_{ijct} = \phi_1 + \beta_1 F_i + \beta_2 F_{jct} + \beta_3 F_i F_{jct} + \beta_4 IN_{jct} + \beta_5 F_i IN_{jct} + \beta_6 AR_{jct} + \beta_7 F_i AR_{jct} + \varepsilon_{ijct}$$

where y_{ijct} is an indicator for whether a cadet i chooses the same branch as tactical officer j, serving in company c, and in year t. F_i is a dummy for whether the cadet is a female or racial minority, and F_{jct} is an indicator for whether the tactical officer j, serving in company c, and for year t is female. In our model, β_3 is the parameter of interest because it calculates the average effect on the probability that a cadet chooses the same branch as her tactical officers given that the cadet and tactical officer are both female.

Female cadets pose an additional econometric issue because they cannot select infantry or armor as one of their branch choices. To correct for this limited choice set, we adjust the model for this limited choice set by adding fixed effects for working under an infantry (IN_{jct}) or armor tactical officer (AR_{jct}) and then interact these fixed effects with the cadet's gender ($F_i IN_{jct}$ and $F_i AR_{jct}$). These fixed effects correct the model by controlling for the fact that it is currently impossible for a female cadet to mimic her infantry or armor officer's branch. For specifications focusing on black or Hispanic cadets, we do not include these fixed effects. However, the results for black and Hispanic cadets are robust to inclusion of these fixed effects.

First, we estimate the model with only a dummy for whether a cadet is female or a racial minority, whether the assigned officer is a female or racial minority, and the interaction term. Second, we estimate the same model but include a number of fixed effects, including dummy variables for the cadet's company (both first and graduating), class year, and the interaction between the two. These fixed effects control for any unobservable shocks in common to a company or a given year. Finally, in addition to company year fixed effects, we include a vector of control variables, including a cadet's

cumulative grade point average when she made her branch selection (beginning of senior year), SAT math and verbal scores, the cadet's leadership and fitness scores, whole candidate score, and whether the cadet was a recruited NCAA athlete. If cadets are truly randomly assigned to companies and tactical officers, then observable exogenous characteristics should have no effect on β_3, the parameter of interest. Thus, this third specification acts as a helpful check on random assignment.

Another specification that would be of interest is to understand the effect of repeated interaction of same-gender mentors. One could imagine that if a female or black cadet was repeatedly exposed to mentors of the same gender or race that these interactions could reinforce each other. However, the previous specification only captures the effect of having a *given* mentor be female. Carrell, Page, and West (2010) propose estimating a specification that replaces the dummy variable for the gender of a mentor with the fraction of same-gender mentors to which the student was exposed. In our specification, the parameter of interest is the interaction between the cadet's gender and the fraction of female officers. To estimate the effect of multiple same-gender or same-race mentors on occupation choice, we collapse our panel such that there exists only one observation per cadet and estimate the following model:

$$(2) \quad y_i = \phi_1 + \beta_1 F_i + (\beta_2 + \beta_3 F_i)\frac{\sum_{j|i} F_j}{n_i} + (\beta_4 + \beta_5 F_i)\frac{\sum_{j|i} AR_j}{n_i} + (\beta_6 + \beta_7 F_i)\frac{\sum_{j|i} IN_j F_i}{n_i} + \varepsilon_{ij}$$

where y_i is whether a cadet's first branch preference matched at least one of her tactical officers' branches, and $(\Sigma_{j|i}F_j)/n_i$ is the fraction of individual, female tactical that cadet i works with during their time at West Point. With a collapsed panel, the interpretation of the model changes subtlety. The dependent variable represents whether a cadet chooses *any* of her officers' branches, not just the officer in a particular year (t). We use the proportion of distinct officers in a cadet's set that are female as an explanatory variable. This measure means that if a cadet has the same female officer for two years, we will count this set as having one officer.

For female officers, this approach gives us considerable variation. In our data, we observe that 67.94 percent of cadets never have a female officer, 29.31 cadets work with one female officer, and 2.75 cadets are matched with two female officers. However, there is little variation for black or Hispanic officers. We observe that 83.18 percent of cadets never work with a black officer, 15.94 percent work with one black officer, and only 0.88 percent work with two officers. No cadets work with more than one Hispanic officer. Because of the lack of variation, we estimate this model only for the female cadet–female officer match. We also include the number of infantry or armor tactical officers interacted with cadet gender to correct for female cadets not having those branches as options.[13]

C. Empirical p-*Values*

One threat to our identification could be that males and females or whites and minorities simply have different tastes and preferences for various types of occupations. One

13. An alternative unit of observation is the set of officers with whom an individual interacts. In the Online Appendix, we estimate a specification where the independent variable is whether a female cadet is *ever* matched with a female officer and the dependent variable is whether a cadet chooses *any* of her tactical officers' branches. We find that our results are robust to this specification as well.

helpful aspect of Army data is that generally all officers are paid according to rank and not branch (with the exception of flight pay to those in aviation and bonuses for medical doctors working in medical services). However, if it is true that females and minorities simply have different preferences for their preferred branches, then any positive and statistically significant finding would simply be a mechanical matching of preferences when female or minority cadets are matched with same-gender or same-race officers. To address this concern, we use simulation techniques with each regression to estimate an empirical *p*-value similar to a technique employed by Carrell, Hoekstra, and West (2016). First, we use West Point's algorithm to assign cadets randomly, within a given academic year, into new cadet companies and then randomly assign each company a tactical officer from the same academic year. Then we reestimate the model specification in question and compare the placebo coefficient to the estimate using actual data. Next, we repeat this simulation exercise 1,000 times and report the fraction of placebo coefficients that were lower in magnitude than the actual coefficient, thus creating a *p*-value. If our results are the effect of a mentoring relationship between a similar cadet and officer, then we would expect that the placebo coefficients would be centered on zero and only rarely exceed our actual estimates. However, if our results are simply the mechanical matching of cadets and officers were similar pre-existing preferences, then our placebo coefficients should be centered on our actual estimates. In each of our regression tables, we report empirical *p*-values in brackets for inference and to show robustness to differences in preferences.[14]

