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Social Media and the Army

Implications for Outreach and Recruiting

The U.S. Army has long relied on traditional marketing and advertising strategies as its main method for recruiting and general outreach. Common outreach and recruiting efforts have included television and radio ads, as well as recruiter-led activities, such as setting up booths at career fairs and sporting events, visiting high schools and other places where youth spend their time, and cold calling.

In recent years, however, important changes have taken place in the way people seek out and receive information, in particular because of the use of technology. Online information and social media provide much of the information sought by many young Americans today. Figure 1 shows that, by 2017, nearly 90 percent of all U.S. adults had used the internet, a figure that grew by more than 50 percent since 2000. Three-fourths of U.S. adults had broadband internet at home, and around the same percentage owned a smartphone.

For the Army's audience of potential recruits, social media is especially important. Young

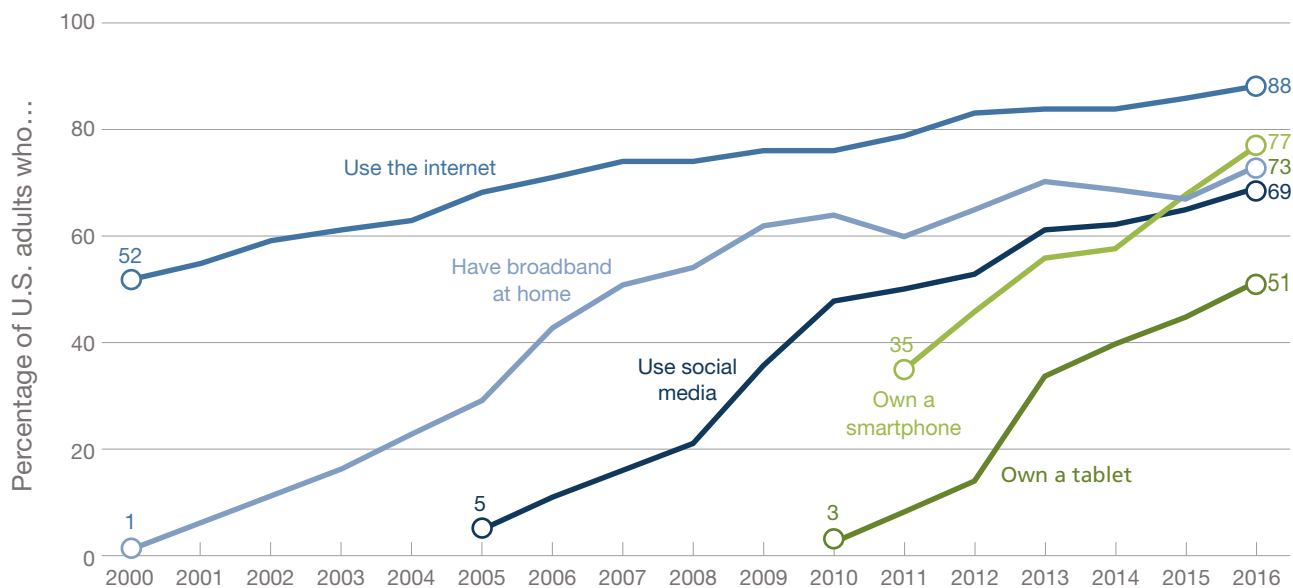
adults use social media at higher rates than other groups. Technology use is prevalent among this population, with more than 90 percent of 18- to 29-year-olds owning a smartphone.¹ About the same proportion use social media (Figure 2).

The widespread use of technology suggests that internet and social media use are the norm among potential Army recruits and also among the adults who might influence potential recruits: three-quarters of 30- to 49-year-olds use social media, and approximately one-half of 50- to 64-year-olds do as well. There are differences in social media platform use by age: Older users, for example, spend relatively

KEY FINDINGS

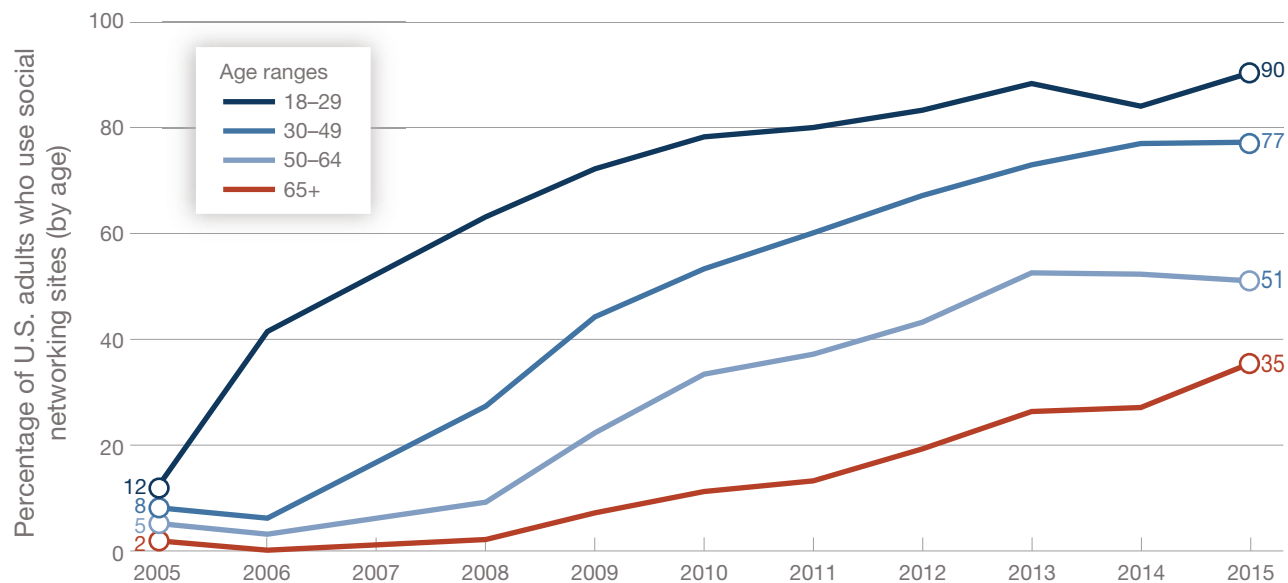
- Visitors are likely to view pages containing career-related information and, to a lesser extent, about procedures and requirements to join the military.
- The number of visitors is positively correlated with contracts, but the relationship is very small.
- People living in densely populated areas and those living in places with higher proportions of minority groups and immigrants appear to use GoArmy.com more intensively than others. In some cases, there are more contracts than would be expected in these areas.
- @GoArmy's Twitter is a good source for building awareness of Army culture, but the platform is less effective in producing contracts.
- GoArmy's Facebook page has an audience made up of the general public, soldiers, veterans, military families, and potential recruits.

FIGURE 1
Trends in Technology Use, 2000–2016



SOURCE: Aaron Smith, “Record Shares of Americans Now Own Smartphones, Have Home Broadband,” Pew Research Center, January 12, 2017.

FIGURE 2
Trends in Technology Use, 2000–2016, by Age Group



SOURCE: : Andrew Perrin, “Social Media Usage: 2005–2015,” Pew Research Center, October 8, 2015.
NOTE: Percentages are for U.S. adults who use any social networking site.

Abbreviations

ACS	American Community Survey
AMRG	Army Marketing Research Group
ASVAB	Armed Services Vocational Aptitude Battery
DEP	Delayed Entry Program
DMA	designated marketing area

more time on Facebook, while younger users are more likely to spread their time across a wide variety of platforms, including Twitter and Pinterest. Young adults also use digital platforms that allow them to interact simultaneously with more than one person. For example, 45 percent of Snapchat users are in the 18–24-year-old age range; this demographic represents 28 percent of Tumblr users and 23 percent of Instagram users. Twitter users are generally younger than Facebook users.² All of this information suggests that different platforms target somewhat different audiences.

