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Military service and STEM employment: Do veterans have an advantage?

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ABSTRACT

We use five years of American Community Survey data to examine how military service provides a non-degree-based pathway into STEM occupations. Military service is associated with STEM occupations in positive and surprising ways. Veterans are more likely than their civilian counterparts to work in STEM, an effect particularly strong for women and among workers without a STEM bachelor's degree. Among workers lacking STEM BAs, veterans were more likely to hold STEM occupations. Indeed, veterans lacking a college degree at all are more likely than their nonveteran counterparts to hold STEM employment. We conclude that military service in itself provides a rarely-discussed route to diversifying STEM and consider the policy implications.

1. Introduction

1.1. *Project scope*

Over the past decade, social science research on military service and veterans has seen a resurgence. The U.S. military remains one of the single-largest employers of young adults, especially men (Teachman and Tedrow, 2007), currently employing more than 1.3m active-duty personnel (USDL, 2019b), of whom about 200,000 are deployed. More importantly for our analyses, as of 2016, more than 20 million veterans lived in the U.S., of whom almost three million are young enough to have served in Iraq/Afghanistan and are currently in their prime working years (Bialik, 2017; Whyman et al., 2011).

Reintegration into civilian life remains one of the most challenging tasks associated with military service (USDL, 2019a; Booth and Segal, 2005; Cate, 2014; Cooper et al., 2018; Moore, 2017). Indeed, state and federal governments devote significant resources into efforts to optimize reintegration of veterans, while falling short in several key areas of need (Fournoy, 2014; Hamrick and Rumann, 2013; Whyman et al., 2011). Extant research suggests that veterans overall tend to experience similar unemployment rates as civilians, and that military service is associated with higher earnings, in racialized and unexpectedly gendered ways (Booth et al., 2000; Padavic and Prokos, 2017; Schulker, 2017). Even though this advantage dissipates over time for some veterans, earnings advantages seem to persist for veterans with less than a college degree, leading several researchers to note that the long-term benefits of military service go disproportionately to workers with lower skills and credentials (Kleykamp, 2010, 2012, 2013; Routon, 2014). Postsecondary and

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vocational training for veterans transitioning into the civilian workforce appears key to avoiding a bimodal, "sink or swim" pattern among veterans in terms of occupational outcomes and earnings (Cate, 2014; MacLean, 2005; Moore, 2017).

Given this growing emphasis on veterans' economic reintegration, it is somewhat surprising how little we understand about the occupational trajectories veterans pursue compared to civilians. On one hand, there is a common perception that veterans disproportionately pursue careers in the public sector, especially in law enforcement and other protective services jobs – fields with average to declining job growth (Graf et al., 2018; Schulker, 2017; USDL, 2019a, 2019b). On the other hand, military recruitment frequently stresses exposure to skills associated with occupations in science, technology, engineering and math (STEM). This range of fields has experienced consistently higher earnings than other jobs requiring comparable skills or credentials, and for years, growth in STEM-related jobs has outpaced virtually all other job sectors (Funk and Parker, 2018; Graf et al., 2018). Moreover, STEM occupations exist at various levels of expertise and education, providing opportunities for adults with and without four-year college degrees. This is important, because veterans have historically been more likely to attend community colleges and technical programs for their post-secondary training (Kleykamp, 2010, 2013; Mettler, 2005).

This leads us to examine explicitly: *To what extent is veteran status associated with employment in STEM occupations? How does the relationship between veteran status and employment in STEM occupations differ by gender? To what extent do these patterns reflect differences in STEM-related credentials?*

To answer these questions, we analyze data from the 5-year (2014–2018) *American Community Survey* sample which facilitates comparing employment outcomes among and between veteran and civilians, by educational status and gender. Our findings inform discussions about causality and the complex ways in which selection and exposure likely play a role in shaping occupational outcomes.

1.2. Background and literature review

1.2.1. Why focus on pathways into STEM?

More than a decade ago, a report by the National Academies called *Rising above the Gathering Storm* (2007) kicked off vigorous public debate about whether a shortage of science, technology, engineering, and mathematics (STEM) professionals exists. It was followed by a series of high-profile research projects and even more public debate about whether this shortage is indeed real and, if so, its causes, extent, and dimensions. Some have argued that the shortage is mythical or exaggerated (Anft, 2013; Martin and Carnevale, 2013; Teitelbaum, 2014); others have pointed to (inter)national studies showing that the U.S. lags in science and technology training (Koebler, 2012; Mervis, 2014). Yet others have pointed out that heavily credentialized STEM occupations that require (post)baccalaureate degrees (especially in fast-growing, well-paid fields related to IT, computer science, and engineering) essentially create barriers to pursuing STEM careers that undermine valiant efforts to broaden participation (Funk and Parker, 2018; Glass et al., 2013; Ma, 2011).

Policy initiatives to address this issue have included e.g., the ADVANCE initiative at the National Science Foundation and similar initiatives at other federal agencies and foundations (James and Singer, 2016). These programs focus on *broadening participation* in STEM fields, which refers to efforts that purposefully seek to diversify and grow the labor pool by recruiting women and historically underrepresented groups into STEM fields broadly conceived (Lim et al., 2013; NAS, 2007; NRC, 2006). However, the gender composition of most STEM fields has changed little in the past decade. For example, women make up just 21% of engineering and 16% of computer and mathematical sciences bachelor degree earners (Yoder, 2016), although these fields comprise over 75% of new STEM jobs posted (and about 2/3 of all STEM jobs (USDL, 2017; NSB, 2018)). Consequently, men comprise a much larger proportion of workers in science and engineering fields (Aud and Wilkinson-Flicker, 2013; NSB, 2018).

The research reviewed below suggests STEM occupational outcomes result from a complex set of determinants. We contribute to this line of inquiry, focusing on the role of the U.S. military as an alternative (i.e., non-degree based), gendered pathway into STEM.

1.2.2. Military service as a pathway into STEM occupations

Discussing "pathways into STEM occupations" immediately raises questions about causality: An association between military service and STEM outcomes could be caused by selection, exposure, or most likely, some combination of the two. First, what do we know about *selection* into the military? Relatedly, what do we know about *exposure* to STEM skills in the military – that might affect *subsequent selection* into STEM occupations?

On selection into the military: The U.S. Armed Forces have played a key role in serving as a potential springboard for upward social mobility. Since the start of the All Volunteer Force (AVF) in the 1970s, the U.S. military has purposely recruited disadvantaged groups, especially working-class and minority youth. As a result, the contemporary U.S. military is one of the most racially diverse work environments in the country, even as it pools largely from high-school graduates whose plans on attending college remain tentative (Bachman, Freedman-Doan, Segal and O'Malley, 2000a; Bachman, Segal, Freedman-Doan and O'Malley, 2000b; DoD, 2018a, b). This is true especially among the enlisted personnel, even though important variation exists between the various armed services (Kleykamp, 2012; Routon, 2014; Segal, Bachman, Freedman-Doan and O'Malley, 1999; Teachman and Tedrow, 2007). Research on selection dynamics suggests that, even controlling for other factors, race/ethnicity remains a key factor predicting enlistment: African Americans and Hispanics are more likely to enlist than whites and Asians (Bachman et al., 2000b; Segal, D. et al., 1998).