V. Results

A. Results for Female Cadets

Table 10 shows results for female cadets. The first panel shows results for whether a cadet indicates her tactical officer's branch as her first choice. The third row shows that if a female cadet works with a female officer, then the cadet is 5.2 percentage points more likely to select her officer's branch without controlling for cadet company, graduation year, or observed characteristics. After controlling for cadet company and graduation year, the magnitude of this coefficient drops slightly to a 4.7 percentage point increase. However, the result from Column 2 is robust to adding exogenous controls, which is evidence for the conditional random assignment of cadets. This result is evidence for a role model effect and that female cadets do seem to respond to mentorship from a fellow female officer by selecting their officer's branch as their first choice.

Using the top three branch preferences as a dependent variable yields results with increased magnitudes. Female cadets are, on average, 4.1 percentage points less likely to select their tactical officer's branch as one of their top three preferences than their male peers, although this result is not statistically significant with class, company, and company–class fixed effects. Regarding the interaction term, we find that if a female cadet works with a female tactical officer, then the cadet is 15.9 percentage points more likely to select her role model's branch.

14. For completeness, we display all of our results using tactical officer level clustered standard errors in the Online Appendix.

Table 10
Estimated Effects of Female Cadet–Female Mentor Match

	First Choice Match (1)	First Choice Match (2)	First Choice Match (3)
Female cadet	–0.004***	–0.002***	0.000***
	[1.000]	[1.000]	[1.000]
Female officer	0.014	0.016*	0.016*
	[0.883]	[0.914]	[0.917]
Female cadet × Female officer	0.052***	0.047***	0.046***
	[0.999]	[1.000]	[0.998]
Observations	24,104	24,104	23,966
R^2	0.069	0.103	0.105
	Top Three Match (1)	Top Three Match (2)	Top Three Match (3)
Female cadet	–0.053***	–0.047***	–0.041***
	[1.000]	[1.000]	[1.000]
Female officer	0.005	–0.002	–0.010
	[0.535]	[0.328]	[0.338]
Female cadet × Female officer	0.166***	0.160***	0.159***
	[1.000]	[1.000]	[1.000]
Observations	24,104	24,104	23,966
R^2	0.097	0.155	0.160
Company & year FE	No	Yes	Yes
Exog. controls	No	No	Yes

Notes: Exogenous controls include whether a cadet is black or Hispanic, GPA, SAT math and verbal scores, cadet leadership score, cadet fitness aptitude, and recruited NCAA athlete. We have also included fixed effects for whether the officer belongs to infantry or armor branches and interacted these fixed effects with the cadet's gender. These fixed effects correct for the limited choice set for female cadets. Square brackets include empirical *p*-values. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

These results also indicate that if the Army wants to encourage more female West Point alumni to select branches where females are underrepresented, then West Point may want to supply more female officers from these branches to mentor female cadets. Thus, the lack of female mentors may perpetuate the gender gap in the officer corps, particularly among West Point alumnae.

B. Results for Black Cadets

Table 11 show results for black cadets and black tactical officers. Similarly to female cadets, we find that black cadets are also less likely to select their officer's branch as their

Table 11
Estimated Effects of Black Cadet–Black Mentor Match

	First Choice Match (1)	First Choice Match (2)	First Choice Match (3)
Black cadet	–0.029*	–0.028**	–0.022*
	[0.948]	[0.953]	[0.933]
Black officer	–0.046**	–0.071***	–0.065***
	[0.985]	[1.000]	[1.000]
Black cadet × Black officer	0.062**	0.065**	0.061**
	[0.962]	[0.973]	[0.975]
Observations	23,966	23,966	23,966
R^2	0.009	0.010	0.059
	Top Three Match (1)	Top Three Match (2)	Top Three Match (3)
Black cadet	–0.059	–0.056	–0.047
	[0.848]	[0.847]	[0.783]
Black officer	–0.081**	–0.103***	–0.103***
	[0.952]	[0.993]	[0.997]
Black cadet × Black officer	0.052	0.061	0.051
	[0.893]	[0.891]	[0.580]
Observations	24,108	24,108	23,966
R^2	0.003	0.048	0.072
Company & year FE	No	Yes	Yes
Exog. controls	No	No	Yes

Notes: All regressions include the following as controls: whether a cadet is female or Hispanic, GPA, SAT math and verbal scores, cadet leadership score, cadet fitness aptitude, and recruited NCAA athlete. Square brackets contain empirical p-values. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

first branch of choice than their white peers. We also find that if the officer is black, cadets (regardless of race) are 4.6 percentage points less likely to choose their branch. One reason for this result is that we do not have full representation of all branches by black officers in our sample. For example, we do not observe any black infantry officers, which is the most popular branch. Since we do not have total representation of all branches among black officers, and cadets are free to choose among any of the 16 branches, we would expect that the coefficient on the black tactical officer dummy variable would be negative and statistically significant. If we had better representation in our data, we would expect this coefficient to tend to zero. We find that black cadets are 6.1 percentage points more likely to select their tactical officer's branch when paired with a black officer. This result is statistically significant. We also find that black students are 5.1 percentage points more likely to select their tactical officer's branch as

