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Research Report

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Understanding the Impact of Department of Defense Youth Programs on Bridging the Civilian-Military Divide

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About This Report

Through its funding and implementation of youth programs, the Department of Defense (DoD) serves communities throughout the United States. The three predominant programs—STARBASE, the National Guard Youth ChalleNGe, and the Junior Reserve Officers' Training Corps (JROTC)—serve more than half a million young people each year. These programs operate in different ways but have a shared commitment to providing service to communities and positive outreach. In this way, these programs have the potential to influence a substantial proportion of the U.S. population and may serve to bridge the civilian-military divide.

While these programs operate in many parts of the country, there is no existing approach to assessing how well the programs are fulfilling the outreach goals of generating awareness of and interest in the U.S. military. To assist the Office of the Assistant Secretary of Defense for Manpower and Reserve Affairs in doing this, RAND Corporation researchers developed an analytic framework to help assess the outreach channels that enable these programs to positively influence their communities and society more broadly.

The findings in this study may enable DoD youth program leadership and other stakeholders to conduct outreach to youth and community members more effectively. It should be noted that the research presented in this report does not explore or test each potential channel of outreach. Rather, it documents many of the key channels through which program influence may be realized going forward. The report concludes with recommendations for program leaders to consider as they work toward improving program outreach.

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RAND National Security Research Division

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Summary

Through its funding and implementation of youth programs, the Department of Defense (DoD) serves communities throughout the United States. The three predominant DoD youth programs—STARBASE, National Guard Youth ChalleNGe (Youth ChalleNGe), and Junior Reserve Officers' Training Corps (JROTC)—serve more than half a million young people each year. Though operating in different ways, these programs have a shared commitment to providing positive outreach and service to communities. These programs serve to bridge the civilian-military divide by creating shared experiences, exchanging knowledge, and building a shared culture between active-duty or veteran service members and civilians. DoD's youth programs are not avenues for military recruiting. They may, however, introduce community members to opportunities for or benefits of military service.

While these programs operate in many parts of the country, there is no existing approach for assessing how well the programs are fulfilling the outreach goals of generating awareness of and interest in the U.S. military. Thus, RAND Corporation researchers developed an analytic framework that can assist the Office of the Assistant Secretary of Defense for Manpower and Reserve Affairs in making such assessments.

The findings in this study may also enable DoD youth program leadership and other stakeholders to conduct outreach to youth and community members more effectively. The research presented in this report does not explore or test each potential channel of outreach. Rather, it documents many of the key channels through which program influence may be realized going forward.

Empirical Approach

The RAND research team developed a framework to identify the various ways these programs influence their participants, communities, and society more broadly. Using this framework as a guide, RAND researchers assessed several key aspects of DoD's youth programs. Although DoD's youth programs have different operational models and serve different populations, they have several key commonalities. First, each program requires *awareness* (i.e., people who possess knowledge of the program's existence and purpose); second, each program features a unique *curriculum*; and, third, each one has the potential to influence both participants and communities. This influence could manifest in a variety of ways, including increasingly positive *community sentiment* toward the military, as well as increased numbers of military applicants and accessions. The change in sentiment, as well as the decision to apply to and enter the military, need not come from those who have taken part in the programs. Instead, this effect could result from the programs' positive outreach; indeed, this is a likely mechanism, as most community members have little to no direct experience with DoD's youth programs.

The research team examined these key commonalties through the following separate, specific approaches:

- *Awareness* of DoD's youth programs was measured through the RAND American School Leader Panel, a standing, representative survey of U.S. school principals.
- *Curricula* were analyzed through a close and rigorous examination of the content of JROTC textbooks. The JROTC program is especially well-suited for this type of analysis because it is the largest of DoD's youth programs and operates with a consistent curriculum and textbooks.
- *Sentiment* was measured through military applicant and accession data and community data. These data enabled the team to begin by calculating military presence within each community. The team then

compared the applicants and accessions from communities that are served by DoD's youth programs with the applicants and accessions from otherwise similar communities that lack such programs, controlling for military presence. Because youth programs are not distributed randomly, this comparison depends on multivariate regression models and a propensity score weighting technique, which allows for a more direct comparison between areas with and without a DoD youth program.

Results

Awareness

School leaders, especially those in higher-poverty schools, cite challenges to providing civics education, such as pressures to focus on other academic subjects, not having staff with the necessary training, and not having necessary resources (e.g., textbooks). JROTC, whose mission emphasizes civic development, is well recognized by school leaders, most of whom have a positive impression of the program. While Youth ChalleNGe is not as well known, leaders who are familiar with the program also have positive impressions. Most are not familiar with STARBASE, which does not operate at the high school level. School leaders generally report that their communities support DoD's youth programs and indicate that these programs build connections between the communities and the military.

Curriculum

JROTC textbooks present detailed descriptions of service-specific history and operations, as well as foundational concepts of U.S. citizenship. The material, however, is often siloed and presented without connection between the civilian and military realms. Most of the curriculum does not focus on civilian-military relations. Also, the sequencing and standardization of curricular materials varies across the services. Thus, not all students will be exposed to the full scope of materials provided in the JROTC textbooks. Combined with school leaders' descriptions of the challenges they face in providing civics education, this suggests that JROTC programs could help schools address a need by emphasizing civics in the classroom portion of the program. This would also ensure an opportunity for JROTC programs to fulfill an aspect of their mission.

Community Sentiment

Military presence is relatively low in most communities. The areas with the highest levels of military connection—the highest populations of service members, military families, and veterans—are located outside urban areas. DoD youth programs are somewhat more common in communities with substantial military presence, but many programs are located in areas with lower-than-average presence.

The research team found some evidence that DoD programs influence community sentiment; communities with DoD youth programs have more military applicants and more military accessions than similar communities without access to DoD youth programs. The difference is on the order of 2.5–2.8 percent. These results imply that DoD saw about 1,900 additional applications and about 1,000 additional accessions in fiscal year 2017 in areas served by DoD youth programs.

Communities with DoD youth programs have about 3 percent more applicants and accessions from historically marginalized groups (those identifying as Black, Asian, Hawaiian Native or Pacific Islander, American Indian or Alaska Native, Hispanic). In suburban areas, DoD youth programs are associated with higher levels of high-quality applicants and accessions. Our results suggest that programs make a contribution to the services' quality and diversity goals. They also suggest that DoD youth programs operate more effectively in areas with substantial military presence.

Recommendations

The findings above elicited three groups of recommendations for DoD youth program decisionmakers to consider as they continue to improve the outreach of these programs. First, they should focus on the need for *additional communications and outreach* to relevant communities and stakeholders. While these outreach efforts will differ across DoD's youth programs, decisionmakers should aim to ensure consistency of information and emphasize program benefits. Second, *better aligning JROTC content with program mission* could ensure that students experience the full scope of the intended materials. Additionally, school leaders' descriptions of the challenges in providing civics education suggests a potential role for JROTC to better address an educational need. Finally, *future program placement should consider existing military infrastructure as well as measures of the population*. Strategically placing future programs should result in more successful outreach, a more diverse military that is reflective of the population, and a narrowing of the civilian-military divide.

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CHAPTER 1

Background and Introduction

The Department of Defense (DoD) has served communities throughout the United States for over 100 years through its funding and implementation of youth programs. These programs are intended to support local communities by increasing the educational attainment of students in K–12 schools; engaging young people in civics and leadership; promoting physical fitness; providing exposure to innovative careers in science, technology, engineering, and mathematics (STEM); and helping to develop engaged and informed citizens. Participating communities have the potential to benefit from these programs by having healthier, better educated, and more civically minded citizens. In turn, DoD receives indirect benefits from civilians who come to better understand and take an interest in the U.S. military; a workforce that supports the military through research, innovation, and maintenance of infrastructure; and individuals interested in pursuing careers in civil service. These programs have an important common theme of *service to the community*, and the positive outreach that they provide is at least implicit in each program's mission statement and/or vision.

To date, DoD has three predominant youth programs:

- **STARBASE** provides instruction to classrooms of fifth-grade students, with their teachers also in attendance. The program emphasizes STEM concepts through hands-on active learning; military personnel also introduce students to the important role of STEM in the military (STARBASE, 2023).
- **National Guard Youth Challenge (Youth ChalleNGe)** serves 15.5- to 18-year-olds who are at risk of dropping out of high school. The program offers a quasi-military residential program and focuses on building academic and job skills as well as young peoples' sense of citizenship and service (National Guard Youth ChalleNGe, 2022).
- **Junior Reserve Officers' Training Corps (JROTC)** offers high school students academic instruction and cocurricular opportunities in areas such as civics, leadership, physical fitness, and community service (Kamarck, 2022).

These programs are *not* avenues to recruit participants into military service; however, they may serve as channels through which community members learn about military career opportunities and benefits. In short, these programs are intended to help bridge the civilian-military divide.[1] The exact approach through which these DoD youth programs achieve these intended benefits varies according to each youth program.

DoD's youth programs operate in every state, as well as the District of Columbia and several U.S. territories. The programs have considerable potential to provide service and positive outreach to many communities throughout the United States. The scope of the programs is large in terms of participants as well; they

[1] The *civilian-military divide* is "the experiential, cultural, and social gulf between servicemembers and veterans, and civilians" often attributed to decreasing proportions of Americans serving or having a connection to someone who has served in the military (WilmerHale Legal Services Center, 2022). A key concern that this divide raises is the country's ability to maintain an all-volunteer force, because fewer Americans may understand the unique challenges and benefits of military service.

provide instruction and activities to well over half a million young people every year.[2] Yet, despite this large potential influence on the communities and individuals they serve, there is no approach to assess how well the programs are performing in terms of their outreach goals of generating awareness of and interest in the U.S. military. To assist the Office of the Assistant Secretary of Defense for Manpower and Reserve Affairs in understanding the effectiveness of DoD youth program outreach, RAND Corporation researchers developed an analytic framework to help assess the outreach channels that enable these programs to positively influence their communities. The intention is that DoD youth program leadership and other stakeholders can use a new understanding of key channels to more effectively conduct outreach to youth and community members. In this report, we do not explore or test each potential channel for influence for each of the three programs. Rather, we focus on documenting some of the key channels of program influence.

The remainder of this chapter provides further context for the study we conducted. First, we review the extant literature used to guide our understanding of how the military influences society. We then describe the three programs—STARBASE, Youth ChalleNGe, and JROTC—that we studied. We conclude by presenting the analytic framework we developed to help define how programs raise awareness, share knowledge, and build connections with local communities and discuss how this framework helped guide the design of this study.

Institutional Presence and the Civilian-Military Divide

Our team scanned the extant literature in search of a guide or framework to help understand military outreach. Burk (2001) offers the most appropriate framework, as his model focuses on how the military has influence in broader society and offers a way to measure such influence. Burk uses the term *institutional presence* to describe the role and centrality of an organization within society. *Institutional presence* refers to "the material and moral integration of an institution within a larger society" (Burk, 2001, p. 248). This definition suggests two types of measurement. One is related to the material side of an institution and should include measures of the frequency, duration, and directness of contact that citizens have with the institution. The other is related to the moral side and should measure how an institution conducts itself versus society's expectations.

Burk argued that the military's material institutional presence decreased in the last decades of the 20th century; this decrease was driven by shrinking numbers of installations and personnel. This trend has continued into the early decades of the 21st century.[3] Service members and veterans currently make up a smaller proportion of the public than in past eras; today, less than 1 percent of the American population is in the military at any point in time, and veterans make up only 7 percent of all adults. The largest group of veterans alive today served during the Vietnam era; this group is currently over 65 years old.[4] Despite ongoing conflicts and substantial military recruiting, the number of veterans decreased by roughly one-third between 2000 and 2018. This suggests that the military's institutional presence has further decreased since Burk's work was published. On the moral side, however, the military remains highly respected: Over the past 25 years, the American public has expressed strong trust in the military. Although current data indicate a recent decrease in trust in the military, the public still reports higher levels of trust in the military than in most

[2] For background information on JROTC, see Kamarck (2022) and Goldman et al. (2017); for information on Youth ChalleNGe, see Wenger, Constant, et al. (2022); for information on STARBASE, see Wenger, Friedman, et al. (2018).

[3] The post-9/11 prominence of military actions and service members in the news may represent an uptick in institutional presence.

[4] Vespa (2020) documents the size and the age distribution of the U.S. veteran population.

other institutions.[5] Using Burk's framework, we can think of youth outreach programs as having the potential to increase the military's institutional presence. We consider mostly the material side but also allow that youth programs may have potential to increase the moral aspect by creating positive impressions.

Today, the outreach aspect of youth programs may hold a particularly salient role in creating or increasing the military's institutional presence, for several reasons. The relatively small numbers of service members and veterans suggest that members of the public may be less likely to interact with military-connected individuals than was the case in the past. Another reason to suspect that the separation between military and civilian life is increasing is that more than 25 percent of current enlistees have a parent who served in the military, leading to a situation that has been described as a *warrior caste* (Schafer, 2017). Of course, this means that the majority of new enlistees are not children of former service members, but when compared with past eras marked by widespread drafts, this figure suggests that today's military could be viewed as relatively isolated from the rest of society.

A variety of studies and research papers from the mid-2010s also suggest that the divide between civilian society and the military is growing (Mattis and Schake, 2016; Schafer, 2017; Brooks, 2016).[6] While this tendency could have implications for the military, key civilian decisionmakers, veterans reentering society, and others,[7] increasing the military's institutional presence would be one way to counteract it. Given the historically small size of the force and the concerns about the civilian-military divide, DoD's youth programs offer a potential route to bridging the divide by increasing the military's institutional presence.

The civilian-military divide generally is discussed in the context of broader society, but DoD youth programs may have a particular role today due to broader changes within the U.S. K–12 education system. Over the past 40 years and especially in the 21st century, U.S. public schools have sharpened and narrowed their focus on measuring student progress; standardized testing has played a major role in this trend (Dee and Jacob, 2010). This push has led to some positive outcomes, such as an increase in the high school graduation rate (see Harris et al., 2020), but, in the current system, students in high school have very little exposure to civics education; additionally, the quality of civics education varies by state, and there is evidence that less advantaged students have lower scores on assessments of civics understanding (Dee and Jacob, 2010; Farkas and Duffett, 2010; Hansen et al., 2018; Shapiro and Brown, 2018). In this environment, the curriculum of DoD's youth programs may take on particular importance. Given the mission and the relatively broad reach of JROTC (with more than 500,000 participants), the material covered in JROTC classes may represent an opportunity not only for positive outreach but also for substantial delivery of civic education.

The Department of Defense's Youth Programs

Here, we describe the three DoD youth programs assessed in this study of program outreach.

[5] See, for example, Jones (2022) on Gallup poll data, as well as data from the General Social Survey ("Confidence in the Military," undated).

[6] But note that this concern predates these references; for an earlier debate, see Huntington (1957), as well as Janowitz (1960). The theoretical basis can be found in Clausewitz (1943).

[7] See, for example, Feaver, Kohn, and Cohn (2001), as well as the other chapters in the same volume.

STARBASE

STARBASE seeks to increase fifth-grade students' interest in STEM subjects. STARBASE is sponsored by the Office of Civil-Military Programs within DoD.[8] The STARBASE mission is to "expose our nation's youth to the technological environments and positive civilian and military role models found on Active, Guard, and Reserve military bases and installations, nurture a winning network of collaborators, and build mutual loyalty within our communities, by providing 25 hours of exemplary hands-on instruction and activities that meet or exceed the National Standards" (STARBASE, 2023). The program focuses on serving students in disadvantaged communities. STARBASE operates in a unique manner: Participating schools send classrooms of students, together with their teachers, to STARBASE sites, where trained instructors provide a curriculum of hands-on instruction and activities. Typically, students and their teacher attend the program for five days in a row, which means that they have more opportunity to carry out hands-on activities than they could during a typical school day. Given this schedule, a single STARBASE program can serve many schools in a local area or within a reasonable commuting distance. STARBASE has been found to improve short- and longer-term outcomes among students who participate, and STARBASE is well situated to create positive outreach (Wenger, Friedman, et al., 2018).

STARBASE 2.0, launched in 2010, is an after-school program operating in middle schools to provide additional opportunities to students who wish to participate in longer-term projects. This after-school program is built on partnerships with local STARBASE programs, school districts, and community volunteers.

National Guard Youth ChalleNGe

Youth ChalleNGe is a quasi-military program that serves youth ages 15.5–18 who have experienced difficulties inside and/or outside a traditional high school. The program began in the mid-1990s with a mission to "intervene in and reclaim the lives of at-risk youth to produce program graduates with the values, skills, education and self-discipline necessary to succeed as productive citizens" (National Guard Youth ChalleNGe, 2022). Participating states operate their site(s) with supporting federal funds and are overseen by state National Guard organizations. As of 2023, there are 39 sites operating in 28 states and territories, including Puerto Rico. The curriculum of the program's 5.5-month residential phase consists of eight core components: life coping skills, academic excellence, job skills, responsible citizenship, leadership/followership, health and hygiene, service to community, and physical fitness (National Guard Youth ChalleNGe, 2022). The 12-month post-residential mentoring phase is a key aspect of the program, during which graduates of Youth ChalleNGe may continue their education, find employment, enlist in the military, or undertake a combination of these activities. Youth ChalleNGe has been found to be effective at improving participants' longer-term prospects; those who take part in the program accrue more education and have higher earnings than otherwise similar young people (Millenky et al., 2011). The program has also been found to be cost-effective (Perez-Arce et al., 2012).

ChalleNGe staff recruit participants by developing relationships within communities; school principals, guidance counselors, and members of the juvenile justice community may refer young people to ChalleNGe. In many cases, ChalleNGe graduates also serve as unofficial ambassadors for the programs. Participants must apply; the process typically includes an interview, and participants must attend the program voluntarily.

Beginning in 2016, the Job ChalleNGe program began to serve Youth ChalleNGe graduates who could benefit from further job training. Like Youth ChalleNGe, Job ChalleNGe has a 5.5-month residential compo-

[8] This office is located within the Office of the Assistant Secretary of Defense for Manpower and Reserve Affairs. The Civil-Military Programs Office also has policy and budgetary oversight of the Youth ChalleNGe program, as well as policy oversight for the JROTC program.

nent, but Job ChalleNGe participants generally obtain training through an educational partner (most often a local community college). As of 2023, there are seven Job ChalleNGe programs, and there are plans to expand this program offering to additional states.

Junior Reserve Officers' Training Corps

JROTC was established by the National Defense Act of 1916 as a leadership and citizenship program affiliated with the U.S. Army (U.S. Army Junior ROTC, undated). The program was expanded in 1964 to all military services to more broadly support JROTC's mission to "instill in students in United States secondary educational institutions the values of citizenship, service to the United States, and personal responsibility and a sense of accomplishment" (U.S. Code, Title 10, Section 2031).

Nearly 3,500 high schools—operating in all 50 states, the District of Columbia, Puerto Rico, and the U.S. Virgin Islands—offer students the opportunity to participate in the JROTC program each year.[9] Each military branch is responsible for a subset of these programs, with the Army running the largest number (approximately 1,700), followed by the Air Force (approximately 900), the Navy (approximately 600), and the Marine Corps (approximately 250). The JROTC program receives shared support from the services and schools, and programming is led by JROTC faculty, who are retired from active duty, reserve duty, or National Guard service and who are trained and qualified in accordance with the National Defense Authorization Act of 2007 for their teaching and mentoring responsibilities (U.S. Army Junior ROTC, undated). Schools that wish to open a program apply; services choose applicants based on the availability of funding. The number of programs that have closed or were newly opened has been quite modest in recent years.

Modeling Influence: A Conceptual Outreach Framework of the Department of Defense Youth Programs

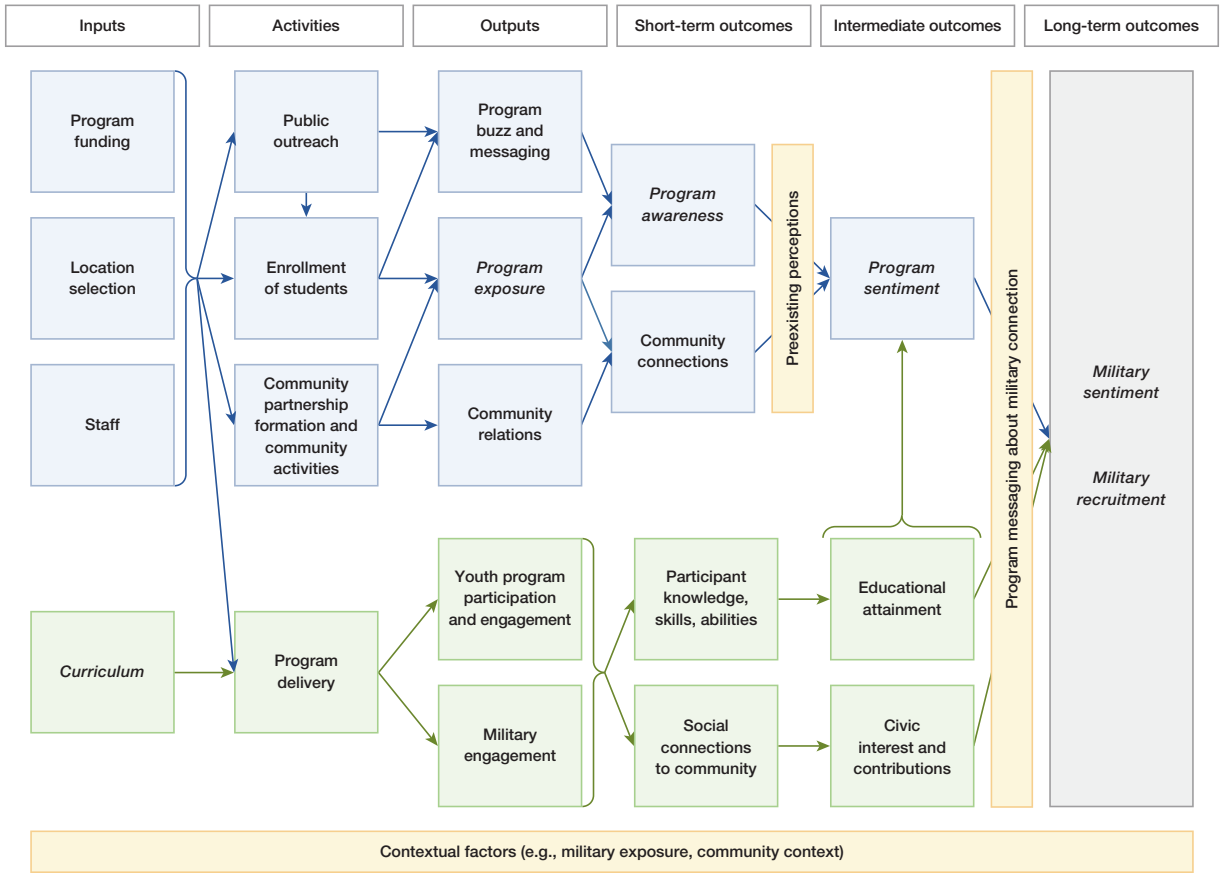
We developed a conceptual model of DoD's youth programs and the expected way these programs influence the lives of the youth who participate and the communities in which these programs reside. We drew on diverse literature—including public service announcement campaigns and town-gown relations (i.e., the relationships between colleges and their surrounding municipalities)—to understand how programs diffuse awareness and knowledge and build connections with local communities (Huhman, Heitzler, and Wong, 2004; Kemp, 2013; Niederdeppe et al., 2008). The mechanisms through which these programs affect participants are likely to be different from those that affect the communities the programs serve. Thus, our model, shown in Figure 1.1, accounts for the two distinct but related pathways of influence for DoD youth programs: on participants and on community members. In green, we demonstrate the flow for the young people who participate in the youth programs. In blue, we demonstrate the flow for the communities in which these programs are situated.

The model follows a typical logic model design (see McLaughlin and Jordan, 2010). When read from left to right, the model lays out the resources and activities of a youth program, how those resources and activities shape what the program provides (i.e., outputs), and the outcomes that these outputs are expected to generate.

[9] This count includes National Defense Cadet Corps (NDCC) programs. These programs receive the same curricula and instructional materials as JROTC programs. The difference between NDCC and JROTC programs is the level of local funding to support the program, with NDCC programs being fully funded through local school funds and JROTC programs having a cost-sharing structure split between the military service branch and the local school.

FIGURE 1.1

Conceptual Model of Department of Defense Youth Programs



NOTE: Italicized portions of the conceptual model indicate components that are assessed in this report.

How Youth Programs Influence the Community

We posit that members of the communities in which these programs operate receive messages about the program. This may be through information schools send to families inviting students to enroll in the program, through outreach from program staff to local organizations for service-learning opportunities, or through invitations to local businesses or civic leaders to discuss career pathways during a class session. These messages generate awareness of the programs as well as connections between the program and the local community. We also posit that community members subsequently develop perceptions of these youth programs, both through the messaging received and through any potential interaction with individuals who participate in the program. Collectively, these exposures generate a broader sentiment about the military and shape the community's recognition of the military as a possible professional pathway. We note, though, that community members are likely to have preexisting perceptions of DoD youth programs and/or the military and that these perceptions may shape how they receive and interpret the program's messaging.

How Youth Programs Influence Participants

Young people who voluntarily enroll in a DoD youth program receive classroom and non-classroom learning opportunities that cover an array of areas, including civics, leadership, U.S. and military history, physical fitness, service learning, and STEM. Most of the staff who provide these learning opportunities are current or former members of the military (although STARBASE is the exception to this). Through engagement with the program's curriculum and the military-connected staff, participants are provided with expanded knowledge, skills, and abilities, as well as connections with their local community. These, in turn, are expected to lead to increased educational attainment, more civic interest and contributions, and eventually to support for and increased awareness of the military.

Connections Between the Model of Department of Defense Youth Programs and Our Research Approach

Given the breadth and variety of DoD's youth programs, we do not assess or even document each aspect of each program.[10] Rather, we use the model (shown in Figure 1.1) to guide us as we focus on some key aspects of the programs; these aspects are identified in the model with italicized text. They were chosen both because they represent aspects of the logic model that can be measured and because they span the entire logic model: They cover some portion of the model's inputs, outputs, and outcomes. Next, we describe each briefly.

Program Awareness, Program Exposure, and Program Sentiment

Of these three important aspects, *awareness* in particular is foundational: If families and educators are not aware of the programs, they will not elect to take part in them. Moreover, the programs operate within a community ecosystem. Both STARBASE and JROTC operate within the existing school structure; Youth ChalleNGe operates outside schools, but members of school communities often play a role in referring potential participants.

To measure awareness and impressions of the DoD youth programs, we added a carefully curated list of questions to an existing survey panel of school leaders. We were particularly interested in school leaders' levels of awareness of the programs and whether they perceived program substitutes. We view school leaders as important decisionmakers in the DoD youth programs ecosystem, and their views serve as a rough proxy for overall community awareness.

Curriculum

Each program features a unique *curriculum*; this forms the first aspect of the student-centered portion of the logic model. For this study, we examine the curriculum of JROTC, as it is the longest operating of the DOD youth programs and has the largest participant base. Moreover, little is known about the content of the program's instructional program. Assessing the JROTC curriculum enabled us to better understand how a curriculum may bolster knowledge in key areas such as civics, leadership, and service.

[10] Future analyses of these programs could consider exploring aspects of program delivery, such as the ways in which different populations of young people experience and internalize the curriculum provided or how perceptions of these populations are influenced through their engagement in the programs.

Military Sentiment and Military Recruitment

Finally, our logic model suggests that youth programs could produce multiple long-term outcomes: that is, the programs can improve *sentiment* toward the military and military missions, and they may improve *military recruitment*. We examine one outcome: military recruitment. We emphasize again that the programs are not recruiting programs. However, we hypothesize that the programs serve to increase awareness and positive sentiment of military opportunities throughout the community as they increase military presence. Given this hypothesis, we model the relationship between the presence of DoD youth programs and the numbers of military applicants and accessions; we assess this relationship after carefully considering how to identify and appropriately compare communities served and not served by DoD youth programs. We also examine the extent to which DoD youth programs serve to increase the military's presence, and we compare communities with access and those without.

We note that the timeline of this project was delayed by the coronavirus disease 2019 (COVID-19) pandemic and the resulting disruptions to the panel of school leaders, as well as by the time required to obtain clearance from the Office of Management and Budget before fielding questions about DoD's youth programs to the school leader panel. Therefore, the data on accessions and applicants are from fiscal year (FY) 2017. An advantage of using data from this somewhat earlier period is that they describe the effects of DoD's youth programs on applicants and enlistees well before the pandemic. Therefore, the results do not reflect any unusual levels of military application and enlistment (the past few years have included substantive disruptions to recruiting and other aspects of the military) and may provide a more accurate description of the near future than data from the past three years.

How This Report Is Organized

The focus of this report is on measuring the effectiveness of DoD youth programs in generating awareness of and support for the military and understanding the mechanisms through which outreach, civic engagement, and military support may be generated. There is no single measure or existing database from which we can draw this information. Consequently, we implemented three lines of inquiry that collectively assess how and the extent to which these programs bridge the civilian-military divide.

In Chapter 2, we focus on awareness and perceptions of DoD's youth programs and present results and analysis from a series of questions included on a spring 2022 wave of RAND's American School Leader Panel (ASLP) survey.

In Chapter 3, we provide an overview of the sequence and flexibility of course content based on fact-finding conversations with JROTC leaders from each service. We then present an analysis of key aspects of the JROTC curriculum, including some comparison of the curricular materials across the JROTC service branches.

In Chapter 4, we look at the longer-term effects of DoD youth programs and how the programs may serve to increase interest in the military. These analyses, based on applicant and enlistment data merged with geographic information, also allow us to assess the extent to which DoD youth programs increase military presence within communities and provide measures of the levels of military presence across the United States.

In Chapter 5, we summarize the findings and offer a series of recommendations.

An annex, available at www.rand.org/t/RRA2697-1, provides full survey results and additional analyses.

CHAPTER 2

School Leaders' Awareness and Perceptions of Department of Defense Youth Programs

In this chapter, we present results from a survey of 664 high school principals conducted in spring 2022 via RAND's ASLP. The survey was administered to a subset of 1,742 principals who lead schools with high school grade levels out of the ASLP's more than 7,000 principals who have agreed to regularly participate in online surveys about various K–12 education topics.[1] One of the main benefits of the ASLP is that principals are recruited into the panel using probability-based sampling methods, such that their survey responses can be weighted to be representative of the national population of public school principals.[2]

Our spring 2022 survey was intended to fill gaps in our understanding of how U.S. public high schools are approaching civics education and what graduation requirements exist for students in physical education, health education, and community service. We focus on these topics for two reasons. First, civics is the academic subject area in which students are most likely exposed to information on civilian-military relations and the pathway through which we would expect students to learn about the military where a DoD youth program does not operate. Second, civics content, physical education, health education, leadership development, and community service are core components of DoD youth programs, and providing DoD with a landscape of current education standards can support program improvement and outreach efforts. The survey also asks school leaders about the prevalence of DoD youth programs, principals' awareness and perceptions of these programs, and general community support for DoD-funded youth programs in schools. Because this research is funded by DoD, RAND received approval from the U.S. Office of Management and Budget to administer the survey before fielding.[3]

We present the survey results by first summarizing how U.S. high schools were approaching civics education in spring 2022. We then focus specifically on DoD youth programs in these schools, as well as principals' perceptions of these programs.[4] When relevant, we consider differences in principals' responses by school demographics (e.g., enrollment size, poverty level, student racial/ethnic composition), as well as school urbanicity and geographic location. In discussing our results, we call out only differences between school subgroups that are statistically significant at the 5 percent level. For complete information about ASLP and how we conducted our analyses, please see Appendix A. An annex, available at www.rand.org/t/RRA2697-1, also includes responses to the full survey, including results not presented in this chapter.