Gender also constitutes a key selection factor into military service (Bachman et al., 2000b; Segal, M. et al., 1998). Women were not allowed to enlist in the U.S. Army until 1948, and not until 1976 did the first military academy (West Point) begin enrolling women cadets. Several sources discuss the complicated history of women's incorporation into the U.S. military at length (e.g., D'Amico and Weinstein, 1999; Segal et al., 2007; Stiehm, 1996). Currently, women constitute 16.2% of the enlisted personnel in the U.S. Armed Forces, and 18.7% among its officers, though women's representation also varies by branch, ranging from 8.7% of enlisted Marines to

25.4% of Air Force officers (DoD, 2018a, b).

Educational aspirations have also been shown to influence selection into the military (Bachman et al., 2000b). Recruitment efforts across the armed services have emphasized postsecondary educational benefits associated with the "GI Bill" ever since the inception of such programs following World War II. Previous research has suggested that access to said educational benefits has played a significant role for many recruits to the military rank and file, across the armed services (Bound and Turner, 2002; Mettler, 2005; Ortiz, 2012; Pash, 2012; Turner and Bound, 2002; Zhang, 2018). Yet, individuals with definite college plans are the least likely enlist: Among men, those who do not plan to attend college are most likely to enlist. In contrast, among women, those who say that they will probably attend college are more likely to enlist than those with no plan to attend college or those with definite plans (Bachman et al., 2000b).

On exposure to STEM skills in the military: The US military, especially the Army, is perceived as providing excellent opportunities to gain valuable technical skills (Hamrick and Rumann, 2013; Mettler, 2005; Ortiz, 2012; Pash, 2012). Moreover, recruitment materials frequently stress the STEM opportunities available in the military (see Lim et al., 2013). Relatedly, the Army offers 190 *military occupational specialties (MOS)*, about 25% of which it classifies as STEM-related.[1] Thus, occupational sorting might provide one clue as to how military service might serve as a pathway into STEM. Yet, women remain overrepresented in medical, supply and administrative positions and underrepresented in infantry and other combat-forward positions (DoD, 2018a, b). Thus, exposure to STEM skills during military service may function to alleviate existing gender gaps in STEM. However, to our knowledge, no systematic analyses have examined the extent to which military service actually exposes individuals to opportunities for developing STEM interest, knowledge and skills.

On selection from the military into STEM fields and occupations: Especially in contrast to the vast literature on factors shaping selection into STEM fields and occupations in the general population (outlined below), we know little about whether and (if so) how military service per se is connected to STEM outcomes. Extant studies of veterans' educational and career outcomes have relied predominantly on the *National Longitudinal Survey of Youth* (NLSY) and or *Current Population Survey* (CPS) data – neither of which contain information on STEM fields (Kleykamp, 2010, 2012, 2013; Sampson and Laub, 1996; Teachman and Tedrow, 2004, 2007). This makes our analyses of data from the *American Community Survey* (ACS) an invaluable tool to assess the extent to which a clear connection even exists between military service and STEM occupational trajectories.

So what do we know more generally about occupational and labor market outcomes for veterans? Research on life-course outcomes among veterans suggests that military service has positive, long-term effects on labor market outcomes that also vary by service era (Kleykamp, 2009, 2013; MacLean and Elder, 2007; Routon, 2014; Segal and Segal, 2004; Segal et al., 1999; Schulker, 2017; Teachman and Tedrow, 2004, 2007). Moreover, white and black male veterans alike benefit from higher employment rates than women veterans, at least in recent cohorts (Kleykamp, 2010; Mettler, 2005). Generally speaking, military service tends to boost incomes of young men from socio-economically disadvantaged backgrounds when compared to same-age civilians, and veterans overall achieve higher levels of earnings than non-veterans (Kleykamp, 2012). Even so, some research indicates that this income premium veterans experience dissipates over time following their discharge (especially for white male veterans). Importantly, the income boost for veterans may not accrue to women, who report lower earnings and family income than their civilian peers (Cooney et al., 2003, but see Padavic and Prokos, 2017).

In sum, research on selection into the military, as well as the subsequent occupational trajectories of veterans suggests that the impact of military service differs by demographic group and educational credential. Moreover, Routon (2014) found persistent effects of military service on veterans' educational and civilian labor market outcomes, even controlling for selection into the Armed Forces using sibling fixed effects and propensity score modeling. Although our data do not allow us to differentiate between selection and exposure effects, our analyses further this line of inquiry. We focus on directly comparing STEM employment odds among veterans and civilians, with particular attention paid to the effects of gender and of postsecondary (STEM/non-STEM) degrees.

1.2.3. The gender gap in STEM occupations

Building a diverse STEM workforce requires both effective recruitment and effective retention efforts. We know a lot about the factors that shape recruitment and retention of women and other traditionally underrepresented groups into STEM, especially recruitment into STEM fields requiring college degrees (Bradley and Charles, 2003; Glass et al., 2013; Han, 2016; Ma, 2011; Mann and DiPrete, 2013; Speer, 2017; Xie and Shauman, 2003). This research has produced a largely coherent picture suggesting that gender plays an early and lifelong role in selecting students and adults into (and out of) STEM fields (as do race-based intersectional dynamics; see e.g., Chang et al., 2008; Espinosa, 2011; Karanja and Austin, 2014; Ma and Liu, 2015; Song and Glick, 2004). Many of these empirical studies explain persistent gender segregation within and across STEM fields as the result of life-long socialization and selection practices. For instance, girls (and students from other historically underrepresented groups) are frequently "cooled out" of science classes as early as elementary and middle school (AAUW, 2010; Hill et al., 2018; Ma and Liu, 2015; Mann and DiPrete, 2013; Piatek-Jimenez, 2008; Rosenbaum and Deil-Amen, 2009).

In addition, research details the roles of organizational and institutional dynamics in providing access and support for STEM aspirants (Acker, 1990; Chang et al., 2008; Crisp et al., 2009; Ridgeway and Correll, 2004; Seymour and Hewitt, 1997; Smith-Doerr, 2004; Wang, 2013; Xie and Shauman, 2003). This research tends to illustrate how individuals make choices regarding occupational trajectories in light of the pervasive "chilly climate" that has been documented in traditionally male-dominated segments of academia

[1] The 190 MOS codes are applied to enlisted career fields. The Army specifically markets 48 of them as STEM-related (https://www.goarmy.com/careers-and-jobs/about-army-stem.html). In addition, they highlight 14 (of 24) officer positions as STEM-related. For examples of recruitment materials see e.g., http://www.usarec.army.mil/msbn/Pages/STEM.htm.

and industry. At the aggregate level, this dynamic contributes to gender segregation and a lack of diversity in many STEM fields (Britton, 2017; Chang et al., 2008; Crisp et al., 2009; Espinosa, 2011; Fox et al., 2009; Hall and Sandler, 1984; Nosek et al., 2002; Riegle-Crumb and Morton, 2017; Welsh, 1999; Zippel, 2006).