In short, technological changes allow individuals and organizations to communicate information to one another in new and creative ways and on a nearly real-time basis. New technologies also offer tools for the Army (and other organizations) to use as part of an overall outreach strategy.³ Technology is making it easier and potentially less time-consuming to collect information about potential recruits and other website and social media users. Website and social media accounts can be used to raise awareness of the Army among the public and, especially, potential recruits, and thus represent important recruiting platforms.⁴

Research Questions

Given the advances in the use of technology described in the previous section, our goal in this report is to analyze several online and social media platforms used by the Army, in particular GoArmy.com (the Army's main recruiting and outreach webpage) and the Facebook and Twitter accounts maintained by the Army Marketing Research Group (AMRG).⁵ We analyze various measures to understand if and how potential recruits are engaging with these platforms

and present information about the likely outcomes of the Army's technology-based outreach efforts. This report will address the following questions:

- What platforms are used, and how much are they used?
- What online material engages people, and who is engaged? To what effect?

Army Social Media Platforms and Followers

Our analyses focus on three online sources of information about the Army: GoArmy.com; the GoArmy Facebook account; and the @GoArmy Twitter account. Other social media platforms have Army-relevant information and are followed by Army personnel and their families, but we focus on these three platforms because they are used by AMRG as primary means of communication and outreach.

Before beginning our analyses of specific accounts, we provide an overview of how the social media accounts—GoArmy.com, Facebook, and Twitter—are used and how many people follow each account. Table 1 shows posts and followers on AMRG's Facebook and Twitter accounts.

Because GoArmy.com is a website that includes many pages containing a wide variety of information, use levels for GoArmy.com cannot be directly compared with those of social media accounts. Our data on this platform include all visits to GoArmy.com between July 2014 and July 2016; during that period, the webpage had more than 150 million total pages viewed and more than 40 million sessions (a session could include views of multiple pages on the website; during an average session, a user looked at three or four different pages). Therefore, we can conclude that the number of GoArmy.com users appears to be larger than the number of Facebook or Twitter users⁶; on one hand, this is not surprising, as GoArmy.com includes many pages and information on a wide variety of topics. On the other hand, visiting a webpage could be viewed as representing less engagement than, for example, following or liking an AMRG account on another platform where the user will continue to see posts from the account.

TABLE 1
Posts and Followers on AMRG’s Facebook and Twitter Accounts

	Facebook January 1, 2014–October 1, 2016	Twitter January 1, 2014–May 2, 2016
Followers	1.1 million	49,600
Posts	4,805 (average 4.8 per day)	5,024 (average 5.9 per day)
Likes (median) per post	1,396	—
Shares (median) per post	80	—
Comments (median) per post	24	—
Mentions and retweets (total)	—	52,811
Follower characteristics	• Most active commenters were family members of soldiers. • Most comments came from general public. • More than half were male. • Significant proportion of service members and members of the public are under the age of 25 (46 percent and 32 percent, respectively). • Official or unofficial connection to the Army (e.g., recruiter, veteran) • Relatively fewer family members of soldiers (e.g., husband, mother)	

NOTE: See Appendix A for details and sources of the information included in this table.

We can contextualize these numbers by comparing them with other military service accounts, as well as other websites and social media accounts popular among young people. The U.S. Marine Corps recruiting Twitter account has 379,000 followers, the USMC Facebook account has 4.1 million; the Navy’s recruiting Twitter account has 36,000 followers, and its Facebook account has 676,000. YouTube and BuzzFeed are popular websites overall among 18- to 24-year-olds, with 241 million and 51 million visitors per *month*.⁷ YouTube’s Twitter and Facebook accounts have 72 million and 83 million followers, respectively, and BuzzFeed’s Twitter and Facebook accounts have 1.24 million and 11 million followers, respectively.

Organization of This Report

The remainder of the report is organized into four sections. “The Army’s Primary Website, GoArmy.com,” “Army Marketing Research Group’s Twitter Account,” and “Army Marketing Research Group’s Use of Facebook,” are organized by platform. “The Army’s Primary Website, GoArmy.com” reviews the use of GoArmy.com, “Army Marketing Research Group’s Twitter Account” focuses on the Army’s Twitter account, and “Army Marketing Research

Group’s Use of Facebook” focuses on AMRG’s Facebook account, including an experiment we conducted on Facebook in partnership with AMRG. For each platform, we provide additional information about the number of visitors or followers, as well as measures of the overall level of engagement (ways of measuring engagement vary by platform) and potential measures of effectiveness. The final section provides conclusions and recommendations.

The Army’s Primary Website, GoArmy.com

One of AMRG’s goals is to drive potential recruits to their website, GoArmy.com, which includes a variety of potentially helpful information, such as detailed descriptions of Army jobs and recruiting-related requirements. However, the website also serves other purposes; in particular, it is an information resource for current soldiers, their families, and others. Therefore, not all of the information on the site is relevant to recruits.

In this section, we concentrate on GoArmy.com’s role as a recruiting tool, presenting analyses that draw on an evolving field of research that links data from website searches to other sources of information, thus increasing the explanatory power of models focusing

on well-established outcomes.⁸ We first examine the website's recruiting content and explore the parts of the site that receive the greatest interest. Next, we look at the effect of website visits on potential recruits by examining the relationship between visits to GoArmy.com and contracts. Finally, we take a closer look at what is known about site users.⁹

Which Pages Are Users Visiting on GoArmy.com?

We used data on pages visited within GoArmy.com to determine the *types* of pages on the site that are viewed most often. We first identified the top 100 webpages (by total number of page views). The top 100 webpages make up about two-thirds of all page views, and visitors spent about two-thirds of their total time on the site viewing these 100 pages. Therefore, these 100 pages include the majority of GoArmy.com information viewed.¹⁰

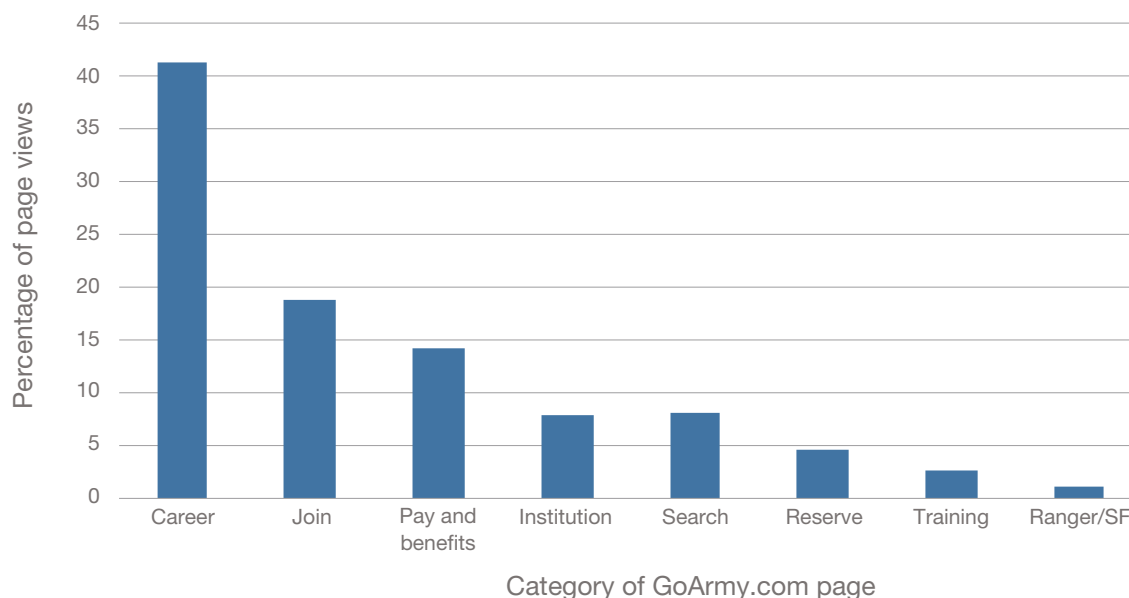
We sorted the top 100 pages by topic, as shown in Figure 3. Pages relating to careers had, by far, the largest number of page views.¹¹ This category contains about 40 percent of the top 100 pages on the website. The top two pages in terms of page views

both focus on careers and are alone responsible for about 20 percent of all page views among the top 100 pages.¹² These two pages describe careers available in the Army; they are likely of interest to those considering enlistment and also potentially to soldiers in the Delayed Entry Program (DEP) as well as perhaps to current soldiers curious about alternate careers in the Army.