[1] Our ASLP survey response rate was 38.11 percent.

[2] To learn more about the technical aspects of the ASLP, please see Robbins and Grant (2020).

[3] OMB Control Number: 0704–0605; active through June 30, 2024.

[4] All surveys were completed by the school principal. We interpret principals' responses as speaking on behalf of their school and therefore often report results using the school as the unit of analysis (e.g., "percent of schools who said X"). However, for survey items that ask about principals' perceptions, we report using the principal (e.g., "percent of principals who said Y"). These terms can be interpreted interchangeably.

U.S. High Schools' Approach to Civics Education

Across the United States, civics education at the secondary level is generally relegated to subject-specific courses rather than being integrated into all subjects taught at school or considered part of the whole school experience (Diliberti and Kaufman, 2022). In alignment with state requirements, high school students generally complete coursework in multiple social studies classes, which may or may not include a course (or courses) explicitly focused on civics (Education Commission of the States [ECS], 2019). High school students' formal civics instruction may be supplemented by their participation in other required or voluntary activities (e.g., community service, student government) that explicitly or implicitly help to build students' civic skills.

In this section, we use our survey results to provide a national overview of high schools' civics-related graduation requirements and adoption of civics standards as of spring 2022. Additionally, we examine the prevalence of such extracurricular activities as student government and debate teams, which support students' civic development and future civic engagement. We also discuss common challenges to principals' ability to focus on civics education.

Graduation Requirements Related to Civics

Each state has autonomy to determine its minimum graduation requirements related to civics (and other subjects). Accordingly, previous research has shown that states vary widely in terms of the number and length of civics courses that students must complete to graduate and whether students must complete other requirements, such as passage of a civics or citizenship exam or performance of community service hours (ECS, 2016; ECS, 2019; Shapiro and Brown, 2018). Given the small sample size of our survey, we were not able to examine state-level patterns. Instead, we summarize differences in high schools' civics-related graduation requirements by school demographics as well as urbanicity and geographic region. In interpreting the results below, readers should keep in mind that the differences presented can be attributed to some extent to variation in state policies.

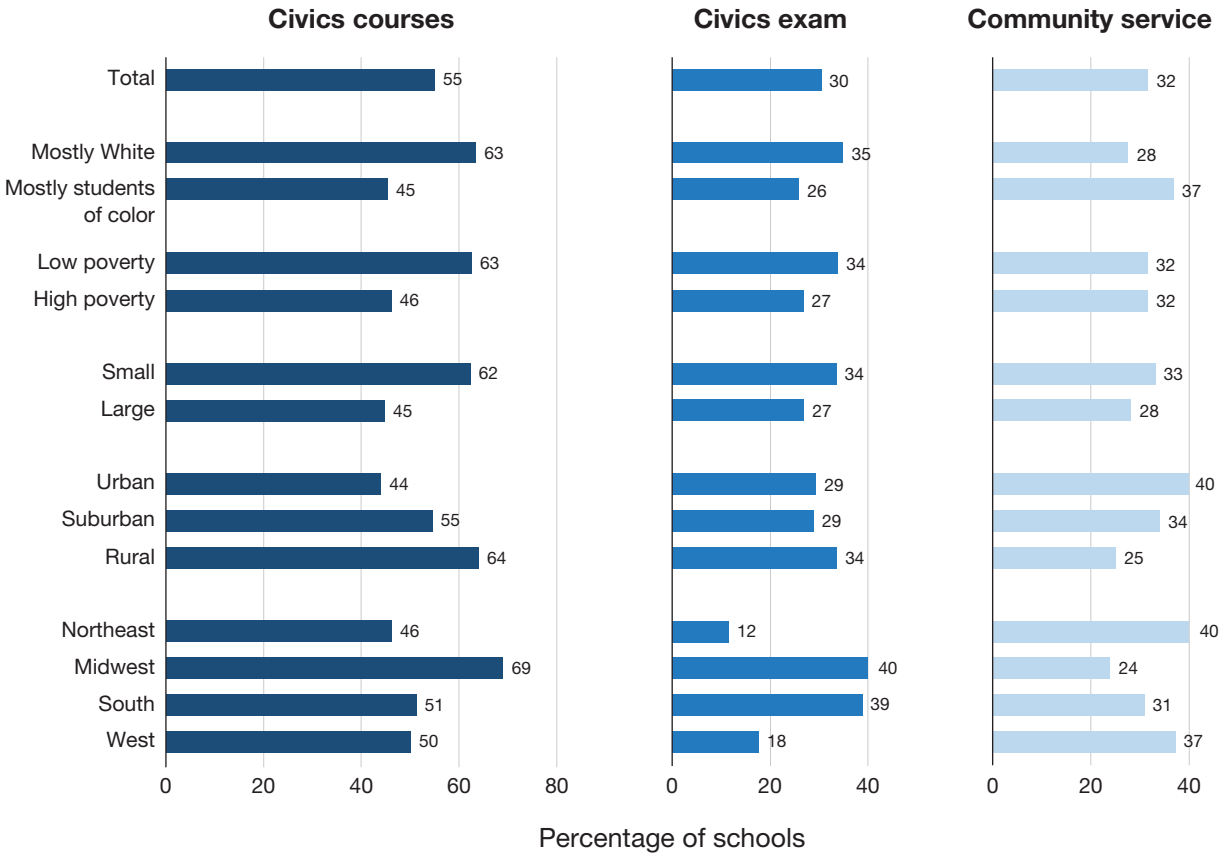
Looking first at civics coursework, 55 percent of high schools surveyed in spring 2022 said that they required civics courses for graduation, and 26 percent said that they offered courses as an elective (Figure 2.1). Importantly, required civics courses were more common in some types of high schools than others. For example, 69 percent of high schools in the Midwest reported offering required civics courses, compared with 51 percent in the South, 50 percent in the West, and 46 percent in the Northeast. Required civics courses were also more common in high schools located in rural areas than in cities, in low-poverty schools than high-poverty schools, in smaller schools, and in schools serving predominately White student populations.[5] Meanwhile, elective civic courses were offered at relatively similar rates across school types.

Principals' responses suggest civics-related graduation requirements beyond formal coursework, such as exams and community service, were not very prevalent in spring 2022—or at least were less prevalent than required civics coursework. Only 30 percent of surveyed high schools said that their students must pass a civics exam (e.g., naturalization assessment, citizenship exam) to graduate. Similarly, only 32 percent said that their school requires students to complete community service to graduate, although 41 percent said that they offer community service as an elective. In the one-third of high schools that did report community service to be a graduation requirement, students must complete 37 hours of service on average.

[5] There is a large degree of overlap in schools' demographic characteristics. For example, schools located in rural areas—common in regions such as the Midwest—tend to have smaller enrollment sizes than their urban counterparts and tend to serve student populations that are predominately White. Thus, we expect to see similar results among demographically overlapping schools.

FIGURE 2.1

Percentage of U.S. High Schools That Had Various Civics-Related Graduation Requirements as of Spring 2022



NOTE: This figure depicts response data from the following survey questions: "Which of the following academic and cocurricular opportunities does your school offer?" "Civics course(s), required for graduation," and "Community service, required for graduation," as well as "Do students in your school have to pass a civics exam for graduation?" (n = 664). Respondents were able to select "I don't know" for the question about required civics exams; only 1 percent of respondents selected this response option.

In addition, different types of schools tended to have different civics graduation requirements above and beyond formal coursework. In a pattern similar to that observed for schools' coursework requirements, 40 percent of high schools in the Midwest and 39 percent of high schools in the South reported having a civics exam as a graduation requirement, compared with only 18 and 12 percent, respectively, of schools located in the West and Northeast. Accordingly, required civics exams were more prevalent in high schools serving predominately White student populations (35 percent required) than in schools serving mostly students of color (26 percent required). In a contrasting pattern, however, community service requirements were more common in high schools serving predominately students of color (37 percent had this requirement versus 28 percent of schools serving mostly White students) and in high schools located in cities (40 percent required versus 25 percent of schools located in rural areas).

Civics Standards

In addition to asking principals about their schools' civics-related graduation requirements, we asked them about adoption of civics education standards. In spring 2022, 63 percent of high schools surveyed reported that their school had adopted standards for civics education. Meanwhile, 27 percent of schools had not adopted any civics education standards, and 10 percent of principals were unsure whether their school had adopted civics education standards. Among those schools whose principals indicated that they had adopted civics education standards, almost all (94 percent) indicated that these standards were set at the state level, presumably by their state department of education. Only 16 percent reported having standards that had been set at the district level, and 18 percent said similarly about school-level standards.

In many ways, these results comport with those documented by other organizations. Unlike other core subjects, such as math and reading, which have national standards, social studies—including civics education—does not, which means that states have historically had a high degree of autonomy to develop their own standards (McCann, 2021). This has led to wide variation in the quality of civics standards across states (Stern et al., 2021; Hansen et al., 2018). Thus, it is not surprising that our surveyed principals overwhelmingly identified their state as the decisionmaker about civics education standards. However, concerns about variation in quality aside, all states have adopted standards for civics topics to some extent (Stern et al., 2021), so it is somewhat puzzling that 27 percent of principals reported that their school had not adopted *any* standards for civics education.[6] One potential explanation for this finding is that these principals may have interpreted this question to be asking only about standards set at the school or district level, and, therefore, their responses may be further indication that it is uncommon for schools to adopt civics education standards above and beyond those set by their state.

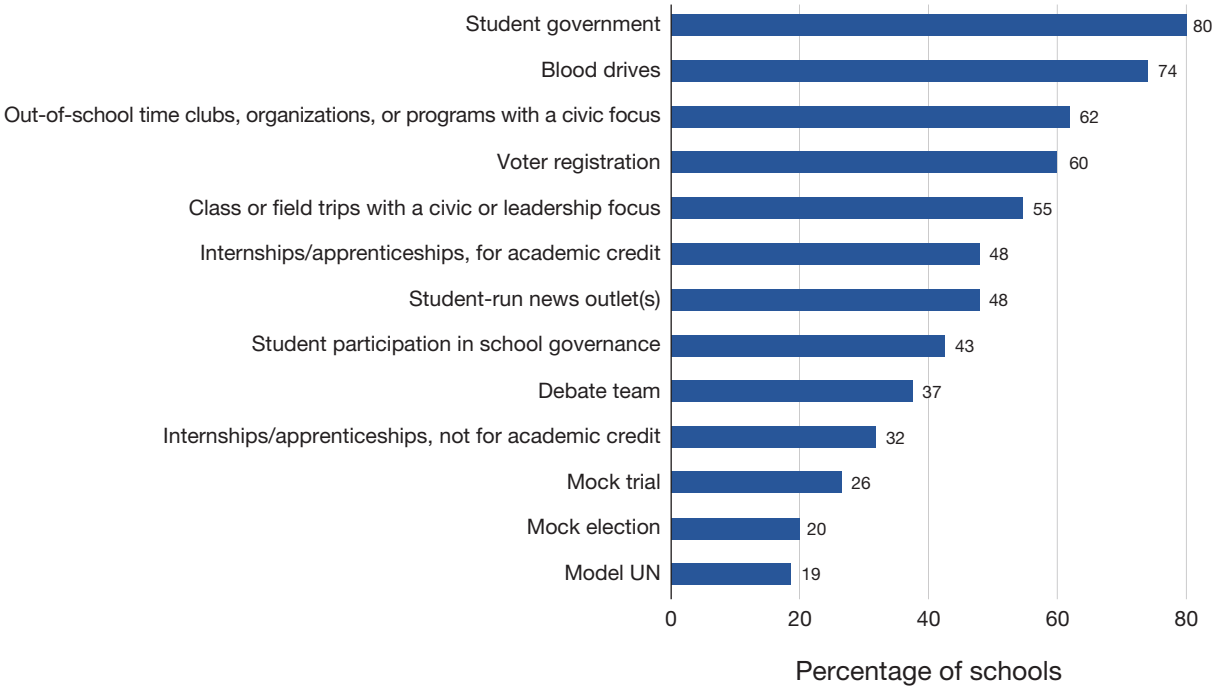
Activities to Support Students' Civic Development and Future Civic Engagement

We found some evidence from our principal survey that most high schools are making at least some effort to support students' current and future civic engagement. For example, in the 2021–2022 school year, 60 percent of surveyed high schools said that they offered voter registration drives. Voter registration drives were especially common in larger high schools (77 percent), high schools serving predominantly students of color (70 percent), high schools located in cities and suburbs (73 and 63 percent, respectively), and high schools located in the South (76 percent).

Beyond voter registration drives—which have an explicit emphasis on encouraging civic engagement—schools' extracurricular activities can also be important sources of developing students' civic skills and dispositions, regardless of whether they have a civics focus (Guilfoile, Delander, and Kreck, 2016). We find evidence that high schools are broadly supporting students' civic development through extracurricular activities (Figure 2.2). For example, majorities of high schools reported offering opportunities such as student government (80 percent offered), out-of-schooltime clubs with a civics focus (e.g., Key Club) (62 percent offered), or class or field trips with a civic or leadership focus (55 percent offered). High schools less commonly offered other activities that might support students' civic development, including a student-run newspaper (48 per-

[6] We hypothesized that principals in schools in states that the Fordham Institute rated as having "inadequate" state-level civics standards might be the ones who indicated that their school did not have *any* civics education standards (Stern et al., 2021). However, we did not find this to be the case. Even in states that have "exemplary" civics standards, some school leaders indicated that their school had not adopted any civics education standards, leading us to further conclude that respondents interpreted this item as asking specifically about civics education standards set at the local level.

FIGURE 2.2
Percentage of U.S. High Schools That Reported Various Civics-Related Extracurricular Activities as of Spring 2022



NOTE: This figure depicts response data from the following survey question: "Which of the following academic and cocurricular opportunities does your school offer?" (n = 653). Respondents were instructed to select all that apply. We omitted from this figure several response options (e.g., "athletics," "community service, elective," or "military recruitment at education/career fairs") to keep the focus on the most directly relevant civics-related extracurricular activities. Some of these responses are discussed elsewhere in this chapter. To see the full set of survey responses, please see the annex available at www.rand.org/t/RRA2697-1. UN = United Nations.

cent offered); student participation in school governance, such as having a student school board seat (43 percent offered); debate team (37 percent offered); mock trial (26 percent offered); mock election (20 percent offered); and model United Nations (19 percent offered).

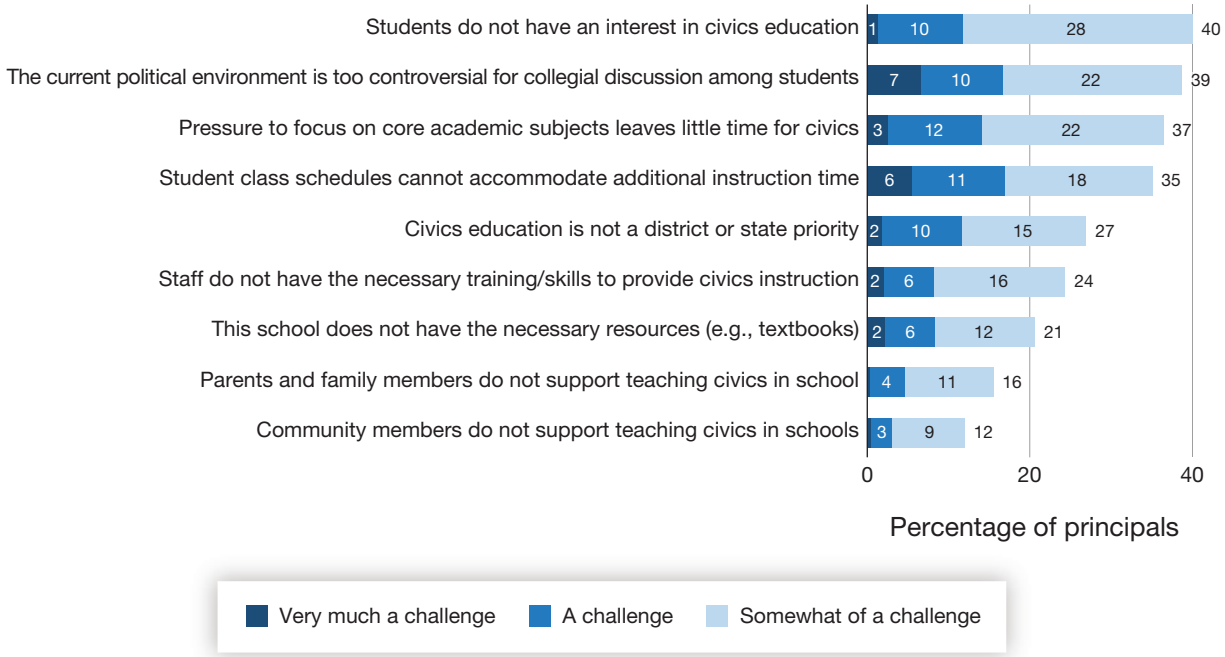
Challenges to Teaching Civics Education

We asked our high school principals to what extent nine considerations presented a challenge to teaching civics education at their school. The most prevalent consideration—selected by 40 percent of principals—was lack of student interest in civics education (Figure 2.3). Nearly four in ten principals also identified the current political environment as a challenge to teaching civics education to some extent. The prevalence of this challenge comports with other surveys of teachers and principals conducted in the 2021–2022 school year, which found evidence that national political discussions are increasingly intruding into schools, causing additional stress for educators and creating uncertainty about whether and how to address controversial topics in the classroom (Woo, Wolfe, et al., 2022; Woo, Lee, et al., 2023).

The next most prevalent challenges—each selected by roughly a quarter to a third of principals—were pressure to focus on core academic subjects, class schedules that cannot accommodate additional instructional time, and lack of state or district prioritization. These challenges are all likely created or exacerbated by high-stakes assessments programs concentrated in math, reading, and sometimes science, as well as the frequent exclusion of student achievement in civics (or social studies more broadly) in states' accountability sys-

FIGURE 2.3

Percentage of Principals Reporting Challenges to Teaching Civics at Their High School as of Spring 2022



NOTE: This figure depicts response data from the following survey question: "To what extent are the following considerations a challenge to teaching civics at your school?" (n = 660). Respondents could also select "This condition does not exist in my school" or "This condition exists but it is not a challenge"; these responses have been omitted from this figure. Bars might not sum to totals because of rounding.

tems (Hansen et al., 2018; Winthrop, 2020; ECS, 2016). Previous research has shown that the introduction of federal and state accountability systems caused schools to increase their focus on high-stakes testing subjects such as math and reading—especially at the elementary level—likely at the expense of other subjects, such as civics (Farkas and Duffett, 2010; Dee and Jacob, 2010; Education Week Research Center, 2018). Finding sufficient time in the school day to focus on civics might be even less of a priority for schools now than before the pandemic began, since schools are urgently working to help students catch up in math and reading after several years of pandemic-related disruptions to learning (National Center for Education Statistics, 2022).

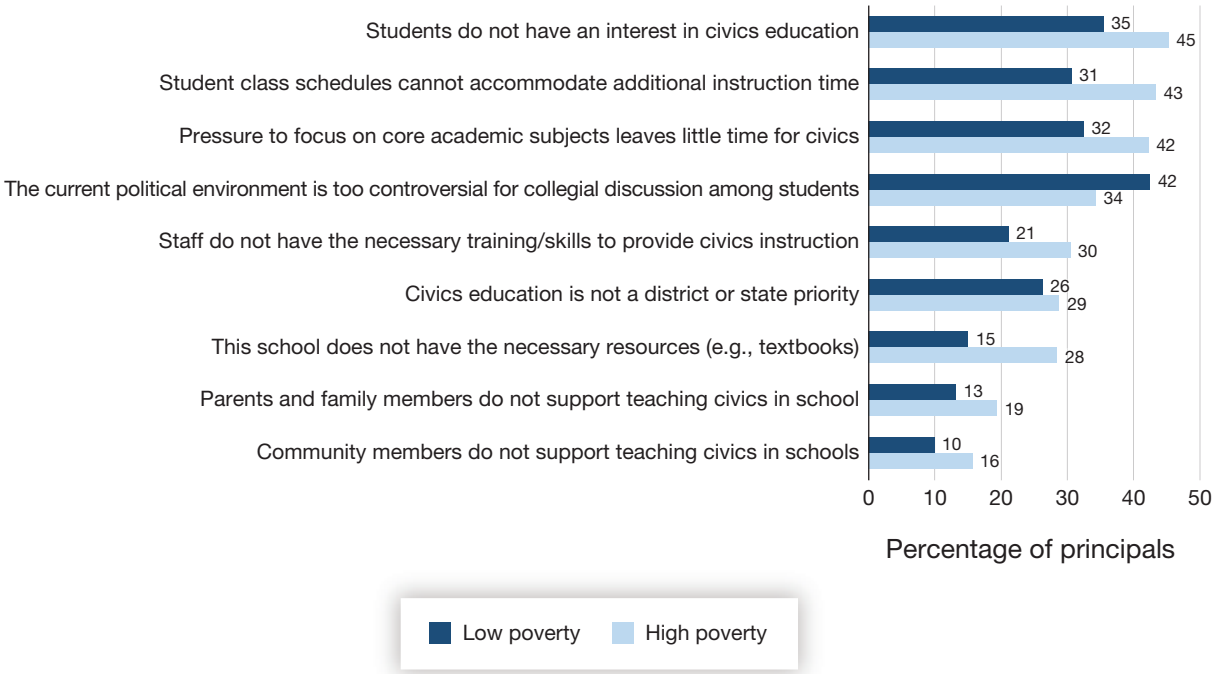
Resource constraints, such as not having staff with the necessary training or textbooks, were slightly less prevalent challenges, each reported by roughly a quarter of high schools. Finally, lack of support for civics education from parents and family members or from community members were generally not prevalent concerns; they were reported by roughly one in ten high schools.

While principals' responses provide some evidence that in spring 2022 high schools were experiencing challenges in their ability to provide civics education, principals generally perceived these to be minor barriers rather than significant hindrances. For each consideration we asked about, fewer than 10 percent of surveyed principals indicated that the consideration was "very much a challenge." However, it is important to note that principals took this survey at the same time they were dealing with other pandemic-related problems, such as staffing shortages, political disagreements over safety procedures and vaccines, and addressing learning loss (Diliberti and Schwartz, 2022). The urgency of these other problems may have made these civics education–related challenges seem lesser and more manageable.

Nevertheless, there were some differences in principals' perceptions of the extent of these challenges by school subgroup. In the most consistent pattern, principals of high-poverty schools were more likely than their low-poverty counterparts to report many of these considerations were a challenge to teaching civics education (Figure 2.4). Specifically, 30 percent of high-poverty schools said that they lack staff with the necessary skills, and 28 percent said that they lack other resources such as textbooks, compared with 21 and 15 percent, respectively, of their low-poverty counterparts. These resource gaps might be related to gaps in funding between high- and low-poverty schools. Furthermore, a higher percentage of high-poverty schools than of low-poverty schools said that pressure to focus on core academic subjects is a challenge (42 versus 32 percent, respectively) and that class schedules cannot accommodate additional civics-related instruction time (43 versus 31 percent, respectively). We hypothesize that these differences could be related to accountability pressures, since high-poverty schools might be particularly concerned with spending adequate time working to improve student performance in high-stakes assessment subjects such as math and reading. *Taken together, these findings suggest that focusing on civics education was a luxury available to low-poverty schools in 2021–2022, while high-poverty schools might have been struggling to provide civics education because they were dealing with a host of other challenges.*

FIGURE 2.4

Percentage of Principals Reporting Challenges to Teaching Civics at Their High School as of Spring 2022, by School Poverty Level



NOTE: This figure depicts response data from the following survey question: "To what extent are the following considerations a challenge to teaching civics at your school?" (n = 632). Figure includes those who selected "Somewhat of a challenge," "A challenge," or "Very much a challenge."

Department of Defense–Funded Youth Programs

In this section, we focus specifically on awareness and perception of DoD-funded youth programs, as well as support for them. This analysis links to the dimensions of *exposure, awareness*, and *sentiment* in the conceptual framework presented in Figure 1.1.

Junior Reserve Officers' Training Corps

Program Prevalence and Awareness

In spring 2022, 29 percent of principals said their high school was offering a JROTC program (or that their students had access to this program in some way). Importantly, certain types of schools were more likely to be offering a JROTC program in than others. As shown in Figure 2.5, schools located in cities and suburbs were more likely to offer a JROTC program than schools located in rural areas. Schools located in the South were particularly likely to offer a JROTC program, while JROTC programs were especially uncommon in schools located in the Northeast. These regional differences are consistent with prior research on JROTC program placement (see Goldman et al., 2017).

There were also some notable differences in the prevalence of JROTC programs by student demographics. For example, 42 percent of schools serving predominately students of color and 35 percent of high-poverty schools said their students had access to a JROTC program, compared with only 19 percent of schools with mostly White student populations and 24 percent of low-poverty schools. JROTC programs were also more common in schools with larger enrollment sizes: Schools offering JROTC programs had an average enrollment size of 1,320 students, while schools without JROTC programs had an average enrollment size of 885 students. Meanwhile, principals in schools with JROTC programs estimated that a smaller proportion of their students (50 percent) have historically gone on to enroll in a two- or four-year college or university upon graduation than did principals in non-JROTC schools (57 percent).

In sum, these patterns suggest JROTC programs were more prevalent in 2021–2022 in schools serving historically disadvantaged student populations. This finding aligns with JROTC policy, which prioritizes serving schools eligible for Title I funding (Kamarck, 2022).[7]

Even though their school might not be operating a JROTC program, school leaders' awareness of the JROTC is quite high: Only 8 percent of surveyed principals were entirely unaware of the program. In fact, principals' awareness of JROTC was higher than for all other military programs (i.e., Youth ChalleNGe, STARBASE, Civil Air Patrol) we asked about on our survey.

Program Alignment with Graduation Requirements

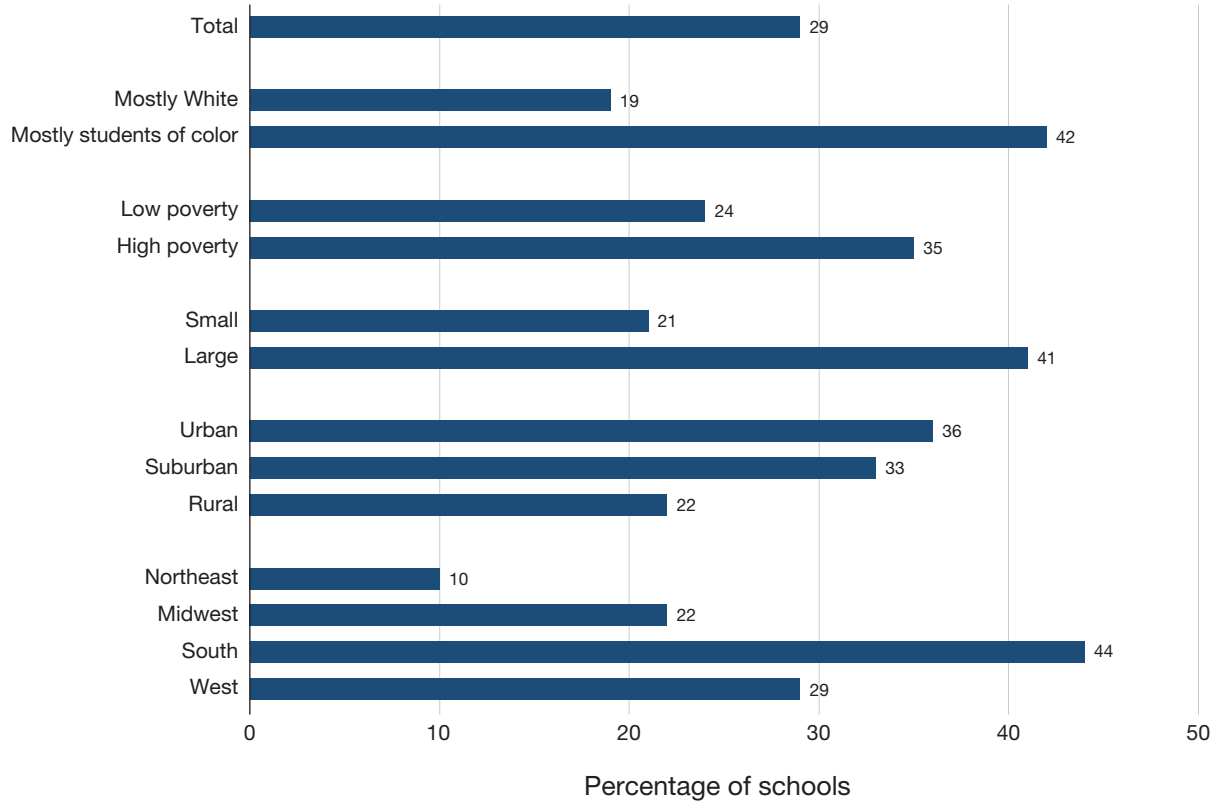
We also asked principals of schools with JROTC programs what type of academic credits JROTC cadets receive for successfully participating in the program. Principals were asked to "select all that apply" among seven types of course credit: physical education, health education, civics/government, history/social studies, science, career/job preparation, and other.

All the schools we surveyed said cadets get credit in some fashion. Most commonly, schools indicated that cadets receive physical education credits for participating in JROTC: Seventy-one percent of schools with JROTC programs said they offered cadets physical education credits as of spring 2022. Ninety-eight percent of schools with JROTC are located in states that require students to have coursework in physical education credits to graduate (on par with non-JROTC schools). Most principals in schools with JROTC programs

[7] Title I funding is available to local education agencies and schools serving large numbers or proportions of low-income students.

FIGURE 2.5

Percentage of Schools Reporting That They Offered JROTC or That Their Students Otherwise Had Access to JROTC as of Spring 2022



NOTE: This figure depicts response data from the following survey question: "Please indicate your awareness of the following youth programs: Junior Reserve Officers' Training Corps (JROTC)" (n = 651). Figure includes those who selected "aware and offer or have access." Respondents could also have selected "Aware but do not offer or have access" or "Unaware"; these responses have been omitted from this figure.

(roughly six in ten) said students need between 1 and 1.99 physical education credits to graduate, although roughly a quarter said students need 2 credits or more. Meanwhile, only 17 percent of schools with JROTC programs offered health education credits for program participation, even though 89 percent of these principals said health education coursework is a requirement in their state—a rate on par with schools nationally.

It is less common for schools to give credit in other areas for successful participation in JROTC. Twenty-eight percent of schools said they give career/job participation credit; it is unclear how these credits are related to state-required academic minimums for high school graduation. Participation in JROTC rarely translated into getting credit in a core academic course, such as civics, history (or social studies broadly), or science. One in ten or fewer schools said that they offered credit toward core academic courses for successfully participating in JROTC.