For our purposes, the history of exclusionary practices in both the military and scientific occupations creates a puzzle: Do women who have served in the military perhaps experience a double disadvantage and become even *less likely to enter STEM occupations*? This is what research on gender, on intersectionality and on organizational dynamics in- and outside the military might lead us to expect (Acker, 1990; AAUW, 2010; Bradley and Charles, 2003; Britton, 2017; Cooney et al., 2003; Espinosa, 2011; Glass et al., 2013; Hanson, 2013; Kleykamp, 2012; Ma, 2011; Mettler, 2005; Ridgeway and Correll, 2004; Smith-Doerr, 2004; Zippel, 2017). Or do women veterans perhaps benefit disproportionately from the selection or exposure dynamics discussed above and thus become *more likely to enter STEM occupations?* We might expect this based on other strands of stratification research indicating that exposure and role models matter for professional trajectories (see e.g., Bachman et al., 2000a; Padavic and Prokos, 2017; Patten and Parker, 2011; Riegle-Crumb and Morton, 2017; Segal et al., 1999; Seymour and Hewitt, 1997; Xie and Shauman, 2003). Moreover, recent research suggests that the strong relationship between military service and earning *STEM degrees* varies by gender: Being a veteran is associated with higher odds of earning a bachelor's degree in a STEM field – especially for women (Steidl et al., 2020). The logical next step is to ascertain whether gendered patterns regarding degrees earned also shape *STEM occupational outcomes*.

In sum, research on the gender gap in STEM suggests that women remain less likely to enter and to complete STEM degree programs for various reasons. Thus, they may be perceived as lacking the skills and credentials necessary to work in a STEM occupation. Our research examines the extent to which military service may provide an alternative and potentially gendered pathway into STEM occupations, either through a pathways unrelated to the classic point of entry via STEM-related college credentials or by channeling veterans into and through STEM post-secondary programs at higher rates.

1.2.4. *The importance of STEM credentials for STEM occupations*

Of course, selection and exposure dynamics are not limited to the military. What do we know more broadly about selection into STEM degree programs, and from STEM degree programs into STEM occupations for the general population – keeping in mind that, just like military service, earning a college degree typically predates long-term occupational outcomes?

On selection into STEM degree programs: Substantial research has examined recruitment into and retention in STEM fields (e.g., Blickenstaff, 2005; Britton, 2017; Hanson, 2013; Min and Jang, 2015; Piatek-Jimenez, 2008; Smith-Doerr, 2004; Sonnert and Holton, 1995; Zippel, 2017). On one hand, careers associated with baccalaureate and professional degrees are often associated with individuals from middle- and upper-class backgrounds. STEM fields are perceived as heavily credentialed, to the point where holding (at least) a college degree is viewed as a prerequisite to entrance into the field, a view that is buttressed by the language of a "STEM pipeline," leaky or otherwise, that connotes a one-directional funnel in which field-specific college credentials play a crucial role. Unsurprisingly then, students with at least one parent who has earned a college degree are more likely to complete a degree in a STEM field (NCES, 2009).

On the other hand, STEM fields have also historically provided an upward social mobility pathway for several disadvantaged groups, including some immigrant groups, plus working-class and first-generation college students (Alfred et al., 2005; Chang et al., 2008; Espinosa, 2011; Hurtado et al., 2007; Steinberg, 2001). In part, this may be because students from lower SES backgrounds are more likely to major in lucrative applied and technical fields and less likely to major in fields where links to economic returns are less tangible (Davies and Guppy, 1997; Goyette and Mullen, 2006; Ma, 2009).

In addition to these ascriptive characteristics (e.g., race, class), selection into STEM occupations may also be associated with acquired characteristics, such as educational credentials/degrees or military service. Many researchers have examined recruitment into and retention in STEM fields, especially those requiring postsecondary degrees (e.g., Blickenstaff, 2005; Britton, 2017; Hanson, 2013; Min and Jang, 2015; Piatek-Jimenez, 2008; Smith-Doerr, 2004; Sonnert and Holton, 1995; Zippel, 2017) Indeed, lack of a particular college degree or STEM-related major can be viewed as an immediate disqualifier, especially at the high end of the labor market (e.g., engineering, medicine). On this note, prior research has provided clear evidence that military service is strongly and positively associated with four-year STEM degree earning, and that this association is particularly pronounced for women veterans (Steidl et al., 2020).

However, despite the common-sense assumption about the strong connection between STEM degrees and occupations, many of them, in fact, do not require a four-year degree. For example, in our sample, 31.5% of those in a STEM occupation do not have a bachelor's degree (e.g., computer or engineering technicians). This raises the question whether alternative credentials and skills, such as those acquired in civilian or military contexts, might provide an alternate pathway into STEM occupations – and how this, perhaps, is gendered as well.

1.2.5. *Hypotheses*

In light of the patterns discussed above, we formulate the following empirical hypotheses:

H1a In general, military service will increase the odds of working in a STEM occupation.

H1b Military service will increase the odds of STEM occupational outcomes for men more than women – i.e, the gender gap among veterans will be larger than the gender gap among civilians; OR.

H1c Military service will increase the odds of STEM occupational outcomes for women more than men – i.e., the gender gap among veterans will be narrower than the gender gap among civilians.

Based on previous research, we expect to replicate classic patterns related to STEM training and STEM occupations:

H2a Having a 4-year college degree will increase the odds of working in a STEM occupation.

H2b Among those *with* 4-year college degrees, having a STEM degree (vs. non-STEM degree) will increase the odds of working in a STEM occupation.

Most importantly, assuming that these patterns also hold for ACS data, we expect to find that:

H3a Among those *with* 4-year college degrees, military service will increase the odds of working in a STEM occupation – even for those with a non-STEM degree ("alternate pathway into STEM").

H3b Military service will more strongly increase the odds of working in a STEM occupation for those *without* a 4-year college degree than for those with 4-year college degrees ("alternate pathway into STEM").

2. Material & methods

2.1. Data: the American community survey

Our analyses employ a 5-year cumulative *American Community Survey* (ACS) sample (2014–2018). ACS data are collected annually by the U.S. Census Bureau and compiled by IPUMS at the University of Minnesota's Population Center (Ruggles et al., 2020). The ACS surveys around 1 percent of households nationwide through a systematic sample to represent each U.S. county (or equivalent). Household and person-level weights are available to account for sampling, nonresponse, and sample probabilities. For this analysis, we use person-level sample weights to account for nonresponse. Using a data set with such a large sample size (N = 15,840,681 including 1,050,352 veterans) allows us to compare employment outcomes among and between veteran and civilian groups, by educational status and gender. Moreover, the ACS gathers information related to educational attainment, degree field (at the bachelor's level) and most recent occupation (if employed in the past five years), as well as a series of demographic characteristics for which our models control (age, race/ethnicity, citizen status, marital status, number of children, and disability status).