Table 12
Estimated Effects of Hispanic Cadet–Hispanic Mentor Match

	First Choice Match (1)	First Choice Match (2)	First Choice Match (3)
Hispanic cadet	–0.003	–0.003	–0.001***
	[0.545]	[0.511]	[1.000]
Hispanic officer	–0.067***	–0.039	–0.038
	[0.987]	[0.812]	[0.853]
Hispanic cadet × Hispanic officer	0.002	–0.001	0.008
	[0.511]	[0.518]	[0.612]
Observations	23,966	23,966	23,966
R^2	0.009	0.010	0.030
	Top Three Match (1)	Top Three Match (2)	Top Three Match (3)
Hispanic cadet	–0.020	–0.019	–0.011***
	[0.609]	[0.512]	[1.000]
Hispanic officer	–0.144	–0.056	–0.056
	[0.609]	[0.805]	[0.815]
Hispanic cadet × Hispanic officer	0.001	–0.003	0.022
	[0.503]	[0.482]	[0.634]
Observations	24,801	24,801	23,966
R^2	0.011	0.045	0.069
Company & year FE	No	Yes	Yes
Exog. controls	No	No	Yes

Notes: All regressions include the following as controls: whether a cadet is female or black, GPA, SAT math and verbal scores, cadet leadership score, cadet fitness aptitude, and recruited NCAA athlete. Square brackets contain empirical p-values. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

one of their top three choices, but this result is not statistically significant. These results are robust to class year, company fixed effects, and the interaction of these fixed effects. At least for the first branch preference, these results show that having a same-race role model may influence the career pathway of black cadets. Thus, providing black cadets with role models who hail from underrepresented branches may encourage cadets to choose those branches.

C. Results for Hispanic Cadets

Table 12 shows results for Hispanic cadets and Hispanic tactical officers. We find that Hispanic cadets do not choose their officer's branch at a statistically different rate than

non-Hispanic cadets. However, if the officer is Hispanic, we find that cadets are 6.7 percentage points less likely to choose their branch. Again, this result is mechanical since the only Hispanic tactical officers that we observe belong to engineering, infantry, and quartermaster branches. The results from the interaction term differ from those of female and black cadets because they show that Hispanic cadets do not seem to choose their tactical officer's branch at a rate different from whites, even while working under a Hispanic tactical officer. The first row of both panels shows the coefficients for the dummy variable indicating if the cadet is Hispanic. We find that Hispanic cadets are 0.6 percentage points less likely to select their Hispanic tactical officer's branch as their top choice. However, if we expand the choice set to the top three branch preferences, then we find that a Hispanic cadet is 2.2 percentage points more likely to select their officer's branch. This result is not statistically significant, which implies that perhaps Hispanic students do not respond differently to a same-race/ethnicity mentor than white students.

There are two possible explanations for why Hispanic cadets may behave differently than female or black cadets. One plausible explanation is that there are very few Hispanic tactical officers in our sample. The small number of observations could mean that there is insufficient statistical power to use our model for Hispanic cadets. Another explanation could be the history of integration of Hispanics in the Army. In particular, during World Wars I and II, the Army labeled Hispanic soldiers as "white," and Hispanics served in integrated units (Dempsey 2010).

D. Results for Fraction of Female Officers

Table 13 presents results for a regression model with the fraction of distinct female officers to which a cadet is assigned as the explanatory variable. This specification is important because it helps us to understand whether multiple interactions with same-gender mentors increases the effect or if the effect is only driven by ever being exposed to a mentor. For this specification, we collapse our panel data so that there is only one observation for each cadet in our data. This change in the structure of the data changes the interpretation of the coefficient because the dependent variable is now an indicator for whether a cadet chooses the branch of one of her tactical officers. The independent variables of interest are whether a cadet is female, the fraction of a cadet's tactical officers that were female, and the interaction term.[15] In this specification, the coefficient of interest is the interaction term. In Column 1, we only include the dummy for female cadet, fraction of female officers, and the interaction, and we find that in a scenario where the fraction of officers increased from zero to 100 percent, the probability that a cadet would choose one of her officers' branches increases by 17.8 percentage points.

After including cadet company and graduation year fixed effects, the magnitude of this effect decreases to 15.8 percentage points. This coefficient, however, is robust to adding exogenous covariates. These results are significant because they show that multiple interactions with same-gender mentors increases the homophily in occupation choice, but does not seem to affect male occupation choice in a statistically significant manner. From the summary statistics, we find that women are 14.9 percentage points

15. We estimated alternative specifications that allowed for nonlinearity in the response to multiple female tactical officers. These results were not statistically significant, so we report our preferred linear specification.