Reasons for Not Having a Program

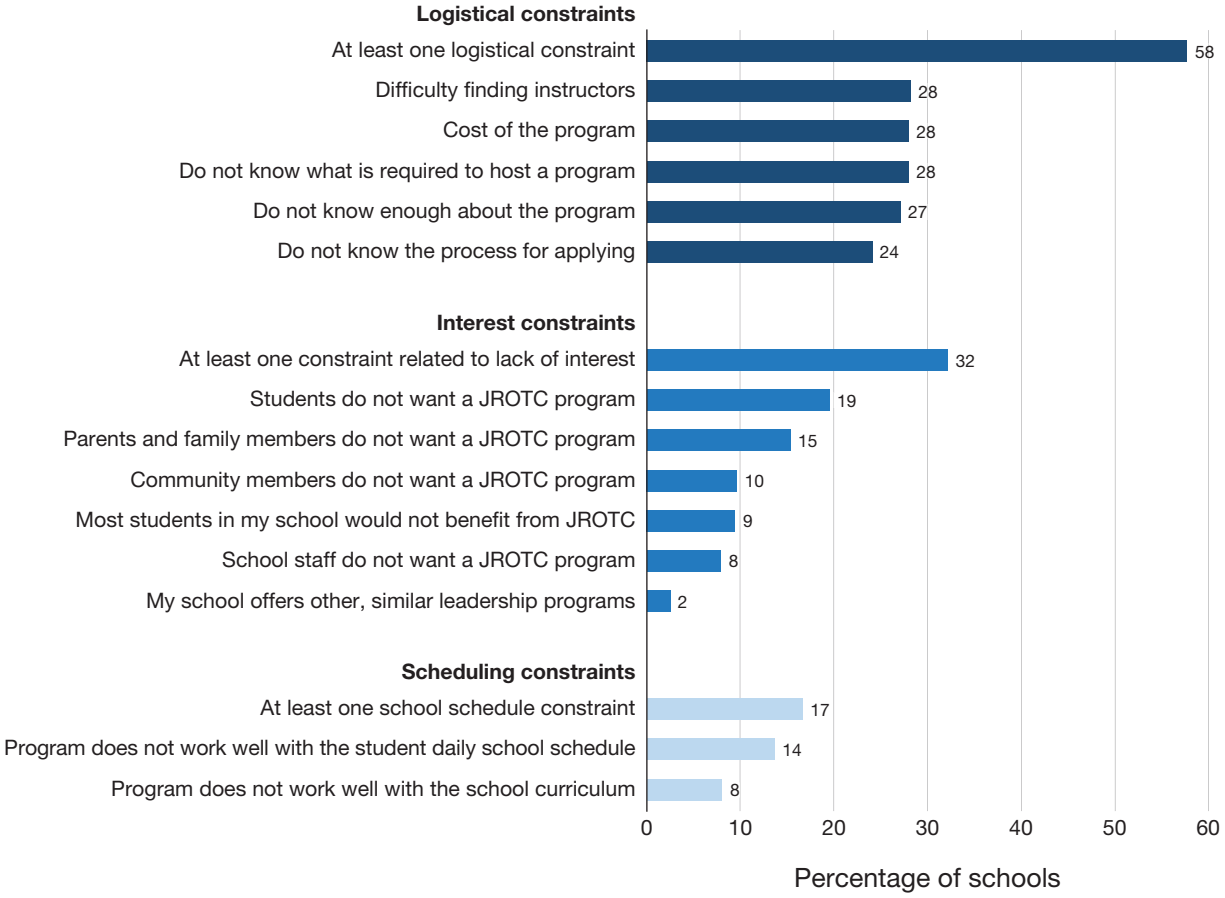
In spring 2022, 63 percent of high schools surveyed said they were aware of JROTC but that their school was not currently operating a program (or that their students did not otherwise have access to the program). Of these schools, 26 percent indicated that they were aware of another high school in their district or local community that offered a JROTC program. Although 7 percent of schools not currently operating a JROTC program said they had previously applied to have one, the vast majority (88 percent) said their school never

applied to do so. (The remaining 5 percent of principals were unsure whether their school had previously applied.)

We asked the subset of principals who were aware of JROTC but in a school that did not offer a program and had never previously applied to do so about their reasons for not offering or applying. We found that schools most often cited logistical constraints as their reasoning for not offering or applying for the program (Figure 2.6). Logistical constraints included both operational considerations (e.g., difficulty finding instructors, cost) and lack of program knowledge (e.g., host requirements, application process).[8] Overall, 58 percent of schools selected at least one logistical constraint as an inhibitor to offering a JROTC program, and a handful of schools (10 percent) selected four or five logistical constraints as inhibitors. No logistical constraint stood out as the most obvious barrier: About one-quarter of schools selected each of the five logistical constraints we asked about.

FIGURE 2.6

Percentage of Schools Reporting They Had Not Applied for or Did Not Have Access to JROTC for Various Reasons as of Spring 2022



NOTE: This figure depicts response data from the following survey question: "Which of the following factor into the reason your school currently does not have or has applied for a program?" (n = 376). Respondents were instructed to select all that apply. The survey question included an "I don't know" option, which was selected by 10 percent of respondents, and an "other" option, which was selected by 16 percent of respondents. Responses to these options have been omitted from this figure.

[8] We presume "cost" to refer to the portion of the instructor salary for which the school or district is responsible, as DoD subsidizes instructor salaries and provides all course materials, such as textbooks, uniforms, and related equipment.

Meanwhile, roughly a third selected at least one constraint related to lack of interest. Among the interest constraints, principals most often said students do not want a JROTC program, followed closely by lack of interest among family and community members. In general, schools infrequently identified scheduling constraints as reasons for not offering or applying for a program.

Finally, respondents were provided the option to write in reasons their school may not offer a program. Fifty-five school leaders opted to provide additional insights. Of these, 18 indicated that their school was too small and/or rural, did not have the ability to sustain the required program enrollment, or did not have the physical space required to host a program. Some of the small schools indicated that they could not meet the enrollment threshold of 100 students and appeared to be unaware that small schools have different enrollment requirements (i.e., 10 percent of the student body). Fifteen school leaders indicated that district-level reasons—including a limit on the total number of programs permitted within the district, students having access at another school even though their own school did not offer the program, and historical lack of support for the program—kept their schools from offering a JROTC program.[9]

Importantly, principals in different types of high schools selected different reasons for not having a JROTC program (Figure 2.7). Small schools—those serving fewer than 1,000 students—were particularly hindered by such logistical constraints as not knowing enough about the program, what is required, or how to apply. In a contrasting pattern, large schools were more likely to select at least one interest constraint, suggesting that large schools have overcome the logistical hurdles faced by smaller schools but are not offering programs because of insufficient interest.

Perhaps because they tend to have smaller enrollment sizes, rural schools were more likely than their urban and suburban counterparts to select logistical constraints, such as costs and difficulty finding instructors, as reasons not to have a program. Conversely, rural schools were less likely than their urban and suburban counterparts to select interest constraints, such as parent, family, and community support, as reasons not to have a program. Urban school principals were also more likely than their rural counterparts to express constraints regarding how these programs fit into their school schedule and curriculum. The regional differences are a bit more difficult to parse. Schools located in the Northeast and Midwest were more likely to say that they did not know enough about the program than schools located in the South and West. Meanwhile, schools in the West were also more likely to express a constraint that JROTC programs would not fit with the school curriculum.

Perceptions of the Junior Reserve Officers' Training Corps

We asked principals who offer JROTC at their school about their perceptions of the program. Overall, these high school principals reported strong impressions of JROTC as of spring 2022 (Figure 2.8). At least nine in ten principals agreed or strongly agreed that JROTC leads to a variety of positive outcomes, saying that JROTC builds student confidence, encourages civic participation, improves student performance, and helps students prepare for college. Principals generally did not feel that JROTC causes conflict in their community and reported high levels of approval from students, school staff, parents, and community members. Principals also had positive feelings about the JROTC curriculum, with the vast majority saying that it does not conflict with other school curricula and that it contributes to student success.

Despite their positive feelings about the program, its curriculum, its results, and certainty of school- and community-level support, principals identified a participation barrier: Half of principals said that JROTC was not of interest to many students.

[9] One respondent indicated that start-up costs were exceptionally high (e.g., "over $300,000"), though this response may better indicate receiving inconsistent information about the program than an accurate portrayal of costs to a school or district. Schools are responsible for paying a portion of the instructors' salaries, but DoD funds the textbooks, uniforms, and equipment needed for administration of the course (Kamarck, 2022).

FIGURE 2.7

Percentage of Schools Reporting They Had Not Applied for or Did Not Have Access to JROTC for Various Reasons as of Spring 2022, by School Subgroup

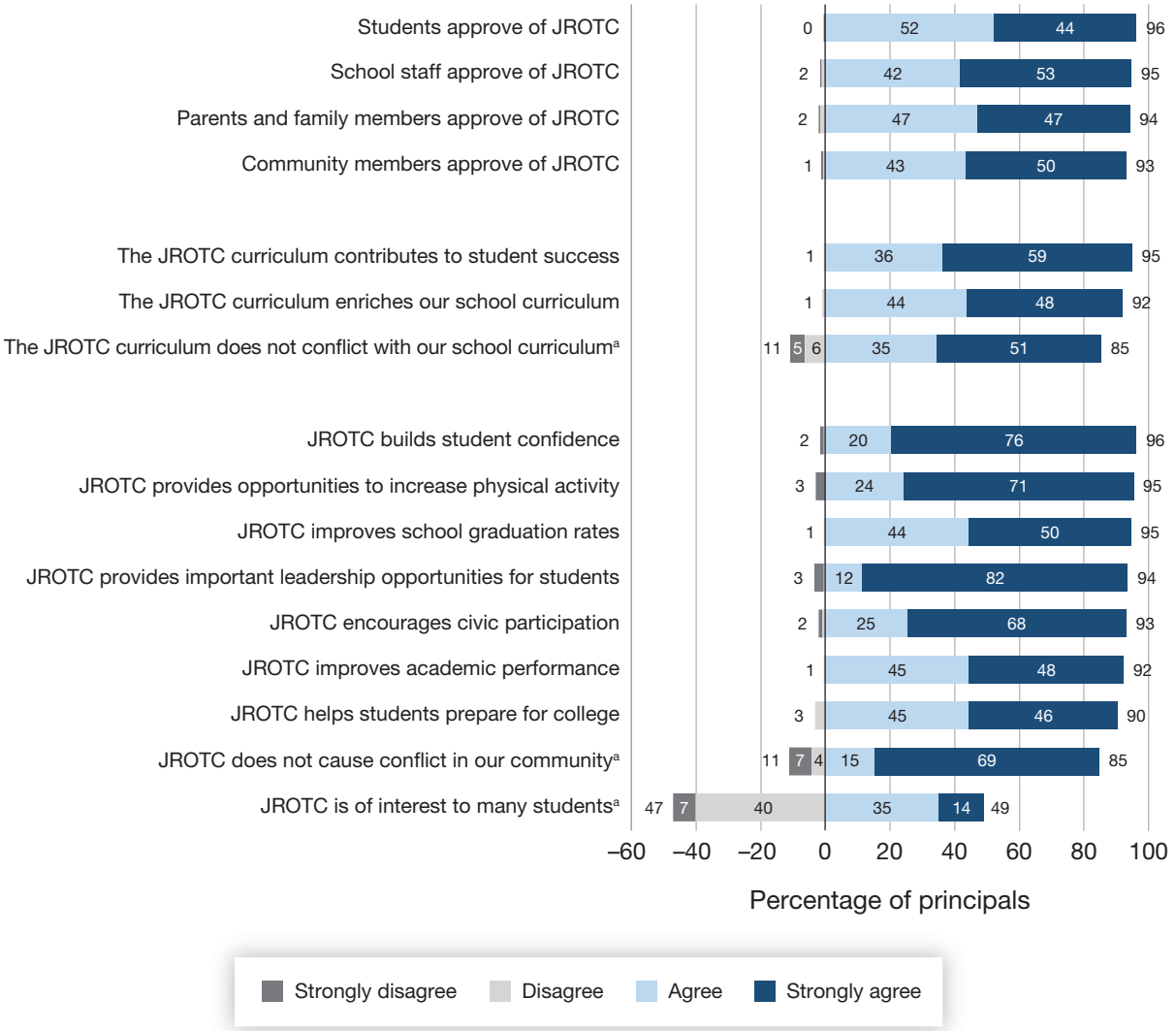
		Size		Locale			Region			
	All schools	Small	Large	Urban	Suburban	Rural	Northeast	Midwest	South	West
Logistical constraints										
Cost of the program	28	30	25	17	16	41	26	27	35	20
Difficulty finding instructors	28	32	22	11	17	44	22	29	33	29
Do not know what is required to host a program	28	33	18	18	29	33	31	39	18	25
Do not know enough about the program	27	35	10	16	25	34	44	38	10	19
Do not know the process for applying	24	29	15	11	22	32	26	33	14	25
Interest constraints										
Students do not want a JROTC program	19	18	21	17	32	13	15	22	15	29
Parents and family members do not want a JROTC program	15	11	23	23	26	5	16	11	13	26
Community members do not want a JROTC program	10	7	13	19	14	2	8	10	10	11
Most students in my school would not benefit from JROTC	9	10	8	13	11	7	9	6	10	15
School staff do not want a JROTC program	8	8	8	17	10	3	8	5	6	16
My school offers other, similar leadership programs	2	2	4	5	1	2	4	1	1	5
Scheduling constraints										
Program does not work well with the student daily school schedule	14	15	13	24	11	11	11	7	18	20
Program does not work well with the school curriculum	8	8	8	21	7	3	7	2	7	21

NOTE: This figure depicts response data from the following survey question: "Which of the following factor into the reason your school currently does not have or has applied for a program?" (n = 376). Respondents were instructed to select all that apply. The survey question included an "I don't know" option, which was selected by 10 percent of respondents, and an "other" option, which was selected by 16 percent of respondents. Responses to these options have been omitted from this figure.

Principals also tended to believe that students' JROTC participation positively impacted some of their behavioral and academic outcomes. In spring 2022, 70 percent of principals at schools offering JROTC indicated that JROTC cadets compared positively with their peers in terms of acting as a positive influence, 73 percent said cadets engaged more in the school community, 68 percent said cadets were involved in fewer disciplinary infractions, 61 percent said cadets attended school more regularly, and 55 percent said cadets graduate on time more often. The remaining principals generally felt that JROTC cadets were no better—but also no worse—than other students in their schools on these same measures. These data reflect principals' impressions; we cannot conclude, based on this survey, that JROTC participation leads to the positive outcomes that principals perceived. However, recent research from RAND suggests that many of these impressions accurately reflect the impact of JROTC on student outcomes (see Zaber et al., 2023).

FIGURE 2.8

Percentage of Principals Who Reported Various Levels of Agreement with Statements About JROTC as of Spring 2022



NOTE: This figure depicts response data from the following survey question: "Please indicate the extent to which you agree or disagree with each of the following statements." (n = 169). Bars might not sum to totals because of rounding and because respondents could also select "I don't know" (a category that has been omitted from this figure). At most, 7 percent of respondents selected this option.

[a] indicates that item has been reverse coded. These questions were posed only to principals who indicated that their school offers or provides access to a JROTC program.

Finally, it is not clear that having access to a JROTC program ultimately affects students' post–high school career decisions. In particular, principals of high schools with JROTC programs estimated that, on average, 5 percent of their students enlisted in the military—a rate on par with high schools nationally.

National Guard Youth ChalleNGe

The results in this section are restricted to principals in schools in states where a Youth ChalleNGe program was actively operational as of 2022.[10] In stark contrast to the pattern we observed with JROTC, the Youth ChalleNGe program did not seem to have strong name recognition in the states in which it operates. In spring 2022, only 13 percent of principals in high schools in states operating a Youth ChalleNGe program correctly indicated that their students had access to the program. Meanwhile, 27 percent of principals in these states incorrectly indicated that their students did not have access to the program despite their awareness of it, while the vast majority (60 percent) were entirely unaware of the program.

We hypothesized that principals' awareness of the Youth ChalleNGe program (or lack thereof) might be related to the types of schools in which they serve—that is, that principals in schools serving different student populations might be more aware of the program than others. We found that, in many ways, the principals who were aware of the Youth ChalleNGe program were in schools that were similar to those in which principals were unaware of the program (see Table 2.1). However, there were a few exceptions: Principals who

TABLE 2.1
Principals' Awareness of Student Access to Youth ChalleNGe in States That Have a Program, by Student Demographic

Student Demographics	Aware That Their Students Have Access	Unaware, Either of the Program Entirely or That Their Students Have Access
Mean enrollment	890	1,200
Percentage of students eligible for free or reduced-price lunch	51	52
Percentage of White students	55	49
Percentage of Black students	18	13
Percentage of Hispanic students	17	29
Percentage of students transferred to an alternative program or school	7	6
Percentage of students enrolled in a dropout prevention program	7	6
Percentage of students who graduate with a typical diploma in four years	88	92
Percentage of graduates who enroll in a two- or four-year college	48	52
Percentage of graduates who enroll in a career technical training or development program	19	15
Percentage of graduates who enter the labor market (nonmilitary)	24	26
Percentage of graduates who enter the military	6	5

[10] States with a Youth ChalleNGe program as of 2022 include Alaska, Arkansas, California, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Kentucky, Louisiana, Maryland, Michigan, Mississippi, Montana, North Carolina, New Jersey, New Mexico, Oklahoma, Oregon, South Carolina, Tennessee, Texas, Virginia, Washington, Wisconsin, West Virginia, and Wyoming. We performed this analysis with and without Pennsylvania as a Youth ChalleNGe state because its program opened only in 2022; inclusion of this state did not impact our results. A handful of principals in states without a Youth ChalleNGe program (5 percent) indicated that their students had access to this program in spring 2022. Although we cannot fully explain this discrepancy, we believe this may be because this program is expanding, but not yet operational, in some states. Other states previously had programs that are no longer operational. These principals are excluded from this analysis, because they were serving in schools in states in which programs were not fully operational as of spring 2022.

were unaware of the Youth ChalleNGe program tended to serve in schools with larger enrollment sizes, with greater shares of Hispanic students, and with smaller shares of students interested in vocational education.

Principals in schools in states with a Youth ChalleNGe program generally indicated that there were many opportunities available to students struggling to complete a high school degree in a traditional setting. Ninety-six percent of principals in states with a Youth ChalleNGe program said that their school offered credit recovery during the school year, and 91 percent said that they offered these programs during the summer. Majorities of these principals said that they offered mentoring or tutoring (79 percent), online or virtual schooling (76 percent), or campus-based alternative schooling (61 percent). Less commonly, schools offered diploma equivalency testing or preparation courses for an equivalency exam (e.g., General Educational Development [GED] tests, High School Equivalency Test [HiSET]).

We asked the principals in states with a Youth ChalleNGe program and who were aware of the program whether any students enrolled in the program. Just over half of principals (54 percent) said at least some students enrolled in the program, although 20 percent of principals said they were not sure whether any students had enrolled.[11] Because so few principals were aware of the Youth ChalleNGe program in 2022 and even fewer knew whether students actually enrolled, we were unable to analyze principals' perceptions of this program in detail. However, with this caveat in mind, we can say that the 28 principals who knew that at least some students in their school enrolled in the Youth ChalleNGe program seemed to have positive feelings toward the program: 72 percent said that the program was effective for the student or students enrolled, while the remaining 28 percent were unsure about the program's effectiveness. No principals said that the program was not effective.

Those principals who indicated that the program was effective for students provided explanations that had some common themes, as represented in the following responses:

> The program offers students a second chance, and credit recovery. It also builds confidence, discipline, and character.

> Students who return from the [Youth ChalleNGe] are always respectful, have a life goal and work towards success. These students craved consistency in their home and school lives that the program could provide.

> Students have come back to school and had more of a focus to finish. If they don't come back, they take their HiSET and move on, so that is a success as well.

> Yes, [Youth ChalleNGe] is a great program and has turned several of our students around, and they were able to graduate high school. Many students need to get out of their environment to be successful.

STARBASE

STARBASE, as described earlier in this report, was originally established as a STEM program for fifth-grade students. In 2010, STARBASE 2.0 was launched to serve sixth- through eighth-grade students as an afterschool program. Awareness of the STARBASE program was low among the population of high school principals surveyed: Overall, 83 percent of principals in all school settings reported that they were entirely unaware of the STARBASE program. Program awareness was low across all school settings. This result is not surprising given that the target population for the STARBASE program is not high school students.

[11] Principal turnover, estimated at 18 percent nationally between school year 2015–2016 and school year 2016–2017, may play a role in some school leaders being unfamiliar with Youth ChalleNGe broadly and whether students in their school enrolled specifically (National Center for Education Statistics, 2021).

However, 15 percent of surveyed principals were aware of the program. We hypothesize that these principals may have encountered this program earlier in their career, perhaps when they were leading or teaching in an elementary or middle school. Even if they did not previously serve in another school, they might have heard about the program if there was one operating in their school district or a neighboring one.

More puzzling is the 2 percent of surveyed principals who indicated that their students had access to this program in spring 2022. Since a few of these schools serve middle school grades, it is plausible that at least some students in these schools had access to this program. More likely, however, we believe principals may be indicating that their current students previously had access to this program in earlier grade levels.

Military Recruiters at School

In addition to asking principals whether their school offered DoD youth programs, we also asked whether they offer military recruitment at education or career fairs. This appeared to be a common practice in U.S. high schools: In spring 2022, 65 percent of high schools indicated that they have military recruitment at education or career fairs. Prevalence was generally high across all school subgroups, with one exception: Military recruiters were more common in larger rather than smaller schools, presumably because recruiters likely have access to more students per visit. In spring 2022, 78 percent of large schools said they had military recruitment at school, compared with 58 percent of small schools.

Principals' Perceptions of Community Support for the U.S. Military

Principals were asked to estimate what proportion of their school community members would consider themselves supportive of the U.S. military. In spring 2022, 84 percent of principals surveyed said that most or nearly all members in their community would consider themselves supportive of the military (Figure 2.9). Principals in low-poverty schools, suburban and rural schools, and schools serving mostly White student populations were especially likely to feel that most or everyone in their local school community would perceive themselves as supportive of the military. These results suggest that principals perceive high levels of military support generally from their local school community and extra high levels in some school settings.

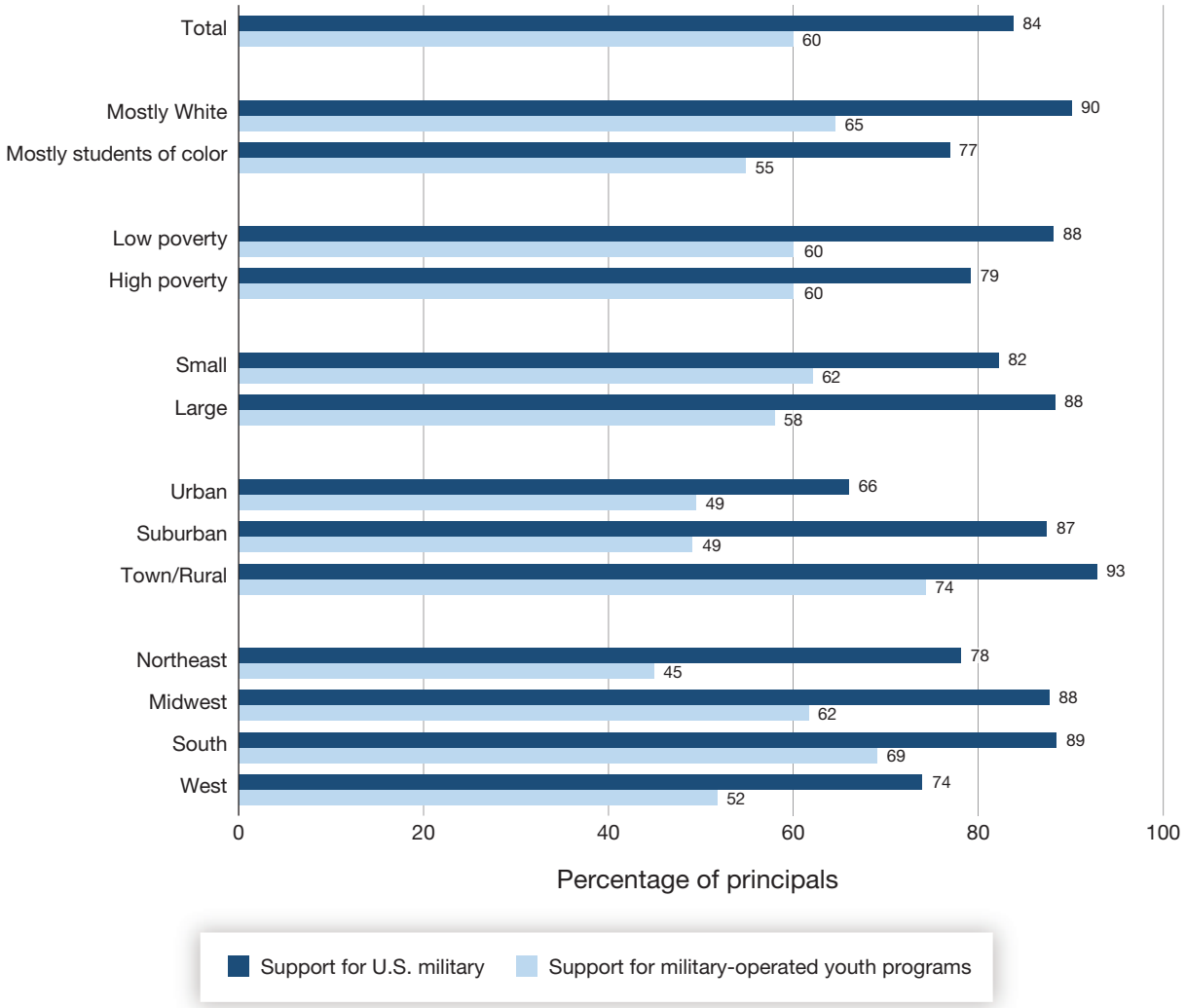
However, it is not clear that these high levels of perceived community support translate into support specifically for military youth programs in schools. In general, principals' responses seem to suggest a perception that support for the military-operated programs in schools is lower than support for the military in general within their local school community. More specifically, despite 84 percent of principals saying that most or nearly all of their local school community supports the military, only 60 percent say the vast majority of their community would agree that military-operated programs enhance the relationship between the community and the military.

This falloff in support was perceived by principals in all school settings (Figure 2.9). However, the divergence between general support for the military and support specifically for military-operated youth programs in schools was especially large in some school settings. For example, although 78 percent of principals in schools located in the Northeast perceived military support from the community, only 45 percent said their community would agree that military-operated youth programs enhance the relationship between the community and the military.

Nonetheless, there is some evidence that general awareness of any DoD youth programs may slightly influence impressions of the military, at least for principals. Most principals (52 percent) said that their impression of the military was unchanged by their awareness of youth programs such as JROTC, Youth ChalleNGe, or STARBASE. One percent of principals said that their awareness of these programs left them with a more

FIGURE 2.9

Percentage of Principals Who Perceived That Most or Nearly All of Their Local School Community Is Supportive of the Military in General as Well as of Military-Operated Youth Programs in Schools as of Spring 2022



NOTE: This figure depicts response data from the following survey question: "Thinking about your school community, approximately how many community members would agree with each of the following statements: I am supportive of the military" and "Military-operated programs for youth improve the relationship between the community and the military" (n = 648). Respondents had six response options: "none," "a few," "about half," "most," "nearly all," and "I don't know." This figure includes those who selected "most" or "nearly all." The other categories have been omitted from this figure.

negative view of the military. By contrast, a sizable 30 percent of principals said that their awareness of these programs positively influenced their impression of the military. (The remaining 17 percent of principals said that they were unsure about how their awareness changed their impression.)

Principals' Connection to the U.S. Military

We inquired about the responding school leaders' military connectedness, recognizing that this connection may inform their responses. Six percent of respondents indicated that they had previously served on active duty, and 2 percent said that they had previously served as a reservist; this aligns with the general U.S. population, which is approximately 7 percent veterans (Vespa, 2020). Seventy-six percent of school leaders said

they had a family member who had previously served in the military, and 12 percent said they had a family member currently serving, which suggests a slightly higher level of military connectedness among school leaders than is found in the general U.S. population (see the "Institutional Presence and the Civilian-Military Divide" section in Chapter 1 of this report). In the end, we did not observe a significant relationship between school leaders' military connectedness and their perceptions of support: Military-connected principals were just as likely to perceive the majority of their community was supportive of the military and of DoD-funded youth programs in schools as their non-military-connected counterparts.

Summary

This chapter focused on a survey administered to RAND's standing panel of school leaders. These individuals were asked about educational requirements and opportunities within their school, their awareness and perceptions of DoD youth programs, and their community's support for the military and military-operated youth programs. Key findings from our survey analysis are as follows:

- Civics education appeared to be more readily available to low-poverty schools in 2021–2022. High-poverty schools cited challenges such as pressures to focus on other academic subjects, not having staff with the necessary training and skills, and not having the necessary resources (e.g., textbooks) to provide civics education.
- JROTC was well recognized by school leaders whose schools both did and did not offer the program. Where a program was offered, school leaders had a positive impression of it but recognized that the program was not suited to the interests of all students.
- School leaders identified logistical constraints (e.g., difficulty finding instructors, not knowing enough about the program) and lack of student interest or competing programs as reasons they had not applied for or offered a JROTC program within their school.
- Youth ChalleNGe was not as well-recognized a program as JROTC, though school leaders familiar with the program reported positive impressions.
- Nearly two-thirds of school leaders said that their school community was supportive of DoD-operated youth programs in schools building connections between communities and the military, though this support fell short of the community's perceived support for the military broadly.

CHAPTER 3

Junior Reserve Officers' Training Corps Curriculum

Public schools play a central role in preparing students for civic life. The U.S. public education system was designed with the primary mission of equipping the citizenry to uphold the nation's democratic system of government. Through formal instruction and engagement in informal learning, schools and co- and extracurricular opportunities can promote the knowledge and values that will contribute to community and national health in the long run (Kaufman, Hamilton, and Hu, 2020).

Scholars and policy experts have identified three categories of competencies that promote young peoples' civic development: civic knowledge, civic skills, and civic dispositions (Hansen et al., 2018; Whitehouse, Baumann, and Brennan, 2017). *Civic knowledge* refers to an understanding of history, government, economics, and related social studies topics. *Civic skills* are the abilities that individuals need to be competent citizens, including critical thinking, media literacy, and the ability to collaborate with a team. *Civic dispositions* are attitudes that individuals hold related to citizenship, including the acknowledgment of the importance of the responsibilities of citizenship (e.g., voting in elections) and an appreciation for the views and experiences of the diverse members of society. This combination of knowledge, skills, and dispositions can be developed through formal and informal educational opportunities.

The JROTC programs represent a co-curricular opportunity for civic development through exposure to civics instruction and development of the value of civic engagement. Each of the four services' JROTC programs has a guiding mission that is tied to developing youth as citizens. While the original establishment and current placement and operation of JROTC programs is well documented, little is known to those outside program operations about the program's curriculum.

Recall from the conceptual model presented in Figure 1.1 that this curriculum, and the instruction through which it is delivered, is a core driver of the program's ability to meet its vision: to "instill in students in United States secondary educational institutions the values of citizenship, service to the United States, and personal responsibility and a sense of accomplishment" (U.S. Code, Title 10, Section 2031). The program's capacity to affect change in the knowledge, skills, and abilities of young people and to ensure those young people are connected to their local community relies on the instructional materials serving these purposes. Prior research demonstrates that curricular materials, specifically textbooks, matter for moving the needle on desired outcomes (Bhatt, Koedel, and Lehmann, 2013; Chingos and Whitehurst, 2012; Crawford and Carnine, 2000; Koedel et al., 2017). In the interest of learning more about the extent to which the formal curriculum, as captured in program textbooks, aligns with JROTC's vision, we undertook an analysis of the content of JROTC textbooks. In what follows, we briefly describe each JROTC service branch's approach to program sequencing and standardizing the content for each course. Then we present the results of our textbook analysis.

Instructional Program Sequence and Required Content

Each military service branch has designed a four-year JROTC curriculum such that interested students are able to participate in each grade, ninth through twelfth, while receiving novel course content each year. However, the four service branches set their own course sequencing, as well as the level of flexibility instructors are given regarding what content from the curriculum they are required to cover within each course. We provide a brief overview of how each branch designs its programmatic sequence and the level of content flexibility provided to instructors. This information was provided to RAND in summer 2019. We held fact-finding conversations with leaders of each service's JROTC program. We inquired about the structure, content, and implementation of the courses and curriculum. We also gathered information on the extent to which the type of course credits allocated to JROTC classes influence the delivered course content.