The analyses presented here focus on those respondents, aged 18–65, who report having an occupation and having been employed during the past five years. Thus, we limit our sample by excluding children and senior citizens (6,069,821), and those individuals who were not employed in the last 5 years (96,006), including younger retirees, homemakers, and the long-term unemployed. Furthermore, the ACS codes being on active military duty as an occupation, which benefits us in two ways. First, it prevents us from analyzing STEM occupations among active duty personnel and second, it enables us to avoid confusion about any potentially contemporaneous civilian and military employment. We thus exclude those respondents currently on active duty (25,241). With these selection criteria, our analytical sample contains 9,649,613 individuals, including 494,119 veterans.

As with any data, the ACS has its limitations, in part related to its mission: to provide a demographic snapshot of the U.S. population. As such, the ACS does not contain information on some factors known to influence occupational fields (e.g., aspirations, labor market dynamics).

A second ACS limitation is related to its cross-sectional data structure. This means that our models cannot directly account for causal or temporal ordering of events. However, the vast majority of military personnel join shortly after high school, serve for one term, and leave the service in their mid 20s. For example, over 80% of all recruits are under 21 years of age. In fact, 98% of US Army recruits are between 17 and 24 years old (average 20.6 years) and serve on average 48.9 months. The age profile of the much smaller Air Force is different, with an average age of 28 for enlisted members and seven years of service. Even in the Air Force, which boasts the highest proportion of members with a BA and the highest ratio of officers to non-commissioned personnel, less than 9% of enlisted members have a BA (AFPC, 2020; Bialik, 2017; DoD, 2018a, b; Patten and Parker, 2011; Rostker, 2006). This creates a sequential set of life course events for most military personnel, in which their service predates (both college and) occupational outcomes. Of course, there are exceptions to this pattern. Commissioned officers in the U.S. Armed Forces have to complete their college degrees *prior* to being placed on active duty. According to a recent study by the U.S. Congress (2015), approximately one third of officers exits after 4–5 years of service, more than 50% leave after 10 years, and the remainder stays until retirement (20 years). There is little variation in these patterns across the branches.

Obviously, whether veterans pursue higher education after leaving the service or not, the majority of their civilian occupational experiences tend to follow rather than predate their military service. The wording of the ACS survey questions confirms this assumption, as the relevant dependent variable (occupational outcome) is measured in terms of the most recent occupation held—including specific categories for military occupations (see below). The key independent variable (veteran status) is limited to those who served previously, but were no longer serving at the time of the survey. Nonetheless, in keeping with the cross-sectional logic of the ACS, we recommend interpreting the findings presented here in *associational terms.*

Table 1
Weighted descriptive statistics.

Variable	Full Sample		Among Civilians		Among Veterans		Among BA Holders		
	Mean/P	CI	Mean/P	CI	Mean/P	CI	Mean/P	CI	Metric
Dependent Variable									
NSF STEM Occupation	.045	[.044, .046]	.044	[.043, .044]	.070	[.069, .071]	.105	[.104, .105]	Binary
Independent Variables									
Education									
Less than a BA	.704	[.704, .705]	.703	[.702, .703]	.735	[.733, .736]	–	–	Categorical
Non-STEM BA+	.188	[.188, .189]	.190	[.189, .190]	.158	[.157, .159]	.637	[.636, .638]	
STEM BA+	.107	[.107, .108]	.107	[.107, .108]	.107	[.106, .108]	.363	[.362, .364]	
Veteran Status	.048	[.048, .049]	–	–	1.000	–	.043	[.043, .044]	Binary
Female	.505	[.504, .505]	.523	[.523, .524]	.135	[.134, .136]	.540	[.539, .541]	Binary
Control Variables									
Age	41.171	[41.160, 41.182]	40.790	[40.779, 40.802]	48.663	[48.618, 48.708]	42.717	[42.670, 42.735]	Continuous
Race/Ethnicity									
White	.612	[.611, .612]	.607	[.607, .608]	.701	[.699, .702]	.705	[.704, .705]	Categorical
Black	.125	[.125, .126]	.124	[.123,.124]	.155	[.154, .157]	.082	[.082, .083]	
Asian/PI	.061	[.060, .061]	.063	[.062, .063]	.021	[.020, .021]	.105	[.104, .105]	
Hispanic	.174	[.173, .174]	.178	[.178, .179]	.091	[.090, .092]	.084	[.083, .084]	
Multiracial/Other	.028	[.027, .028]	.027	[.028, .029]	.032	[.032, .033]	.024	[.023, .024]	
Non-Citizen	.093	[.092, .093]	.097	[.096, .097]	.008	[.007, .008]	.076	[.075, .076]	Binary
Married	.518	[.518, .519]	.513	[.512, .513]	.629	[.627, .631]	.632	[.632, .633]	Binary
Number of Children	.765	[.765, .766]	.769	[.768, .770]	.702	[.698, .705]	.820	[.818, .821]	Continuous
Disabled	.108	[.107, .108]	.107	[.107, .108]	.190	[.188, .191]	.050	[.050, .051]	Binary
N	9,649,613		9,155,494		494,119		2,960,358		

2.2. *Variables*

Table 1 contains descriptive information about our dependent variable, key independent variables, and covariates.

STEM Occupations. Our dependent variable is a dichotomous measure of whether respondents reported being employed in a STEM occupation. We present analyses based on an occupation code for STEM fields modeled after the STEM definition used by the *National Science Foundation* (NSF). This definition includes mathematics, computer science and engineering fields as well as a range of life and social sciences, while excluding a gamut of management and health care fields that could turn STEM into a "kitchen sink" concept (NCES, 2009). Using the Bureau of Labor Statistics guide for occupation descriptions (USDL, 2015) as the basis for matching the NSF definition with ACS occupational fields, Table 1 shows that 4.5% of respondents in our overall sample report working in STEM occupations[2] (4.4% of civilians and 7.0% of veterans). Not entirely surprisingly, the proportion of STEM workers is also significantly higher among those with BAs (about 10.5%) than in the general population (4.5%).

Veteran Status. ACS respondents age 17+ reported their veteran status. Focusing on those 18 years and older, we create a dummy for veteran status where the comparison group is civilians (either no military service or training *only* as part of the National Guard/Reserves). Service members currently on active duty are excluded from our analyses. This also means that we know the temporal order despite the ACS's cross-sectional design: military service predates the most recent occupation reported by respondents. Veterans compose 4.8% of our sample.

Gender. Gender is coded dichotomously, with men as the reference category. Women compose 50.5% of our overall sample (52.3% of civilians and 13.5% of veterans).

Education. We employ a three-category independent variable that gauges educational credentials completed at the time of the survey: less than a BA (70.4%), non-STEM BA (18.8%), and STEM BA (10.7% of overall sample). The STEM BA degree category indicates that a respondent's bachelor's degree was in a STEM field as defined by NSF (parallel to the NSF definition of STEM occupations used as the dependent variable). Respondents with degrees are coded as STEM BA or non-STEM BA, regardless of whether they earned a Bachelor's of Arts or Bachelor's of Science.