Table 13
Estimated Effects of Female Cadet—Fraction of Female Mentor Match

	First Choice Match (1)	First Choice Match (2)	First Choice Match (3)
Female cadet	–0.058***	–0.054***	–0.051***
	[1.000]	[0.998]	[0.998]
Frac. female officers	0.000	–0.050	–0.051
	[0.542]	[0.148]	[0.141]
Female cadet × Frac. female officers	0.178***	0.158***	0.153***
	[1.000]	[0.995]	[0.995]
Observations	6,253	6,253	6,217
R^2	0.049	0.071	0.076
	Top Three Match (1)	Top Three Match (2)	Top Three Match (3)
Female cadet	–0.138***	–0.133***	–0.120***
	[1.000]	[1.000]	[0.999]
Frac. female officers	0.027	–0.031	–0.029
	[0.672]	[0.349]	[0.384]
Female cadet × Frac. female officers	0.331***	0.320***	0.300***
	[1.000]	[1.000]	[0.998]
Observations	6,253	6,253	6.217
R^2	0.079	0.121	0.127
Company & year FE	No	Yes	Yes
Exog. controls	No	No	Yes

Notes: Exogenous controls include whether a cadet is black or Hispanic, GPA, SAT math and verbal scores, cadet leadership score, cadet fitness aptitude, and recruited NCAA athlete. We have also included fixed effects for whether the officer belongs to infantry or armor branches and interacted these fixed effects with the cadet's gender. These fixed effects correct for the limited choice set for female cadets. Square brackets contain empirical p-values. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

less likely to mimic their mentor's occupation choice. Thus, if a female was exposed to a set of officers who were all female, this gender gap between male and female cadets with regards to choosing their officer's branch would close.

The second panel of Table 13 shows results for a cadet's top three preferences. We find that when the fraction of a female cadet's officers that are female increase by a standard deviation, the cadet is 6.06 percentage points more likely to select *any* of her tactical officers' branch as one of her top three choices. When we add cadet company and graduation year controls, the effects shrinks to 5.86 percentage points. The addition of exogenous demographic controls also shrinks the coefficient, but only to 5.49

Table 14
Estimated Effects of Female Cadet–Female Mentor Match, by SAT Math Score

	SAT ≤ 650 (1)	SAT > 650 (2)
Panel A: First Choice Match		
Female cadet	0.004	–0.012***
	[0.064]	[1.000]
Female officer	0.008	0.023**
	[0.735]	[0.967]
Female cadet × Female officer	0.028*	0.082***
	[0.903]	[1.000]
Observations	11,781	12,185
R^2	0.077	0.087
Panel B: Top Three Match		
Female cadet	–0.051***	–0.044***
	[1.000]	[1.000]
Female officer	–0.028	0.010
	[0.131]	[0.641]
Female cadet × Female officer	0.149***	0.185***
	[0.999]	[1.000]
Observations	11,781	12,185
R^2	0.150	0.135
Company & year FE	Yes	Yes
Exog. controls	Yes	Yes

Notes: All regressions include the following as controls: whether a cadet is black or Hispanic, GPA, SAT math and verbal scores, cadet leadership score, cadet fitness aptitude, and recruited NCAA athlete. We have also included fixed effects for whether the officer belongs to infantry or armor branches and interacted these fixed effects with the cadet's gender. These fixed effects correct for the limited choice set for female cadets. Square brackets contain empirical p-values. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

percentage points. These models show that not only does having one same-gender mentor influence occupation choices of female cadets, but multiple interactions can reinforce the effect.

E. Results by SAT Scores

One question, given our setting, is how responsive are high ability students to a same-gender mentor when compared to low ability students? For example, Carrell, Page, and West (2010) find that students with a higher math SAT do better when exposed to a same-gender teacher. One reason that we might expect a difference is that higher ability

cadets may be more motivated to seek mentorship from mentors of the same gender, and they might receive more positive attention from these mentors. We extend our findings by estimating the model using subsamples restricted to cadets below the median and above the median SAT math score. We choose the SAT math score as a proxy for aptitude because much of the curriculum at West Point focuses on engineering and other STEM fields, and many Army branches (such as engineering and chemical corps) require high quantitative skills. These models show how responsive female cadets are to similar tactical officers given where the cadets lie in the skills distribution.

Table 14 displays results for female cadets given their placement in the SAT math score distribution. We find that female cadets with lower SAT math scores are not as responsive to role modeling by female officers as their higher ability classmates. We find that females below the median SAT score are 2.8 percentage points less likely to select their female tactical officer's branch, albeit the result is not statistically distinguishable from zero. For cadets of higher ability, the magnitude of coefficient for the interaction term increases to 8.2 percentage points and is statistically significant. However, the difference between the two coefficients fails a χ^2 test, so while the gap between the two is large, it is not statistically significant.

We find that a female cadet paired with a female officer is 14.9 percentage points more likely to select her officer's branch in her top three preferences when she earns a score below 640 on the SAT math test. For above median performers on the SAT math test, the magnitude for having a female officer is 18.5 percentage points. These results show that lower performing female cadets are not as responsive to role model effects as those cadets with SAT scores above the median SAT match score for the top preference, but having a same-gender role model does affect occupation choice across the academic spectrum for the top three preferences as opposed to cadet's first choice. However, similar to the results from the top choice model, while the difference between the two coefficients is large, according to the χ^2 test, it is statistically insignificant.

VI. Robustness Checks

Potential areas of concern with the main analysis are that women cannot choose infantry or armor branches, the timing of the mentor relationship, and whether confounding covariates are driving our results. We address these concerns through a series of robustness checks.