The next two most popular categories of pages were related to joining the Army and to pay and benefits. Pages providing information about joining the Army make up nearly 20 percent of all page views.¹³ While the career-related pages contain information that is likely useful to future and current soldiers, pages providing information on pay and benefits or joining the Army are most likely to be relevant to future soldiers (and perhaps to recent enlistees in the DEP who are exploring options). The other categories shown in Figure 3 each account for fewer than 10 percent of all page views.

Based on our analyses of page views, it appears likely that potential enlistees use GoArmy.com to get information about procedures and requirements to join the military. However, the pages that provide military occupation specialty (MOS)-specific career

FIGURE 3
Frequently Viewed Pages on GoArmy.com, by Category



SOURCE: Authors' tabulations using data from GoArmy.com; data include the 100 pages with the largest numbers of page views, July 2014–July 2016.

GoArmy.com has thousands of daily visits. Our regression results indicate that, while the number of visitors is positively correlated with contracts, the relationship is very small.

information are viewed far more often than pages related to procedures and requirements. Career-related information is likely useful to both current soldiers and potential recruits. Although we do not know the characteristics of visitors to the website, we believe potential enlistees and current soldiers use the website to gather information, but the pages they visit likely differ somewhat.

Are Visits to GoArmy.com Correlated with Contracts?

We next examined page views and similar measures to test for a correlation between webpage use and Army contracts. To the extent that contracts and page views are correlated, this would suggest that potential recruits are among those viewing GoArmy.com pages, and/or that new recruits find information on GoArmy.com. However, we stress that we are not actually able to follow the individuals who visit GoArmy.com to measure their eventual enlistment; our analyses are carried out by region or area and time.

We organized our data on website visits by designated marketing area (DMA) and month. The United States is divided into 210 DMAs; GoArmy.com captures the general geographic location (the DMA) of each website user. See the appendix for more details about these data. We used these website statistics (total number of visitors, time spent on the site) in conjunction with data from the Regular Army (RA) analyst database on the number of contracts and high-quality contracts by geographic area and time.¹⁴

We used a simple regression model to explain the number of contracts as a function of GoArmy.com

visits and indicators of the fiscal year, month of the year, and DMA.¹⁵ This technique allowed us to examine the relationship between website visits and contracts after netting out other factors that explain much of the variation.

GoArmy.com has thousands of daily visits. Our regression results indicate that, while the number of visitors is positively correlated with contracts, the relationship is very small. Indeed, our results indicate that other factors explain most of the differences in contracts across areas; holding everything else constant but increasing the number of visitors approximately sixfold is associated with less than one new contract per DMA per month (DMAs produce about 25 contracts per month). We also tested for the relationship between website visits and high-quality contracts; again, we found that visits are correlated with contracts, but we saw an even smaller effect than when we looked at all contracts.

We found similar results using other measures. We tested other website-use measures (time on page, number of pages viewed); in each case, the results were quite similar to what we found using number of visitors. GoArmy.com provides an opportunity for potential enlistees to enter their information so that a recruiter can contact them (entering this information on GoArmy.com is referred to as a *goal completion* or as completing a *thank you page*). Again, we found similar results using “thank you” pages as a measure of website use. Such results are not surprising, as all of the website measures we examined are highly correlated with one another.¹⁶ This is noteworthy, as it suggests that *any* of these measures is appropriate for tracking website use.¹⁷

In many cases, contracting and enlistment happen over a period of time; also, soldiers who are

in DEP may visit GoArmy.com to learn more about life in the Army. Therefore, website use may either precede or lag behind contracts. To understand this phenomenon, we looked at the relationship between website use in one month and contracts in later months, as well as the relationship between contracts in one month and website use in a later month.

We found a positive but very small correlation between the number of visitors and the number of future contracts; however, past contracts also were correlated with current website visits.¹⁸ An interpretation of this result is that website use does precede contracting in some cases, and that those who recently contracted visit GoArmy.com as well. These results suggest that GoArmy.com serves as a source of information both for those who are considering enlistment and for those who have enlisted recently.

The small relationship between visits and contracts implies that most of the visitors to GoArmy.com do not subsequently sign a contract with the Army. One potential explanation for this is that the site is designed to serve both potential recruits and current soldiers. We analyzed the search data that most commonly brought visitors to GoArmy.com and discovered that many visitors were searching for specific information, such as information on pay charts, policies relevant to reservists, Reserve Officers' Training Corps (ROTC) scholarships, or "green to gold" information. Many of these searches were most likely carried out by current soldiers. This implies that many of the visitors to GoArmy.com would not be expected to subsequently contract with the Army because they are already in the Army. Some may revisit the site to learn additional details about Army life, perhaps while in DEP. And others may be potential recruits who visit to learn more about Army opportunities, but who ultimately decide

to pursue other opportunities. Indeed, GoArmy.com could serve to provide information to certain types of potential recruits: examples include those who have hesitations about joining or those who have concerns about their capacity to qualify to serve. Learning more about the potential recruits who visit GoArmy.com could be valuable to recruiting efforts in general.

Who Visits GoArmy.com?

To learn more about who uses GoArmy.com, we used data from the American Community Survey (ACS) to break down DMA-specific differences and to better understand the relationship between geography, demographic factors, and GoArmy.com use.¹⁹

Figure 4 shows the percentage of each group or outcome (youth population, website users, and contracts) by the size of the DMA the individual lives in. It shows that youth population, website use, and contracts all vary sharply depending on the size of the DMA.²⁰ As expected, all measures are highest in the DMAs with the biggest populations, and the numbers of contracts (and high-quality contracts) are roughly proportional to the population. However, it is also noteworthy that measures of website use (number of visitors, number of thank you pages) are disproportionately high in the DMAs with the largest populations. Put another way, those from the most populous DMAs appear to use GoArmy.com more intensively than those from other DMAs.

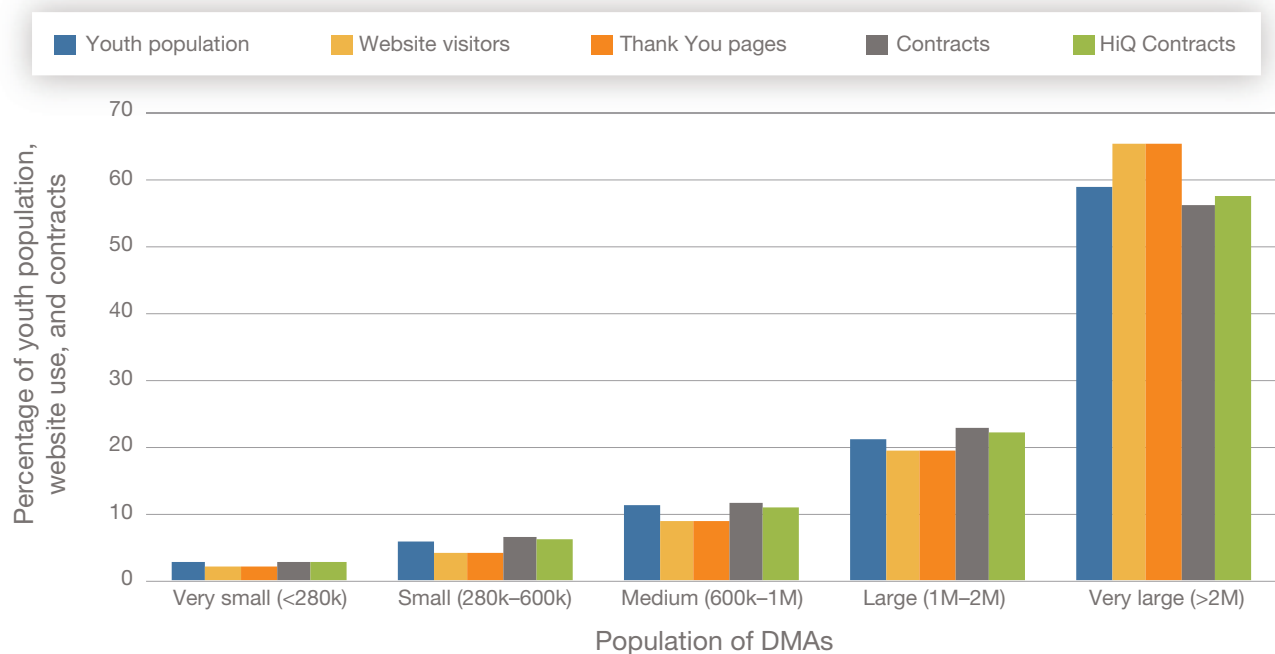
These results suggest the people in the largest, most densely populated DMAs are more likely than others to visit GoArmy.com and to provide contact information but are no more likely than others to enter the Army.