U.S. Air Force

The U.S. Air Force JROTC curricular content focuses on three components: aerospace science (40 percent), leadership (40 percent), and wellness (20 percent). The Air Force instructors are required to ensure that the full four years of the program's curriculum are covered every four years, but the courses are not required to be delivered in order of Leadership, Training, and Education (LET) 100 sequentially through LET 400. It is likely that many schools offer the course in the traditional sequence. However, because the Air Force program does not require students start with the 100-level course, the Air Force program can place students with varying years of experience in the same classroom. A high school junior with two years of prior JROTC participation can be assigned the same classroom as a junior who is brand new to the program or a senior who also has two years of prior JROTC participation.

The instructional requirement given to Air Force JROTC instructors is for the minimum acceptable teaching time. The instructors are given full flexibility on the content of that instructional time. This means that each school may provide slightly different subsets of the available curricular content to cadets over the course of four years. From our fact-finding conversations, we gather that instructors are likely to consider the type of course credit (e.g., physical education, health, civics) assigned to the JROTC course when choosing the content on which they focus. For example, Tennessee provides civics credit to individuals who successfully complete a JROTC course. Thus, Tennessee JROTC instructors may place more focus on civics-related content than on other topics (e.g., health).

U.S. Army

Army JROTC has designed a sequenced four-year curriculum for interested students. Each cadet who enrolls in JROTC for the first time will begin in the first JROTC course in the sequence (LET 100), regardless of whether this individual is a first-year high school student or a senior. The cadets then progress to the second level and so on. Within each course level, instructors must cover core content drawn from six topical categories. This means that cadets participating in the first course in Alabama and in California will receive instruction in the same six topical categories. After instructors have met the core content requirements, they have the flexibility to address elective curricular content. Like Air Force instructors, Army instructors can use the elective time to focus on aspects of the curriculum that align with the course credits cadets receive. In some schools, cadets may receive instruction related to civics, STEM, financial planning, or in components related to disaster planning and first-aid response through which they can earn a Teen Community Emergency Response Team certification.

U.S. Marine Corps

The U.S. Marine Corps (USMC) has a structure similar to that of the Army in terms of course sequence and instructor content flexibility. USMC has a sequenced four-year curriculum for interested students. Each cadet who enrolls in the program for the first time begins with the first JROTC course (e.g., LET 100); students with the same number of years in the program are grouped together, regardless of school grade level. For each course, there is an assigned textbook as well as a core book that is used for every year of the program.

Program policy outlines core constructs and lessons that instructors must cover within each course. Instructors are given flexibility to adjust instruction to meet the needs of the students in the classroom or to acknowledge what might be happening locally or nationally, where relevant, but instructors must stick to the core constructs as identified. Instructors can use remaining instructional time to identify other content within the curriculum to cover, typically aligning the material to the course credit area students receive for participation.

U.S. Navy

The Navy also structures its JROTC program to be sequenced such that all first-time participating students will be together in the first level course, regardless of grade level. The first three courses in the sequence, Naval Science 1–3, have corresponding textbooks. The fourth course relies on multiple publications to provide the full scope of the course content, though there are plans to introduce a single Naval Science 4 textbook into the program.

The Navy does not set minimum content or topic requirements for instructors; the only expectation is that instructors stay within the provided curriculum. To enable instructors to stay within this requirement, they are provided with substantially more curricular content than they would be able to cover each year.

Below, we provide the results of our textbook analysis to understand how the content enables the development of military knowledge and awareness, as well as how it may bolster knowledge in key areas, such as civics, leadership, and service.

Guiding Questions

We coded textbooks for the inclusion of content that furthers cadets' understanding of and exposure to the military and is relevant to civic development. Through this analysis, we aimed to answer the following questions:

1. To what extent do the JROTC textbooks cover knowledge and insights about the military?
2. To what extent does content in the JROTC textbooks focus on fostering civil-military relations?
3. To what extent does content in the JROTC textbooks focus on civic development?

For each of these questions, we also sought to identify the focus of relevant content and how this content and focus varied across the textbooks.

Overview of Data and Methods

We assessed the content of the first- and second-level textbooks (e.g., LET 100 and LET 200) for the Air Force, Army, USMC, and Navy JROTC programs for coverage of military knowledge, civil-military relations, and civics-related attitudes and values. Among the first decisions we had to make in our analysis was which text-

books to examine for an analysis that would best capture the formal curriculum for each service. Youth can participate in the JROTC program for all four years of high school, and, consequently, each service has multiple textbooks for use by instructors in its JROTC program. The branches take different approaches to curriculum sequencing, as discussed earlier in this chapter. We focused our analysis on the 100- and 200-level textbooks because they are designed to cover foundational material for each respective JROTC program. In total, we coded and analyzed 185 chapters across the eight reviewed textbooks.

Two members of the research team examined the tables of contents and the chapters of the first- and second-level textbooks to classify their topical coverage. In particular, we sought to identify the prevalence of topics that are represented in state standards for civics education (ECS, 2016), including history and global affairs, government and economics, and citizenship. The primary civics education topics that we sought to identify were those related to the military and DoD civil-military relations and to the rights and responsibilities of citizenship. With regard to the military and DoD, we looked for passages focused on developing cadets' knowledge of the branches of the military, ranking structure, careers, and DoD and its overall responsibilities. In identifying passages related to civil-military relations, we looked for the discussion of citizen support for the military, the relationship between the military and civilians, and any efforts to bridge the civil-military divide. We also looked for content focused on the rights and responsibilities of U.S. citizens and information describing how to meet these responsibilities and leverage one's rights. Complete details regarding the data and methods used for this research are available in Appendix B.

Findings

Overall, the JROTC 100- and 200-level textbooks cover information across numerous domains intended to develop individual cadets and their knowledge of U.S. history and government; the military; citizenship; leadership and followership; and nutrition, health, and fitness. Textbooks for the four services include ample coverage of history and government, the military, and citizenship. The specific focus and depth of coverage of these topics varies by textbook. There is very little discussion of the relationship between civilians and the military. Before we address each of these content areas to answer our research questions in depth, we explore the coverage of topics to which the textbooks devote substantial space but that are peripheral to the main focus on this study: leadership and followership, as well as nutrition, health, and fitness. We examine the coverage of these topics not only because of their uniform presence across textbooks but also because their inclusion provides striking examples of the variation in the degree to which content, stock or otherwise (see Box 3.1), is tied back to the JROTC program or the military. We summarize the variation we identified for leadership and followership, as well as wellness, in Table 3.1. In the subsequent sections of this chapter, we answer the guiding questions, beginning with military knowledge and insights, then diving into civil-military relations, and concluding with civic-related attitudes and opinions.

To What Extent Do the Textbooks Cover Knowledge and Insights About the Military?

Bridging the civilian-military divide requires a cohort of emerging adults who have a keen sense of the military's charter, history, and purpose. We examined the textbooks to understand the extent to which these topic areas are covered, the foci of this content, and whether there is variation by service and textbook level. We summarize aspects of the results in Table 3.2.

BOX 3.1

JROTC Textbooks Leverage "Stock" Content

Not all material in the program textbooks is developed solely for JROTC. The textbooks include publisher "stock" material (i.e., content that is used in multiple textbooks developed by the publisher). Take, for example, the 1969 U.S. Supreme Court case *Tinker v. Des Moines Independent Community School District*, which concerned protection of speech under the First Amendment. Students engaged in a silent protest of the Vietnam War by wearing armbands to school; the students who led the protest were suspended from school and challenged that suspension. The Air Force 100-level textbook provides the following three sentences for additional context at the start of the case presentation: "Division over the war in Vietnam racked the nation during the 1960s. Millions of Americans agreed with the war, while many other millions disagreed. Protests occurred frequently" (Editors at Pearson, 2015, p. 480). Everything that follows those contextual sentences is verbatim with the case's presentation in McGraw Hill's (2009) *Civics Today: Citizenship, Economics, & You*, a textbook not developed for JROTC programs. The publisher acknowledges, for example, that material included in the Air Force 100-level textbook pulls excerpts from at least two other textbooks produced by the publisher. However, none of the books provides section-by-section indications as to which material is or is not stock content. As a result, we are unable to assess the extent to which stock content, relative to custom content, is connected with the JROTC program context.

Military Knowledge

All eight of the reviewed textbooks include substantial content that focuses on developing cadets' knowledge of the military. Though the breadth of this content varies across the four JROTC service branches, all coded textbooks emphasize the history, customs, uniform, and rank and structure of the branch of JROTC in which the cadet is enrolled. The textbooks characterize their own branches of the military and provide background on systems (e.g., planes, ships, and other weapons systems); terminology (e.g., jargon specific to the U.S. military and each branch); and relationships with other branches (e.g., describing the defense structure of the United States and providing brief overviews). Some textbooks dedicate space to information related to habits and skills necessary for success in that branch of the military. For example, the Navy JROTC textbooks discuss geography and maritime science and the importance of this knowledge for success in the Navy.

Coverage of military knowledge varies by textbook level and service. The 100-level textbooks are home to the bulk of the material focused on military knowledge. These introductory textbooks cover foundational information regarding codes of conduct, personal appearance and uniform, rank structure, and chain of command. The 200-level textbooks build on this knowledge by revisiting foundational material and providing additional branch-specific history and culture. In most of the 100-level textbooks, the chapters focused on military knowledge are concentrated in the first third of the textbook. If instructors follow the textbook order as written, this material is what students first encounter when they begin JROTC. In the 100-level Marine Corps textbook, by contrast, the JROTC and military overview content is distributed throughout the book; a few early chapters target military and Marine Corps leadership values in a broader unit on leadership skills, followed by additional coverage in the second half of the book, where general military subjects span many chapters. Taken together, 100-level JROTC textbooks provide cadets with exposure to the history, customs, and traditions of the military. The 200-level textbooks reinforce and build on this military knowledge but focus less on military knowledge than the preceding texts.

There are also differences in coverage of military subjects by JROTC branch. Most 100-level textbooks focus on knowledge and traditions of the corresponding service; the Air Force 100-level textbook goes into more depth. It also presents comprehensive coverage of JROTC program structure across all the services, describing the mission, history, objectives, curriculum, and instructor qualifications for each one. The text

TABLE 3.1
Leadership and Followership and Wellness Content, by Service Course–Level Textbook

Service	Course Level	Content Description
Air Force	100	• **Leadership and Followership:** Stock content adopted from other textbooks with no direct connection between competencies and citizenship or success in JROTC or the military • **Wellness:** Stock content adopted from Pearson's *Life Skills Health* (Pearson AGS Globe, 2006) presented without integration into or reference of the JROTC or Air Force context
	200	• **Leadership and Followership:** Content connects directly to JROTC with highlights of Air Force personnel and historic military and civilian figures to illuminate relevance of personal and professional development content • **Wellness:** Stock content adopted from publisher that integrates military contexts and U.S. history into discussions of effective communication, positive attitude, personal integrity, and conflict resolution
Army	100	• **Leadership and Followership:** Stock content adopted from other textbooks with no direct connection between competencies and citizenship or success in JROTC or the military • **Wellness:** Stock content adopted from other textbooks with no direct connection between competencies and citizenship or success in JROTC or the military
	200	• **Leadership and Followership:** Stock content adopted from other textbooks with no direct connection between competencies and citizenship or success in JROTC or the military • **Wellness:** Stock content adopted from other textbooks with no direct connection between competencies and citizenship or success in JROTC or the military
Marine Corps	100	• **Leadership and Followership:** Content appears written specifically for JROTC program • **Wellness:** Stock content adopted from other textbooks that provides the Marine Corps definition of *physical fitness* but does not otherwise tie wellness and fitness to JROTC or the Marine Corps
	200	• **Leadership and Followership:** Content appears written specifically for JROTC program • **Wellness:** Stock content adopted from other textbooks that does not directly tie wellness and fitness to JROTC or the Marine Corps
Navy	100	• **Leadership and Followership:** Content appears written specifically for JROTC program • **Wellness:** Occasionally integrates military history related to exercise, nutrition, hygiene, stress control, drug awareness, first aid, geography, and survival skills to further the JROTC or Navy mission
	200	• **Leadership and Followership:** Content connects directly to JROTC and uses service-specific examples to underscore importance of life skills and knowledge for personal, JROTC, and military success • **Wellness:** Occasionally integrates military history related to exercise, nutrition, hygiene, stress control, drug awareness, first aid, geography, and survival skills to further the JROTC or Navy mission

NOTE: Textbooks from which content was adopted include other Pearson Education Company publications, such as *Keys to Success: How to Achieve Your Goals* (Carter, Bishop, and Kravits, 2001), *Prentice Hall Health: Skills for Wellness* (Pruitt, Crumpler, and Prothrow-Smith, 2001), and *World Geography: Building a Global Perspective* (Baerwold, 2002).

also includes a visual presentation and accompanying narrative covering military insignia and pay grades across all services, with special emphasis on Air Force JROTC insignia and badges. The military-focused chapters also include a brief history of customs and courtesies and outline expected behaviors of JROTC participants, which are largely aligned with expectations of junior service members (E1). The bulk of this military-focused content is concentrated in the beginning of the 100-level text, with brief mentions of Air Force–specific leadership principles in the 200-level text.

By contrast, the Army 100- and 200-level textbooks do not cover specific, technical details related to Army and other branches' structure and operations. Rather, the military knowledge chapters in the Army textbooks focus on giving an overview of Army JROTC, its chain of command, and strategies for cadet success. The Army textbooks make a point to note the alignment between the JROTC structure and skills with the roles and responsibilities of members of the Army and other military services.

TABLE 3.2

Coverage of Military Foundational Topics and Military Subjects, by Service Course–Level Textbook

Service	Course Level	Foundational Topics	Content Description
Air Force	100	✔	• JROTC program structure, mission, history, objectives, curriculum, instructor qualifications (all services) • Military insignia and pay grades • Air Force customs and courtesies • Expected behaviors of JROTC cadets
	200		• Air Force–specific leadership principles
Army	100	✔	• Army JROTC overview, chain of command, and cadet success strategies • Alignment between JROTC structure and skills and Army and service roles and responsibilities • Alignment between JROTC structure and skills and military roles and responsibilities
	200		• Alignment between JROTC structure and skills and military roles and responsibilities
Marine Corps	100	✔	• Military history and operations • Extensive coverage of general military subjects • History used to explain current structure and functions, emphasize need for learning practical skills (e.g., first aid)
	200		• Extensive coverage of general military subjects
Navy	100	✔	• Comprehensive view of Navy operations and technical details, including overview of the Navy ships, aircraft, weapon systems • Constitutional and governmental framework within which the military operates • Listing of auxiliary naval components and command location
	200		• Comprehensive view of Navy operations and technical details

NOTE: Foundational topics include JROTC program, structure, and operations of the service, history and traditions, codes of conduct, personal appearance and uniform, rank structure, and chain of command. General military subjects include content such as rank structure across all branches, war history, and navigation, as well as military punishments and/or discharges.

The Marine Corps textbooks also discuss military history and present operations at length; they include nearly 200 pages of "General Military Subjects" in the 100-level text and another 150 pages of such content in the 200-level book.[1] In total, this coverage spans approximately 47 percent of the pages in these textbooks. History is used as background and justification to describe the Marine Corps' current structure and function, with greater emphasis placed on understanding historical context and learning practical skills (e.g., basic first aid for hot- and cold-weather injuries) than describing current systems and operations. For example, the 100-level text leverages history to illustrate the importance of the Marines' modern agile posture (e.g., discussion of post–Korean War readiness).

The Navy JROTC textbooks cover Navy operational and technical details with exceptional comprehensiveness. The 100-level text includes an overview of the Navy's ships (Navy 100-level, *Introduction to the*

[1] General military subjects include topics such as rank structure across all branches, war history, and navigation, as well as military punishments and discharges.

Navy Junior Reserve Officer Training Corps, 2017, pp. 146–155), aircraft (Navy 100-level, *Introduction to the Navy Junior Reserve Officer Training Corps*, 2017, pp. 164–170), and weapon systems, as linked to U.S. strategy and national defense structure. More than other service branches, the Navy's JROTC textbooks describe the constitutional and governmental framework within which the military operates and list auxiliary naval components and command locations (Navy 100-level, *Introduction to the Navy Junior Reserve Officer Training Corps*, 2017, pp. 130–133).

There is overlap in coverage of military subjects across branches and repetition of content between textbooks within branches. The foundational topics, such as behavior and rank structure, are covered in depth in each of the 100-level textbooks. The 100-level textbooks for each branch cover similar material about their respective JROTC program, structure and operations of the branch, and its history and traditions. These topics are revisited and built on in the 200-level textbooks. For instance, the Marine Corps 100-level textbook covers rank structure and chain of command and the underlying purpose of this structure, and then the 200-level textbook goes into detailed description of the roles of officers and noncommissioned officers. These textbooks also provide background on the other branches of the military, though they vary in the depth and nature of this coverage. The USMC 200-level textbook clearly describes the relationship between the Marine Corps and the Navy and contains several chapters of background on the Navy. The 100-level Navy textbook also covers its relationship with the Marine Corps, but in brief and only with regard to operational structure.

Military Recruitment and Careers

Across all textbooks, coverage of recruitment and military careers is limited, which is to say that the books do not overstep the mission of JROTC. However, some of the textbooks include content on applying for civilian jobs and interview skills and information on career planning. The USMC 200-level text, for instance, includes a chapter discussing public service and career exploration with detailed guidelines on how to complete job applications and plan for a successful interview. The Navy 100-level textbook takes a less applied approach, with a chapter on career planning and various career pathways. The Navy is described as a career option in this section, and cadets are reminded of their preparation for such careers through JROTC, but Navy recruitment is not the primary focus of the career planning material.

Overall, each of the 100- and 200-level textbooks dedicate substantial attention to developing cadets' knowledge of their JROTC branch and the military more broadly. The 100-level textbooks are home to the bulk of this material, covering foundational information regarding the codes of conduct, personal appearance and uniform, rank structure, and chain of command. The 200-level textbooks build on this knowledge by revisiting foundational material and providing additional branch-specific history and culture. The 100- and 200-level JROTC textbooks provide cadets with exposure to the history, customs, and traditions of the military.

To What Extent Does Content in Junior Reserve Officers' Training Corps Textbooks Focus on Fostering Civil-Military Relations?

Our second line of inquiry seeks to understand the extent to which bridging civil-military relations is explicitly addressed in the JROTC textbooks. We examined the textbooks for content related to citizen supports for the military, relationships between civilians and the military, and efforts to bridge the civilian-military divide. The simple answer to our question is that explicit topics related to civilian-military relations appear sparsely across the reviewed textbooks of the four JROTC programs.

We expected that explicit discussion of the civilian-military relationship and divide would be limited. Therefore, when analyzing the content of the textbooks, we coded for the broadest conceptualization of civilian-military relations possible to ensure we did not overly simplify this content. For example, we coded for topics such as perceptions of the military by civilians, civilian control of the military, public and civil

service, funding of the military, and defense policymaking. In more broadly conceptualizing how textbook content addresses the relationship between civilians and the military, we cataloged content that referenced cadets' development as responsible citizens and their role in representing the military to the public as JROTC cadets, as well as service members' role in representing the military to the public. Even with this more inclusive coding approach, we found references in just under 10 percent of chapters in the eight coded textbooks. These chapters, 18 in total, contain references related to cadet development and the representation of the armed forces by JROTC cadets and service members. Many of these references focus on civic responsibilities, the rights and responsibilities of citizenship, and the ways in which cadets can develop as individuals in order to contribute to their communities. Other references note that cadets' conduct and performance are a reflection of the military and could shape the way in which their communities view the military.

Across all eight textbooks, there is only one chapter (Air Force 100-level) that contains content that directly addresses perceptions of the military by civilians and the relationship between the military and civilians, and there is one chapter (Marine Corps 100-level) that discusses civilian-military relations in a concentrated fashion, repeatedly and explicitly stating the importance of JROTC cadet conduct and appearance to improving or maintaining community members' perceptions of the military. Otherwise, the textbooks contain sparse references to the perceptions of the community of the JROTC cadets, or the military on the whole, which imply the existence and importance of a relationship between civilians and the military. The scarcity of content related to civilian-military relations is apparent, especially when compared with the frequency of other content areas. For example, the Navy 100-level textbook has dozens of passages related to military knowledge distributed through ten chapters, while it has only two chapters with references to civilian-military relations.

The Air Force 100-level textbook features two chapters related to the purpose of JROTC, standards for cadets, and citizenship ("Introduction to JROTC Programs" and "The Foundations of US Citizenship"). A third chapter in the 200-level text addresses the importance of leadership and followership both inside and outside the military ("Adaptive Leadership"). Civilian-military relations content in the Army textbooks is scarce and indirect: It appears in two chapters and two appendixes of the 100-level text in relation to citizen development and military traditions and in two citizenship-related chapters of the 200-level text. Within the Marine Corps textbooks, both the 100- and 200-level editions feature chapters titled "General Military Subjects" and "Leadership" that include indirect discussion of civilian-military relations. The 100-level text presents one other chapter related to personal development that touches on the importance of civilian-military relations by way of discussion of the impact of cadets' interactions with their communities. The 100-level text of the Navy's textbook series highlights material related to civil-military relations across the textbook's chapters. Within the 200-level textbook, chapters related to geography and the Apollo missions to the moon present concrete examples of civilian-military cooperation not found in other services' texts.

While there is only limited content throughout the textbooks that directly describes the impact of JROTC cadets' participation in program activities on civilian-military relations, many passages draw a connection to civilians' perceptions of the military through their observations of cadets and cadets' interactions with the community. For instance, some textbooks, in their coverage of grooming and uniforms, discuss how the physical appearance and behavior of cadets affects civilian perception and attitude toward the military. The USMC's 100-level text describes the importance of peer recognition of military dress: "Since many of your peers will now recognize you as a [Marine Corps JROTC] cadet, they will be watching you, and your appearance, more closely than before. Therefore, your appearance both in and out of uniform must be immaculate" (USMC 100-level, *Marine Corps Junior Reserve Officers' Training Corps: Leadership Education 1*, 2002, p. 262). Broadening the importance of communicating military pride through dress, the Army 100-level text states that "your personal appearance in uniform should project the image to others that you are a part of one of the finest groups in the world" (Army 100-level, *Leadership Education and Training (LET 1)*, 2005, p. 50). The

importance of military dress across all the services is perhaps best summarized by the Air Force 100-level text: "Whenever you wear the uniform—during indoor and outdoor training periods, at cadet social functions, and during base visits—you represent the corps. How you wear the uniform exposes you to praise or criticism from fellow cadets, fellow students, and society at large" (Air Force 100-level, *Leadership Education 100: Traditions, Wellness, and Foundations of Citizenship*, 2015, p. 25). These passages related to cadet appearance underscore the services' belief that cadets' appearances shape civilians' perceptions of the military.

Similarly, the textbooks remark on the role of cadets' conduct in shaping civilian perceptions of the military and their respective branch. Cadets are advised to uphold excellent conduct, as exemplified in the Marine Corps 200-level textbook: "Maintain high standards of conduct—Your actions in and out of uniform, on and off school grounds, reflect the [Marine Corps JROTC] and the Marine Corps. Set a good example and live up to the proud tradition that you have inherited" (Marine Corps 200-level, *Marine Corps Junior Reserve Officers' Training Corps: Leadership Education 2*, 2002, p. 28). The Air Force 100-level textbook connects the culture of the parent branch to expectations for JROTC cadets:

> Bad conduct in uniform is a longstanding taboo. Aside from the disrespect a person reaps as a result of bad conduct, it is a disgrace to the uniform and the branch of service represented. The good impression created by a large number of cadets who have dressed and behaved properly in public can be destroyed by just one cadet who presents a poor appearance or acts inappropriately. . . . Part of the Air Force mission is to keep citizens of the United States interested in airpower. As a result, anything that detracts from a favorable impression also detracts from the success of the Air Force mission. (Air Force 100-level, *Leadership Education 100: Traditions, Wellness, and Foundations of Citizenship*, 2015, p. 53)

The previous passage is perhaps the clearest articulation in all the textbooks we examined of the potential for JROTC to shape civilian perceptions of the military. The excerpt notes the goodwill that JROTC programs have developed for the military in communities around the country and the goal of the Air Force in garnering civilian interest. It also acknowledges that this reputation is delicate and ties cadet performance to the achievement of the Air Force mission overall.

Still, we found that discussion of civilian-military relations is quite limited in the 100- and 200-level JROTC textbooks. While they provide extensive detail about JROTC-related topics (e.g., military structures and operations), civics and history (e.g., institutions and processes and constitutional rights), and professional and personal skills development (e.g., leadership and good hygiene practices), direct connections between the military and civilian worlds are rarely made. The relationship between civilians and the military is not discussed directly; there is no description of the historical relationship, present status, or future vision for civilian-military relations. Rather, as we explain in the following section, the textbooks place a greater emphasis on promoting cadets' knowledge of citizenship and their maturation into civilians with a knowledge of and respect for the military.

To What Extent Does Content in Junior Reserve Officers' Training Corps Textbooks Focus on Civic Development?

Through their representation of the U.S. government and the rights and responsibilities of citizenship, the JROTC textbooks have the potential to shape the attitudes and actions of young people and, indirectly, others in the communities in which programs are located. Each service's JROTC branch includes content focused on foundational knowledge about the structure and function of the U.S. government. For example, the textbooks cover the contents and implications of the U.S. founding documents (e.g., Bill of Rights, U.S. Constitution) as well as the functions of Congress and similar material in considerable depth. More directly, all eight textbooks focus on the development of cadets as citizens by addressing the rights and responsibilities of citi-

zens. Many chapters note how cadets can contribute to the well-being of their communities. In this section, we describe the ways in which the textbooks discuss civic development.

Content focused on the development of cadets as citizens features prominently in each of the 100-level textbooks. Three of the textbooks (Air Force, Army, Navy) tie this concept specifically to the JROTC mission; the Marine Corps, in contrast, introduces citizenship topics prior to the discussion of the JROTC mission. The sections on citizenship discuss the rights and responsibilities of citizenship, particularly the civil and political rights of U.S. citizens and their civic responsibilities. For example, each 100-level textbook contains quotations from or full reprints of the Bill of Rights and explains what the text means. The textbooks also detail the responsibilities that citizens have toward their communities and country. Knowledge of rights and fulfillment of responsibilities are represented as crucial to holding the government accountable against abuses of power and contributing to the common good of society, respectively. The textbooks vary in their emphasis of the various responsibilities of citizens. For example, the Marine Corps 100-level textbook mentions volunteerism as the main responsibility that citizens have toward their communities. The Air Force (100-level), Army (200-level), and Navy (100-level) textbooks give examples of a fuller suite of responsibilities of citizens, such as obeying the law, serving on juries, voting in elections, and defending one's country.

The textbook chapters that make a direct connection between citizenship development and JROTC mission provide the most concrete representation of the envisioned role of cadets and the JROTC programs in the community. These chapters, consequently, exemplify the clearest pathway through which JROTC textbooks have the potential for JROTC programs to foster the relationship between civilians and the military: through the contributions of cadets to the well-being of their communities. Some of the chapters directly reference communities as the cadets' sphere of influence. For example, the beginning of the 100-level Navy textbook describes cadets' responsibility to themselves, their fellow cadets, and their community as follows: "The opportunities provided [in the NJROTC program] . . . are designed to assist you in improving yourself and your fellow cadets. . . . Moreover, your actions through community service will allow you to play a role in the development and betterment of your community and to discover what it really means to be a citizen" (Navy 100-level, *Introduction to the Navy Junior Reserve Officer Training Corps*, 2017, p. 5). The 100-level Air Force textbook speaks to the shared mission of JROTC programs across branches: "All JROTC programs develop cadets' citizenship, character, leadership traits, and responsibility. . . . While in the program you will learn a wide range of life skills for success in school, work, and family. . . . you will learn to be a productive and valued citizen in your community" (Air Force 100-level, *Leadership Education 100: Traditions, Wellness, and Foundations of Citizenship*, 2015, p. 7).

Overall, the JROTC programs' 100-level textbooks provide thorough coverage of the responsibilities of citizenship undergirded by foundational information on the U.S. government. Many chapters provide an application of this content by recommending actions that cadets can take in their communities. The focus on citizenship development in the 100-level textbooks introduces cadets to both the importance of fulfilling their responsibilities as citizens and the broad purpose and mission of the JROTC program, which is common across the branches: to "[motivate] young people to be better citizens" (Army 100-level, *Leadership Education and Training (LET 1)*, 2005, p. 4; see also USMC 100-level, *Marine Corps Junior Reserve Officers' Training Corps: Leadership Education 1*, 2002, p. 236; Air Force 100-level, *Leadership Education 100: Traditions, Wellness, and Foundations of Citizenship*, 2015, p. 7; Navy 100-level, *Introduction to the Navy Junior Reserve Officer Training Corps*, 2017, p. 4). In particular, through the rhetoric in textbooks and the required community service components of JROTC (documented in each textbook's appendix), cadets are encouraged to reflect on the way in which their actions in the community, both their deliberate service as well as their day-to-day comportment, will reflect on JROTC and the military.

If instructors use their service's 100-level textbooks in their entirety, cadets will see a thread woven throughout the chapters demonstrating the various ways in which they can, as citizens, positively influence

their communities. However, not all JROTC programs use the 100-level textbook as the first textbook in their sequence, and instructors may choose to focus their time and attention on particular chapters. So, this broad introduction to citizenship development, connection to the program mission, and recommendations regarding community engagement may not be the first JROTC content to which cadets are exposed or represent a consistent theme of their JROTC education.

Summary

The services take a varied approach to providing students with the full JROTC course sequence and the extent to which the curricular materials are standardized for JROTC participants in classrooms across the country. This variation suggests that not all students are exposed to the full scope of materials provided in the JROTC textbooks.

Through our analysis of the 100- and 200-level textbooks of Air Force, Army, Marine Corps, and Navy JROTC textbooks, we find that each book presents detailed descriptions of service-specific history and operations, JROTC activities, and foundational concepts of U.S. citizenship. However, the information is often siloed and presented without connection between military and civilian realms of operation. Even where the material lends itself to making such a connection, instructors would most likely need to help participants make the desired linkages.

The 100- and 200-level textbooks may provide cadets with a thorough understanding of their JROTC branch and the military. All services leverage the 100-level textbooks to collate the bulk of this material to cover foundational information regarding the codes of conduct, personal appearance and uniform, rank structure, and chain of command. The 200-level textbooks build on this knowledge by revisiting foundational material and providing additional branch-specific history and culture.

Information regarding the relationship between civilians and the military is quite limited in the 100- and 200-level JROTC textbooks. Cadets learn in detail about JROTC-related topics (e.g., military structures and operations), civics and history (e.g., institutions and processes and constitutional rights), and professional and personal skills development (e.g., leadership and good hygiene practices). However, civilian-military relations and working relationships are not described historically, nor is a future vision for such collaboration presented. The textbooks instead emphasize the development of cadets into civilians with a knowledge of and respect for the military.

Rather than directly addressing the past, present, or future relationship between civilians and the military, the textbooks focus on developing cadets' civic knowledge and establishing communities as their spheres of influence for fostering civilian perceptions of the military. The 100-level textbooks explain the foundations and functioning of the U.S. government, provide a thorough overview of the responsibilities of citizenship, and offer examples of ways in which cadets can contribute to their communities. Sometimes, passages focused on community involvement remind cadets that their actions in the community will reflect on JROTC and the military.