A. Robustness Checks—Excluding Infantry and Armor Officers

The limiting of female cadets to only certain branches may pose a threat to our findings because the coefficient estimate on the interaction term could be mechanical and a result of barring women from infantry and armor branches. In previous specifications, we control for this policy using fixed effects for whether the officer belongs to the infantry or armor branches and then interact these fixed effects with whether the cadet is female. As a robustness check, we exclude all infantry and armor officers from our sample and compare previous results. Excluding tactical officers from infantry or armor branches would compare cadets who worked under officers who belonged to a branch that was

Table 15
Estimated Effects of Female Cadet–Female Mentor Match, Excluding Infantry and Armor Officers

	First Choice Match (1)	First Choice Match (2)	First Choice Match (3)
Female cadet	–0.004***	–0.004***	–0.006***
	[0.996]	[0.999]	[0.998]
Female officer	0.014	0.014	–0.014
	[0.829]	[0.0860]	[0.847]
Female cadet × Female officer	0.052***	0.049***	0.050***
	[0.995]	[0.999]	[0.990]
Observations	16,299	16,299	16,210
R^2	0.023	0.023	0.025
	Top Three Match (1)	Top Three Match (2)	Top Three Match (3)
Female cadet	–0.058***	–0.050***	–0.052***
	[1.000]	[1.000]	[1.000]
Female officer	0.005	–0.023	–0.024
	[0.517]	[0.805]	[0.799]
Female cadet × Female officer	0.166***	0.160***	0.161***
	[0.998]	[0.999]	[0.999]
Observations	16,299	16,299	16,210
R^2	0.005	0.075	0.079
Company & year FE	No	Yes	Yes
Exog. controls	No	No	Yes

Notes: All regressions include the following as controls: whether a cadet is black or Hispanic, GPA, SAT math and verbal scores, cadet leadership score, cadet fitness aptitude, and recruited NCAA athlete. Square brackets contain empirical p-values. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

open to male and female cadets alike. This robustness check allows us to simulate a situation where there is no limited choice set for cadets. Econometrically, dropping infantry and armor offices should be equivalent to adding the infantry and armor fixed effects interacted with gender from the main results. This test is important to ensure that we are actually correcting for the limited choice sets for females.

Table 15 shows results from estimating the previous model while dropping infantry and armor officers. The results are very similar to those in the previous section. We find that a female cadet who is matched with a female officer is 5.0 percentage points more likely to select her officer's branch as her top choice and 16.1 percentage points more likely to select the officer's branch in her top three preferences. These results are very

similar in magnitude and statistical significance to the results in previous sections. We conclude that using the branch fixed effects for infantry and armor branches do sufficiently control for the limited branch choice for female cadets.

B. Robustness Check—Timing of Mentorship

Seniors at West Point select their branch during the third week of fall semester. Regarding branching, this timing implies that only the tactical officers for the freshman, sophomore, and junior years should really matter (or at least the tactical officer in the senior year should not be driving our result). We would be very suspicious of our results if the senior year officer explained a larger proportion of the variation than previous years' officers since cadets would have only had three weeks with this officers before choosing their branches. To ensure that this situation is not the case, we estimated our model with a dummy variable indicating that the female officer and female cadet match happened during the cadet's freshman, sophomore, or junior year and then interact this dummy variable with the tactical officer's and cadet's gender. We find that the timing of having a same-gender tactical officer is not of concern for our results, or the senior year tactical officer is of equal importance because they are the most readily available resources when cadets make their branching decision.

Table 16 shows the results for this robustness check for the timing of the mentorship. We find that results for neither the top branch choice nor the top three preferences are affected, and both the year fixed effects and the interaction of the year fixed effects and the gender match terms are neither economically nor statistically significant. These results imply that having a female tactical officer for the cadet's senior year does not affect the cadet's preferences differently than the previous three years.

C. Robustness Check—Confounding of Covariates

One difficulty in interpreting our results could be that we have included both females and racial/ethnic minorities in our sample. This fact may make it difficult to separate a gender effect from a racial effect, especially if these effects are interacting with each other (that is, how would a black, female cadet respond to either a black, male or white, female officer). To disentangle these effects, we estimate three separate regressions with subsamples that exclude all but one of our cadet populations of interest.

Table 17 shows results for these models. Column 1 shows results from a subsample including only white males and females and thus should only measure the effect of having a same-gender role model independent of race. We find that for white, female cadets, having a same-gender role model increases the probability that the cadet selects her officer's branch by 4.8 percentage points and 15.9 percentage points for her top preference and top three preferences, respectively. Column 2 shows results for estimating the model with a subsample excluding Hispanic and female cadets. These results isolate an effect for black cadets independent of gender. We find that when West Point pairs a black, male cadet with a black officer then the cadet is 6.2 and 5.6 percentage points more likely to pick his officer's branch as his top or among his top three preferences, respectively. As in the main results, the coefficient estimates for the top branch preference are statistically significant, while the result for the top three preferences is not. Finally, Column 3 shows results when we exclude female and black cadets from our

Table 16
Estimated Effects of Female Cadet–Female Mentor Match, by Year of Exposure

	First Choice Match (1)	Top Three Match (2)
Female cadet × Female officer	0.042**	0.186
	[0.980]	[0.856]
Female cadet × Freshman year	0.016	–0.009
	[0.387]	[0.434]
Female officer		
Female cadet × Sophomore year	–0.028	–0.074
	[0.094]	[0.500]
Female officer		
Female cadet × Junior year	0.033	0.013
	[0.882]	[0.463]
Female officer		
Observations	23,966	23,966
R^2	0.080	0.139
Company & year FE	Yes	Yes
Exog. controls	Yes	Yes

Notes: All regressions include the following as controls: whether a cadet is black or Hispanic, GPA, SAT math and verbal scores, cadet leadership score, cadet fitness aptitude, and recruited NCAA athlete. We have also included fixed effects for whether the officer belongs to infantry or armor branches and interacted these fixed effects with the cadet's gender. These fixed effects correct for the limited choice set for female cadets. Squared brackets contain empirical p-values. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

sample. We find that male, Hispanic cadets are 0.9 percentage points more likely to pick their officer's branch as their top choice when paired with a Hispanic officer. We find that having a Hispanic officer increases the probability of picking their officer's branch in their top three preferences by 3.1 percentage points. However, this result is not statistically significant. The results from all three columns are very similar to the main results from earlier in the paper.