One potential reason for the differences observed in Figure 4 is that GoArmy.com may serve as a substitute for recruiters in areas where recruiters

The small relationship between visits and contracts implies that most of the visitors to GoArmy.com do not subsequently sign a contract with the Army.

FIGURE 4

Distributions of Population, Website Users, Contracts, by Size of DMA



SOURCE: Authors' tabulations using data from ACS, GoArmy.com, and Reserve Army analyst.

NOTES: Each bar represents the percentage of that variable that comes from DMAs with populations listed on the x-axis. For instance, 3 percent of the youth population lives in DMAs that have populations smaller than 280,000 people. Fifty-nine percent of youth live in DMAs with more than 2 million people. The yellow and orange bars, representing website visitors and thank you pages, respectively, indicate the percentage of each website activity that comes from users who live in the displayed population-sized DMAs. For example, 65 percent of website visitors and those who complete thank you pages live in large (more than 2 million people) DMAs. Finally, the gray and green bars indicate the percentage of Army contracts that come from various DMAs. Although 59 percent of youth live in DMAs with more than 2 million people, only 56 percent of contracts come from those large DMAs.

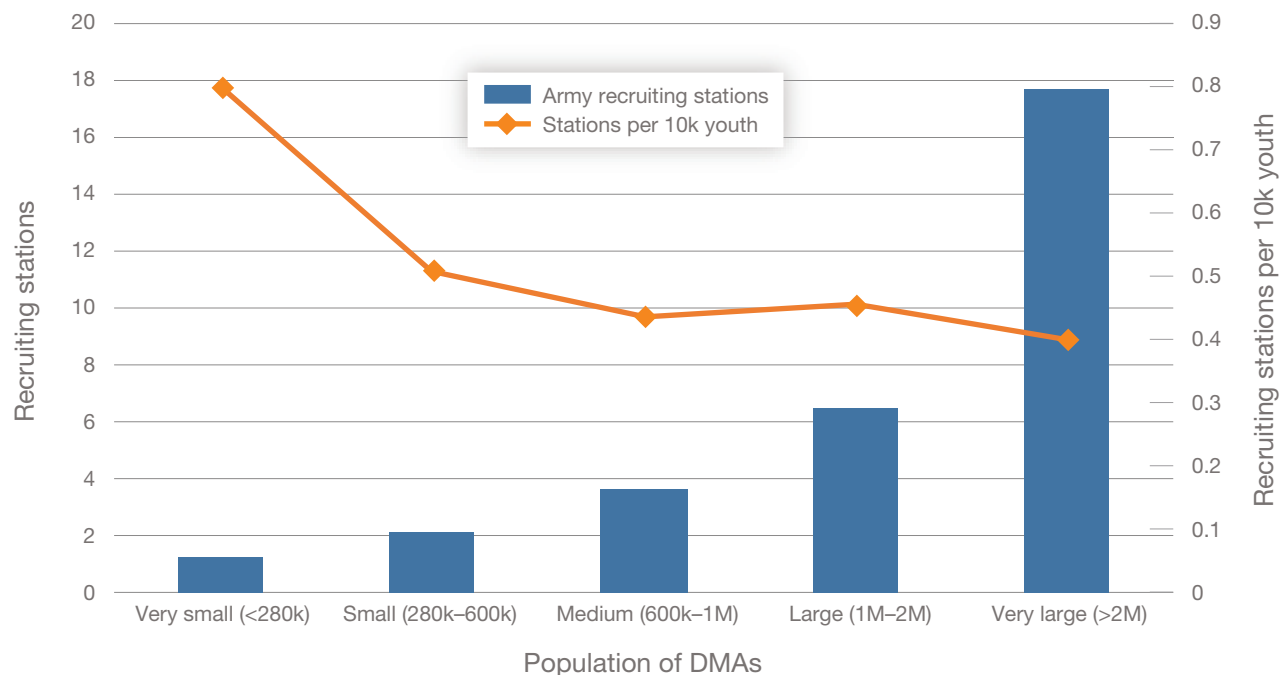
spend less time. While we lack detailed data on distances between website visitors and the nearest recruiter, we can compare the density of recruiters across various types of DMAs.

Figure 5 demonstrates that DMAs with the smallest populations have the smallest numbers of recruiting stations, but these areas may require fewer recruiters because they have fewer people. When we calculate the number of stations per 10,000 young people, we see that the least-populated DMAs now have higher numbers of stations (see dotted line). This measure is somewhat imprecise, as it includes the number of *stations* rather than the number of *recruiters* (the latter measure was not available in our data sources). However, the data suggest that young people in the most highly populated DMAs have access to roughly as many recruiting stations as young people in most other DMAs (with the exception of the smallest DMAs—young people

in these areas may be viewed as having access to more recruiters, although they may also need to travel substantial distances to meet with recruiters). If, as seems likely, recruiting stations in the most populated areas are larger than other recruiting stations, young people in the most populated areas may actually have better access to recruiters than young people in some of the smaller DMAs. In any case, there is little evidence that the pattern in Figure 4 is driven by a lack of access to recruiters.

There are a number of other potential explanations for the more intensive use of GoArmy.com in the most highly populated DMAs. First, internet access could vary, with those in more populated areas having better access; however, analyses of the internet-related questions on the ACS revealed that access is very similar across DMAs. We also examined the data of DMAs with the largest Army bases to see the extent to which current soldiers and

FIGURE 5
Distribution and Average Number of Recruiting Stations, by Population of DMAs



SOURCE: Authors' tabulations using data from the ACS.

their families were driving our results. We found that the largest bases are scattered across DMAs of various sizes, suggesting that current soldiers and their families are not driving the patterns shown in Figure 4.²¹ Finally, we looked at demographic characteristics. GoArmy.com visits are higher in DMAs in which more of the population is foreign-born and where more of the population is black or Hispanic; contracts are higher as well in these areas.²² These results suggest that a more detailed analysis of how webpage visits vary by DMA characteristics could yield valuable information; for example, it may be the case that pages with certain types of content are more heavily visited by those living in areas with more foreign-born residents. This could indicate that this type of information is in demand among the population in such areas; this could even suggest methods of targeted advertising.

In summary, we found that those living in the most populated areas and in areas with higher proportions of minority groups and immigrants appear to use GoArmy.com more intensively than

others; contracts are also higher in areas with more immigrants and more ethnic minorities.

Key Takeaways

We analyzed data from GoArmy.com to understand how online visitors use the website, as well as how website usage correlates with contracts. While the communication on GoArmy.com is unidirectional in the sense that the Army presents information to visitors, our analysis of website data says more about how users are communicating their needs and interests to the Army based on the pages from which they seek information. Some of our key findings on this topic are as follows:

- Based on our analyses of page views, we found that, while potential enlistees appear to use GoArmy.com to obtain information about procedures and requirements to join the military, site visitors as a whole are far more likely to view pages containing career-related information as opposed to information about

Taken together, these results suggest that simply increasing web traffic is likely to result in few new contracts, but that GoArmy.com may be an especially important source of information for potential recruits in some areas with diverse populations.

procedures and requirements to join the military.

- Our regression results indicate that, while the number of visitors is positively correlated with contracts, the relationship is very small.
- Our analyses of GoArmy.com users found that those living in areas with higher proportions of minority groups and immigrants and in the most populated areas appear to use the website more intensively than others and that contracts are higher in areas with more immigrants and more ethnic minorities.