Control Variables. Again, ACS data limits the extent to which we can control for other factors shown to impact occupational field of

[2] The ACS data generally reflect national patterns. Our rather conservative measure leads us to categorize 4.5% of respondents as employed in STEM occupations. Broader STEM definitions that include health occupations report a larger proportion of the workforce employed in STEM fields (e.g., 6.2% according to the Bureau of Labor Statistics (2017) or even 13% according to the Pew Research Center (Funk and Parker, 2018)). Among STEM workers, the ACS data are broadly in line with federal reports regarding occupational distributions (BLS, 2017; National Science Board, 2018): 79% of ACS respondents employed in NSF STEM Occupations work in Computer Science or Engineering (CSE)-related fields (including jobs that do not require a BA). Results reported here are overwhelmingly robust to differences in operationalization, though using broader STEM definitions that include health care fields (used by the Department of Defense and National Institutes of Health) reveals somewhat different patterns described in the results section below.

employment, however we do control for seven demographic factors.

Age. Age is a continuous variable measuring the age of the respondent in years ranging from 18 to 65. The mean age in our sample is 41.17 years.

Race/Ethnicity. Previous research has identified varying rates of military service by race/ethnicity (Bachman et al., 2000b; DoD, 2018a, b; NCVAS, 2017; Patten and Parker, 2011), as well as racial differences in rates of STEM degree earning (Flowers and Banda, 2015; Hanson, 2013; Hurtado et al., 2007; Song and Glick, 2004; Strayhorn, 2015). We follow (Harcey and Smith, 2017) in coding race/ethnicity into five mutually exclusive categories: White (61.2%); Black (12.5%); Asian (including Pacific Islanders, 6.1%); Latina/o (17.4%) and multiracial/other (2.8%). Respondents of Hispanic, Spanish, or Latina/o origin are coded as Latina/o. In our analyses, white is the reference category.

Citizenship. Citizenship and immigration background play a significant role in determining STEM outcomes (Han, 2016; Margolis et al., 2000). Our variable, Non-Citizen, indicates respondents who were not U.S. citizens at the time of the survey (9.3%); the reference category includes both native-born and naturalized citizens.

Married. Both marital status and parenthood are known to affect occupational outcomes, including in STEM occupations (AAUW, 2010; Glass et al., 2013; Xie and Shauman, 2003; Zippel, 2017). Our variable, Married, indicates that a respondent was legally married at the time of the survey (51.8%), regardless of whether they were living with their partners. The reference category (non-married) includes those who were widowed, divorced, or single.

Number of children. This variable provides a count of children living in the household at the time of the survey; we truncate this variable, collapsing households with six or more children (mean response = .765).

Disability. Angrist and Chen (2008) and NCES (2012) have documented substantially higher rates of disability among veterans, including those enrolled as students. Disability is coded 1 if respondents provided a positive response for any of six ACS measures of disability: cognitive difficulty, ambulatory difficulty, independent living difficulty, self-care difficulty, vision difficulty, and hearing difficulty (10.8%).[3]

2.3. Analytic method

We use weighted logistic regression to identify factors associated with employment in STEM occupations. All analyses employ individual-level probability weights calculated by IPUMS (Ruggles et al., 2020) to represent the population over the five given years. The full regression table (with odds ratios (OR) and log odds) is reported in Table 2. Our initial model assesses the associations between STEM employment and three independent variables: education (whether BA, what kind), veteran status, and gender. Additional models explore how intersectional effects (veterans by gender; veterans by education) influence STEM employment outcomes. All models also include a series of controls outlined above. In the results/discussion section we discuss the full models and the visual presentation of marginal effects for ease of interpretation – note that findings are entirely robust and consistent across partial and full models.

Some scholars have criticized logistic regression models with interaction effects on the grounds that changes in log odds are difficult to interpret (Norton et al., 2004). Using marginal changes and predicted probabilities instead of the odds ratios eases the interpretation of the results (Long and Freese, 2014). To assist readers in interpreting the results, we present group-level predicted probability plots, which facilitates interpreting the magnitude of the interaction effect across our models and makes the results more intuitively meaningful. These predicted probabilities suggest the relative probability of an outcome by group (e.g., veterans vs. civilians), and are calculated from the corresponding multivariate models by centering variables at their mean (in Stata using the `margins` command post model estimation).

3. Results

3.1. Main effects

Our first multivariate model (Table 2, Model 1) examines the effects of gender, veteran status and education on rates of employment in a STEM occupation. Fig. 1 contains three different predicted marginal probability plots (constructed from Table 2, Model 1), each focusing on one of our main hypotheses regarding the effects of gender, veteran status, education.

Fig. 1a illustrates the predicted marginal effect of **gender on STEM occupational outcomes.** Not surprisingly, our results parallel the existing literature on the gender gap in STEM. The predicted probability of being in a STEM occupation for men (.041) is 2.7 times higher than that for women (0.015). This figure confirms a massive gender gap favoring men in STEM occupations.

Fig. 1b illustrates the predicted marginal effect of **veteran status on STEM occupational outcomes**. Findings clearly support

[3] In analyses not reported here, we exchanged the age variable with a series of cohort dummies. Substantive findings remain unchanged. More recent cohorts were more likely to be employed in STEM occupations, which may reflect labor market trends overall. We also analyzed race and ethnicity effects separately. Including Latina/o in the race/ethnicity variable implicitly makes Latina/o the main identity, instead of designating race (black or white) as the main identity coded by the ACS. Congruent with previous research (Harcey and Smith, 2017), the combined race/ethnicity measure provides a clearer picture of group-specific dynamics. We also constructed an alternate disability measure based on the Veterans Administration's disability classification definition. Because the VA uses more stringent criteria, individuals captured by that measure are subsumed in our broader disability measure reported here. Findings are robust, available on request.

Table 2
Logistic regression models: Determinants of STEM occupations.

	Model 1 Main Effects Model		Model 2 Veteran Status by Sex Interaction		Model 3 Veteran Status by Education Interaction		Model 4 Full Model	
	OR	log odds	OR	log odds	OR	log odds	OR	log odds
Independent Variables:								
Education								
Non-STEM BA+	2.160***	.770	2.158***	.769	2.242***	.807	2.244***	.808
STEM BA+	10.91***	2.390	10.90***	2.389	11.65***	2.455	11.65***	2.455
Female	.365***	−1.007	.362***	−1.016	.366***	−1.006	.362***	−1.017
Veteran Status	1.496***	.403	1.451***	.372	2.097***	.741	2.042***	.714
Control Variables:								
Race/Ethnicity								
Black	.678***	-.389	.677***	-.390	.680***	-.386	.679***	-.387
Asian/PI	1.765***	.568	1.765***	.568	1.750***	.560	1.750***	.560
Hispanic	.570***	-.563	.569***	-.563	.577***	-.550	.577***	-.550
Multiracial/Other	.995***	-.005	.994***	-.006	.999***	-.001	.998	-.002
Non-Citizen	1.037***	.037	1.037***	.037	1.034***	.033	1.034***	.033
Married	1.226***	.204	1.227***	.204	1.222***	.200	1.223***	.201
Number of Children	.939***	-.063	.939***	-.063	.940***	-.062	.940***	-.062
Disability	.577***	-.550	.577***	-.550	.577***	-.550	.577***	-.550
Age	.992***	-.008	.992***	-.008	.992***	-.008	.992***	-.008
Interaction Variables:								
Gender x Veteran Status Interaction								
Female x Veteran			1.407***	.341			1.501***	.406
Education x Veteran Status Interaction								
Non-STEM BA + x Veteran					.720***	-.329	.701***	-.356
STEM BA + x Veteran					.441***	-.820	.436***	-.831
Intercept		−3.116***		−3.114***		−3.149***		−3.147***
N	9,649,613		9,649,613		9,649,613		9,649,613	
AIC	60465526.7		60460527.1		60394727.4		60387538.6	
BIC	60465723.9		60460738.3		60394952.7		60387778.0	

$^*p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$.