In addition to dropping some of our subsamples to get a "cleaner" control group, we estimate a triple difference model that interacts the effects of being both female and black to disentangle the two effects. For this specification we estimate:

$$(3)\quad y_{ijct} = \phi_1 + \beta_1 F_i + \beta_2 F_{jct} + \beta_3 F_i F_{jct} + \beta_4 B_i + \beta_5 B_{jct} + \beta_6 B_i B_{jct} + \beta_7 F_{ict} B_{jct} + \beta_8 F_i B_i + \beta_9 F_i B_i F_{jct} B_{jct} + \varepsilon_{ijct}$$

where in addition to the previous parameters, we include dummies for whether officer i is black (B_i), whether cadet j in company c during year t is black (B_{jct}), and the interaction, whether officer i is a black female, whether cadet j is a black female, and the interaction between being a black female officer matched with a black female cadet. We

Table 17
Test for Confounding of Covariates

	Female–Male First Choice Match (1)	Black–White First Choice Match (2)	Hispanic–White First Choice Match (3)
Female cadet × Female officer	0.048*** [1.000]		
Black cadet × Black officer		0.062*** [1.000]	
Hispanic × Hispanic officer			0.009*** [1.000]
Observations	23,966	23,557	23,579
R^2	0.079	0.026	0.023
	Top Three Match (1)	Top Three Match (2)	Top Three Match (3)
Female cadet × Female officer	0.159*** [1.000]		
Black cadet × Black officer		0.056*** [1.000]	
Hispanic cadet × Hispanic officer			0.031*** [1.000]
Observations	23,966	23,557	23,579
R^2	0.137	0.072	0.069
Company & year FE	Yes	Yes	Yes
Exog. controls	Yes	Yes	Yes

Notes: All regressions include the following as controls: GPA, SAT math and verbal scores, cadet leadership score, cadet fitness aptitude, and recruited NCAA athlete. In Column 1, we have also included fixed effects for whether the officer belongs to infantry or armor branches and interacted these fixed effects with the cadet's gender. These fixed effects correct for the limited choice set for female cadets. Standard errors are clustered at the tactical officer level. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

also include fixed effects for whether the officer belongs to infantry or armor and the interaction between these fixed effects and the cadet's gender.

Table 18 presents the results for this specification. We find that our main results for having a female officer matched with a female cadet are robust in this specification, as is having a black officer matched with a black cadet. For the case of the top branch preference (Column 1), we find that the interaction between gender and race is large, with an empirical p-value of 1.000 (however, clustered standard errors show that this result is imprecisely estimated, as shown in the Online Appendix). This finding is

Table 18
Triple Interaction of Female and Black Cadet–Officer Match

	First Choice Match (1)	Top Three Match (2)
Female	–0.003***	–0.051***
	[1.000]	[1.000]
Female officer	0.019**	–0.023
	[0.962]	[0.827]
Female cadet × Female officer	0.044***	0.159***
	[0.998]	[1.000]
Black cadet	–0.024	–0.042
	[0.565]	[0.761]
Black officer	–0.028***	–0.084***
	[1.000]	[1.000]
Black cadet × Black officer	0.042	0.039***
	[0.824]	[1.000]
Female cadet × Black cadet	0.007	0.030
	[0.166]	[0.839]
Female officer × Black officer	–0.008***	0.159***
	[1.000]	[1.000]
Black female cadet × Black female officer	0.279***	0.043***
	[1.000]	[1.000]
Total female effect	0.061***	0.085**
	(0.022)	(0.037)
Total black effect	–0.010	–0.087**
	(0.029)	(0.038)
Total effect	0.329	0.219
	(0.276)	(0.249)
Observations	23,966	23,966
R^2	0.080	0.139
Company & year FE	Yes	Yes
Exog. controls	Yes	Yes

Notes: Square brackets contain empirical *p*-values. Standard errors for total effects in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

because we observe only three black female tactical officers in our entire sample. We also only observe 101 black female cadets in our sample. These officers and cadets only match four times. Thus, these results are underpowered and should be interpreted with caution. Both regressions include cadet company fixed effects, graduation year fixed effects, and exogenous controls.

VII. Conclusion

In this paper, we use the conditional random assignment of cadets to tactical officers at the United States Military Academy at West Point. West Point sorts students into companies and assigns each company a tactical officer who serves as a supervisor and role model for the company. This random assignment of mentors to mentees is unique, and we use it to identify the effect of a role model on occupational choice. At the beginning of each year, the seniors rank their preferences for jobs within the Army. These occupation choices will determine many aspects of the cadet's Army career, including their prospects for promotion to higher ranks. We use a unique data set that matches each cadet to each of the tactical officers they work under during their time at West Point. We find that if a female cadet works with a female tactical officer, then the cadet is 5.9 percentage points more likely to pick her tactical officer's branch as their top choice and 18.1 percentage points more likely to pick the officer's branch as one of their top three choices. We also find these results are robust across ability spectrum (measured by SAT math scores) and statistically significant for cadets above the median score of 650. We also show that these results are robust when we exclude tactical officers who belong to the infantry and armor branch. We also find that there is no statistically significant difference regarding the timing of the match.