We presented analyses based on several aspects of GoArmy.com in this section. The data indicate that career-related pages are frequently visited. This suggests that many of the visitors to GoArmy.com seek career-related information. However, the data have potential well beyond the analyses that we present here; first, a more-detailed analysis of pages visited, perhaps by population characteristics, could provide information to allow for more targeted recruiting. Also, tracking the visits to GoArmy.com and correlating those with specific recruiting or advertising events could provide an intermediary measure of effectiveness.

Taken together, these results suggest that simply increasing web traffic is likely to result in few new contracts, but that GoArmy.com may be an especially important source of information for potential recruits in some areas with diverse populations. Past research found that potential recruits frequently search for information about qualifications,²³ so

concerns about qualifications or availability of key career paths may help to explain this finding. At the same time, the website serves multiple purposes and users with diverse needs, and GoArmy.com is a source of a wide range of information about Army life.

Army Marketing Research Group's Twitter Account

In this section, we present our analysis of the @GoArmy Twitter account to understand how it is used to interact with potential recruits and share information and news about the Army. We begin by providing a basic quantitative overview of the account, looking at tweeting and retweeting patterns over time. We then use lexical analysis to characterize the content of the @GoArmy account to determine what the account talks about and how its users respond. Finally, we compare the themes, topics, and effects of the @GoArmy account to similar accounts from other services to identify where the Army might improve its social media marketing strategy. Unfortunately, unlike the previous section, we are unable to link tweets to contracts or other important Army outcomes.

Before we present the results of our analyses, we offer a few definitions:

- Tweet: Consistent with other analyses of Twitter, we use the term tweet to refer to any entry on a Twitter account.

- **Post:** Post refers to a tweet originating from the account in question (in this case, @GoArmy).
- **Retweet:** A retweet is a tweet that repeats content from another user, usually citing the original author; this can also be referred to as a share.
- **Mention:** A mention is a tweet that includes another account's username; for example, "Look what [the] Army is doing! @GoArmy"
- **Firehose:** The firehose refers to the archive of Twitter content, both historical and real-time.

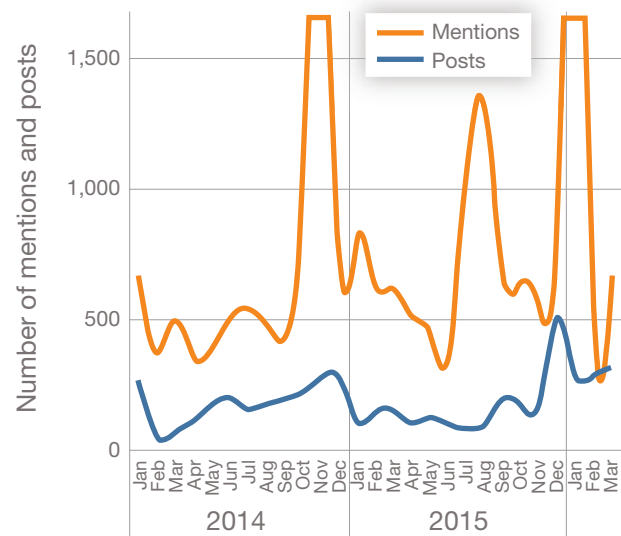
Overview of @GoArmy Twitter Account Use

Between January 1, 2014, and May 2, 2016, the @GoArmy Twitter account posted 5,024 times, an average of 5.9 times per day (maximum of 176 posts in a single day, which occurred shortly after January 1, 2016). The account was mentioned or retweeted a total of 52,811 times, averaging 61.9 times per day, by 22,275 other users.²⁴ The number of posts from @GoArmy is relatively constant over time, although there were more posts in late 2014 and from December 2015 to January 2016 than at other times. When the @GoArmy Twitter account was mentioned in large numbers by other users, content tended to focus on expressions of remembrance on behalf of veterans and messages about Independence Day. Most other sharp changes in volume on the @GoArmy account were related to holidays, especially New Year's Day,²⁵ Independence Day, and Veterans Day. The large concentration of mentions around Independence Day and Veterans Day provides an opportunity: @GoArmy could take advantage of this upswell in activity to create targeted marketing and increase their own volume on those days. Figure 6 illustrates some of these patterns.

What Is Discussed on the Army Marketing Research Group's Twitter Account?

To dive deeper into the content of AMRG's Twitter account, we used lexical analysis to characterize

FIGURE 6
Monthly Volume of Posts by and Mentions of @GoArmy



the discussion on the @GoArmy Twitter stream. Searching a historical archive of the Twitter firehose,²⁶ we obtained all tweets originating from or mentioning the @GoArmy Twitter account from May 1, 2016, to July 31, 2016. During this period, the @GoArmy account tweeted 672 times (581 original posts and 91 shares). During this same period, the @GoArmy account was retweeted 5,994 times and mentioned 2,166 times, for a total of 8,160 audience interactions.

We used text-analysis software (RAND-Lex) to get a big-picture view of @GoArmy's Twitter stream, specifically three different sets of content:

1. content generated by the @GoArmy account, including original content (tweets/posts) and content created by other users that @GoArmy retweets (shares)
2. content generated by other users that mentions the @GoArmy account (e.g., "Once a #Soldier, always a soldier. #SoldierForLife! <https://soldierforlife.army.mil/> @USArmy @USNationalGuard @USARECPAO @USArmyReserve @GoArmy #ArmyTeam" posted by @csaSoldier4Life)
3. retweets of @GoArmy tweets by other users.

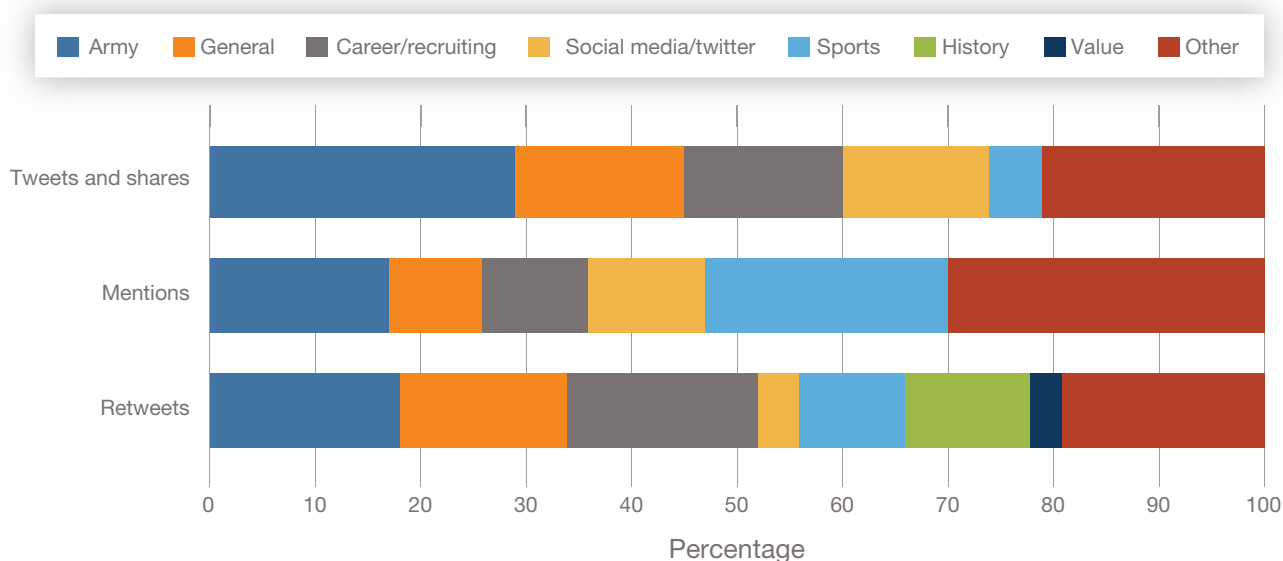
We characterized the stream and compared it with a representative sample of Twitter data, which included a baseline corpus comprising all tweets, retweets, and mentions of U.S. military service and recruiting accounts, along with the U.S. Peace Corps.²⁷ Using this sample, we identified word pairings (i.e., words that occur frequently together or in close proximity), which can point to important relationships. We extracted keywords that appear frequently on the @GoArmy Twitter stream (original tweets and retweets) to get a holistic sense of what the account talks about. These keywords are words that show up significantly more often than would be expected from the baseline Twitter data. A more detailed discussion of the methods used in the lexical analysis is found in the appendix. We then performed a thematic analysis by categorizing each keyword, word pair, and word triplet found using the RAND-Lex analysis into one or more high-level categories, such as “Army,” “Career,” “Sport,” to identify main themes. This process is similar to what a subject-matter expert would use in making a qualitative judgment of the “aboutness” of a particular corpus but is more of a mixed method in that we perform

qualitative coding of quantitative results and then compare the resulting percentages.