Recent analyses of JROTC suggest that most participants engage with the program for two or fewer years (Zaber et al., 2023). Given the variation in course sequencing, the flexibilities given to course instructions, and the relatively minimal, though potentially sufficient, availability of civics-related content in the 100- and 200-level textbooks, it is possible that individuals who participate in JROTC may not receive the amount of civics-focused content expected. Ensuring sufficient provision of civics instruction, especially in the first two courses a cadet enrolls in, may be critical to guaranteeing that JROTC meets its mission of instilling "in students in United States secondary educational institutions the values of citizenship, service to the United States, and personal responsibility and a sense of accomplishment" (U.S. Code, Title 10, Section 2031).

CHAPTER 4

Department of Defense Youth Programs, Military Presence, and Influence on Military Recruitment and Accessions in Served Communities

The DoD youth programs in our study—STARBASE, Youth ChalleNGe, and JROTC—serve more than 500,000 young people each year and in every state, the District of Columbia, and U.S. territories. These programs aim to provide young people with opportunities that help shape their educational attainment and their career aspirations. These programs are not intended as recruitment programs; the career aspirations of these young people may include civil service positions, STEM fields, or medical professions. Such careers are critical to society and may indirectly support the military through a dedication to supporting the military in civilian roles, improved research, and engaged and informed public servants.

Our conceptual framework, presented in Figure 1.1, illustrates the many ways in which DoD youth programs contribute to the communities they serve. Program participants receive curricula and programmatic opportunities that can influence their educational interests and attainment and their awareness and perception of the military. Communities served by these programs benefit through the improved educational outcomes of the participating youth, as well as through an increase in civic engagement. Additionally, these programs may provide a way of decreasing the civilian-military divide. One potential long-term outcome of communities served by these programs is an increase in military interest, which could result in increased numbers of applications and accessions; this increase need not be driven by those who participate in the program and could be an outgrowth of increased awareness and appreciation for military service within the community.

Our specific hypothesis is that if DoD youth programs function as intended, improving the trajectories of young people who participate and providing communities with positive impressions of the program, then military sentiment of those communities will be positive, and interest in the military as a potential career path and community members' propensity to serve will increase. Though these outcomes are not a comprehensive measure of the ways that the DoD youth programs might bridge the civilian-military divide or support an all-volunteer force, they provide one indication of the programs' effect on the communities they serve.

Because DoD youth programs are not recruitment tools for the military, using military applications and accessions as outcomes in our analyses may seem inherently contradictory. We would be remiss to not acknowledge that DoD has a vested interest in understanding recruitment and what aspects of its own operations support these efforts. However, we emphasize that we are not measuring the recruitment of DoD youth program participants and are, instead, measuring the recruitment of individuals in communities these programs serve. In fact, in the case of STARBASE and ChalleNGe, an increase in applicants and accessions from program participants would be very unlikely; STARBASE participants are too young to enter the military, and many ChalleNGe participants lack credentials and/or test scores to qualify for military opportunities (Wenger, Constant, et al., 2022).

This chapter presents the results of our analysis of the extent to which DoD youth programs expand or replicate military presence and whether communities served by these programs have different rates of military recruitment and accessions. We note again that recruitment and accessions are used herein as a proxy for military sentiment (see Figure 1.1). Our work is guided by three research questions:

1. What is the average military presence in a U.S. community, and how do communities with higher and lower levels of military presence differ from one another?
2. To what extent do DoD youth programs increase military presence in communities? How do communities served and not served by a DoD youth program differ from one another?
3. What is the association of DoD youth programs, above any military presence influence, with the long-term community outcomes of military recruitment and accession?

In the remainder of this chapter, we document the data sources required to answer these questions, provide a brief overview of the methods we leveraged for our analysis, and present the results of our analysis. Appendix C includes additional details on the data, methods, and results. An annex (available at www.rand.org/t/RRA2697-1) also provides tables, including model specification checks and supplemental analyses.

Overview of Data and Analytic Approach

In an ideal evaluation, we would randomly assign DoD youth programs to communities and track the behavior of all possible applicants and accessions in communities served and not served by these programs. This approach would ensure that communities served and not served by the programs are comparable on all observed and unobserved dimensions and allow us to discern the causal effect of programs on applications and accessions. This approach is not feasible, however, because DoD cannot randomly place these programs in communities. Each DoD youth program has requirements that establish the types of communities they must serve (e.g., JROTC programs prioritize serving Title I schools). These programs require facilities, which also influences where these programs are located (e.g., Youth ChalleNGe).

In light of these restrictions, we used the quasi-experimental technique of propensity score weighting to compare the number of applications and accessions in communities near DoD youth programs with communities that look similar in terms of characteristics but are not near DoD youth programs. This analysis allows us to understand whether the presence of DoD youth programs is associated with community-wide counts of applications and accessions. We defined communities as census tracts, and therefore all variables in our analyses are aggregated up to the census tract level.[1]

Data

We combined data from multiple sources, both publicly available and restricted access, for our analyses. The U.S. Census Bureau's American Community Survey (ACS) provides demographic, economic, and educational characteristics of all census tracts in the 50 states and District of Columbia. The Defense Manpower Data Center (DMDC) provides person-level data on FY 2017 active-duty service members, their dependents, retired service members, and applicants and accessors to the military. We obtained the physical address

[1] Census tracts are defined by the U.S. Census Bureau and are generally subdivisions of counties. They have a population that ranges between 1,200 and 8,000, with the aim of each tract having an optimal size of 4,000 people. This emphasis on population size causes the land area of census tracts to be smaller in more densely populated areas and larger in more sparsely populated areas. Tracts are generally stable over time but can split or merge due to large changes in population. There are roughly 73,000 census tracts in the United States today.

location for each Youth ChalleNGe, JROTC, and STARBASE program operating in 2019. Because there is limited turnover in program locations year over year, these data should closely reflect the program locations in FY 2017. We also obtained the physical address location for each recruiting station in the United States in FY 2017. Finally, we used the Defense Installations Spatial Data Infrastructure (DISDI) program's Military Installations, Ranges, and Training Areas (MIRTA) data to identify distances between census tracts and active military installations.

Calculating Military Presence

In Chapter 1, we discussed Burk's (2001) concept of *institutional presence* as a measure of an organization's centrality in a community. The more central an organization, the more frequent and longer contact citizens within a community are expected to have with that institution. Given our interest in measuring the outreach of DoD youth programs and the fact that these programs are not randomly placed in communities or evenly distributed throughout the country, any measure of program outreach needs to account for the extent to which the military is already present and central in a community. Thus, we begin our analysis with a calculation and examination of military presence in communities with and without a DoD youth program.

We geocoded the addresses of active-duty service members, their dependents, and retired service members; this process assigned a census tract to each person's address. We then created census-tract level counts of each of these populations and used those counts, along with the ACS counts of the tract population and veteran population, to calculate a tract's civilian, active-duty, active-duty dependent, non-retired veteran, and retired veteran population. We consider the latter four populations to be military-connected persons.

Military presence is calculated via a spatial exposure index (Reardon and O'Sullivan, 2004), which measures the degree to which civilians interact with military-connected individuals. The spatial exposure index allows military-connected individuals within a 30-mile radius of the tract center to contribute to military presence, with individuals closer to the tract center given more weight. The final measure ranges from zero to one, where zero indicates that civilians live in areas with no military-connected individuals within a 30-mile radius and one indicates the presence of only military-connected individuals within the 30-mile radius.

Defining Applications and Accessions

We have three outcomes of interest: application starts, application continuations, and accessions. Application starts include any individual who has interacted with a Military Processing Station and who has a valid military service code associated with their application. Application continuations are a subset of application starts and include those individuals who also have a valid Armed Forces Qualifying Test (AFQT) score, a recent medical assessment, and education status information. These three additional data points are required components of an application to serve in the armed forces. Thus, having these components on file demonstrates an effort to access into the military in the near future. Finally, accessions include those individuals who have a valid AFQT score, medical assessment, education status information, and a code indicating the branch and component into which they enlisted.[2] These four components are required to complete the accession process.

All applications and accessions occurred in FY 2017. Only individuals applying or accessing to the enlisted, active-service components of the Air Force, Army, Marine Corps, or Navy were included. Our sample is also limited to those individuals without prior military service.

[2] Accessions are not a subset of applications. An individual may have applied in FY 2017, but their accession may have occurred at later date. Conversely, an individual may have accessed in FY 2017 but applied previously.

Defining Census Tracts Served and Not Served by Department of Defense Youth Programs

In identifying communities served and not served by DoD youth programs, we first connected each program to its respective census tract and calculated the straight-line distance between each tract's center and the closest DoD youth program. We then identified tracts served and not served by DoD youth programs according to their distance to the nearest program. In urban communities, we define tracts within 1.5 miles of a program as served (i.e., a treated tract) and tracts without a program within 1.5 miles as not served (i.e., a comparison tract). We repeat this process in suburban and rural communities using a distance of 6 and 17 miles, respectively, to create treated and comparison tracts. We chose to define treatment differently and analyze tracts separately by urbanicity because an investigation of our data indicated substantial differences in community characteristics between urban, suburban, and rural communities. Please see Appendix C for more details on these analysis decisions.

Our definition of treatment includes communities that have a program within its boundaries as well as surrounding communities within the relevant distances. There are a total of 73,391 communities in our sample. Of these, 18,536 communities are defined as being served (treated) by a DoD youth program, with about 20 percent of these communities (i.e., 3,494) containing a program within its boundaries and the remaining 80 percent of communities being within the defined distance from a DoD youth program. Approximately 25 percent of census tracts in the United States are considered treated for our purpose; this figure highlights the relatively small number of communities in the country that contain, or are located near, DoD youth programs.

We provide an illustration of the two types of communities that make up our treated communities as well as the comparison communities on which our analysis relies. A map of Bexar County, Texas, home of San Antonio, is provided in Figure 4.1. The red border represents the boundaries of Bexar County. Each census tract, or community, within Bexar County is outlined in light gray. The blue tracts represent treated communities where a program, represented with a red dot, is within its boundaries. The green tracts represent treated communities that fall within the appropriate distance of the programs. The white tracts represent the comparison communities. In the next section we present a brief overview of our analytic approach that relies on these treatment and comparison communities.

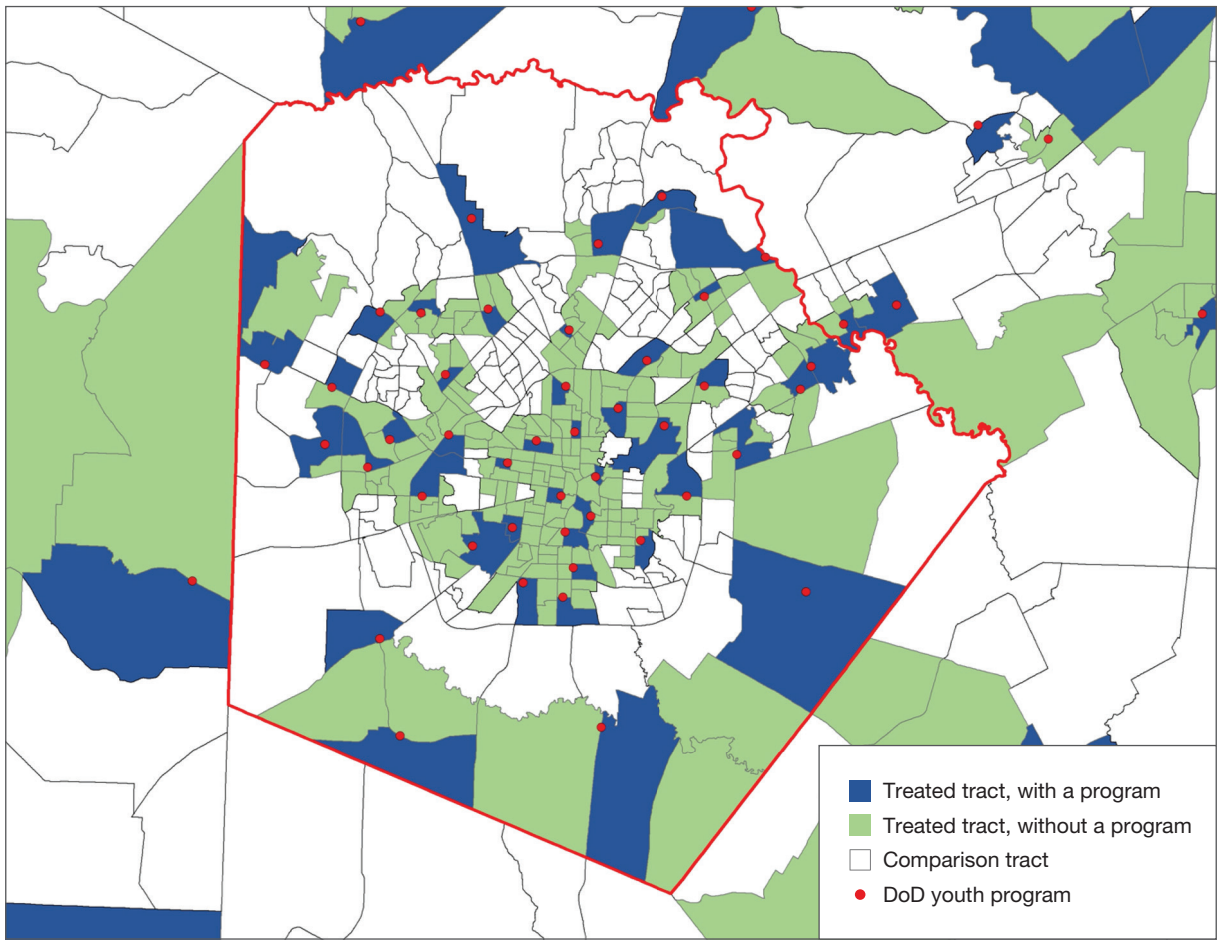
Analytic Approach

To answer our first research question—What is the average military presence in a U.S. community, and how do communities with higher and lower levels of military presence differ from one another?—we analyzed our measure of military presence. The overall average across the country will provide the average military presence in the United States. We then split tracts into quartiles by military presence and looked at the difference in characteristics among these groups of tracts. That is, we ranked the tracts from least to greatest military presence, split the sample into four equally sized groups, and compared characteristics across these groups of tracts.

To answer our second research question—To what extent do DoD youth programs increase military presence in communities? How do communities served and not served by a DoD youth program differ from one another?—we looked at how our treatment definition intersects with military presence. Here, we again split the sample into quartiles by military presence. In each quartile, we calculated the number of DoD youth programs. Comparisons across quartiles will provide an indication of how programs are distributed across communities with varying amounts of military presence. To understand how communities served by DoD youth programs differ from those that lack them, we compared the tract characteristics across treated and untreated tracts.

FIGURE 4.1

Communities Served and Not Served by Department of Defense Youth Programs in Bexar County, Texas



For our third research question—What is the association of DoD youth programs, above any military presence influence, with the long-term community outcomes of military recruitment and accession?—we employed the quasi-experimental technique of propensity score weighting, where comparison tracts are weighted to look statistically similar to treatment tracts on observable characteristics. In this manner, communities in treatment and comparison tracts look similar in all observable ways, and we could more confidently attribute differences in outcomes to the presence of DoD youth programs and not to differences in the communities. After this statistical adjustment, our models estimated the average difference in outcomes between the treatment and comparison communities. Our analytic modeling was run separately for urban, suburban, and rural tracts, and we used a fixed-effect meta-analytic average to calculate a weighted, overall estimate for the United States. In this average, the urban tract estimate was weighted more heavily, given that these tracts make up 70 percent of all U.S. census tracts and the estimates were more precise.

Limitations

The advantage of the propensity score weighting approach is that the technique makes treatment and comparison tracts as similar as possible. With the detailed data from the ACS and our measure of military presence, we are likely accounting for many of the major factors that could affect our results. However, the main

limitation to any propensity score weighting approach is that we can only account for the characteristics we observe. We do not consider our results strictly causal, because there could be other pertinent tract characteristics that we cannot account for in our models that could confound our results. For example, there could be unobserved tract characteristics that are associated with military recruitment and accessions, as well as with the types of tracts that are served by DoD programs. This omitted characteristic would make our results inaccurate because our results would contain not only the true effect of the programs but also differences in outcomes because of these unobserved differences in communities. For additional discussion on this point, see Appendix C. Our results suggest that simple comparisons of treatment and comparison tracts overstate the effects of DoD youth programs. Thus, while we believe that our propensity score weighting results are much closer to the true effect of DoD youth programs, they, too, may be overstated.

Furthermore, we denote a community (i.e., a census tract) as either exposed to a DoD youth program or unexposed based on the distance between the nearest DoD youth program and the census tract's center. This approach places a hard boundary on exposed communities based on geography, and it is possible that residents on either side of a census tract boundary will be given different treatment conditions despite their close geographic proximity to each other. The placement of programs is also unlikely to be at the tract center, and the shape of a tract is often irregular, such that people are not uniformly placed around tract centers in all directions. This means that, within tracts, people can be close to a DoD youth program but reside in a tract that is marked as unexposed and vice versa. Thus, the hard lines of treatment interact with the distribution of program locations and tract centroids in complex ways. These interactions are also likely to be larger in suburban and rural communities, where the census tracts are larger in geographic area. However, these interactions could affect our estimates only if they are systematic and related to applications and accessions through channels not accounted for by the characteristics in our model. Given the rich set characteristics we included in our models, bias from these interactions may be less likely.

Results

What Is the Average Military Presence in a U.S. Community, and How Do Communities with Varying Levels of Military Presence Differ from One Another?

We are interested in both the average military presence in each U.S. community and whether communities with varying amounts of military presence differ from each other in terms of demographic, educational, and economic characteristics. The military presence of the average census tract is 7.5 percent. Tracts range in military presence from 0 to 56.7 percent, with 95 percent of tracts falling under 14.1 percent military presence. In other words, it is atypical for a community to have very high military presence; in most communities, the vast majority of people are not military-connected.

We split the sample of census tracts by quartile of military presence to examine how these communities differ from each other. In Table 4.1, the bottom quartile (i.e., quartile 1) represents the 25 percent of tracts with the lowest military presence, quartile 2 represents the 25 percent of tracts with the next highest military presence, and so forth. We then look at the average value of select tract characteristics among tracts in each presence.

We found that most tract characteristics varied across quartiles of military presence, though the third quartile did not always align with the trend across the other quartiles. In moving from the first quartile (lowest military presence) to the fourth quartile (highest military presence), the overall population count and the count of people between the ages of 15 and 29 decreased slightly, with 15- to 29-year-olds making up approximately one-quarter of the population in tracts across the quartiles. Communities in quartiles with higher military presence had increasing proportions of the population identifying as White and correspond-

TABLE 4.1
Tract Population Characteristics by Quartile of Military Presence

	Quartile 1	Quartile 2	Quartile 3	Quartile 4
Range of military presence	0% to 5.3%	5.3% to 6.8%	6.8% to 8.4%	8.4% to 56.7%
Tract characteristics				
Total population count	4,648	4,485	4,251	4,356
Population count of 15- to 29-year-olds	1,201	1,132	998	1,014
Percentage White	41.5%	64.0%	74.6%	68.2%
Percentage Black	15.6%	15.6%	11.1%	11.5%
Percentage Hispanic	30.3%	13.2%	8.6%	13.0%
Percentage with high school diploma/GED or less	40.7%	39.1%	44.1%	41.8%
Percentage with some college	25.1%	28.9%	30.2%	31.6%
Percentage with college degree or more	34.2%	32.0%	25.7%	26.6%
Percentage with income below poverty level	16.6%	16.0%	15.1%	15.3%
Percentage urban	93.1%	79.6%	53.3%	60.2%
Percentage suburban	4.5%	15.1%	32.5%	25.7%
Percentage rural	2.4%	5.2%	14.2%	14.1%
Population density (population per square mile)	11,202	3,445	2,311	2,424

ing decreases in the proportion of the population identifying as Black or Hispanic. We saw that the proportion of residents with a high school degree or less remained relatively stable across quartiles, that the proportion of residents with some college increased with higher levels of military presence, and that the average proportion of the population with at least a college degree decreased with higher levels of military presence. We saw relatively stable rates of the proportion of households with incomes below the poverty line across the four quartiles. The most notable differences were in the urbanicities of the communities. Communities in the first quartile of military presence were almost exclusively urban communities (93 percent), while communities in the fourth quartile had the broadest mix of urbanicities, with tracts in that quartile being 60 percent urban, 25 percent suburban, and 14 percent rural. There was a corresponding large shift in population density (defined as people per square mile). Tracts with low military presence had a much higher density, which is expected, given that urban communities tend to be more densely populated.[3]

These results suggest that communities with varying levels of military presence also vary in other characteristics. The greatest variation is found in the racial and ethnic mix of the community, the urbanicity of the community, and the population density of the community. Smaller variation is found in population counts, educational achievement, and poverty level of the community. Military presence and these other community characteristics are part of a complex ecosystem that produces support for the military and shapes where DoD youth programs are placed. In turn, the interplay between military presence, DoD youth programs, and other community characteristics in this ecosystem influences a young person's interest in a military career. These

[3] In Table C.3, we present the results of regressing each ACS variable in Table 4.1 on indicators for the military presence quartiles. Tests show that, for all ACS variables, the average ACS characteristics across all four quartiles are not equal. All tests are significant below the 1-percent level.

results highlight the need to carefully account for military presence and other community characteristics when estimating the effect of DoD youth programs on military applications and accessions.

To What Extent Do Department of Defense Youth Programs Increase Military Presence in a Community, and How Do Communities Served and Not Served by a Department of Defense Youth Program Differ from One Another?

DoD youth programs serve to provide support to local communities and to create a connection between the military and the civilians of a community. In order for these new exposures and connections to be created, it is important that these programs be placed in ways that do not perfectly replicate existing military presence. In other words, for DoD youth programs to increase military presence in the United States, they need to be placed in communities with varying levels of military presence rather than only in communities with high military presence. In our data, we were looking to see the extent to which programs were located across the military presence quartiles or were concentrated at the higher end of the presence spectrum.

To understand how DoD youth programs contribute to military presence in a community, we looked at the military presence of the census tract in which DoD youth programs are found and tabulated how many programs were in tracts that fell into each quartile of military presence. There are 3,517 DoD youth programs in our data,[4] and Table 4.2 presents how they are distributed among the quartiles of military presence. More programs are found in tracts that have a higher military presence; 1,238 programs (35.2 percent) reside in census tracts that are in the fourth quartile of military presence. Notably, however, 653 programs (18.6 percent) are found in tracts that fall into the first quartile of military presence, and 797 programs (22.7 percent) are in census tracts in the second quartile of military presence. This distribution suggests that DoD youth program placements have the potential to create new exposures to the military and do not perfectly replicate existing military presence in the communities they serve.

Beyond examining the military presence in communities where DoD youth programs are placed, we looked at how communities that are and are not served by DoD youth programs differ from one another. We present descriptive statistics in Table 4.3. Average characteristics of the two types of communities were compared with t-tests to detect statistically significant differences between the two types of communities. We observed substantial differences in characteristics between communities served and not served. Communities that are served by DoD youth programs have slightly more military presence, a finding that is consistent with previous analyses. Served communities also have slightly more 15- to 29-year-old residents.

TABLE 4.2
Count of Department of Defense Youth Program Locations, by Military Presence Quartile of Placement Tract

Military Presence Quartile	STARBASE	Youth ChalleNGe	JROTC
First	3	3	647
Second	11	7	779
Third	10	4	815
Fourth	29	21	1,188

[4] There were 3,547 DoD youth programs in our data. Thirty programs were removed from this tabulation. Seven of these programs (four STARBASE and three JROTC) are in tracts with no residential population, and military presence cannot be calculated. Twenty-three programs are in tracts in which there is not enough information to calculate a military presence measure (i.e., zero non-military-connected persons).

TABLE 4.3
Characteristics of Communities Served and Not Served by Department of Defense Youth Programs

	Not Served by Programs	Served by Programs	Statistically Different?
Military presence	7.4%	7.8%	Yes
Total population count	4,460	4,355	Yes
Population count of 15- to 29-year-olds	1,077	1,117	Yes
Percentage White	67.0%	47.7%	Yes
Percentage Black	10.7%	21.3%	Yes
Percentage Hispanic	14.1%	22.5%	Yes
Percentage with high school diploma/GED or less	39.8%	46.0%	Yes
Percentage with some college	29.3%	28.1%	Yes
Percentage with college degree or more	30.9%	25.9%	Yes
Percentage with income below poverty level	14.3%	19.9%	Yes
Percentage urban	70.9%	73.4%	Yes
Percentage suburban	20.1%	17.7%	Yes
Percentage rural	9.0%	8.9%	No
Population density (population per square mile)	3,984	7,250	Yes

NOTE: The sample includes tracts in the 50 states and the District of Columbia. Tract characteristics are tract-level means taken from the U.S. Census Bureau ACS. A community is defined as being served by a youth program if the census tract is within one mile of a program in urban tracts, five miles of a program in suburban tract, and nine miles of a program in rural tracts. All other tracts are defined as not being served by a youth program.

The overall populations of served communities are slightly less than in non-served communities, which implies that communities served by the programs have a higher proportion of 15- to 29-year-olds. Served communities also have a substantially lower proportion of individuals identifying as White (47.7 percent in served communities and 67.0 percent in non-served communities) and a greater proportion of the population who identify as Black (21.3 percent in served communities and 10.7 in non-served communities) or Hispanic (22.5 percent in served communities and 14.1 percent in non-served communities). Served communities have less educational attainment. The proportion of the population with a high school degree or less is larger, while the proportion of the population with some college or a college degree or more is smaller. Communities served by DoD youth programs also have a larger proportion of the population with incomes below the poverty line. Finally, communities served by the programs have a higher proportion of urban tracts (73.4 percent in served communities and 70.9 percent in non-served communities) and a lower proportion of suburban tracts (17.7 percent in served communities and 20.1 percent in non-served communities) and rural tracts (8.9 percent in served communities and 9.0 in non-served communities). With the greater proportion of urban tracts, served communities have a greater population density (7,250 people per square mile in served communities and 3,948 people per square mile in non-served communities). All these differences are large enough for us to detect statistically.

These differences confirm that the DoD youth programs are not evenly distributed across communities. These findings also highlight the fact that we cannot merely compare outcomes among communities served and not served by programs. Rather, we must statistically adjust for these observed differences to make com-

munities comparable and to detect a more accurate estimate of DoD youth programs' influence on the communities they serve.

What Is the Association of DoD Youth Programs, Above Any Military Presence Influence, with the Long-Term Community Outcomes of Military Recruitment and Accession?

We seek to understand the extent to which DoD youth programs influence the communities they serve and the civilian-military divide in particular. Our data enabled us to examine the association between programs and long-term community interest in and support for the military, as proxied by community-level applications to and accessions into the military. We hypothesize that the activities of the DoD youth programs affect the attitudes not only of the youth who participate but also their peers and the larger community. Any positive change in attitudes toward the military may ultimately be reflected in greater interest in joining the military.

Our prior analyses make clear that these programs are not placed in communities at random. Rather, the communities that house these programs differ in the level of military presence and other characteristics of their residents. Military presence is likely to have a substantive relationship with both the establishment of DoD youth programs and the community's attitudes toward the military. Similarly, demographic, educational, and economic characteristics of a community may affect community attitudes toward the military, as well as the placement of youth programs (Leal, 2005; Butler and Johnson, 1991). Thus, we investigated how DoD youth programs affect the outcomes of interest, above any influence of military presence already in a community, after statistically adjusting for observed differences in among communities.

Recall that, to this end, we compared the number of application starts, application continuations, and accessions in communities served by DoD youth programs ("treated communities") with communities that were not served ("comparison communities"). Our models provided us with the average difference in these outcomes between groups, after we statically accounted for differences in observable characteristics. We looked separately at urban, suburban, and rural communities and calculated one overall average from these three estimates.

Our models provided effects in the form of an incidence rate ratio (IRR). An IRR is defined in this study as the ratio of expected counts of applications and accessions in FY 2017 in treated tracts relative to those expected counts in comparison tracts in FY 2017. If DoD youth programs increase applications or accessions, then we would expect the ratio to be greater than 1. For example, if treated tracts saw 1,020 accessions and comparison tracts saw 1,000 accessions in FY 2017, the IRR would be 1,020/1,000 = 1.02. Furthermore, our models attributed the extra 20 accessions to the presence of the DoD youth programs, which implies that they increased accessions by 2 percent compared with the comparison tracts. Appendix C and an annex (available at www.rand.org/t/RRA2697-1) provide more detail on our modeling approach, including model specification checks.

Main Results

Table 4.4 presents the results of the analysis for each outcome, by urbanicity of tract and the overall meta-analytic average across all three types of tracts. Overall, the IRR among all tracts for application starts was 1.025. This means that over the course of FY 2017, treated communities experienced 2.5 percent more application starts compared with comparison communities. Similarly, the IRR for application continuations was 1.028, which implies that treated communities experienced 2.8 percent more application continuations com-

TABLE 4.4

Department of Defense Youth Programs and Military Applications and Accessions, Incidence Rate Ratios

Outcome	All Tracts	Urban Tracts	Suburban Tracts	Rural Tracts
Application Starts	1.025**	1.023**	1.027	1.051
Application Continuations	1.028**	1.027**	1.038*	1.028
Accessions	1.026**	1.019*	1.051*	1.060

NOTE: Each cell contains an estimate from a negative binomial model that includes covariates in Tables C.5 through C.7 (available in an annex at www.rand.org/t/RRA2697-1) and propensity score weights (PSWs), expressed as an IRR. The tables also contain the standard errors of the untransformed estimates. Separate models were estimated by each type of urbanicity. The estimate among all tracts is a meta-analytic average of the results among the three urbanicities.

** = $p < 0.01$.

* = $p < 0.05$.

pared with comparison communities. Finally, the IRR for accessions was 1.026, which implies that treated communities experienced 2.6 percent more accessions compared with comparison communities.

These overall differences were generally driven by urban and suburban communities. Urban treated communities experienced 2.3 percent, 2.7 percent, and 1.9 percent increases in application starts, application continuations, and accessions, respectively, over their counterpart comparison communities. Estimates were slightly higher in suburban communities, which experienced 3.8 percent and 5.1 percent increases in application continuations and accessions, respectively. The estimate for application starts in suburban communities is positive but not precise enough to detect statistically because of the smaller number of suburban communities. Similarly, the estimates in rural communities can be as large, if not larger, than the suburban and rural communities, but the limited number of rural communities in the United States, and thus our analyses, precluded us from statistically detecting the effects of DoD youth programs in these communities.

We estimated the number of application starts, application continuations, and accessions that our models indicated that treated communities would have experienced in the absence of a DoD youth program to better contextualize our results. This analysis will help us understand how many fewer applications and accessions DoD would have expected had the programs not existed or, conversely, how many more applications and accessions DoD received in areas where the programs existed. We show this in Table 4.5. The 1.025 IRR among all tracts for application starts discussed previously in this section implies that DoD received approximately 1,900 additional application starts in FY 2017 in areas where the programs were present. Put another way, our models estimate that DoD would have seen about 1,900 fewer application starts in FY 2017 had the programs not existed. Similarly, the 1.028 IRR estimate for application continuations implies that DoD saw 1,550 more application continuations, and the 1.026 IRR for accessions implies that DoD saw 1,020 more accessions because of the presence of the programs in FY 2017. Recall that 70 percent of communities in our sample are considered urban and that these communities generally hold more people. This unequal distribution of communities and people among communities means that the additional applications and accessions came largely from the urban areas. Even though the association of DoD youth programs and outcomes is smaller in urban areas, these communities produced more applications and accessions simply because there are more of these communities and more people live in them.