We find similar results for black cadets assigned with black officers. We find that black cadets are 6.1 percentage points more likely to pick their tactical officer's branch as their top choice when their officer is also black. This result is also statistically significant. Black cadets are also 3.3 percentage points more likely to select their black officer's branch in their top three preferences, but the result for the top three preferences is not statistically significant. For Hispanic cadets, we find that Hispanic students are 0.6 percentage points less likely to pick their officer's branch as their top choice if the officer is also Hispanic. Results for Hispanic cadets, however, are statistically insignificant.

One concern that the Army has is the underrepresentation of women and minorities in certain branches of the officer corps. One potential reason for these gender and racial disparities is the lack of mentors for these groups, particularly in the combat arms. Our findings indicate that if the Army would like to increase gender or racial diversity in certain branches, then selecting female or black officers of those branches to serve as tactical officers may prove effective. Regarding blacks, our results show that same-race role models are important for a cadet's first branch preference, and an increased number of black role models may help encourage blacks to enter Army branches where they have been historically underrepresented. While the unique setting at West Point allows for causal estimates within this framework, these results also have implications for other fields where there are gender and racial disparities.

The random assignment of cadets to mentors serves as quasi-experimental evidence of the effect of having a same-gender or same-race mentor on occupation choice. This random assignment combined with very distinct choices allows us to contribute to the robust literature of the effects of mentors on a variety of outcomes for females and racial minorities. While these results should not be extrapolated outside of the West Point setting, the double random assignment allows us to identify homophily among same-gender and same-race mentors and the occupations that college students select. We find strong evidence that shows that mentors may play a role in explaining gender and racial disparities in various occupations.

References

Ammermueller, Andreas, and Jorn-Steffen Pischke. 2009. "Peer Effects in European Primary Schools: Evidence from the Progress in International Reading Literacy Study." *Journal of Labor Economics* 27(3):315–48.

Arcidiacono, Peter, Esteban M. Aucejo, and Joseph V. Hotz. 2016. "University Differences in the Graduation of Minorities in STEM Fields: Evidence from California." *American Economic Review* 106(3):525–62.

Baldwin, J. Norman. 1996. "The Promotion Record of the United States Army: Glass Ceilings in the Officer Corps." *Public Administration Review* 56(2):199–206.

Bettinger, Eric P., and Bridget Terry Long. 2005. "Do Faculty Serve as Role Models? The Impact of Instructor Gender on Female Students." *The American Economic Review: Papers and Proceedings* 95(2):152–7.

Blau, Francine D., and Lawrence M. Kahn. 2017. "The Gender Wage Gap: Extent, Trends, and Explanations." *Journal of Economic Literature* 55(3):789–865.

Briscoe, Detrick Lamont. 2013. "The Black Community Perspective: Recruiting Blacks into Combat Arms." U.S. Army War College Monograph. Carlisle, PA: U.S. Army War College.

Brook, Tom Vanden. 2014. "Concerns Raised over Army's Lack of Black Officers." *Army Times.*

Canes, Brandice J., and Harvey S. Rosen. 1995. "Following in Her Footsteps? Faculty Gender Composition and Women Choices of College Majors." *Industrial and Labor Relations Review* 48(3):486–504.

Carrell, Scott E., Mark Hoekstra, and James E. West. 2016. "The Impact of College Diversity on Behavior toward Minorities." NBER Working Paper 20940. Cambridge, MA: NBER.

Carrell, Scott E., Marianne E. Page, and James E. West. 2010. "Sex and Science: How Professor Gender Perpetuates the Gender Gap." *Quarterly Journal of Economics* 125(3):1101–44.

Carrell, Scott E., and James E. West. 2010. "Does Professor Quality Matter? Evidence from Random Assignment of Students to Professors." *Journal of Political Economy* 118(3):409–32.

Carter, Susan Payne, Whitney Dudley, David S. Lyle, and John Z. Smith. 2016. "The Effects of Mentor Quality, Exposure, and Type on Junior Officer Retention in the United States Army." NBER Working Paper 22383. Cambridge, MA: NBER.

Dee, Thomas S. 2005. "A Teacher like Me: Does Race, Ethnicity, or Gender Matter?" *The American Economic Review: Papers and Proceedings* 95(2):158–65.

———. 2007. "Teachers and the Gender Gaps in Student Achievement." *The Journal of Human Resources* 42(3):528–54.

DeLeire, Thomas, and Helen Levy. 2004. "Worker Sorting and the Risk of Death on the Job." *Journal of Labor Economics* 22(4):925–53.

Dempsey, Jason K. 2010. *Our Army: Soldiers, Politics, and American Civil–Military Relations.* Cambridge, MA: The MIT Press.

Ehrenberg, Ronald G., Daniel G. Goldhaber, and Dominic J. Brewer. 1995. "Do Teachers' Race, Gender, and Ethnicity Matter? Evidence from the National Educational Longitudinal Study of 1988." *Industrial and Labor Relations Review* 48(3):547–61.

Escobar, Jacqueline S.L. 2013. "Breaking the Kevlar Ceiling: A National Security Case for Full Gender Integration in the U.S. Army." *Military Review*, 70–8.

Fairlie, Robert W., Florian Hoffmann, and Philip Oreopoulos. 2014. "A Community College Instructor like Me: Race and Ethnicity Interactions in the Classroom." *American Economic Review* 104(8):2567–91.

Ginther, Donna K., and Shulamit Kahn. 2004. "Women in Economics: Moving Up or Falling Off the Academic Career Ladder?" *Journal of Economic Perspectives* 18(3):193–214.