The results of our thematic categorization are shown in Figure 7.²⁸ From this analysis of the RAND-Lex analytic results, we can see that the largest categories of content coming from the @GoArmy Twitter account (tweets and retweets) focus on careers in the Army as well as recruiting, the Army, and social media-specific language (e.g., “follow,” “share,” “Snapchat”). This indicates that the @GoArmy Twitter account is fairly focused on vocational topics. Posts about Army values are not visible (making up less than 3 percent of posts), but sports topics occur more frequently.

Figure 7 also shows the content of mentions and retweets of @GoArmy content by other users, which illustrates how @GoArmy’s users interacted with the account.²⁹ Note that general Army topics are less evident in mentions and retweets than in @GoArmy tweets; sports-related words are much more common in mentions than in the original tweets. Sports- and career-related tweets also make up a higher percentage of retweets than would be expected, given the percentage of original posts for those categories. Finally, tweets pertaining to history and Army values

FIGURE 7
@GoArmy Posts and Shares, Mentions, and Retweets



NOTE: For an example of the words used in each category, see the appendix. Categories that represented less than 3 percent of all posts and shares were combined into “Other.” They include other services, emoji, value, and movie.

are retweeted much more frequently; there are so few original @GoArmy tweets in these categories that these topics are lumped into the “Other” tweets in the top bar in Figure 7.³⁰ This indicates that some tweets are far more likely than others to be circulated and magnified.

While sports-related tweets (such as those mentioning the Army Bowl or marathons) constitute a large portion of the @GoArmy mentions data, tweets about history (such as those mentioning D-Day or famous veterans) and those related to careers (in particular, “Career of the Day,” an example of which is shown in Figure 8) are prominent in retweets of Army content. This indicates a connection between the @GoArmy account and the national discussion of military service, particularly through the @GoArmy posts that were retweeted. These findings may be potentially useful for designing future marketing campaigns. Note also that most posts were not retweeted a significant number of times. The mean number of retweets was 13.7, and the median was 19. Twenty-five percent of all @GoArmy tweets are retweeted ten times or fewer, and 75 percent are retweeted 61 times or fewer. This reflects the Twitter trend that, in general, very few @GoArmy tweets ever go viral.

FIGURE 8
Example “Career of the Day” Tweet



How Connected Are the @GoArmy Twitter Stream and GoArmy.com?

We also analyzed the extent to which tweets create visits to GoArmy.com. If a goal of the account is to drive users to the website, a helpful way to get them there is to make it easy to click on a link directly from a tweet. In three months (April–June 2016), there were 4,324 tweets that included a link to GoArmy.com—128 from the @GoArmy account, and 4,196 from other users, as shown in the Table 2.³¹

Of the 4,196 tweets, nearly half of those (1,948) were original posts, and the remainder, 2,248 posts, was content that was retweeted. Of those 2,248 retweets from other users, 863 were, in fact, retweets of @GoArmy posts, so 23 percent of all tweets that included a link to the website originated from the @GoArmy account (128 from the @GoArmy account plus 863 retweets of @GoArmy posts). These tweets are very consistent in messaging: 87 out of the 128 @GoArmy posts are “Career of the Day” tweets. Other tweets that included a link to the site were similar job-related posts, promotions of the upcoming *Independence Day: Resurgence* movie, and responses to other users.

Comparing these data with those from website sessions (visits to GoArmy.com originating from Twitter), we found that, from April to June 2016, approximately 0.34 sessions per tweet were associated with a link to the site, for a total of 1,474 unique visits to GoArmy.com originating from Twitter. Clearly, many tweets linking to GoArmy.com do not include mention of a career, and it is possible that those tweets are driving the visits to the site. Unfortunately, we cannot determine with the data available which specific tweets are leading to more website visitors. A controlled experiment would be helpful for understanding which type of content will generate the most (and higher-quality in terms of

TABLE 2
Tweets Linking to GoArmy.com

User	Post	Retweet	Total
@GoArmy	120	8	128
Other	1,948	2,248	4,196
Total	2,068	2,256	4,324

duration and pages visits) website visits. Additionally, there are no available, established standards to help us determine how many visits to expect per tweet with a link.

However, given the very small relationship between GoArmy.com visits and contracts, these results suggest that tweets directly produce a nearly indiscernible small number of contracts. Of course, tweets could easily have a positive influence on other outcomes, or an indirect influence on recruiting. Detecting and measuring such effects would require data that allowed researchers to link tweets to eventual contracts or other Army-relevant outcomes.

How Does the @GoArmy Twitter Account Compare with Similar Twitter Accounts?

We now ask how the @GoArmy account compares with that of the other services (Navy, Air Force, Marines), and how connected is it to the Army's primary Twitter account?³² Are there any lessons to be learned by comparing use of the Army's account with that of another organization focused on national service, such as the U.S. Peace Corps? This section

applies the same methodology used in the previous section to compare the results from the @GoArmy account with those from similar Twitter accounts.

Return on Content

We pulled social media data from Twitter accounts associated with the U.S. Army, Air Force, Navy, and Marines, along with their respective recruiting accounts, for all tweets from May 1 to July 31, 2016. We also pulled Twitter data from the main and recruiting accounts for the Peace Corps for the same time period to see if there were any meaningful differences for a similarly national service-oriented but nonmilitary organization. Table 3 summarizes the data we analyzed from each of these accounts.

Because of the small number of tweets from the Air Force and Navy recruiting accounts, we focused our comparative analysis on the differences and similarities between the Army, Marine Corps, and Peace Corps accounts. Note that this comparison is not perfect; each of the accounts serves a slightly different purpose. For example, the @USMarineCorps account is run by the U.S. Marine Corps Recruiting Command.

TABLE 3
Comparison Twitter Account Statistics for the Army and Other Organizations

Account Name	Fiscal Year 2016 End Strength	Type of Account	Followers	Content from Account		Content from Other Users	
				Posts	Shares	Retweets	Mentions
GoArmy	1,011,255	Recruiting	48,500	581	91	5,994	2,166
USArmy		General	908,000	541	134	41,908	15,077
USAFRecruiter	488,974	Recruiting	71	3	1	0	7
USAirForce		General	636,000	627	108	35,763	68,915
USMarineCorps	222,018	Recruiting	379,000	342	18	34,906	7,268
USMC		General	781,000	244	41	70,068	74,884
AmericasNavy	378,081	Recruiting	36,100	29	3	244	445
USNavy		General	696,000	592	9	53,415	99,801
GoPeaceCorps	7,213	Recruiting	3,042	750	26	420	217
PeaceCorps		General	860,000	574	379	9,024	11,253

SOURCES: Peace Corps, *Agency Financial Report: Fiscal Year 2016*, Washington, D.C.: Paul D. Coverdell Peace Corps Headquarters, 2016; Office of the Under Secretary of Defense, Personnel and Readiness, *Populations Representation in the Military Services*, 2016.

NOTES: All tweets from May 1, 2016, to July 31, 2016, that are from or include a mention of one of these accounts. $N = 592,222$ (139,016 posts, 453,206 retweets). Recruiting accounts are shown first, and the Twitter account associated with the service second.

Table 3 shows that the accounts associated with the main service appear to have a far larger impact (in terms of retweets and mentions) than the corresponding recruiting accounts; this is to be expected, as the main accounts are more “general” and serve a less-specific purpose. Interestingly, the Marine Corps recruiting account in particular appears to do “better” social media marketing; it is an order of magnitude larger in the number of followers and retweets compared with the other recruiting accounts. However, the raw numbers do not tell the whole story, as the number of followers for each account varies over time and clearly affects the number of mentions and retweets that an account can have.