TABLE 4.5
Estimates of Additional Military Applications and Accessions Received in Communities Served by DoD Youth Programs

Outcome	Actual Count in Served Communities	Predicted Count Had Programs Not Existed	Count Attributed to Presence of Programs (Actual Minus Predicted)
Application starts	78,630	76,712	1,918
Application continuations	56,712	55,167	1,545
Accessions	40,362	39,339	1,023

NOTE: Tabulations in column 1 were created by summing the outcome across all treated communities in urban, suburban, and rural areas. Tabulations in column 2 were taken by dividing total counts by the meta-analytic effect on the outcome. Column 3 is the difference between columns 1 and 2.

Secondary Outcomes

We conducted secondary analyses to explore the association between DoD youth programs and specific types of applications and accessions. We looked at high-quality and technical eligible applicants and accessors, as well as the applications and accessions of people from historically marginalized populations. We defined these groups as follows:

- A "high-quality" individual holds a Tier-1 education credential and obtained an AFQT score that is at or above the 50th percentile.[5]
- A "technical eligible" individual holds a Tier-1 education credential and obtained an AFQT score that is at or above the 80th percentile.
- A recruit from a historically marginalized population is any individual reporting a race/ethnicity other than non-Hispanic White. This includes individuals who identify as Black, Asian, Hawaiian Native or Pacific Islander, American Indian, or Alaskan Native and individuals who identify as Hispanic, regardless of race.

Note that we could not look at application starts as an outcome for high-quality or technical eligible individuals because our application start definition does not require complete education information or a recorded AFQT score.

Table 4.6 presents the association between DoD youth programs and these subsets of applications and accessions, again presented as IRRs. The first column of outcomes shows that, overall, DoD youth programs are associated with a statistically significant 2.0 percent increase in high-quality application continuations. Estimates of the association between programs and high-quality accessions and technical eligible applications and continuations are smaller and not statistically significant. DoD youth programs are associated with application starts, application continuations, and accessions for individuals from historically marginalized populations by 2.8 percent, 3.9 percent, and 3.0 percent, respectively.

Looking at associations between high-quality application continuations and accessions by urbanicity, we detected relationships only in suburban communities. In communities with programs, high-quality application continuations were 5.5 percent higher, and accessions were 5.2 percent higher. Relationships were too small to detect in urban communities, and while estimates were about the same size in rural communities, the smaller number of communities prevented us from statistically detecting effects. For technical eligible

[5] A Tier-1 education credential requires that an individual completed high school or received an equivalent diploma. Individuals who apply while still attending high school are considered to have a Tier-1 education credential.

TABLE 4.6

Department of Defense Youth Programs and Secondary Military Applications and Accessions, Incidence Rate Ratios

Outcome		All Tracts	Urban Tracts	Suburban Tracts	Rural Tracts
High quality	Application continuations	1.020*	1.012	1.055*	1.040
	Accessions	1.009	0.997	1.052*	1.054
Technical eligible	Application continuations	1.017	1.014	1.033	1.000
	Accessions	1.002	1.002	0.989	1.060
Historically marginalized populations	Application starts	1.028**	1.027**	1.038	1.036
	Application continuations	1.039**	1.037**	1.073*	1.001
	Accessions	1.030**	1.027*	1.039	1.129

NOTE: Each cell contains an estimate from a negative binomial model that includes covariates in Tables C.8 through C.11 (available in an annex at www.rand.org/t/RRA2697-1) and PSWs, expressed as an IRR. The tables also contain the standard errors of the untransformed estimates. Separate models were estimated by each type of urbanicity. The estimate among all tracts is a meta-analytic average of the results among the three urbanicities.

** = $p < 0.01$.

* = $p < 0.05$.

applications and accessions, we were unable to detect associations within any community type; most estimates were small.

Effects were more robust on outcomes in individuals from historically marginalized populations. In historically marginalized urban communities, DoD youth programs are associated with 2.7 percent higher application starts. Again, the size of the suburban and rural community samples precluded us from statistically detecting relationships. Programs are also associated with 3.7 percent higher application continuations in urban communities and 7.3 percent higher application continuations in suburban communities; there was no effect seen in rural communities. Finally, programs are associated with a 2.7 percent higher level of accessions from historically marginalized urban communities. Though relationships were of the same or larger magnitude in suburban and rural communities, the smaller number of these communities likely precludes us from statistically detecting associations.

Table 4.7 translates the overall relationships seen in the high-quality and historically marginalized populations into estimated counts of additional applications and accessions associated with the presence of DoD youth programs in FY 2017. We estimate that DoD saw about an additional 710 high-quality application continuations due to the presence of the programs. Furthermore, we estimate that DoD saw approximately 1,270 additional application starts, 1,200 additional application continuations, and 670 additional accessions from individuals from historically marginalized populations because of the programs.

Our results from the analyses of these secondary outcomes indicate that DoD youth programs may be helping to ensure that the military has a pool of applications and accessions that is diverse and has the skills needed to the support the needs of an evolving military. These programs are associated with more application and accessions overall, as well as with "high-quality" individuals who have the credentials to assume roles that demand higher-level skills and with recruits from historically marginalized communities who can help diversify the armed forces. While it is possible that programs are also associated with "technical eligible" applications and accessions, we are not able to statistically detect such an effect.

TABLE 4.7

Estimates of Additional Military Applications and Accessions Received, from High-Quality Applicants and Persons from Marginalized Populations, in Communities Served by DoD Youth Programs

Outcome		Actual Count in Served Communities	Predicted Count Had Programs Not Existed	Count Attributed to Presence of Programs (Actual Minus Predicted)
High quality	Application continuations	36,300	35,588	712
Marginalized populations	Application starts	46,705	45,433	1,272
	Application continuations	31,959	30,759	1,200
	Accessions	22,961	22,292	669

NOTE: Tabulations in column 1 were created by summing the outcome across all treated communities in urban, suburban, and rural areas. Tabulations in column 2 were taken by dividing total counts by the meta-analytic effect on the outcome. Column 3 is the difference between columns 1 and 2.

Community Characteristics Moderating Department of Defense Youth Program Relationships

We are also interested in understanding whether some community characteristics are associated with higher or lower DoD youth program relationships. In particular, we are interested in whether a community's level of military presence, education (i.e., proportion of individuals with a high school degree or less), or poverty (i.e., proportion of individuals below the poverty line) is associated with different youth program relationships. For example, youth programs may have particularly strong associations with outcomes in communities where there is little other military presence because they can serve as a main conduit of exposure to the military. Conversely, youth programs may have particularly strong associations with outcomes in communities with high military presence if the sustained military presence in the community amplifies the effectiveness of the youth programs. Education levels and poverty levels may similarly interact with youth programs to produce differential relationships.

To understand these relationships, we sorted communities by quartiles of military presence, education, and poverty. We then estimated the association between DoD youth programs in these communities and our outcomes of interest for each quartile. We marked an estimate as statistically significant if a quartile's estimate was statistically distinguishable from the estimate of quartile 1. Table 4.8 presents the results in IRRs. Looking at military presence, we found that the associations of DoD youth programs with outcomes tend to be larger in areas with higher military presence. For example, the association between the program and application starts in communities with the highest levels of military presence (quartile 4) is 1.038, while the association in communities with the lowest levels of military presence (quartile 1) is 1.002. Similarly, the association between the program and accessions in communities with the highest levels of military presence is 1.049, while the association in communities with the lowest levels of military presence is 1.003. For application starts and accessions, we did not have the statistical power to tease out differences in associations for those communities in quartiles 2 and 3. Similarly, though the estimate of association between the program and application continuations continually increases with each quartile of military presence, we did not have the power to statistically distinguish differences in effects. Thus, at best, we see suggestive evidence that programs are related to higher rates of applications and accessions in communities with higher military presence.

In terms of the proportion of communities with a high school degree or less, no estimate is statistically different from the estimate in quartile 1. However, we see a pattern in application starts and continuations in which associations increase in communities that have a higher proportion of the population with a high

TABLE 4.8
How Department of Defense Youth Program Associations Vary by Community Characteristics

		Application Starts	Application Continuations	Accessions
Military presence	Quartile 1	1.002	1.014	1.003
	Quartile 2	1.036	1.031	1.023
	Quartile 3	1.029	1.029	1.024
	Quartile 4	1.038*	1.040	1.049*
Proportion of community with high school degree or less	Quartile 1	1.016	1.015	0.988
	Quartile 2	1.017	1.022	1.034
	Quartile 3	1.027	1.028	1.039
	Quartile 4	1.037	1.045	1.040*
Proportion of community with income below the poverty line	Quartile 1	1.031	1.037	1.027
	Quartile 2	1.013	1.010	1.008
	Quartile 3	1.025	1.030	1.028
	Quartile 4	1.026	1.035	1.039

NOTE: Each set of rows contains an estimate from a negative binomial model that interacts indicators of quartiles of each row's measure (e.g., military presence) with the DoD youth program treatment variable. All models include covariates in Tables C.12 through C.14 (available in an annex at www.rand.org/t/RRA2697-1) and PSWs, and results are expressed as an IRR. The tables also contain the standard errors of the untransformed estimates. Each cell contains the total treatment effect for that quartile (interaction term added to main effect). Separate models were estimated by each type of urbanicity. The estimate among all tracts is a meta-analytic average of the results among the three urbanicities.

* $p < 0.05$ and indicates a significantly different effect compared with the effect of quartile 1, the reference quartile.

school degree or less (i.e., communities with lower education levels). The pattern is less clear with accessions, though here estimates are statistically greater in communities with the greatest proportion of high school degrees or less (1.040) compared with communities with the smallest proportion (0.988).

Finally, we see that there is no clear relationship between the programs and the proportion of the community with incomes below the poverty level. Again, no estimate is statistically distinguishable from the effects seen in quartile 1, which further limits our ability to draw any conclusions about this relationship.

In short, our ability to draw firm conclusions from these analyses was limited by statistical power. The clearest relationship we see is some limited statistical evidence that the association between programs and applications and accessions increases as military presence in a community increases. This relationship suggests that DoD youth programs may be more effective at changing community relationships when they can build off an existing strong military presence in the community.

Summary

This chapter presented the results of analyses of how DoD youth programs expand or replicate the military presence in communities. By combining census data and data on military applicants and enlistments, we were able to track one measure of the long-term influence of DoD's youth programs on communities. Key findings from our analyses are as follows:

- Military presence is relatively low in most communities; the average presence is 7.5 percent, and 95 percent of tracts fall under 14.1 percent. Therefore, in a typical tract, about 1 in every 13 people is connected

to the military. The most connected tracts are typically located outside urban areas, with relatively low population density. These tracts are somewhat less diverse than others (in terms of race/ethnicity), and people in these tracts typically have not completed college.

- DoD youth programs are somewhat more common in the communities with the most substantial military presence, but many programs are located in areas with lower-than-average military presence.
- Communities with DoD youth programs have more military applications and more military accessions than similar communities without DoD youth programs. After accounting for a variety of factors, the difference is on the order of 2.5–2.8 percent.
- The differences in applications and accessions appears to be driven by urban and suburban areas. Our estimates imply that, during FY 2017, DoD saw about 1,900 additional applications and more than 1,000 additional accessions than would have been the case if there were no youth programs.
- The presence of DoD youth programs is associated with higher levels of historically marginalized applicants and accessions (where *historically marginalized* is defined as those who identify as Black, Asian, Hawaiian Native or Pacific Islander, American Indian or Alaska Native, or Hispanic). These effect sizes are on the order of 3 percent.
- In suburban areas, DoD youth programs are associated with higher levels of high-quality applicants and accessions (where *high-quality* is defined as holding a Tier-1 education credential and scoring at or above the 50th percentile on the AFQT). These effect sizes are on the order of 5 percent.
- We find some evidence that the associations between DoD youth programs and outcomes of interest are larger in communities with a more substantial military presence. This suggests that DoD youth programs may operate best in communities with substantial additional military presence. Thus, military presence and infrastructure may assist the programs in reaching their potential.

In Chapter 5, we summarize the overall conclusions from this research and provide a series of recommendations.

CHAPTER 5

Conclusions and Recommendations

Youth programs funded by DoD are intended to serve as a social support, developing connections between local communities across the country and the U.S. military community. In this way, they can serve to bridge the civilian-military divide. To date, there has been no single approach to estimating the effectiveness or even the extent of the outreach provided by DoD youth programs. This report summarizes the results of three distinct lines of research analyses:

- **Awareness and perceptions:** We focused specifically on school leaders' awareness and perceptions of DoD-funded youth programs.
- **Curriculum:** This line of inquiry involved an examination of JROTC curricula, particularly the textbooks of the first two courses in the JROTC course series, and how they generate discussion and support learning about civic engagement, community outreach, and civilian-military relations.
- **Military presence and influence:** We explored the extent to which the presence of DoD youth programs contributes to outcomes such as military recruitment and accessions among community members.

We chose these three areas because each addresses a different aspect of the DoD youth programs' outreach. These analytic efforts can be thought of as bringing into focus some of the key outreach characteristics of these programs. (See Figure 1.1 for a model that describes the functioning of DoD's youth programs and the ways in which these programs interact with and influence the communities they serve.) Here, we summarize the overarching conclusions from our analysis and present a series of actionable recommendations that are drawn from our results.

Conclusions

School leaders responding to RAND's standing ASLP survey indicated that providing civics education can be a challenge, especially in higher-poverty schools. Our data suggest that most school communities are supportive of the military, and a majority also support DoD-funded youth programs in schools. DoD's JROTC program was well recognized by school leaders throughout the country; leaders of the schools with programs had positive impressions of the program's benefits for participants. School leaders were less aware of Youth ChalleNGe, but those who were familiar with the program saw it as beneficial for participants.

Our discussions with service representatives and analyses of the JROTC curriculum materials indicate that not all students are exposed to the entirety of materials included in JROTC textbooks. Along with substantial information on military history and operations, the 100- and 200-level textbooks present foundational information on concepts related to U.S. civics and citizenship, but the information is often siloed. While texts include information on the functioning of the government, responsibilities of citizens, and the importance of service to community, they do not feature content on civilian-military relations prominently. Instead, the curriculum focuses on development of citizens with knowledge of and respect for the military. Given the fact that most JROTC participants complete two or fewer years of coursework (Zaber et al., 2023),

the variation and flexibility of course sequencing imply that individuals participating in JROTC may receive minimal content focused on civics education or on the civilian-military divide. Ensuring sufficient provision of civics instruction, especially in the first two courses a cadet enrolls in, may be critical to ensure that JROTC meets its mission of instilling "in students in United States secondary educational institutions the values of citizenship, service to the United States, and personal responsibility and a sense of accomplishment" (U.S. Code, Title 10, Section 2031).

By combining census data and data on military personnel and dependents, applicants, and enlistments, we were able to describe the military's institutional presence in the United States, characterize the communities that have access to DoD's youth programs, and track one measure of the long-term influence of these programs on communities: military applications and accessions. We find that DoD youth programs are somewhat more common in communities with the highest levels of military presence, but many programs are located in areas with lower-than-average presence. This suggests that these programs could serve to increase military footprint or institutional presence. We find that communities with DoD youth programs have higher number of applicants and accessions than otherwise similar communities. We estimate that without DoD youth programs, the services would have seen roughly 2.5–2.8 percent fewer applicants, and around 3 percent fewer applicants from historically marginalized populations. The programs are also associated with higher levels of high-quality applicants; this effect size is on the order of 5 percent. DoD youth programs appear to operate more effectively in communities with substantial other military presence. This may reflect the importance of DoD infrastructure to ensure program effectiveness, as well as other factors.

Recommendations

Here, we offer recommendations based on the findings in this study for DoD youth program leadership and personnel to consider as they move forward with their community outreach goals.

Further Improve Consistency of Communications and Outreach

Given the varying levels of awareness of DoD youth programs, *additional communications and outreach to relevant communities about program mission, eligibility criteria for participants, costs to communities, and examples of program benefits would be appropriate*. DoD could play a role in ensuring consistency of materials and information with program mission and policy and across program locations (i.e., Youth ChalleNGe, STARBASE) and service branches (JROTC). These materials serve to help program recruitment but also to ensure community awareness and build support for the programs and their efforts to bridge the civilian-military divide. Of course, each DoD youth program should use communication and outreach efforts tailored to its needs and operations.

- The Youth ChalleNGe program has dedicated recruiters to assist sites in engaging eligible youth. Most states have a single program location; some sites have up to three locations. The location may not enable regular or in-depth connections with all communities across a state each year, and recruiters may not be able to connect in person with interested communities or eligible youth. *For this program, analyzing past applications to identify underserved areas and ensuring that recruiters connect with school leaders and other stakeholders in those areas* should serve to increase awareness. Given the upheaval of the COVID-19 pandemic and the overall turnover among school personnel, these efforts should reoccur periodically. Web-based strategies, such as those developed during the pandemic, could increase the effectiveness of these efforts (see Wenger, Constant, et al., 2022).

- STARBASE's outreach task is more straightforward. Because programs serve schools and students in communities within an easy travel distance of the hosting military installation, improving communications and outreach for each STARBASE program involves a fairly localized effort. We also note that the research team did not examine specific curriculum or outcomes from STARBASE as part of this effort; therefore, this recommendation could be updated in the near future based on information about current outreach efforts.
- To the extent that JROTC leaders are interested in and resourced to expand into underserved areas, outreach to school leaders would be a logical step. Some school leaders expressed misunderstandings or general lack of information about JROTC programs. One strategy to address this is to *work with JROTC service leads to develop comprehensive, consistent communication plans regarding the focus of the program, requirements of the school, relevant costs, and challenges and benefits of hosting a program*. Consistent communication and outreach materials will become especially pertinent should DoD or service-level JROTC policy be modified in ways that could affect current and potential program sites.

Ensure that the Junior Reserve Officers' Training Corps Curriculum Content Is Aligned with Mission

Meeting the intended mission of JROTC requires content aligned with that mission. While the 100- and 200-level textbooks provide content coverage on the U.S. military, civic engagement, and civic participation, each military service should *ensure that classroom activities cover enough of this content for the program to serve its mission*. Given the variation in course sequencing and instructor flexibility for selecting the content of instruction, this may be especially crucial for JROTC participants who complete only one or two years of the JROTC program. These students may not be exposed to the full scope of intended curricular materials. Moreover, school leaders identified challenges to providing civics education; *the JROTC program could help schools address a need by emphasizing civics in the classroom portion of the program*. This would also ensure an opportunity for JROTC programs to fulfill an aspect of their mission. This could be accomplished by working with JROTC service leads to review core content requirements for each course to ensure they cover desired or at least minimum civics components and by ensuring that JROTC instructors receive sufficient guidance regarding the amount of time allocated to civics instruction or the specific components of civic content that should be taught.

New Program Placement Should Consider Each Community's Existing Military Infrastructure

Communities with DoD youth programs see higher numbers of military applicants and accessions. While our empirical results are somewhat suggestive in nature, some of the patterns are especially interesting. For example, the differences are larger among historically marginalized populations. This suggests that DoD's youth programs may have the capacity to improve the diversity of the military. Additionally, there is evidence that DoD's youth programs operate in concert with other military infrastructure. Taken together, these findings suggest that new program positioning should consider the community's military infrastructure and population; *placing youth programs in areas with diverse populations and substantial military infrastructure has the potential to result in more successful outreach, a more diverse military reflective of the population, and a narrowing of the civilian-military divide.*

APPENDIX A

American School Leader Panel Analytic Approach

To obtain a national view of schools' approaches to civics education and their perceptions of DoD youth programs, RAND researchers surveyed 664 high school principals between March 14, 2022, and April 26, 2022. The survey took principals an estimated ten minutes to complete and, among other topics, included questions on schools' approaches to civics education, student access to and participation in DoD youth programs, school and community support for these programs, and principals' general dispositions toward the military. The survey was programmed using skip logic to target follow-up questions to principals based on their responses to previous survey items. For example, principals who indicated their schools offered access to JROTC programs were asked follow-up questions about student enrollment and their views of the program, whereas principals in schools without a JROTC program were asked why the school may not have applied to host a program.

Surveyed principals were all members of RAND's ASLP, a nationally representative panel of current K–12 public school principals. All ASLP members in schools serving grades 9 through 12 were invited to complete our survey (N = 1,742); 664 principals completed at least 10 percent of the survey and were included in the final data file for a completion rate of 38.1 percent. After data collection was complete, survey responses were weighted to be representative of the national population of public school principals.

Because schools' experiences vary, we examined differences in principals' responses by school demographics:

- locale (urban, suburban, town/rural)
- enrollment size (schools serving fewer than 1,000 students were categorized as "small"; schools serving 1,000 students or more were categorized as "large")
- poverty level (schools serving student populations in which half or more qualified for free or reduced-meals were categorized as "high-poverty"; the remaining schools were categorized as "low-poverty")
- student racial/ethnic composition (schools serving student populations in which half or more of students are non-White were categorized as serving "majority students of color"; the remaining schools were categorized as "majority White students")
- region ("Northeast" includes Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont, New York, New Jersey, and Pennsylvania; "Midwest" includes Indiana, Illinois, Michigan, Ohio Wisconsin, Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota; "South" includes Delaware, Washington, D.C., Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia, Alabama, Kentucky, Mississippi, Tennessee, Arkansas, Louisiana, Oklahoma, and Texas; "West" includes Arizona, Colorado, Idaho, New Mexico, Montana, Utah, Nevada, Wyoming, Alaska, California, Hawaii, Oregon, and Washington).

We obtained data on school demographics by linking survey data files to the 2020–2021 Common Core of Data (CCD) (CCD, undated). Due to higher-than-normal levels of data missingness in the 2020–2021 CCD likely caused by pandemic-related disruptions to schooling, we supplemented these data with data

from the most recent pre-pandemic school year (2018–2019). For example, in cases in which schools or states did not report data on student free or reduced-price lunch eligibility in 2020–2021, we carried forward their data from 2018–2019. We feel comfortable with these adjustments, given that schools' demographics across school years are very highly correlated. We are missing complete school demographic information for a small number of respondents (less than 5 percent) due to incomplete school identifying information in panel records and in the CCD.

We conducted statistical significance testing to determine whether principals' responses differed by school demographics. Throughout Chapter 2 of this report, we present only differences that are statistically significant at the 5 percent level. Due to the exploratory nature of this study, we did not apply multiple hypothesis test corrections.

Complete Survey Results

The remainder of this appendix, which contains the full set of questions and the responses collected using this survey panel (Tables A.1 through A.33), weighted to be nationally representative, is available in an annex at www.rand.org/t/RRA2697-1.

APPENDIX B

Junior Reserve Officers' Training Corps Textbook Analysis Technical Appendix

This technical appendix details the data sources and the methodological approach used to analyze the content of the JROTC textbooks. We include a table to summarize details regarding the 100- and 200-level textbooks for Air Force, Army, Marine Corps, and Navy JROTC. We also provide the codebook used for coding these textbooks.

Junior Reserve Officers' Training Corps Textbooks

The JROTC textbook analysis relied on one source of data: the content of the current 100- and 200-level textbooks for the Air Force, Army, Marine Corps, and Navy JROTC programs. Each service has multiple textbooks for use by instructors in its JROTC program. The branches take different approaches to curriculum sequencing as discussed in Chapter 3, so we focused our analysis on the first- and second-level core textbooks, given our understanding that these are designed to cover foundational material for each respective JROTC program.

The textbooks vary slightly in their organization. The Air Force, Army, and Navy textbooks are organized into units consisting of chapters with multiple lessons in each chapter presented under different level headings. For example, Unit 2 of the 100-level Army textbook is "Leadership Theory and Application," and its two chapters, "Being a Leader" and "Leadership Skills," are composed of short lessons on discrete subjects. The Marine Corps textbooks are composed of chapters and lessons, but they are not organized into units. The Marine Corps textbook lessons are much shorter than those in the Air Force, Army, and Navy textbooks. Although the length and depth of lessons varies between the textbooks, chapter content coverage is fairly consistent. Thus, for the purposes of our research, we examined the number of chapters in each textbook that cover particular civics-related topics and the civics content area that was represented.

The textbooks were published across the span of 15 years, from 2002 to 2016. The Army and Navy JROTC textbooks are all published by Pearson and draw on common material derived from other high school textbooks: *Keys to Success: How to Achieve your Goals* (Carter, Bishop, and Kravits, 2001) and *Prentice Hall Health: Skills for Wellness* (Pruitt, Crumpler, and Prothrow-Smith, 2001). Table B.1 includes the title, service and course, and publication year of each book included in our analysis.

Analytical Approach

Our approach to analyzing textbooks required five key steps: (1) identify common civics content and standards for high school students; (2) establish a coding framework using common standards to review the textbook content; (3) establish coding reliability among members of the research team and finalize categories, codes, and code definitions; (4) code the 100- and 200-levels of the civics textbooks using the established and

TABLE B.1
Source Textbooks

Textbook Name	Service and Course	Publication Year
Leadership Education 100: Traditions, Wellness, and Foundations of Citizenship	Air Force, 100	2015
Leadership Education 200: Communication, Awareness, and Leadership	Air Force, 200	2016
Leadership Education and Training (LET 1)	Army, 100	2005
Leadership Education and Training (LET 2)	Army, 200	2005
Marine Corps Junior Reserve Officers' Training Corps: Leadership Education 1	Marine Corps, 100	2002
Marine Corps Junior Reserve Officers' Training Corps: Leadership Education 2	Marine Corps, 200	2002
Introduction to the Navy Junior Reserve Officer Training Corps	Navy, 100	2017
Naval Science 2: Maritime History, Leadership, and Nautical Sciences for the NJROTC Student	Navy, 200	2014

tested framework; and (5) analyze the findings from the coding process to resolve discrepancies and identify emergent themes. We detail these steps in sequence below.

Civics Content and Standards

Our analytic approach began with deductive codebook creation, which involved identifying the content and standards addressed in the wide array of civics courses throughout the United States. One research team member reviewed civic education policies across the United States, both in summary and as profiled in state standards and course of study frameworks. We leveraged the rigorously developed ECS (2016) review of civic education policies, which summarizes state civics standards and content and was assembled using publicly available state statute, administrative code, and curriculum and standards frameworks. We also reviewed the standards and course of study frameworks for individual states (e.g., California State Board of Education, 2000; Texas Administrative Code, 2020) to create a running list of all topic areas included in state-level standards for civic and citizenship education. We found, for example, that common civics standards for high school students include demonstrating knowledge of and critical engagement with the concepts of federalism, the rights and responsibilities of citizens in a democratic republic, and the local, state, and federal election processes.

Textbook Coding Schema

After compiling the topic areas from the ECS and state resource reviews, two research team members organized these topic areas through an iterative process. We broadly categorized the topic areas (e.g., History, Government and Economics, Citizenship) and then continually refined the categories until each was distinct from the content of the others. We then defined the broad topic areas and subtopics within these areas. We constructed definitions of the subtopics based on the relevant content and standards as cataloged in the ECS review of civic education policies.

In order to test the categorization schema, define inclusion and exclusion criteria, and ensure the alignment of relevant subtopics, two members of the research team independently coded two textbook chapters in each of two books (i.e., Air Force 100-level, *Leadership Education 100: Traditions, Wellness, and Foundations of Citizenship*, 2015, Chapters 1 and 5; Navy 100-level, *Introduction to the Navy Junior Reserve Officer Training Corps*, 2017, Unit III, Chapters 2 and 3), noting the presence of child code topics, as well as any questions regarding the parameters of the code and criteria for inclusion or exclusion of a code for a particular passage.

We met to refine code definitions and inclusion and exclusion criteria by discussing the coding of each passage of the test chapters.

Coding Reliability

After the initial coding schema was established, two other members of the research team familiarized themselves with the codebook, definitions, and examples. They independently read common chapters from the Army and Marine Corps textbooks and applied the codes by lesson. Through multiple rounds of this iterative process between the two coders and another member of the research team, we refined the codes and definitions and established *reliability*—that is, a high degree of agreement among the two independent coders regarding the application of the coding scheme. By the end of the training period, the coders were consistently applying the codes to passages, and the research team was confident that the codebook was capturing the intended concepts in a comprehensive manner.

The coders then proceeded to both code the 100- and 200-level textbooks in full for each of the four services. They met with a third research team member on a weekly basis to resolve inconsistencies in coding and to ensure that the codebook continued to reflect the content related to the research questions. The research team then aggregated lesson-level coding up to the chapter level in order to have a more common, comparable unit of analysis for the content of the Air Force, Army, and Navy textbooks with the Marine Corps textbooks.

Final Categories, Codes, and Code Definitions for Textbook Content Coding

Table B.2 contains the categories, codes, and code definitions used for the coding and analysis of the content of the JROTC textbooks. The codes that informed our findings in Chapter 3 are civil-military relations, rights and responsibilities of citizens, and Department of Defense specifics.

- The **civil-military relations** code is defined to capture instances within the text that discuss citizen support for the military, relationship between the military and civilians, and any efforts to bridge the civil-military divide. Our use of this code includes passages of the textbooks that discussed efforts by the military to garner civilian support or the focus of the DoD youth programs (STARBASE, Youth ChalleNGe, JROTC) on developing citizens and promoting individual service to the nation/community.
- The **rights and responsibilities of citizenship** code captures discussion of the rights and responsibilities of U.S. citizens, as well as nuts-and-bolts knowledge about how to meet these responsibilities and leverage ones' rights.
- The **Department of Defense specifics** code captures instruction focused on developing cadets' knowledge of the branches of the military, ranking structure, military careers, duties and responsibilities, training, eligibility, and recruitment, as well as JROTC branches, mission, and structures.

Thematic Analysis

After we coded the eight textbooks and reconciled any discrepancies through group consensus, three members of the research team met to discuss the overarching themes that emerged from the process. We focused on emergent findings related to the extent to which the JROTC textbooks provide exposure to the military (research question 1) and focus on fostering civil-military relations (research question 2), as well as the mechanism through which the textbooks can influence young people and their communities (research question 3). We discussed relevant emergent themes from the coding process and worked iteratively to document trends across the textbooks, describe predominant themes, and pull relevant passages to support our findings. The coders iteratively developed analytic memos, drawing on feedback from one another on an ongoing basis, with weekly discussions with a third research team member. These analytic memos formed the basis for the drafting of the findings in Chapter 3.

TABLE B.2

Codebook Used for Analysis

Category	Code	Definition
History and Global Affairs	World history	Origins of democracy (Greek and Roman); roles of other countries in wars or economies prior to 9/11
	U.S. history	Experiences of individuals or events in the present-day United States from the beginning of recorded history to 9/11—e.g., Civil War, U.S. military history (for example, why USMC was established), political movements, and domestic events prior to 9/11
	Contemporary global affairs	9/11–present geopolitical considerations and events, such as Operation Enduring Freedom; includes U.S. domestic affairs, such as the Women's March on Washington
	Civil-military relations	Citizen support for military; relationship between military and civilians; efforts to bridge civil-military divide
Government and Economics	Forms of government	Description of types of government, including but not limited to democracy, republic, communism, autocracy, oligarchy, theocracy, and fascism
	Economic systems	Capitalism, socialism, laissez-faire, welfare state, market economy, command economy, traditional economy
	Economics	Supply and demand, goods and services, job growth, economic recessions (e.g., Great Depression, Great Recession), taxes/tax revenue, financial trading
American Government	Founding documents	Mention and/or description of Declaration of Independence, Constitution, Bill of Rights
	Institutions and processes	Mention and/or description of bodies and functions of American government
	Department of Defense specifics	Branches of the military, ranking structure, military careers, duties and responsibilities, training, eligibility, recruitment; JROTC branches, missions, structures
	Funding	Taxes, federal and state budgeting process, government shutdowns, debt and debt ceiling
	Politics	Political parties, party platforms, evolution of platforms, values
	Elections	Voting process, primary elections, general election, electoral college, runoffs, gerrymandering, lobbying, political action committees
U.S. Citizenship	Rights and responsibilities	Rights: freedom of expression; freedom of religion; right to a prompt, fair trial; right to vote; right to apply for a federal job; right to run for elected office; freedom to pursue "life, liberty, and pursuit of happiness"
		Responsibilities: support/defend the Constitution, be informed about community issues, participate in democratic process, respect and obey laws, respect rights/beliefs/opinions of others, participate in local community, pay taxes, serve on a jury, defend the country (if need arises)
	Immigration and naturalization	What is required or not required to be a U.S. citizen, immigration (documented or undocumented), Green Card, citizenship tests, birthright citizenship, naturalization
	Civic participation (protests, community involvement)	Community service, philanthropy, fundraising for nonpolitical purposes (i.e., not elections), protests and marches, symbolic nonparticipation (boycotts, conscientious objectors), natural resources and environmentalism

NOTE: Categories, codes, and definitions were identified and refined based on the ECS (2016) review of civic education policies and refined through an iterative process by four members of the research team.