Hypothesis 1a: Veterans are indeed significantly more likely to work in STEM occupations. Being a veteran results in a 0.037 predicted probability of being in a STEM occupation. This is 1.5 times higher than the predicted probability for civilians (0.025) and should be viewed as an indication that military service may provide a distinct pathway into STEM occupations. Keeping in mind that only a small proportion of the labor force is employed in STEM occupations, this boost for veterans is empirically meaningful. Importantly, because the model controls for STEM degrees, our findings indicate that military service impacts STEM occupational outcomes *above and beyond* educational credentials earned. This indicates that military service seems to provide an alternative pathway or labor market advantage into STEM occupations.

Fig. 1c illustrates the predicted marginal effect of **education on STEM occupational outcomes**. Findings confirm Hypotheses 2a and 2b: Not surprisingly, having a college degree of any kind—but especially a STEM degree—significantly predicts employment in a STEM occupation. In terms of predicted probabilities, our findings indicate that respondents with less than a BA have a predicted probability of .017 of being in a STEM occupation. Note, however, that having a college degree increases the probability of being in a STEM occupation, regardless of degree type. For those with a non-STEM degree, the predicted probability is .036, meaning that respondents with a non-STEM degree are more than twice as likely to work in a STEM occupation as respondents with less than a bachelor's degree. Respondents with a STEM degree have by far the highest predicted probability of being in a STEM occupation (0.159), which is 9.4 times higher than individuals with less than a bachelor's degree and 4.4 times higher than individuals with a non-STEM degree. This clearly indicates that STEM occupations generally rely heavily on matched credentials.

Alternatively, readers can consult Table 2 (Model 1), which conveys these results based on odds ratios. Table 2 also demonstrates the effects of our control variables, which echo well-known patterns: Asians and non-Citizens are consistently overrepresented in STEM occupations. This pattern likely reflects selective immigration trends that, in turn, result from differential recruitment to alleviate STEM worker shortages in fields ranging from computer science and engineering to medicine. In contrast, Latinos and African Americans as well as other minorities are consistently underrepresented in STEM occupations, as are people with disabilities. Age and number of children are also negatively associated with working in STEM, though being married is positively associated with our outcome. This suggests a largely non-diverse population of STEM workers who are more likely than the general population to be married, tend to be younger, and tend to have fewer (if any) children.

To summarize, the multivariate results displayed as predicted marginal probabilities in Fig. 1a through 1c suggest the following main effects: Having a STEM degree is the largest predictor of working in STEM occupations, followed by being male, and by being a veteran. However, STEM fields are inherently gendered, as are opportunities to serve in the military. Because we suspect that focusing on main effects alone might underestimate the actual effects of gender and of military service on occupational outcomes, we now turn to models that include interaction effects: gender and veteran status, plus education and veteran status (also see hypotheses 1b, c plus

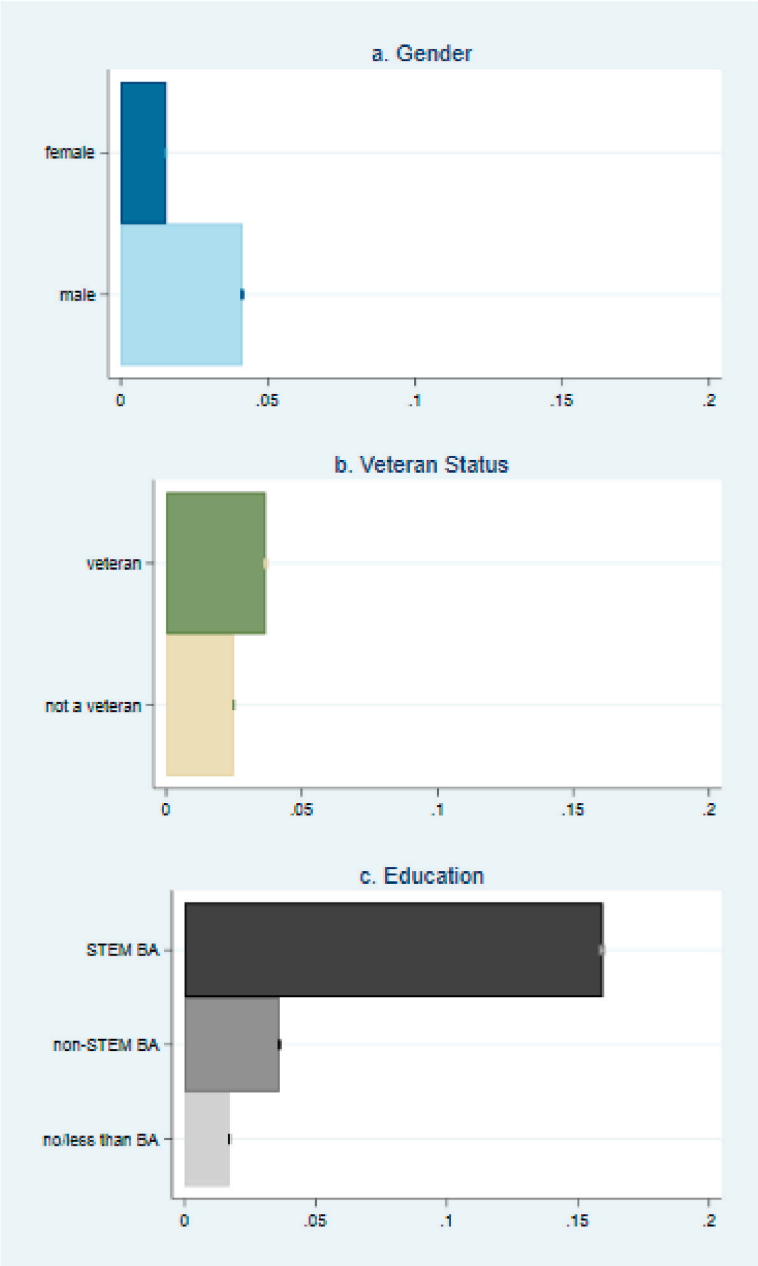

Fig. 1. Predicted marginal probability of STEM occupation across gender, veteran status, and education.

3a, b).

3.2. Interaction effects by gender and veteran status

Table 2 (Model 2) and the corresponding Fig. 2 introduces an interaction effect, examining the extent to which the relationship between military service and STEM occupations differs by gender. To recap, our analysis in Model 1 confirmed previous findings that men are significantly more likely than women to enter STEM occupations. We also showed that the military (a male-dominated institution) provides an alternative pathway into STEM (H1a). We postulated that this creates a puzzle with regard to women veterans: Do they experience a double disadvantage and become even less likely to enter STEM fields? Or do women perhaps benefit from exposure to STEM skills in the military and thus become more likely to enter STEM fields?