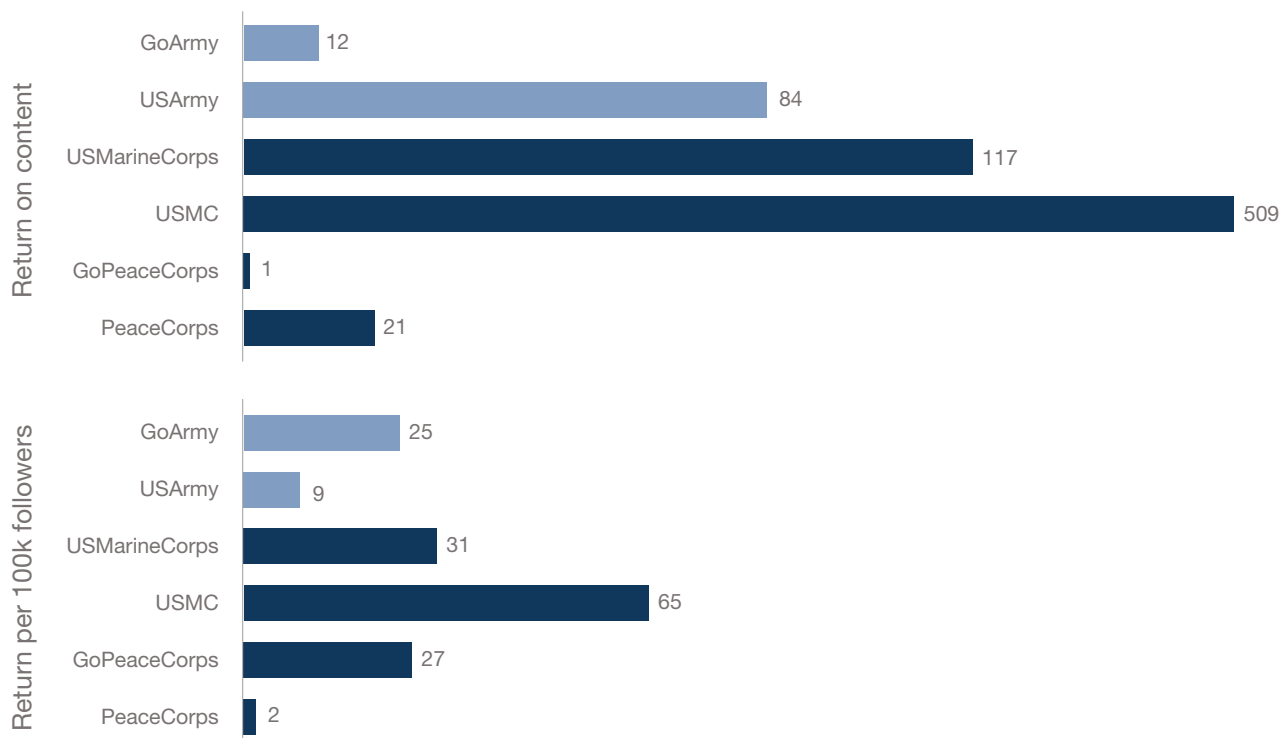
To objectively compare these accounts and account for the differences in audience size, we created a “return on content” metric to measure the productivity of posted content:

$$\text{Return on content} = \frac{\text{Number of content is shared by others}}{\text{Number of times content is posted}} = \frac{\text{Retweets} + \text{mentions}}{\text{Posts} + \text{shares}}$$

This metric is shown in Figure 9 for the Army, Marine Corps, and Peace Corps accounts. When we standardized the return on content to see the return per 100,000 followers (shown in the lower portion of Figure 9), we see that the Marine Corps and Peace Corps accounts have more interactions with their followers than @GoArmy through retweets and mentions, although the differences are not as drastic as the raw numbers might indicate. Interestingly, for the main service accounts, @USMC does very well, while the large numbers of followers of the main Army account, @USArmy, do not appear to be particularly active, and the followers of @PeaceCorps are even less so.³³ We note that the success of the Marine Corps accounts could be due to the fact that the Marines instill a very high level of esprit de corps in their members, rather than having better social media marketing techniques.

These metrics lead us to make two observations about the @GoArmy account. First, more followers (i.e., a larger audience) can increase the reach of the account, increasing the chances that content will be retweeted or the account will be mentioned. Second,

FIGURE 9
Return on Content for Selected Twitter Accounts



increasing the number of active followers is key to increasing the potential impact of a Twitter account. Strategies vary for increasing the number of followers and making existing ones more active but depend in large part on the type of content posted. We examine this in the next section.

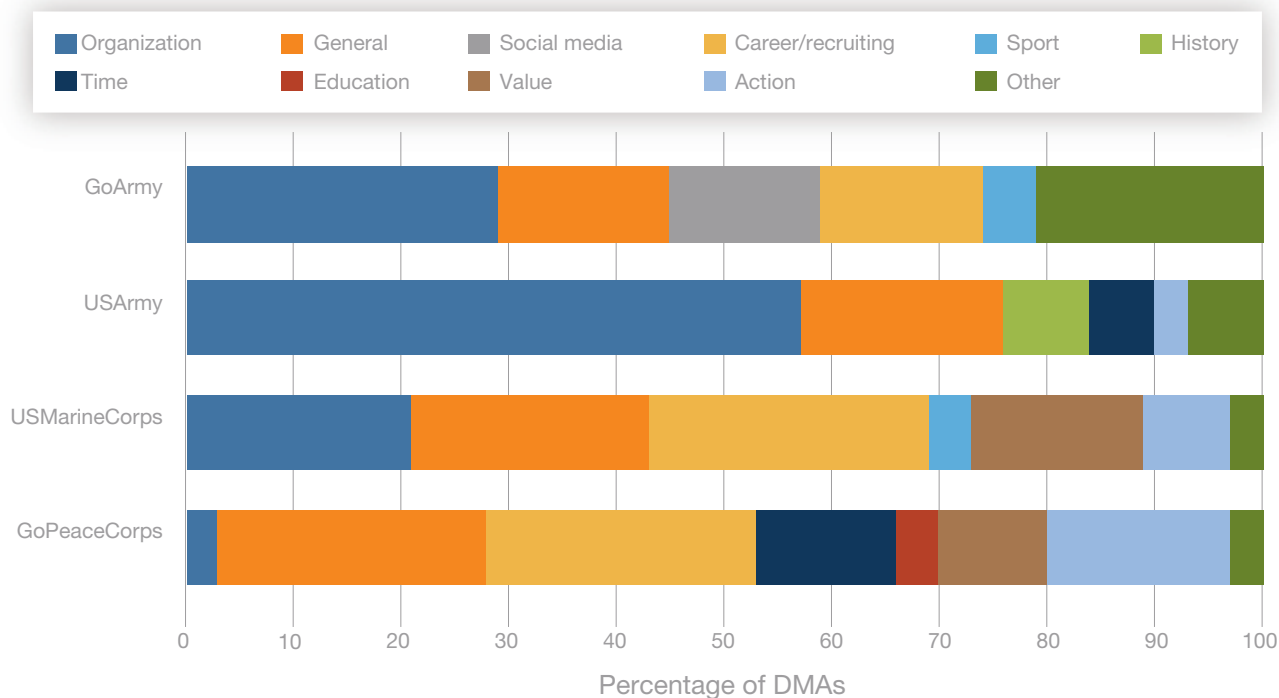
Comparison of Themes and Topics

We used the same type of lexical analysis to compare the content on the @GoArmy account with that of other key accounts. Figure 10 summarizes the posts and shares on four separate accounts: @GoArmy, @USArmy, @USMarineCorps (the recruiting account), and @GoPeaceCorps (the recruiting account).³⁴

As before, we see that the content on @GoArmy is scattered across a number of topics, including the organization (the Army in general, Army leadership, or other specific Army news), general, social media, career/recruiting, sport, and other. But Figure 10

also shows that the content on @USArmy is highly focused, with the majority of posts and shares concerning the Army as an organization.³⁵ When comparing @GoArmy with the other recruiting accounts, @USMC and @GoPeaceCorps, we see that the latter accounts are more likely than @GoArmy to feature recruiting- and values-specific content in their posts. Twenty-six percent of @USMarineCorps and 25 percent of @GoPeaceCorps keywords and co-locates are associated with careers and recruiting.³⁶ Values also feature prominently in both accounts, with such words as “discipline,” “leadership,” “confidence,” (Marine Corps) and “volunteer” and “serve” (Peace Corps). Neither account puts the same focus on social media-specific language; instead, their tweets tend to sound like regular English language. The Peace Corps recruiting account also highly emphasizes action and time with tweets that advertise application deadlines and employ action-oriented language, such as “Apply

FIGURE 10
Thematic Comparison of Account Posts and Shares



NOTES: Categories that represented less than 3 percent of all posts and shares were combined into “Other.” They include value, exercise, other services, social media, sport, education, and international. The @USArmy “Organization” posts include those that could be categorized as “Army news” and “Army leadership,” as well as more general Army-specific topics. Eight percent of @USArmy posts and shares are related to Medal of Honor winners; these are included in the “Other” category.