APPENDIX C

Estimating the Association Between Department of Defense Youth Programs and Military Accessions and Applications

This technical appendix details the data sources, the analytical sample and its construction, and the statistical approach we used in analyzing the relationship between DoD youth programs, military presence, and the community-level outcomes of active-duty recruitment and accessions. Supplementary analyses and specification checks are available in an annex at www.rand.org/t/RRA2697-1.

Data Sources

We leveraged both publicly available and restricted-access data from four sources, including the U.S. Census Bureau's ACS, personnel records from DMDC, the location of each DoD youth program, the DISDI program's publicly available geospatial data on military installation locations, and the location of each recruitment station in the United States.[1] In what follows, we describe the population, time frame, and information of each data source. Table C.1 provides the full list of data used in our analysis.

American Community Survey

We obtained information on all U.S. census tracts from the U.S. Census Bureau's ACS. The ACS provides a unique ID for each census tract, as well as tract-level estimates of demographics (e.g., proportion of the tract's population by race/ethnicity, educational attainment, marital status); urbanicity of the tract; economic well-being indicators (e.g., proportion of population that receives public assistance, unemployed, average income); length of time in the country, county, and address; commute times; internet access; veteran status; and population density. Table C.1 lists all census tract characteristics used in our analyses. We used the ACS 2017 five-year estimates, which span data collected from January 2013 through December 2017.[2]

Defense Manpower Data Center Data

We received two subsets of data from DMDC: Defense Enrollment Eligibility Reporting System (DEERS) and Military Entrance Processing Command (MEPCOM) data. DEERS maintains files on military sponsors (i.e., personnel), dependents, and other individuals who are eligible for military-related benefits and services.

[1] For more information on DISDI, please refer to Office of the Assistant Secretary of Defense for Energy, Installations, and Environment (undated).

[2] For more information on ACS 2017 five-year estimates, please refer to U.S. Census Bureau (2023).

TABLE C.1

Data Sources, Categories, and Elements

Data Source	Data Category	Data Element
U.S. Census Bureau's ACS	Tract age and family structure	*Age:* counts of population aged 15–29; median age *Marital status:* proportion of population never married; married; divorced, separated or widowed *Intergenerational household:* proportion of households with grandparent living with owner
	Tract race and ethnicity	*Race*: proportion of population who are Black; other; White *Ethnicity*: proportion of population who are Hispanic
	Tract education	*Proportion of population with* less than a high school degree; a high school diploma or GED; some college; Bachelor's degree or higher
	Tract citizenship/origin and language	*Proportion of population* who are native born; speak language other than English in the home *Proportion of foreign-born population*: citizens, noncitizens, entered U.S. before 1990; entered U.S. between 1990 and 2000; entered U.S. between 2000 and 2010; entered U.S. 2010 or later
	Tract veteran population	*Proportion of veterans* who served in World War II; served in the Korean War; served in Vietnam War; served in the 1990 Gulf War; served in the 2001 Gulf War or later
	Tract urbanicity	*Urban tract*: metropolitan core (population greater than 50,000) *Suburban tract:* 30% or more commute to a metropolitan core, less than 30% commute to a metropolitan core; micropolitan core (10,000 to 49,999 people), 30% or more commute to a micropolitan core, less than 30% commute to a micropolitan core *Rural tract:* small town core (2,500 to 9,999 people); 30% or more commute to a small town core, less than 30% commute to a small town core, outside a small town core
	Tract economic well-being	*Income:* proportion of households with public assistance income, Supplemental Security Income, income below the poverty line; median tract income *Labor market:* proportion of labor force unemployed *Real estate:* proportion of occupied households occupied by renter; median rent; median property value *Insurance:* proportion of population without insurance
	Mobility of households	*Time living in tract:* proportion of population living in same house as prior year; moving within county within past year; moving from a different state within past year; moving from abroad within past year *Local mobility:* proportion of working population without vehicles
	Tract commuting	*Working from home:* proportion of working population working from home *Form of transportation:* proportion of working population commuting by car (alone); carpooling; public transportation; walk or bicycle; other transportation *Commute time:* proportion of population working outside the home with a commute time of 0–29 minutes; 20–29 minutes; 30–44 minutes; 45–59 minutes; 60–89 minutes; 90–99 minutes
	Tract information connectivity	Proportion of households with broadband internet; dial-up internet only; satellite internet; smartphone data plan
	Tract density	*Household crowding:* proportion of households not overcrowded; overcrowded; severely overcrowded *Overall tract density*: population density (people per square mile); housing density (housing units per square mile)
	Tract location	State abbreviation; census tract ID

Table C.1—Continued

Data Source	Data Category	Data Element
DMDC, DEERS	Person identification	Unique, anonymous service person ID; unique, anonymous dependent ID; service code; fiscal year; month of fiscal year
	Location	Street address; city; state; zip code; country
DMDC, MEPCOM	Person identification	Unique, anonymous person ID
	Demographics	Person sex; person race; person ethnic affinity; person education years completed
	Application data	AFQT percentile; AFQT category; applicant age; applicant educational designator code; application transaction date; applicant uniform service organization code; height; weight
	Accession data	Accession age; accession educational designator code; accession pay grade; accession primary enlistment specialty; accession term of enlistment year; accession training enlistment specialty; accession transaction date; accession uniform service code
	Location	Current street address, city, state, zip code, country; home of record street address, city, state, zip code, country
DoD youth program data	Location	Program type, street address, city, state, zip code
Military installation data	Location and installation detail	Base boundaries, service, component, and status (i.e., active/inactive)
Recruitment station data	Location of recruitment station	Exact address and service

We received data on active-duty personnel, dependents of active-duty personnel, and military retirees for the months of September 2017 and October 2017. Each of these person-level records is linked to a unique, anonymous individual ID. We use the military sponsor ID to distinguish military personnel from their dependents. For each military sponsor, we received service codes (i.e., branch and component) and for each person-level record a current address (i.e., street address, city, state, and zip code).

The MEPCOM dataset contains person-level records of all individuals who interacted with MEPCOM during FY 2017. This dataset includes a unique, anonymous individual ID; demographic information (e.g., gender, age, race/ethnicity, education level); military background data, including an indicator of prior service; participation in the Delayed Entry Program; application-related data, including AFQT scores and test dates, medical information (e.g., height, weight, medical waiver recommendation flag), application date, application military branch and component; and accession-related data, including accession date, branch and component of accession, pay grade, and service and training enlistment specialty. Finally, each record in the MEPCOM file has home of record (i.e., street address, city, state, and zip code) and current address (i.e., street address, city, state, and zip code) data.

Department of Defense Youth Program Locations

We received a file including each DoD youth program from our project sponsor. These data contained the physical location addresses for each JROTC, STARBASE, and Youth ChalleNGe program operating in 2019. Notably, there is limited turnover in program locations from one year to the next, and thus these data should accurately reflect the location of programs during the time frame of the ACS and DMDC data used for our analyses.

Military Installation Locations

The DISDI program is responsible for maintaining geospatial information on military installations across the United States (Office of the Assistant Secretary of Defense for Energy, Installations, and Environment, undated). We obtained the 2017 MIRTA shapefile.[3]

Recruitment Station Installation Locations

We obtained a list of all military recruiting stations for the Army, Air Force, and Navy in the United States in FY 2017. The file contained exact addresses that can be used for geocoding.

Creating the Analytic Sample

Geocoding Person Data

The first step in creating the analytic dataset was to connect the DEERS, MEPCOM, and DoD youth program location data to the ACS census tract IDs through a process known as geocoding. ESRI ArcGIS 10.7 was used to geocode these addresses using a StreetMap Premium 2017 Release2 composite locator using an 80 percent match rate as the benchmark for matching.

We created subsets of the provided DEERS and MEPCOM data files that included only the anonymous ID and the address data. Then, each record from the DEERS September 2017 and October 2017 data was entered into the geocoding program. For each record, the geocoding process output included latitude and longitude coordinates, match rate, along with the match type, which degrades in locational granularity starting with address point, street address, street name, postal (zip code) and admin place (city). All addresses that had a match of street name and below were considered to be unmatched.[4] Most of the unmatched data points tended to be international addresses; post office box addresses; or U.S. territories such as Guam, Virgin Islands, American Samoa, and Puerto Rico. The output address datasets from the geocoding process were compiled, and a spatial join tool was used to merge the 2017 census tract ID to the latitude and longitude coordinates. This tool joined the census tract Federal Information Processing System data to all address points that fell within the tract boundary.

The MEPCOM data were geocoded using the same process as the DEERS data. However, the MEPCOM file is unique in that it provided two sets of addresses: home of record and current address. The home of record address was given priority, and when a match of address point or street address was not returned, the current address was used in its place.

After the geocoding process was completed for all individuals in the DEERS and MEPCOM data, the output files were expunged of the address information, and all that remained were the census tract and unique person ID.

Geocoding Program Location Data

DoD youth program locations (n = 3,547) were geocoded in ArcMap (Version 10.6.1) at the street address level. A discrete X,Y coordinate was output corresponding to the program address. We used a spatial join tool to attach program location coordinate data to the corresponding census tract ID of where a program resides.

[3] These data were obtained from DoD (2021).

[4] If an individual was included in both the September 2017 and the October 2017 DEERS records, priority was given to October 2017. Where a match was not possible for October 2017 or the person was not in the October 2017 file, the September 2017 address and match were used.

We then sought to identify the census tracts that fall within the surrounding area of a DoD youth program. Using the "select by location" tool, we identified all census tracts with a tract centroid no more than 30 miles away from a DoD youth program, as measured by the Euclidean distance. The output from this process included the actual distance (e.g., 3.43 miles) between a program and the nearby tract's centroid. If a program fell within the boundaries of the census tract, we assigned that census tract a program distance of zero miles.

Measuring Distance to Military Installations

In ArcMap, we generated a near table to obtain the distance between each MIRTA-provided base boundary and each U.S. census tract centroid. We generated a file that included a list of all tracts that were within 100 miles of a base boundary, including base details such as the corresponding service and component, as well as the installation's active status.

Measuring Distance to Recruiting Installations

Once again, we used ArcMap to generate a near table to obtain the distance between each military recruitment station and each U.S. census tract centroid. We generated a file that included a list of all tracts that were within 100 miles of a recruitment station, including the recruitment stations' service.

Calculating Military Presence

After geocoding the data, we proceeded to calculate a measure of military presence in each tract. To this end, we took the geocoded data and created a count of active-duty personnel, dependents of active-duty personnel, and retirees in each census tract. We then merged these counts with the ACS data, which contained the overall population of each tract and the counts of veterans in each tract. We subtracted the counts of active-duty personnel and their dependents from the total tract population to obtain a count of civilians in a tract. We split the ACS count of veterans in a census tract to reflect retired and nonretired veterans in each tract.

When then calculated an exposure index. In our context, *exposure* refers to the extent that civilians in a tract encounter individuals who are military-connected (i.e., active-duty personnel, dependents, and retired or nonretired veterans). Because people in a tract can encounter individuals both in their tract and outside their tract, we implemented a spatial exposure index that defines a "local area" in which civilians can interact with individuals who are military-connected. Specifically, we implemented a version of the following spatial exposure index (Equation C.1) (Reardon and O'Sullivan, 2004):

$$ {}_{c}P^{*}_{m} = \int_{q \in R} \frac{\tau_{qc}}{T_{c}} \widetilde{\pi}_{qm} d_{q} \tag{C.1} $$

where ${}_{c}P^{*}_{m}$ represents the spatial exposure, P^{*}, of civilians, c, to individuals who are military-connected, m; τ_{qc} represents the density of civilians in a census tract, q; T_{c} represents the total number of civilians in a census tract; and $\widetilde{\pi}_{qm}$ represents the proportion of individuals who are military-connected in the "local environment" of the census tract. The local environment is defined by a predetermined radius around a census tract. We define the local environment to be 30 miles, though our results are robust to local environments that are as small as ten miles. Further, embedded in $\widetilde{\pi}_{qm}$ is a decay function that weights individuals in nearby census tracts more highly than individuals from a farther census tract. We use the following exponential decay function (Equation C.2):

$$ w(d) = e^{-d} \tag{C.2} $$

where *w(d)* represents the decay function, and *d* is the Euclidean distance between census tract centers. This form of the decay function has been conventionally used in the literature (Hong, O'Sullivan, and Sadahiro, 2014).

The integral in Equation C.1 sums the census tract–specific exposures across all census tracts to create a nationwide spatial exposure index. As we are interested in census tract–specific measures, we do not sum across all tracts; rather, we use a tract-level measure calculated by $\frac{\tau_{qc}}{T_c}\widetilde{\pi}_{qm}$. The resulting exposure measure can range from 0 to 1. A value of 0 indicates that civilians in a census tract will not encounter military-connected individuals within a 30-mile radius of the tract, and a value of 1 indicates tracts where only military-connected individuals live in a 30-mile radius of the census tract. In this study, we refer to this exposure measure as a measure of military presence.

Defining Application Starts, Application Continuations, and Accessions

The outcomes of interest in these analyses are applications to the services and accessions by those with no previous military service into the enlisted ranks of the active-service components of the Air Force, Army, Marine Corps, or Navy.

We created two application measures: application "starts" and "continuations." Application starts included any individual who has a valid application service code in the MEPCOM data. Application continuations included those individuals with a valid application code as well as a valid AFQT score, medical assessment, and education information. We created these two measures to provide an indication of individuals who expressed interest in the military and an indication of individuals who made at least some progress toward accessing into the military. To be included in the sample of accessions, individuals must have a valid accession service code, AFQT scores, medical assessment, and education information.

All applications and accessions occurred in FY 2017. The application measures include any individual with an application transaction date in FY 2017. The accession sample includes all individuals with an accession transaction date and accession service date in FY 2017. While application continuations are a subsample of application starts, accessions are not a subsample of application continuations. An individual may have applied in FY 2017 but their accession will occur at later date. Conversely, an individual may have accessed in FY 2017 but applied previously.

Defining Secondary Outcomes

We also look at specific subsets of applications and accessions. We focus some attention on "high-quality" applications and accessions; as is the norm, "high-quality" indicates the combination of a Tier-1 education credential and AFQT scores in the 50th percentile or above.[5] In addition, we define "technical eligible" applications and accessions as those with a Tier-1 education credential and AFQT scores in the 80th percentile or above.[6] We chose to analyze these subsets of applications and accessions to understand whether DoD youth programs are helping ensure an adequate pool of individuals who can qualify to fill the more technical roles in the military.

We also looked at applications and accessions from historically marginalized populations. We define an individual as being a part of this population if the individual either identifies with a race other than White (e.g.,

[5] Tier-1 education credentials include high school diplomas and other credentials that are considered equivalent. Individuals who apply while still attending high school are considered to have a Tier-1 education credential. Application continuations and accessions are defined for these outcomes because education levels and AFQT scores are required; application starts may lack this information.

[6] For more information on qualifications and requirements in technical military occupations, see Wenger, O'Connell, and Lytell (2017) or Wenger, Miller, and Sayala (2010).

Black, Asian, Hawaiian Native or Pacific Islander, American Indian or Alaskan Native) or as being Hispanic, regardless of race. We looked at this outcome to understand whether DoD youth programs are helping to maintain a diverse body of military personnel, representative of the youth population in the United States. Here, we are able to analyze application starts, application continuations, and accession decisions of these individuals.

Defining Census Tracts Served and Not Served by Department of Defense Youth Programs

We used the ACS rural-urban commuting area codes to designate a tract as either urban, suburban, or rural. Tracts that contained a metropolitan core (defined as containing 50,000 people or more) were designated as urban tracts. Tracts that had a commuting flow toward a metropolitan core, contained a micropolitan core (10,000 to 49,999 people), or had a commuting flow toward a micropolitan core were defined as suburban tracts. Tracts that contained a small town core (2,500 to 9,999 people), a commuting flow toward a small town core, or a commuting flow outside a small town core were defined as rural tracts.

We then looked at average tract characteristics and the distribution of nearest DoD youth programs to tracts in the entire sample and by each urbanicity category. This analysis uncovered substantial differences in characteristics among tracts by urbanicity. For example, the three categories of tracts differ in terms of population of 15- to 29-year-old residents (the population most relevant to our analysis), proportion of people identifying as a race other than White, and population and housing densities. Urban tracts have the largest percentages of each of these characteristics, followed by suburban tracts, with rural tracts having the lowest values. Further, the closest DoD youth programs are substantially farther away from most of the population in rural tracts compared with suburban or urban tracts. These differences indicated that comparisons of tracts would be most valid within each urbanicity category and that the definition of tracts served by DoD youth programs should vary by urbanicity.

In defining a tract that is served by a DoD youth program, we chose a distance that was near the 25th percentile of the distance distribution, such that approximately 25 percent of tracts in each urbanicity category are designated as served. With this approach, tracts were designated as served if the nearest DoD youth program was within 1.5 miles in urban areas, 6 miles in suburban areas, and 17 miles in rural areas. Tracts were designated as not served if no DoD youth program was located within 1.5 miles, 6 miles, or 17 miles, as determined by the tract's urbanicity. For simplicity, henceforth we called tracts served by DoD youth programs "treated tracts" and tracts not served by DoD youth programs "comparison tracts." In coming to this final definition, we examined several alternative definitions and found that this definition produced the most comparable treatment and comparison tracts.[7] Results also remained consistent under alternative definitions of treatment.

Characteristics of the Analytic Sample

The final analytic dataset contained an observation for each census tract with ACS tract characteristic data merged with the spatial exposure measure of military presence, the distance to the nearest DoD youth program, and aggregate census tract–level counts of military application starts, application continuations, and accessions. Only census tracts in the 50 states and the District of Columbia were included in the analysis. Any census tract with a noninstitutionalized population of zero was excluded from the analysis. The analytic sample contains 72,388 census tracts, with 51,820 urban tracts, 14,073 suburban tracts, and 6,495 rural tracts. Table C.2 describes pertinent characteristics of tracts, exposure, and outcomes.

[7] While there is no theory to help us define the different tracts across urban, suburban, and rural areas, we also performed specification tests and found that outcomes were stable to adjustments in changing the definition of urban areas.

TABLE C.2

Descriptive Statistics of Average Census-Level Tracts, Overall and by Urbanicity

	Full Sample		Urban Tracts		Suburban Tracts		Rural Tracts	
Variable	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Panel A: Military and DoD Youth Program Variables								
Military presence	0.075	0.044	0.071	0.044	0.087	0.046	0.085	0.034
Proportion of tracts served By DoD youth program	0.256	0.436	0.263	0.440	0.233	0.423	0.254	0.435
Panel B: Outcomes								
Number of application starts	3.831	4.177	3.885	4.371	4.214	3.939	2.578	2.549
Number of application continuations	2.886	3.174	2.859	3.280	3.349	3.106	2.092	2.106
Number of accessions	2.043	2.424	2.034	2.506	2.345	2.381	1.463	1.609
Number of high-quality applicants	1.949	2.316	1.934	2.385	2.277	2.301	1.359	1.542
Number of high-quality accessors	1.382	1.783	1.374	1.833	1.607	1.785	0.958	1.195
Number of technical eligible applicants	0.581	0.950	0.596	0.975	0.633	0.952	0.354	0.664
Number of technical eligible accessors	0.408	0.758	0.415	0.778	0.453	0.762	0.258	0.546
Number of application starts from historically marginalized populations	1.809	2.891	2.128	3.132	1.176	2.152	0.637	1.346
Number of application continuations from historically marginalized populations	1.270	2.071	1.483	2.239	0.855	1.584	0.463	0.996
Number of accessions from historically marginalized populations	0.910	1.608	1.066	1.741	0.606	1.232	0.323	0.776
Panel C: ACS Variables								
Demographic variables								
Count of population ages 15–29	1,087	716	1,151	756	998	604	772	467
Median age	39.282	7.768	38.170	7.759	41.562	6.885	43.216	7.270
Proportion of population Black	0.135	0.217	0.159	0.234	0.077	0.150	0.067	0.150
Proportion of population White	0.620	0.301	0.553	0.301	0.786	0.222	0.802	0.226
Proportion of population other	0.082	0.111	0.096	0.113	0.045	0.079	0.056	0.131
Proportion of population Hispanic	0.163	0.214	0.193	0.227	0.093	0.158	0.075	0.134

Table C.2—Continued

	Full Sample		Urban Tracts		Suburban Tracts		Rural Tracts	
Variable	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Proportion of population never married	0.335	0.131	0.361	0.133	0.273	0.096	0.263	0.097
Proportion of population married	0.444	0.146	0.421	0.149	0.504	0.117	0.499	0.116
Proportion of population divorced, separated, or widowed	0.220	0.070	0.217	0.071	0.223	0.064	0.238	0.063
Proportion of households with grandparent living with owner	0.042	0.036	0.043	0.038	0.040	0.029	0.036	0.035
Proportion of population with less than high school education	0.133	0.108	0.132	0.115	0.135	0.086	0.144	0.083
Proportion of population with a high school diploma or GED	0.280	0.110	0.253	0.106	0.343	0.092	0.363	0.084
Proportion of population with some college	0.290	0.081	0.283	0.084	0.309	0.068	0.306	0.071
Proportion of population with a college degree or more	0.296	0.190	0.332	0.202	0.214	0.118	0.187	0.097
Proportion of population who are native-born	0.875	0.136	0.842	0.143	0.955	0.062	0.965	0.055
Proportion of population who speak language other than English in the home	0.200	0.214	0.245	0.224	0.089	0.133	0.082	0.126
Proportion of foreign-born population who are noncitizens	0.065	0.081	0.081	0.087	0.026	0.044	0.022	0.041
Proportion of foreign-born population who are citizens	0.060	0.072	0.077	0.077	0.019	0.025	0.014	0.023
Proportion of foreign-born population who entered U.S. before 1990	0.372	0.235	0.357	0.208	0.412	0.286	0.410	0.302

Table C.2—Continued

	Full Sample		Urban Tracts		Suburban Tracts		Rural Tracts	
Variable	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Proportion of foreign-born population who entered U.S. in 1990–1999	0.221	0.166	0.226	0.144	0.213	0.210	0.196	0.218
Proportion of foreign-born population who entered U.S. in 2000–2009	0.260	0.189	0.264	0.166	0.248	0.233	0.250	0.251
Proportion of foreign-born population who entered U.S. in 2010 or later	0.148	0.170	0.154	0.158	0.127	0.189	0.144	0.213
Proportion of veterans who served in World War II	0.053	0.074	0.056	0.081	0.042	0.051	0.052	0.055
Proportion of veterans who served in Korean War	0.097	0.093	0.096	0.099	0.093	0.072	0.110	0.074
Proportion of veterans who served in Vietnam War	0.360	0.155	0.345	0.163	0.393	0.128	0.406	0.128
Proportion of veterans who served in 1990 Gulf War	0.174	0.138	0.179	0.148	0.174	0.113	0.142	0.096
Proportion of veterans who served in 2001 Gulf War or later	0.155	0.150	0.165	0.162	0.136	0.114	0.112	0.106
Urbanicity variables								
Metropolitan core	0.716	0.451	1.000	0.000	---	---	---	---
30% or more commute to a metropolitan core	0.094	0.292	---	---	0.485	0.500	---	---
Less than 30% commute to a metropolitan core	0.009	0.095	---	---	0.046	0.210	---	---
Micropolitan core	0.058	0.234	---	---	0.300	0.458	---	---
30% or more commute to a micropolitan core	0.027	0.163	---	---	0.140	0.347	---	---
Less than 30% commute to a micropolitan core	0.006	0.075	---	---	0.029	0.168	---	---
Small town core	0.030	0.170	---	---	---	---	0.332	0.471

Table C.2—Continued

	Full Sample		Urban Tracts		Suburban Tracts		Rural Tracts	
Variable	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
30% or more commute to a small town core	0.011	0.106	---	---	---	---	0.127	0.333
Less than 30% commute to a small town core	0.005	0.069	---	---	---	---	0.053	0.224
Outside of a small town core	0.044	0.205	---	---	---	---	0.488	0.500
Economic well-being variables								
Proportion of households with public assistance income	0.028	0.032	0.029	0.034	0.024	0.025	0.026	0.028
Proportion of households with Supplemental Security Income	0.058	0.048	0.057	0.050	0.059	0.040	0.065	0.044
Proportion of population with income below the poverty line	0.157	0.122	0.158	0.130	0.150	0.099	0.168	0.092
Median income	61,700.89	30,747.43	65,365.68	33,617.06	55,195.53	20,661.21	46,492.88	12,781.85
Proportion of population without insurance	0.071	0.049	0.072	0.051	0.067	0.042	0.067	0.048
Proportion of occupied households occupied by renter	0.368	0.228	0.409	0.241	0.261	0.155	0.270	0.127
Median rent	902.032	457.850	1,021.577	462.246	645.575	290.068	502.818	181.972
Median property value	245,904.89	219,816.50	281,676.29	240,695.60	167,883.99	120,383.02	132,763.05	98,763.37
Proportion of labor force unemployed	0.105	0.075	0.105	0.078	0.102	0.061	0.112	0.068
Mobility variables								
Proportion of population living in same house as prior year	0.853	0.090	0.844	0.095	0.874	0.076	0.876	0.069
Proportion of population moving within county within past year	0.086	0.058	0.093	0.060	0.069	0.047	0.062	0.039
Proportion of population moving from different state within past year	0.023	0.033	0.025	0.034	0.019	0.026	0.021	0.032

Table C.2—Continued

	Full Sample		Urban Tracts		Suburban Tracts		Rural Tracts	
Variable	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Proportion of population moving from abroad within past year	0.006	0.013	0.008	0.014	0.003	0.008	0.003	0.009
Proportion of working population without vehicles	0.049	0.098	0.059	0.111	0.022	0.033	0.028	0.048
Commuting variables								
Proportion of working population working from home	0.047	0.040	0.047	0.040	0.044	0.037	0.054	0.048
Proportion of working population commuting by car alone	0.756	0.153	0.737	0.169	0.816	0.078	0.784	0.100
Proportion of working population commuting by carpooling	0.093	0.052	0.091	0.054	0.097	0.047	0.100	0.048
Proportion of working population commuting by public transportation	0.054	0.117	0.073	0.134	0.006	0.017	0.005	0.024
Proportion of working population commuting by walk or bicycle	0.036	0.064	0.039	0.069	0.025	0.042	0.042	0.062
Proportion of working population commuting by other transportation	0.013	0.019	0.013	0.019	0.012	0.016	0.013	0.024
Proportion of population working outside of home with 0–19 minute commute	0.430	0.175	0.411	0.166	0.446	0.191	0.544	0.162
Proportion of population working outside of home with 20–29 minute commute	0.205	0.084	0.216	0.080	0.188	0.090	0.154	0.080
Proportion of population working outside of home with 30–44 minute commute	0.198	0.091	0.205	0.089	0.194	0.098	0.155	0.079
Proportion of population working outside of home with 45–59 minute commute	0.078	0.056	0.077	0.055	0.086	0.060	0.068	0.048

Table C.2—Continued

	Full Sample		Urban Tracts		Suburban Tracts		Rural Tracts	
Variable	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Proportion of population working outside of home with 60–89 minute commute	0.061	0.058	0.063	0.061	0.058	0.051	0.050	0.042
Proportion of population working outside of home with 90–99 minute commute	0.028	0.030	0.027	0.031	0.028	0.029	0.029	0.028
Internet access variables								
Proportion of households with broadband internet	0.650	0.175	0.695	0.158	0.557	0.165	0.491	0.153
Proportion of households with dial-up internet only	0.006	0.009	0.005	0.008	0.010	0.011	0.012	0.013
Proportion of households with satellite internet	0.055	0.048	0.042	0.031	0.084	0.063	0.094	0.065
Proportion of households with smartphone data plan	0.480	0.128	0.503	0.127	0.440	0.110	0.383	0.105
Density variables								
Population density (people per square mile)	4,820	8,577	6,507	9,572	632	1,325	195	563
Housing density (housing units per square mile)	2,014	3,849	2,716	4,331	274	563	86	185
Proportion of households not overcrowded	0.964	0.053	0.960	0.058	0.976	0.031	0.975	0.037
Proportion of households overcrowded	0.036	0.053	0.040	0.058	0.024	0.031	0.025	0.037
Proportion of households severely overcrowded	0.011	0.025	0.013	0.027	0.007	0.013	0.007	0.023

NOTE: Military presence variable was constructed from counts of the total civilian population and military-connected population in a census tract. Tracts designated as served by a DoD youth program vary by urbanicity definition. Urban tracts are served if the closest DoD youth program is within 1 mile of the tract center, suburban tracts if it is within 5 miles of the tract center, and rural tracts if it is within 9 miles of the tract center. An urban tract is one that contains a metropolitan core. A suburban tract is one that has any commute to a metropolitan core, a micropolitan core, commute to a micropolitan core, or a small town core. Rural tracts have commutes to a small town core or are outside a small town core.

As shown in Table 4.1, these characteristics also differ by the level of military presence, as expressed in quartiles of the distribution of military presence in the sample. Areas with higher military presence have a greater proportion of people who identify as White in the population, are more highly educated, are less urban, and have higher incomes. Table C.3 regresses each ACS variable on indicators for the quartiles of military presence. In all cases, F-tests that all the coefficients on all quartiles are equal reject that null hypothesis.

Analytic Approach

Propensity Score Weighting

In an ideal research scenario, DoD youth programs would be randomly assigned to communities so that we could understand how their presence affects civilian-military relations, which can in turn affect outcomes such as military applications and accessions. Such a design would ensure that community characteristics in treatment and comparison tracts are similar in expectation. Such an approach is clearly not feasible. DoD chooses program locations that satisfy predetermined requirements (e.g., JROTC programs have a focus on Title I schools) and have sufficient staff and facilities to sustain the programs. While this purposive placement of programs supports the successful completion of the programs' charge, it also complicates estimating the effect of the programs on outcomes of interest. Most critically, communities identified as treatment tracts are unlikely to be comparable to communities identified as comparison tracts. Thus, simple comparisons in outcomes between the two types of tracts will be inaccurate. Any differences in outcomes will include the effect of the DoD youth programs as well as differences in outcomes because communities contain different types of people (e.g., people of different ages, ethnicities, and economic backgrounds).

In the absence of the ideal evaluation design, the next best approach employs quasi-experimental analyses, which produces measures that closely reflect the causal estimate of a program on its intended outcomes. In this case, we elected to use the propensity score weighting approach. We consider this approach defensible in these circumstances based on studies that show, when used properly, propensity score weighting methods can re-create estimates from randomized controlled trials (Dehejia and Wahba, 2002) and are generally considered valuable when other options are not available (Crown, 2014). In propensity score weighting, comparison tracts are weighted such that they looked statistically similar on observed characteristics to treatment tracts. This technique occurs in two steps. First, each tract is given a propensity score. The propensity score is the conditional probability of being treated given the observable characteristics input into the model. To calculate the propensity scores, we used a machine learning technique called Generalized Boosted Models (GBMs; Ridgeway, Madigan, and Richardson, 1999). GBMs use non-parametric[8] models that allow for interactions and non-linearities among the covariates. This flexibility aids in finding the appropriate functional form that minimizes covariate differences between treatment and comparison groups while eliminating any judgment from the analyst as to which functional form is the best.[9]

Once propensity scores were calculated for each census tract, we then calculated the associated PSW. The estimand of interest in this study is the treatment-on-the-treated estimand. All treatment tracts were

[8] Non-parametric models do not constrain the covariates to have a specific mathematical relationship with the outcome variable (e.g., linear, quadratic, or with specified interactions). Instead, they allow for more flexible relationships with the outcome variable.