Our results clearly show that the gender gap among veterans is narrower than among civilians, leading us to reject Hypothesis 1b in favor of Hypothesis 1c. Specifically, the association between military service and STEM occupations is markedly stronger for women

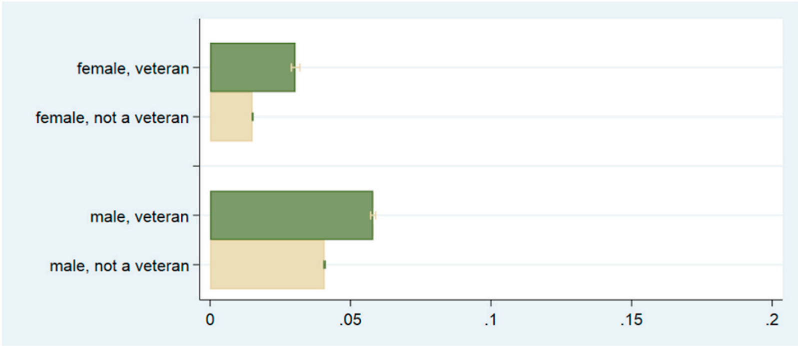

Fig. 2. Predicted marginal probability of STEM occupation by gender and veteran status.

than for men. Fig. 2 helps visualize and contextualize this pattern. Women veterans (0.030) are twice as likely to work in a STEM occupation, compared to female civilians (0.015). In contrast, male veterans (0.058) are only 1.4 times as likely to work in a STEM occupation, compared to civilian men (0.041). In other words, veteran status appears to have a much larger influence on women's rates of STEM employment than on men's.

Yet, as Fig. 2 also confirms, all men, regardless of veteran status, are more likely to work in STEM occupations. Thus, although women who are veterans are significantly more likely to work in STEM occupations than their civilian peers, female veterans remain less likely to work in a STEM occupation than either male veterans or male civilians (even though female veterans almost close the gap with male civilians). The predicted probability of employment in a STEM occupation for civilian men (.040) is 2.7 times as high as the predicted probability for civilian women (0.015). While male veterans are still at an advantage, the predicted probability for male veterans (0.058) is only 1.9 times as high as the predicted probability for female veterans (0.030). In other words, serving in the military enables women to at least *narrow the gender gap* in STEM occupations.[4]

3.3. Interaction effects by education and veteran status

To pinpoint the extent to which holding a STEM degree influences the association between military service and STEM occupations, our third model includes an interaction between veteran status and education (see Table 2, Model 3). This enables us to test Hypotheses 3a and 3b. Fig. 3 presents predicted marginal probabilities for this interaction effect.

Fig. 3 demonstrates how examining education reveals a more nuanced relationship between military service and STEM occupational outcomes than indicated by main effects alone. Not surprisingly, Fig. 1 (and Model 1) showed that respondents with a bachelor's degree in a STEM field are much more likely to work in a STEM occupation than respondents whose degree is in a non-STEM field, or respondents who lack a college degree. On one hand, Fig. 3 further augments our findings from Fig. 1 regarding the tight coupling between STEM credentials and STEM occupations. This pattern holds for both veterans and civilians. On the other hand, Fig. 3 also shows that the type of post-secondary credential moderates the relationship between military service and STEM occupations.[5]

Indeed, we find that veterans with a STEM degree have a *lower* predicted probability of working in a STEM occupation (0.151) than their similarly educated civilian peers (0.161). This 0.010 difference means that civilians with a STEM degree are 1.1 times as likely as their similarly educated veteran peers to work in a STEM occupation. In contrast, among respondents whose bachelor's degree is *not* in a STEM field, we find the expected positive association between military service and STEM occupations (0.053). Thus, compared to similarly educated civilians (0.036), veterans with a non-STEM BA are 1.5 times as likely to work in a STEM occupation. Overall, these findings provide partial support for Hypothesis 3a. Finally, when we focus on those without a college degree, we find the *strongest* positive relationship between military service and STEM occupations. That is, veterans *without* a bachelor's degree are twice as likely to

[4] We found substantial differences in the extent to which military service narrows the gender gap depending on the STEM definition used. A comparison of model fit (AIC/BICs across models) makes it clear that the NSF models presented here are superior to those using other STEM definitions. This means that our models have more predictive power when we employ this more stringent STEM definition. Analyses using broader definitions that include e.g., medical fields (used by the Department of Defense and National Institutes of Health) suggest that the relationship between military service and STEM occupations is strong enough that it effectively *closes or even reverses the gender gap*, so that female veterans have a higher marginal probability of working in a STEM field than both male veterans and male civilians. In analyses using more narrow STEM definitions (the NSF definition used here, or the Department of Education's), we find that military service still helps reduce the gender gap but does not entirely close (nor reverse) it. Thus, using the relatively narrow STEM measure presented here provides a conservative estimate of the extent to which the military can serve as an alternate pathway into STEM – particularly for women, potentially for other historically underrepresented groups.

[5] These results are robust to different definitions of STEM. Using both narrow (NSF and DOE) and broader (DOD and NIH) STEM definitions analyses show the same trends. All STEM definitions predict civilians with a STEM BA to be more likely to work in STEM occupations than veterans with a STEM BA. Similarly, our findings regarding non-TEM BA holders and non-BA holders are also robust: veterans *without* a college degree are more likely to be in a STEM occupation than civilians *without* one.

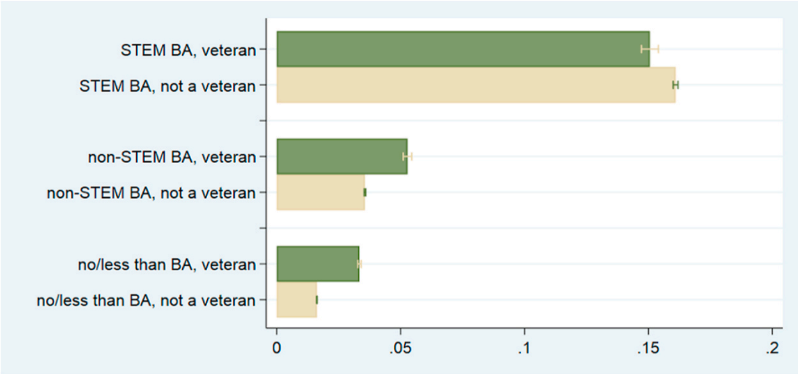

Fig. 3. Predicted marginal probability of STEM occupation by education and veteran status.

work in a STEM occupation (.033) as similarly educated civilians (0.016), making them twice as likely to work in a STEM. This finding provides strong support for Hypothesis 3b.

To summarize, compared to their similarly educated civilian peers, veterans with a STEM degree are less likely to work in a STEM occupation. Veterans with a non-STEM degree are 1.5 times as likely to work in a STEM occupation. And veterans with no college degree are twice as likely to work in a STEM occupation. Notably, these results suggest that *military service* functions as an alternative pathway into STEM occupations for individuals *with non-STEM* college degrees and for those *without* college degrees. This may be tied to exposure or experience acquired while serving in the military.