Gneezy, Uri, Kenneth L. Leonard, and John A. List. 2009. "Gender Differences in Competition: Evidence from a Matrilineal and a Patriarchal Society." *Econometrica* 77(5):1637–64.

Goldin, Claudia. 2014. "A Grand Gender Convergence: Its Last Chapter." *American Economic Review* 104(4):1–30.
Good, Phillip L. 2006. *Resampling Methods: A Practical Guide to Data Analysis*, 3rd ed. Boston, MA: Birkhauser.
Grazier, Suzanne, and Peter J. Sloane. 2008. "Accident Risk, Gender, Family Status, and Occupational Choice in the UK." *Labour Economics* 15(5):938–57.
Griffith, Amanda L. 2014. "Faculty Gender in the College Classroom: Does It Matter for Achievement and Major Choice." *Southern Economic Journal* 49(3):730–49.
Hellerstein, Judith K., and David Neumark. 2008. "Workplace Segregation in the United States: Race, Ethnicity, and Skill." *The Review of Economics and Statistics* 90(3):459–77.
Hilmer, Christiana, and Michael Hilmer. 2007. "Women Helping Women, Men Helping Women? Same-Gender Mentoring, Initial Job Placements, and Early Career Publishing Success for Economics PhDs." *The American Economic Review* 97(2):422–26.
Hirsch, Barry T., and David A. Macpherson. 2004. "Wages, Sorting on Skill, and the Racial Composition of Jobs." *Journal of Labor Economics* 22(1):189–210.
Hoffmann, Florian, and Philip Oreopoulos. 2009. "A Professor like Me: The Influence of Instructor Gender on College Achievement." *The Journal of Human Resources* 44(2):479–94.
Humlum, Maria K., Kristin J. Kleinjans, and Helena S. Nielsen. 2012. "An Economic Analysis of Identity and Career Choice." *Economic Inquiry* 50(1):39–61.
Karaca-Mandic, Pinar, Nicole Maestas, and David Powell. 2013. "Peer Groups and Employment Outcomes: Evidence Based on Conditional Random Assignment in the U.S. Army." Working Paper.
Kirby, Sheila Natarah, Margaret C. Harrell, and Jennifer Sloan. 2000. "Why Don't Minorities Join Special Operations Forces?" *Armed Forces & Society* 26(4):523–45.
Lavy, Victor, and Edith Sand. 2015. "On the Origins of Gender Human Capital Gaps: Short and Long Term Consequences of Teachers' Stereotypical Bias." NBER Working Paper 20909. Cambridge, MA: NBER.
Lehmann, Erich L., and Joseph P. Romano. 2005. *Testing Statistical Hypothesis*, 3rd ed. Springer Texts in Statistics. New York: Springer.
Lim, Jaegeum, and Jonathan Meer. 2017. "The Impact of Teacher–Student Gender Matches: Random Assignment Evidence from South Korea." *Journal of Human Resources* 52(4):979–97.
Lim, Nelson, Jefferson P. Marquis, Kimberly Curry Hall, David Schulker, and Xiaohui Zhuo. 2009. "Officer Classification and the Future of Diversity among Senior Military Leaders: A Case Study of Army ROTC." RAND Technical Report. Santa Monica, CA: RAND Corp.
Lopez, Todd, and Julia Henning. 2013. "Army Plans to Open All Jobs to Women by 2016." Army News Service. https://www.army.mil/article/106406/army_plans_to_open_all_jobs_to_women_by_2016 (accessed July 12, 2018).
Lyle, David S. 2007. "Estimating and Interpreting Peer and Role Model Effects from Randomly Assigned Social Groups at West Point." *Review of Economics and Statistics* 89(2):289–99.
Lyle, David S., and John Z. Smith. 2014. "The Effect of High-Performing Mentors on Junior Officer Promotion in the US Army." *Journal of Labor Economics* 32(2):229–258.
Macpherson, David A., and Barry T. Hirsch. 1995. "Wages and Gender Composition: Why Do Women's Jobs Pay Less." *Journal of Labor Economics* 13(3):426–471.
Neumark, David, and Rosella Gardecki. 1998. "Women Helping Women? Role Model and Mentoring Effects on Female Ph.D. Students in Economics." *The Journal of Human Resources* 33(1):220–46.
Ouazad, Amine. 2011. "Assessed by a Teacher like Me: Race and Teacher Assessments." *Education Finance and Policy* 9(3):334–72.
Price, Jay. 2015. "Women Fight Their Way through Army's Grueling Ranger School." National Public Radio.

Sönmez, Tayfun. 2013. "Bidding for Army Career Specialties: Improving the ROTC Branching Mechanism." *Journal of Political Economy* 121(1):186–219.
Sönmez, Tayfun, and Tobias B. Switzer. 2013. "Matching With (Branch-of-Choice) Contracts at the United States Military Academy." *Econometrica* 81(2):451–88.
Turner, Sarah E., and William G. Bowen. 1999. "Choice of Major: The Changing (Unchanging) Gender Gap." *Industrial and Labor Relations Review* 22(2):289–313.
United States Military Academy. 2015a. "Brigade Tactical Department." https://www.usma.edu/btd/SitePages/Home.aspx.
United States Military Academy. 2015b. "Profile-Class of 2015." https://www.usma.edu/admissions/sitepages/class%20profiles.aspx.
Weinberger, Catherine J. 1999. "Mathematical College Majors and the Gender Gap in Wages." *Industrial Relations* 38(3):407–13.
Zafar, Basit. 2013. "College Major Choice and the Gender Gap." *Journal of Human Resources* 48(3):545–95.