[9] We use the TWANG (Griffin et al., 2014) package in STATA to estimate propensity scores via GBMs. Models were allowed to run 5,000 times with up to three-way interactions of the covariates. Models were chosen to minimize the mean effect-size statistic.

TABLE C.3

Regressions of American Community Survey Variables on Quartile of Military Presence

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Military Presence	Total Population Count	Population Count 15–29	Proportion White	Proportion Black	Proportion Hispanic	Proportion High School/ GED or Less	Proportion with Some College	Proportion with College Degree or More	Proportion Income Below Poverty	Proportion Urban	Proportion Suburban	Proportion Rural	Population Density (per sq mile)
Quartile 1	4,648.060**	1,200.638**	0.415**	0.156**	0.303**	0.407**	0.251**	0.342**	0.166**	0.931**	0.045**	0.024**	11,202.054**
	(16.375)	(5.315)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.003)	(0.002)	(58.220)
Quartile 2	4,484.939**	1,132.089**	0.640**	0.156**	0.132**	0.391**	0.289**	0.320**	0.160**	0.796**	0.151**	0.052**	3,445.069**
	(16.375)	(5.315)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.003)	(0.002)	(57.739)
Quartile 3	4,250.932**	997.956**	0.745**	0.111**	0.086**	0.440**	0.302**	0.257**	0.151**	0.533**	0.325**	0.142**	2,310.446**
	(16.375)	(5.315)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.003)	(0.002)	(57.780)
Quartile 4	4,355.934**	1,013.860**	0.682**	0.115**	0.130**	0.418**	0.316**	0.266**	0.153**	0.602**	0.257**	0.141**	2,423.655**
	(16.375)	(5.315)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.003)	(0.002)	(58.050)
Observations	72,391	72,391	72,391	72,391	72,391	72,383	72,383	72,383	72,248	72,391	72,391	72,391	71,605
R-squared	0.802	0.699	0.841	0.285	0.462	0.847	0.930	0.717	0.626	0.749	0.252	0.120	0.380
F-Test of Equality Q1–Q4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

NOTE: Each column represents the results of a regression of the ACS demographic variable indicated by the column headers on the quartile of military presence. *P*-value of the F-test that all coefficients on the quartiles of military presence are equal is given in the last row. Robust standard errors are in parentheses.

** = $p < 0.01$.

given a weight of one (1). The weights of comparison tracts were calculated with the following formula (Equation C.3):

$$w_t = \frac{p(x_t)}{1 - p(x_t)} \tag{C.3}$$

where w_t is the weight of comparison tract, t, and $p(x_t)$ is the propensity score of that tract, t.

A comparison tract that is more similar on observables to a treatment tract will likely have a higher propensity score and, in turn, will be given more weight in the outcome models.

Finally, because we varied the definition of treatment for urban, suburban, and rural tracts, propensity scores and their associated weights were calculated independently for each treatment definition.

Main Outcome Models

Our main models aim to estimate the effect of a tract being served by DoD youth programs on the number of applications starts, application continuations, and accessions in a census tract. Our main outcome models take the following form (Equation C.4):

$$Y_{ts} = \beta_0 + \beta_1 Treat_{ts} + \boldsymbol{X_{ts}}\boldsymbol{\beta}_2 + \alpha_s + \varepsilon_{ts} \tag{C.4}$$

where Y_{ts} represents the outcome of interest (e.g., application starts) for census tract, t, in state, s; $Treat_{ts}$ is an indicator for whether the census tract is served by a DoD youth program; $\boldsymbol{X_{ts}}$ is a vector of standardized census tract characteristics presented in Panel C of Table C.2 and includes the spatial exposure measure with a local environment defined by a 30-mile radius;[10] α_s are state-fixed effects that control for stable differences across states; and ε_{ts} is a tract-level stochastic error term. All regressions are weighted by the PSWs. The parameter of interest is β_1, which will estimate the effect of being served by a DoD youth program on the outcome of interest. The inclusion of $\boldsymbol{X_{ts}}$, which contains the covariates used in the propensity score models, results in doubly robust estimates.[11] As long as either the propensity scores or controlling for the variables used in the propensity score model account for all of the differences between treatment and comparison tracts, estimates produced in our analyses would be unbiased. However, including both provides additional safeguards in case either approach is insufficient.

As stated in the previous section, propensity scores and their associated weights were created for each treatment definition. Outcome models were therefore estimated separately for urban, suburban, and rural tracts so that the appropriate treatment definition and associated weights could be used in the regression. Outcome models of each urbanicity type also employed PSWs from propensity score models that used the appropriate treatment definition. This approach resulted in three estimates of β_1, one for each outcome, Y_{ts}. A single estimate was calculated using a fixed effect meta-analytic average approach. This approach weights each estimate by its precision, with more precise estimates receiving more weight in the overall average. Because the majority of tracts are urban tracts, the meta-analytic averages are more similar to urban estimates.

Finally, all outcomes of interest in this analysis are count variables, and the distribution of each outcome is not normal and includes a large mass at zero. Ordinary least square estimates can provide biased estimates in these situations, even in a causal framework. We therefore use negative binomial models, a parametric

[10] In Tables C.15 through C.24 (available in an annex at www.rand.org/t/RRA2697-1), we show that results are robust to controlling for spatial exposure measures with a local environment defined by a radius of ten miles.

[11] A small amount of covariate data was missing from ACS files. We therefore performed multiple imputation via Stata's -mi- command. All outcome models were estimated using the multiple imputation except those with technical eligible application continuations as the outcome in rural tracts. In those cases, the models would not converge on the multiple imputation datasets, and missing data were imputed with the rural mean of the covariate and an indicator for missingness.

regression suitable for count variables with a large mass at zero.[12] The point estimates on negative binomial models are difficult to interpret; therefore, in addition to these estimates, we present IRRs.[13] IRRs can be interpreted as the percent increase in expected counts of the outcome over the course of the fiscal year.

Covariate Balance

The propensity score weighting approach aims to make comparison tracts as similar as possible to treatment tracts on observable characteristics. Before estimating outcome models, we formally estimate the difference in observables between treatment and comparison tracts through models of the following form (Equation C.5):

$$X_{ts} = \beta_0 + \beta_1 Treat_{ts} + \varepsilon_{ts} \tag{C.5}$$

where X_{ts} is a standardized tract characteristic from the vector in Equation C.4, $Treat_{ts}$ is an indicator for being a treatment tract, and ε_{ts} is an idiosyncratic error term. The parameter of interest is once again β_1, which indicates the difference in the characteristic between treatment and control tracts in standard deviation units. If treatment and comparison tracts are similar on the observed variable, β_1 will be quantitatively small and statistically insignificant. We use ordinary least square regression analyses to verify the covariate balance between treatment and comparison tracts because tract characteristics follow an approximately normal distribution. Finally, as with our main outcomes, separate models are used for each tract urbanicity to incorporate the appropriate treatment definition and PSWs, and an overall estimate was calculated through a meta-analytic average. Equation C.5 was used to measure the balance of each covariate in the vector delineated in Equation C.4.

We present the results of the covariate balance tests in Table C.4. The first column shows the meta-analytic average of the imbalance of the covariates without including PSWs, and the second column shows the meta-analytic average of the imbalance when including PSWs. Almost all covariates are significantly imbalanced, as shown in column 1 of Table C.4, with some imbalances as high as 0.775 standard deviations. These estimates confirm that DoD youth programs are not randomly placed in communities, making simple comparisons between tracts inviable. After incorporating the PSWs, of 62 covariates tested, 19 are imbalanced to the 5-percent level or less. This rate of imbalance is greater than a person would expect by chance; however, many of the point estimates are quantitatively small.

The What Works Clearinghouse (2020) sets forth best practices when applying quasi-experimental methods, including propensity score weighting. The What Works Clearinghouse does not require any additional adjustment if a covariate imbalance is less than 0.05 standard deviations. Covariate adjustment is needed if the imbalance is between 0.05 and 0.25 standard deviations. Imbalance above 0.25 standard deviations indicates a threat to the design that cannot be corrected by controlling for the covariate. Of the 19 covariates that are statistically significantly imbalanced, 17 are less than 0.05 standard deviations, only two are between 0.05 and 0.25 standard deviations, and no estimates are above 0.25 standard deviations. Thus, despite the greater than expected statistical imbalance, the magnitudes indicate that the remaining bias is likely small after incorporating PSWs. Furthermore, controlling for the vector of covariates and using PSWs in the subsequent outcome models produce doubly robust estimates, thereby resolving lingering bias on observables.

[12] In analyzing count variables, a class of parametric regressions including Poisson regression, negative binomial regression, and zero-inflated version of each are options. In choosing from among these models, we follow Long and Freese (2014) and compare the Akaike information criterion, the Bayesian information criteria, and the Vuong statistic via Stata's -countfit- command. In all cases, the negative binomial model was preferred to all other model choices.

[13] An IRR is calculated by raising *e* to the power of ß$_1$.

TABLE C.4

Covariate Balance, Meta-Analytic Average, Spatial Exposure Within 30-Mile Local Environment

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Meta-Analytic Average		Urban Tracts		Suburban Tracts		Rural Tracts	
Variable	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted
Exposure								
Military presence	0.071**	0.014	0.056**	0.003	0.252**	0.115**	−0.034	−0.131
	(0.009)	(0.013)	(0.011)	(0.014)	(0.025)	(0.036)	(0.026)	(0.085)
Demographics								
Count of population ages 15–29	0.07**	−0.042**	−0.005	−0.059**	0.200**	0.026	0.199**	0.008
	(0.008)	(0.01)	(0.010)	(0.011)	(0.018)	(0.025)	(0.020)	(0.038)
Median age	−0.326**	0.016	−0.344**	0.014	−0.285**	0.023	−0.253**	0.019
	(0.008)	(0.009)	(0.009)	(0.010)	(0.018)	(0.024)	(0.027)	(0.040)
Proportion of population never married	0.428**	0.014	0.527**	0.035**	0.260**	−0.060*	0.242**	−0.055
	(0.008)	(0.009)	(0.010)	(0.011)	(0.016)	(0.024)	(0.024)	(0.036)
Proportion of population divorced, separated, or widowed	0.266**	0.000	0.276**	0.011	0.263**	−0.011	0.190**	−0.113**
	(0.009)	(0.01)	(0.010)	(0.011)	(0.020)	(0.027)	(0.027)	(0.038)
Proportion of population Black	0.477**	0.006	0.481**	0.012	0.433**	0.014	0.564**	−0.095+
	(0.009)	(0.014)	(0.012)	(0.016)	(0.017)	(0.034)	(0.026)	(0.055)
Proportion of population other	0.022*	0.03**	0.001	0.011	0.123**	0.092**	−0.145**	−0.006
	(0.009)	(0.01)	(0.011)	(0.012)	(0.017)	(0.019)	(0.031)	(0.033)
Proportion of population Hispanic	0.284**	0.005	0.482**	0.054**	0.210**	−0.038	−0.058**	−0.086**
	(0.008)	(0.011)	(0.012)	(0.015)	(0.017)	(0.025)	(0.017)	(0.024)
Proportion of population with less than high school education	0.462**	−0.008	0.558**	0.012	0.226**	−0.074**	0.485**	−0.009
	(0.009)	(0.012)	(0.011)	(0.014)	(0.017)	(0.026)	(0.023)	(0.036)

Table C.4—Continued

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Meta-Analytic Average		Urban Tracts		Suburban Tracts		Rural Tracts	
Variable	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted
Proportion of population with a high school diploma or GED	0.082**	−0.032**	0.199**	−0.019+	−0.215**	−0.077**	−0.015	−0.042
	(0.008)	(0.009)	(0.009)	(0.010)	(0.016)	(0.020)	(0.023)	(0.032)
Proportion of population with some college	−0.133**	−0.045**	−0.122**	−0.068**	−0.053**	0.032	−0.399**	−0.017
	(0.008)	(0.01)	(0.011)	(0.012)	(0.017)	(0.023)	(0.027)	(0.038)
Proportion of foreign-born population who are noncitizens	0.2**	−0.035**	0.375**	−0.026+	0.144**	−0.045*	−0.002	−0.043*
	(0.007)	(0.01)	(0.012)	(0.015)	(0.012)	(0.019)	(0.015)	(0.022)
Proportion of foreign-born population who are citizens	0.08**	−0.018*	0.144**	−0.015	0.095**	−0.015	−0.007	−0.040+
	(0.005)	(0.008)	(0.011)	(0.013)	(0.008)	(0.012)	(0.011)	(0.023)
Proportion of population who speak language other than English in the home	0.24**	−0.01	0.404**	0.019	0.174**	−0.039+	−0.035*	−0.054*
	(0.008)	(0.01)	(0.011)	(0.014)	(0.014)	(0.021)	(0.017)	(0.023)
Proportion of foreign-born population who entered U.S. 2000–2009	0.02*	−0.016	0.019*	−0.023*	0.021	0.012	0.021	0.074
	(0.008)	(0.01)	(0.009)	(0.010)	(0.022)	(0.026)	(0.040)	(0.060)
Proportion of foreign-born population who entered U.S. 1990–1999	0.096**	−0.001	0.084**	−0.012	0.180**	0.092**	0.124**	0.042
	(0.008)	(0.009)	(0.009)	(0.010)	(0.025)	(0.030)	(0.042)	(0.064)
Proportion of foreign-born population who entered U.S. before 1990	0.053**	0.016	0.047**	0.015	0.090**	0.003	0.084*	0.060
	(0.008)	(0.009)	(0.009)	(0.010)	(0.025)	(0.031)	(0.041)	(0.056)

Table C.4—Continued

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Meta-Analytic Average		Urban Tracts		Suburban Tracts		Rural Tracts	
Variable	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted
Proportion of veterans who served in 2001 Gulf War or later	0.171**	0.024*	0.150**	0.016	0.214**	0.054*	0.179**	0.027
	(0.009)	(0.012)	(0.012)	(0.014)	(0.017)	(0.026)	(0.024)	(0.052)
Proportion of veterans who served in 1990 Gulf War	0.14**	0.06**	0.085**	0.051**	0.235**	0.087**	0.208**	0.087*
	(0.009)	(0.011)	(0.011)	(0.013)	(0.018)	(0.026)	(0.022)	(0.038)
Proportion of veterans who served in Vietnam War	−0.098**	0.001	−0.079**	0.007	−0.155**	−0.023	−0.070**	0.007
	(0.009)	(0.011)	(0.011)	(0.013)	(0.017)	(0.025)	(0.026)	(0.049)
Proportion of veterans who served in Korean War	−0.128**	−0.024*	−0.147**	−0.037**	−0.073**	0.003	−0.154**	−0.002
	(0.008)	(0.011)	(0.011)	(0.013)	(0.016)	(0.021)	(0.024)	(0.035)
Proportion of veterans who served in World War II	−0.107**	−0.037**	−0.151**	−0.039**	−0.022	−0.027	−0.123**	−0.046+
	(0.008)	(0.01)	(0.011)	(0.012)	(0.014)	(0.020)	(0.021)	(0.027)
Urbanicity								
30% or more commute to a metropolitan core	−0.135**	−0.001	---	---	−0.135**	−0.001	---	---
	(0.034)	(0.043)	---	---	(0.034)	(0.043)	---	---
Less than 30% commute to a metropolitan core	−0.29**	−0.059	---	---	−0.290**	−0.059	---	---
	(0.037)	(0.037)	---	---	(0.037)	(0.037)	---	---
Micropolitan core	0.775**	0.054	---	---	0.775**	0.054	---	---
	(0.041)	(0.055)	---	---	(0.041)	(0.055)	---	---

Table C.4—Continued

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Meta-Analytic Average		Urban Tracts		Suburban Tracts		Rural Tracts	
Variable	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted
30% or more commute to a micropolitan core	−0.59**	−0.04	---	---	−0.590**	−0.040	---	---
	(0.034)	(0.033)	---	---	(0.034)	(0.033)	---	---
Less than 30% commute to a micropolitan core	−0.249**	−0.002	---	---	−0.249**	−0.002	---	---
	(0.036)	(0.034)	---	---	(0.036)	(0.034)	---	---
Small town core	0.462**	−0.007	---	---	---	---	0.462**	−0.007
	(0.081)	(0.122)	---	---	---	---	(0.081)	(0.122)
30% or more commute to a small town core	0.436**	−0.03	---	---	---	---	0.436**	−0.030
	(0.096)	(0.16)	---	---	---	---	(0.096)	(0.160)
Less than 30% commute to a small town core	0.283**	−0.017	---	---	---	---	0.283**	−0.017
	(0.1)	(0.148)	---	---	---	---	(0.100)	(0.148)
Outside of a small town core	−0.705**	0.027	---	---	---	---	−0.705**	0.027
	(0.068)	(0.1)	---	---	---	---	(0.068)	(0.100)
Economic well-being								
Proportion of households with Supplemental Security Income	0.369**	0.01	0.431**	0.017	0.164**	−0.012	0.465**	−0.020
	(0.009)	(0.012)	(0.012)	(0.014)	(0.019)	(0.029)	(0.031)	(0.056)
Proportion of households with public assistance income	0.202**	−0.066**	0.318**	−0.052**	0.031+	−0.134**	0.013	−0.066
	(0.009)	(0.013)	(0.011)	(0.014)	(0.016)	(0.032)	(0.029)	(0.051)

Table C.4—Continued

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Meta-Analytic Average		Urban Tracts		Suburban Tracts		Rural Tracts	
Variable	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted
Proportion of population with income below the poverty line	0.435**	−0.008	0.512**	0.005	0.269**	−0.040	0.362**	−0.080+
	(0.009)	(0.011)	(0.011)	(0.013)	(0.018)	(0.029)	(0.023)	(0.042)
Proportion of labor force unemployed	0.345**	−0.012	0.401**	0.002	0.197**	−0.075*	0.370**	−0.050
	(0.009)	(0.013)	(0.011)	(0.014)	(0.018)	(0.033)	(0.029)	(0.054)
Median income	−0.292**	0.023**	−0.464**	0.013	−0.085**	0.048*	−0.154**	0.036+
	(0.007)	(0.008)	(0.010)	(0.010)	(0.015)	(0.020)	(0.013)	(0.019)
Median rent	−0.068**	0.006	−0.186**	−0.011	0.129**	0.054**	−0.003	0.015
	(0.007)	(0.008)	(0.010)	(0.010)	(0.015)	(0.019)	(0.013)	(0.018)
Median property value	−0.079**	0.022**	−0.183**	−0.006	0.008	0.044**	−0.016	0.054**
	(0.007)	(0.007)	(0.010)	(0.011)	(0.011)	(0.013)	(0.014)	(0.016)
Proportion of occupied households occupied by renter	0.408**	−0.008	0.529**	−0.006	0.330**	0.003	0.155**	−0.054
	(0.008)	(0.01)	(0.010)	(0.011)	(0.015)	(0.022)	(0.018)	(0.035)
Proportion of population without insurance	0.412**	−0.002	0.531**	0.027*	0.232**	−0.072*	0.147**	−0.106**
	(0.009)	(0.011)	(0.011)	(0.013)	(0.017)	(0.029)	(0.026)	(0.035)
Mobility								
Proportion of population living in same house as prior year	−0.113**	0.03*	−0.100**	0.033**	−0.190**	0.031	−0.033	0.054
	(0.008)	(0.011)	(0.010)	(0.011)	(0.018)	(0.023)	(0.025)	(0.047)
Proportion of population moving within county within past year	0.198**	0.002	0.234**	−0.006	0.228**	0.028	0.027	−0.035
	(0.008)	(0.011)	(0.011)	(0.012)	(0.018)	(0.023)	(0.020)	(0.037)

Table C.4—Continued

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Meta-Analytic Average		Urban Tracts		Suburban Tracts		Rural Tracts	
Variable	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted
Proportion of population moving from abroad within past year	0.066**	−0.002	0.054**	−0.029*	0.089**	0.029	0.059*	0.057
	(0.008)	(0.012)	(0.011)	(0.012)	(0.015)	(0.018)	(0.030)	(0.037)
Proportion of population moving from different state within past year	0.022*	0.021	−0.013	0.013	0.145**	0.033	0.054	0.053
	(0.009)	(0.013)	(0.010)	(0.011)	(0.020)	(0.027)	(0.037)	(0.058)
Proportion of working population without vehicles	0.13**	0.000	0.487**	0.068**	0.058**	−0.022	0.021	−0.042*
	(0.006)	(0.01)	(0.013)	(0.017)	(0.007)	(0.015)	(0.013)	(0.018)
Commuting								
Proportion of working population commuting by public transportation	0.036**	0.006	0.434**	0.063**	0.015**	−0.003	0.006	0.012
	(0.003)	(0.005)	(0.013)	(0.016)	(0.003)	(0.006)	(0.008)	(0.008)
Proportion of working population commuting by walk or bicycle	0.068**	0.015	0.188**	0.039**	−0.032*	−0.031+	−0.222**	0.022
	(0.008)	(0.01)	(0.011)	(0.013)	(0.013)	(0.017)	(0.028)	(0.032)
Proportion of working population commuting by other transportation	0.178**	0.041**	0.213**	0.047**	0.127**	0.036	0.030	−0.140+
	(0.009)	(0.012)	(0.011)	(0.014)	(0.019)	(0.028)	(0.032)	(0.077)
Proportion of working population working from home	−0.251**	−0.004	−0.251**	−0.000	−0.183**	−0.018	−0.438**	−0.072
	(0.008)	(0.009)	(0.009)	(0.009)	(0.019)	(0.024)	(0.032)	(0.058)
Proportion of population working outside of home with 20–29 minute commute	−0.062**	−0.016	−0.052**	−0.009	−0.260**	−0.064*	0.211**	−0.030
	(0.008)	(0.01)	(0.010)	(0.011)	(0.021)	(0.029)	(0.028)	(0.044)

Table C.4—Continued

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Meta-Analytic Average		Urban Tracts		Suburban Tracts		Rural Tracts	
Variable	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted
Proportion of population working outside of home with 30–44 minute commute	0.115**	0.027**	0.162**	0.041**	−0.222**	−0.072**	0.292**	0.057
	(0.009)	(0.01)	(0.010)	(0.012)	(0.022)	(0.028)	(0.026)	(0.038)
Proportion of population working outside of home with 45–59 minute commute	0.072**	0.037**	0.075**	0.031**	−0.080**	0.030	0.275**	0.119**
	(0.009)	(0.01)	(0.010)	(0.012)	(0.021)	(0.027)	(0.026)	(0.041)
Proportion of population working outside of home with 60–89 minute commute	0.112**	0.02	0.142**	0.013	−0.016	0.026	0.187**	0.071+
	(0.009)	(0.011)	(0.011)	(0.013)	(0.018)	(0.023)	(0.022)	(0.042)
Proportion of population working outside of home with 90–99 minute commute	0.038**	−0.024*	0.074**	−0.014	−0.093**	−0.053*	0.075*	−0.063
	(0.009)	(0.011)	(0.010)	(0.012)	(0.019)	(0.025)	(0.029)	(0.042)
Internet								
Proportion of households with dial-up internet only	−0.064**	−0.003	−0.035**	−0.002	−0.316**	−0.015	−0.214**	0.014
	(0.008)	(0.008)	(0.008)	(0.009)	(0.026)	(0.029)	(0.045)	(0.057)
Proportion of households with smartphone data plan	−0.253**	00	−0.350**	−0.000	0.013	0.021	−0.139**	−0.037
	(0.008)	(0.01)	(0.010)	(0.012)	(0.019)	(0.026)	(0.025)	(0.037)
Proportion of households with satellite internet	−0.104**	−0.011	−0.050**	−0.002	−0.619**	−0.106**	−0.398**	−0.078+
	(0.006)	(0.006)	(0.006)	(0.007)	(0.021)	(0.024)	(0.035)	(0.046)

Table C.4—Continued

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Meta-Analytic Average		Urban Tracts		Suburban Tracts		Rural Tracts	
Variable	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted
Density								
Population density (people per square mile)	0.034**	00	0.492**	0.078**	0.059**	−0.005	0.008**	−0.000
	(0.002)	(0.003)	(0.013)	(0.017)	(0.004)	(0.005)	(0.002)	(0.003)
Housing density (housing units per square mile)	0.014**	−0.003	0.465**	0.094**	0.055**	−0.003	0.003*	−0.004+
	(0.001)	(0.002)	(0.014)	(0.017)	(0.003)	(0.005)	(0.001)	(0.002)
Proportion of households with grandparent living with owner	0.334**	0.018	0.371**	0.024+	0.236**	−0.008	0.390**	0.035
	(0.009)	(0.011)	(0.011)	(0.013)	(0.017)	(0.024)	(0.034)	(0.047)
Proportion of households overcrowded	0.227**	−0.03**	0.389**	−0.036*	0.103**	−0.034+	0.049*	−0.002
	(0.008)	(0.011)	(0.012)	(0.016)	(0.013)	(0.019)	(0.023)	(0.028)
Proportion of households severely overcrowded	0.174**	−0.013	0.311**	−0.011	0.069**	−0.021	0.042	0.023
	(0.008)	(0.012)	(0.013)	(0.017)	(0.012)	(0.018)	(0.038)	(0.041)
Observations	71,605–72,338		51,265–51,820		13,597–14,073		6,164–6,495	

NOTE: Each cell in columns 1 and 2 represents the result of a meta-analytic average of regressions of the covariate on an indicator for representing a treatment tract. Meta-analyses averaged separate regressions in urban, suburban, and rural areas. Columns 3–8 present the results from regressions in the urbanicity subsamples. Treatment tracts are defined as having the closest youth program within 1 mile in urban areas, 5 miles in suburban areas, and 9 miles in rural areas. All covariates are standardized. Column headings indicate urbanicity and whether regressions are weighted. Weights are treatment-on-the-treated weights calculated from propensity scores. All variables were included in propensity score weighting models except ages greater than 44 and household overcrowding variables.

+ = $p < 0.10$.

* = $p < 0.05$.

** = $p < 0.01$.

Limitations

The propensity score weighting approach corrects for a substantial number of differences between treatment and comparison tracts. Any lingering bias not fully accounted for by the propensity score weighting is likely alleviated in doubly robust estimates. Further, the ACS provides a rich set of covariates on which to match, covariates that predict the probability of applying or accessing to the military in addition to being served by DoD youth programs. Despite these methodological strengths, this approach has limitations.

The first limitation is inherent in all propensity score weighting models in that this approach can only control for observed differences between treatment and comparison tracts. To the extent that the observed tract characteristics can completely account for all tract characteristics that predict outcomes of interest in addition to the placement of DoD youth programs, the results estimates can be interpreted as causal. However, it is possible that important characteristics not included in the ACS or captured by the spatial exposure measures, and therefore unobserved in our models, could be biasing the results.

The second limitation is that we can only control for community characteristics as measured by ACS tract characteristics. We are unable to control for individual characteristics or weight at the individual level. This alternate approach would require individual-level data on all *potential* applicants and accessors in treatment and comparison tracts. Such data do not exist at scale, and we only have individual-level data on *actual* applicants and accessors, not the entire pool of *potential* applicants and accessors. To the extent that the community-level weighting accounts for all pertinent differences between treated and untreated tracts, including any differences in the pool of potential applicants and accessors, our estimates can still be considered causal, albeit likely less precise. However, the possibility of unobserved characteristics being omitted from our models precludes us from ensuring that the pool of applicants and accessors is identical between treated and comparison tracts.

Third, we denote a community (i.e., census tract) as either exposed to a DoD youth program or unexposed based on how far the nearest DoD youth program is from the census tract center. This approach places a hard boundary on exposed communities based on geography. Thus, it is possible that residents on either side of a census tract boundary will be given different treatment conditions despite their close geographic proximity to each other. The placement of programs is also unlikely to be at the tract center, and the shape of a tract is often irregular, such that people are not uniformly placed around tract centers in all directions. It is possible that, in a large tract, a program is far from the centroid and the tract is denoted as unexposed, despite some of the population being close to the program. Furthermore, in an exposed tract, if a program is closer to one portion of the boundary, then families just beyond the boundary in an adjacent unexposed tract will be part of the comparison group despite being geographically closer to the program than families in the tract that contains the program but who reside near the far boundary. Thus, the hard lines of treatment interact with the distribution of program locations, tract centroids, and population in complex ways. These interactions are also likely to be larger in suburban and rural communities, where the census tracts are larger in geographic area. However, whether these interactions bias our estimates is unclear and will only occur if they are systematic and related to applications and accessions through channels not accounted for by the characteristics in our model. Given the rich set of characteristics we include in our models, bias from these interactions may be less likely.

While our analytical approach does not provide causal estimates, it provides results that more closely reflect causal estimates. Our main results, presented in Tables C.5 through C.7 (which are available in an annex at www.rand.org/t/RRA2697-1), show that unadjusted estimates are much larger than those produced after controlling for tract characteristics and including PSWs. This pattern indicates that naïve comparisons between treatment and comparison tracts are biased upward or overstate the effect of DoD youth programs. Therefore, while our approach produces estimates that more accurately reflect the true effect of DoD youth programs, the estimates may still be overestimating the effect.

Results

The remainder of this appendix, with Tables C.5 through C.24, is available in an annex at www.rand.org/t/RRA2697-1.

Abbreviations

ACS	American Community Survey
AFQT	Armed Forces Qualifying Test
ASLP	American School Leader Panel
CCD	Common Core of Data
COVID-19	coronavirus disease 2019
DEERS	Defense Enrollment Eligibility Reporting System
DISDI	Defense Installations Spatial Data Infrastructure
DMDC	Defense Manpower Data Center
DoD	Department of Defense
ECS	Education Commission of the States
FY	fiscal year
GBM	Generalized Boosted Model
GED	General Educational Development
HiSET	High School Equivalency Test
IRR	incidence rate ratio
JROTC	Junior Reserve Officers' Training Corps
LET	Leadership, Education, and Training
MEPCOM	Military Entrance Processing Command
MIRTA	Military Installations, Ranges, and Training Areas
PSW	propensity score weight
STEM	science, technology, engineering, and mathematics
USMC	U.S. Marine Corps

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Through its funding and implementation of youth programs, the Department of Defense (DoD) serves communities throughout the United States. The three predominant programs—STARBASE, National Guard Youth ChalleNGe, and Junior Reserve Officers' Training Corps—serve more than half a million young people each year and have a shared commitment to providing service and positive outreach to communities. These programs have the potential to reach a substantial proportion of the U.S. population and may help bridge the civilian-military divide.

There is no existing approach to assessing how well the programs fulfill their outreach goals. The authors developed an analytic framework to help assess the channels that enable these programs to positively influence communities and society more broadly. The authors hypothesize that if DoD youth programs function as intended—improving the trajectories of young people who participate and providing communities with positive impressions of such programs—community member sentiment toward the military will be more favorable, and interest in the military as a potential career path will increase.

The authors surveyed school leaders for their awareness and perceptions of the DoD youth programs, examined one program's curricula, and estimated the extent to which these programs influence military recruitment and accessions. Although these are not comprehensive measures of the ways that DoD youth programs might bridge the civilian-military divide or support an all-volunteer force, they provide one indication of the programs' impact on the communities they serve.

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