4. Discussion and conclusions

This paper examines the relationship between military service, educational credentials, and STEM occupational outcomes, with particular focus on how these pathways might be gendered.

Most importantly, we find substantial gender differences in the relationship between military service and STEM occupations. Crucially, we find no evidence that women veterans experience a "double disadvantage" with respect to employment in STEM fields. On the contrary, despite their gender and background in an arguably male-dominated organization, women veterans are significantly more likely to work in STEM occupations than their civilian peers – to such an extent that women veterans substantially narrow the gap with male civilians entering STEM occupations. This pattern emerges even with the relatively stringent way of operationalizing STEM used here, which excludes the broad range of health-science related fields in which women have traditionally worked while serving in the military. In analyses not reported here, using broader STEM definitions that do include health care fields further magnifies the observed advantage for women veterans entering STEM occupations. In other words, the results presented here provide a conservative estimate of the gendered impact military service has on broadening participation in STEM (see footnote 4).

Thus, our first major contribution is that we identify military service as a key alternative (i.e., non-degree based) and *gendered* pathway into STEM occupations. Future research should examine in more detail the mechanisms behind this pattern: What is it about military service that pulls women veterans into STEM occupations? Using the ACS data, we are unable to assess directly to what extent this pattern reflects selection bias (i.e., who joins the military) or perhaps results from experiences that expose women to tangible STEM knowledge/skills during military service, making them more likely to pursue a STEM occupation (Cooney et al., 2003; Kleykamp, 2009, 2013; Patten and Parker, 2011; Routon, 2014). Alternatively, exposure to military norms and practices might lead women veterans to possess intangible skills that facilitate navigating the organizational climate and institutional hurdles that contribute to civilian attrition from STEM fields (e.g., Nosek et al., 2002; Riegle-Crumb and Morton, 2017; Smith-Doerr, 2004; Zippel, 2017). Put differently, female veterans likely face challenges similar to those faced by female civilians in pursuing a STEM careers. Having successfully negotiated the culture of the U.S. military may encourage women to select and succeed in STEM fields at higher rates despite the well-documented "chilly climate" (AAUW, 2010; Britton, 2017; Flowers and Banda, 2015; Fox et al., 2009).

Future research should also examine the specific STEM fields in which male and female veterans seek employment. To test the robustness of our findings, we explored several alternative definitions of "STEM occupations" in analyses not reported here. Those findings suggest that, in fact, women veterans are more likely to enter STEM fields than their civilian peers no matter how we measure STEM. Even when we exclude traditionally female-dominated STEM occupations (e.g., health and medical fields, social science fields) and focus exclusively on male-dominated ones (e.g., math and engineering), the advantage of women veterans persists. We take this as strong evidence of the fact that military service not only helps diversify the STEM pool but also helps mitigate the entrenched gender segregation patterns within STEM. Nonetheless, understanding the specific occupational choices of veterans constitutes a critical next step in disentangling the mechanisms driving these patterns.

Our second major contribution is related to the finding that military constitutes an alternative pathway into STEM occupations that seems to operate primarily for individuals who would be excluded from the traditional STEM "pipeline." In particular, veterans who lack a 4-year college degree and those who have a non-STEM college degree are far *more likely* to work in STEM occupations than are comparable civilians. Indeed, our findings suggest that military service seems to provide the greatest advantage for veterans who have not earned a college degree at all, but who quite possibly acquired STEM-related skills and experiences while serving in the military. In that sense, our findings dovetail those of earlier research showing that veterans with less formal education or human capital benefit the most in terms of employment and earnings (Kleykamp, 2010, 2012, 2013; Routon, 2014). These findings could also serve as a reminder for social scientists not to rely too heavily or exclusively on educational credentials as predictors of labor market outcomes.

Simultaneously, we find that veterans with STEM degrees are actually *less likely* to work in STEM occupations than are comparable civilians (with STEM degrees). This finding is surprising given the high correlation between military service and STEM degree earning found in previous research (Steidl et al., 2020). On one hand this may suggest that the STEM labor market disadvantages veterans who have followed the more traditional STEM pipeline. For example, age may result in downward channeling of these veterans in the labor market: Not only do STEM degrees tend to take longer than non-STEM degrees (Malcolm and Feder, 2016), but veterans who begin post-secondary education after completing their military service are already several years older than their civilian peers. On the other hand, veterans with STEM degrees may experience upward channeling in the labor market, being recruited into other, more lucrative fields at higher rates (e.g., defense contracting). Future research should examine particular labor market trajectories related to STEM credentials and/or military experience.

In conclusion, our results further provide an innovative extension to extant research on the relationship between military service, education, and occupational outcomes. Previously, Cate (2014) documented a (largely descriptive) positive relationship between military service and STEM degrees. Our own research has confirmed this pattern in multivariate models, showing that military service serves as an alternate pathway into STEM degrees, particularly for women (Steidl et al., 2020). The findings presented here extend these insights by demonstrating parallel effects regarding gendered dynamics involving veterans' occupational outcomes.

Future research should investigate the possible factors driving these effects, which may be related to a combination of exposures/experiences known to affect non-STEM related occupational outcomes more generally (Booth et al., 2000; Kleykamp, 2010, 2013; Mettler, 2005; Routon, 2014; Segal et al., 1999; Teachman and Tedrow, 2004, 2007). Examining what drives these STEM-related occupational trajectories could help optimize the design and implementation of policies and programs seeking to broaden the pool of individuals with aspirations to enter STEM fields. For example, simply understanding the unexpectedly strong association between military service and STEM occupational outcomes could inform the military's overall efforts to optimize veterans' reintegration into civilian life. STEM occupations should be at the top of the list for job counselors in and outside of the military. Moreover, lessons learned from identifying the conditions that help veterans without STEM degrees enter STEM fields might also inform efforts to recruit and train non-traditional civilian groups into STEM occupations (i.e., those with non-STEM degrees or without college degrees).

Put differently, policy efforts to diversify the STEM workforce should involve not only recruiting children and young adults into STEM education (with the assumption that STEM jobs will naturally follow), but identify alternative pathways into STEM frequently taken by groups traditionally underrepresented in many STEM occupations and fields. For example, STEM fields such as computer science and engineering remain heavily dominated by men and whites yet comprise by far the largest share of STEM job openings (Funk and Parker, 2018, USDL, 2017). Efforts to broaden participation in these fields could benefit from a deliberate effort to recruit women and other underrepresented groups from all walks of life, including the military and from non-STEM backgrounds.

A final word on data limitations. Due to ACS limitations, we have virtually no information on the specifics of how military service (e.g., service period and length, deployments, MOS codes, use of GI bill benefits) might influence subsequent occupational trajectories. Moreover, we are not aware of other data sets that contain relevant information to answer these questions. Thus, we call for additional research and data collection efforts to unpack the complex causal (or associational) dynamics leading to the patterns identified here. Until that time, policies and interventions designed to broaden participation in STEM occupations will have to rely on insights derived from associational findings like the ones presented here.

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Declaration of competing interest

None. The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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