Reducing the variety of topics covered by the @GoArmy account, streamlining messaging, and posting about Army values could increase impact and lead to higher interaction with potential recruits.

now!”—thus expressing an urgency that is not seen in the @GoArmy account.³⁷

Since these different accounts represent different services, we expected different language to be used. Nevertheless, the consistent messaging from the U.S. Marine Corps and Peace Corps accounts, which highlight a few concepts such as values and recruiting, offers a potential lesson learned for @GoArmy: Consistency in message is key. The Marine Corps and Peace Corps accounts are clearly recruiting accounts and do not try to be anything else. To be clear, the Peace Corps account has a relatively low return on content; however, both of these accounts appear to do better when we normalize for audience size (see, again, Figure 9).

Reducing the variety of topics covered by the @GoArmy account, streamlining messaging, and posting about Army values could increase impact and lead to higher interaction with potential recruits. A unique aspect of the Army is that it allows recruits to choose their careers/military occupational specialty track, which is worth highlighting, but incorporating these messages into a larger “brand” and linking them to the sports and historical content, which appear to have high resonance with the audience, would help to streamline the messaging. It is also worthwhile to consider focusing the Army brand, which as it stands, is very broad.³⁸ Such an effort would help to identify the key themes and messaging that the @GoArmy account should emphasize.

Findings from the @USArmy account are similar—this account too appears more focused than the @GoArmy account. But given the relationship between the accounts, a potential strategy for increasing the impact of the @GoArmy account would be to leverage the higher number of @USArmy

followers. Through retweeting each other’s content, @GoArmy could reach a larger, broader audience. It could also participate in the larger conversation about the Army by commenting on tweets from @USArmy about leadership or history and adding a recruiting angle specific to its unique audience. Additionally, given that the @GoArmy account also serves the purpose of informing audiences about the Army brand, it may be useful to highlight some of the same themes as the @USArmy account to create a more cohesive message.

The focus of our analysis has been on how users engage with the @GoArmy Twitter account. To the extent that engagement is at least an intermediate goal of social media, our results suggest that more consistent messaging could be helpful for the @GoArmy account. Using current available data, we were not able to measure the extent to which the interest created by these accounts results in improved recruiting or other outcomes of interest for any of these organizations. The need to link social media data to longer-term outcomes of interest is a theme we will return to in the final section.

Key Takeaways

The @GoArmy Twitter account is used to interact with potential recruits and share information and news about the Army. The analysis presented in this section serves to characterize how the @GoArmy account is currently used, how its audience interacts with it, and compare it with other similar Twitter accounts. Among our key findings on this topic are the following:

- Twitter accounts associated with a service in general (rather than focusing on recruiting

Our analyses indicate that some types of content (especially posts related to sports or history, and possibly posts related to the Army's values) receive more frequent audience interactions than other types of content

specifically) appear to have a far larger impact (in terms of retweets and mentions) than the corresponding recruiting accounts. This is to be expected, as the main accounts are more general and serve a less-specific purpose.

- Content originating from the @GoArmy account focuses on careers, the Army in general, and social media-specific language, as opposed to values and recruiting, which are featured in select comparison accounts. The content of mentions and retweets by @GoArmy followers, however, tends to be about sports or history.
- We found that about one in three tweets containing a link to GoArmy.com led to a visit to the site; however, given the very small relationship between GoArmy.com visits and contracts, the results suggest that tweets directly produce a nearly indiscernible small number of contracts.

Our analyses indicate that some types of content (especially posts related to sports or history, and possibly posts related to the Army's values) receive more frequent audience interactions than other types of content. This suggests that focusing on the most appealing content could help further increase the return on content. Reaching a larger number of followers, interacting with other platforms, and encouraging followers to share content are other routes to improve the effectiveness of the AMRG Twitter account. Finally, interacting with other accounts or platforms—such as engaging with the @USArmy account and linking to GoArmy.com—could help drive users to this account.

Army Marketing Research Group's Use of Facebook

We now turn to another AMRG social media platform with an active account and a large following—Facebook. In this section, we analyze information from the Army's Facebook account to learn about posts that generate the most interest and engagement. We also describe potential opportunities to use experiments to enhance messaging and present the results and lessons learned from a simple experiment focusing on women in the Army. In most cases, responses were quite similar between posts that featured female soldiers and those that did not; we note the exceptions later in this section. In the course of our analyses and experiment, we found several potential hazards that are relevant to all types of social media communication; we also discuss these in this section.

We use the following definitions in this discussion:

- Post: We use the term *post* to describe an entry that AMRG posts to the GoArmy Facebook page.
- Like: The term *like* indicates that a Facebook user clicked the “like” icon under the post to indicate their interest in it.
- Share: A *share* indicates a user has included the post on their Facebook page (so that all their Facebook connections can see the post).
- Comment: A *comment* indicates that a Facebook user wrote one or more words in response to the post.

Typical Engagement: GoArmy Facebook Page Activity

On Facebook, all statistics are relative—some pages have activity levels that are orders of magnitude higher than the activity on other pages, and there is no single established metric of a popular site (a site with a high level of engagement). However, the activity on the GoArmy account would fit most definitions of high engagement—the account generates a lot of content and has a large audience that consumes the content repeatedly over time. Between January 2014 and October 2016, the GoArmy Facebook page hosted 4,805 posts, averaging just under five posts per day. The average post was served to 464,522 unique Facebook users.³⁹ At that time, the account had 1.1 million followers, and the median post received 1,396 likes, 24 comments, and was shared 80 times. Some posts received far more engagement (likes, shares, and comments) from the GoArmy audience than others; the top 10 percent of posts accounted for the vast majority of participatory interaction (i.e., 46 percent of likes, 61 percent of shares, and 67 percent of comments). In general, higher volumes of user engagement (e.g., likes, comments, shares) are considered a positive sign because users often express negative sentiment by “voting with their feet” (i.e., disengaging from the content or unfollowing the page). There was some disengaging activity on GoArmy—the average post generating 101 “hide this post” clicks, 39 “hide all posts” clicks, and four “unlike this page” clicks. However, at a ratio of 257 likes for every one “hide this post” clicks, reactions to GoArmy’s Facebook account can be characterized as generally positive. A particularly strong measure of Facebook engagement is when a user repeatedly comments on posts. Over the 33-month period of our review, 138,236 unique users engaged with GoArmy’s Facebook, generating 361,594 comments. While 63 percent of commenters left just one comment, 21 percent left at least three comments, and 18 percent commented over a period of 90 days or more.

In addition to the content of posts, chronological factors also influence user engagement significantly. User engagement varied by time of day, day of the week, and time of year. Fifty percent of comments

were written in response to a Monday or Saturday post. Posts were much more likely to be viewed in December and somewhat more likely to be viewed in May or June than in other months. Note that the same pattern is present in the Twitter data. Viewers were especially engaged in May and June (a period including posts related to Memorial Day and Independence Day); over one-third of all comments, likes, and shares occurred during those two months.

Based on our analysis of user names and comments, GoArmy commenters can be inferred as falling into three broad categories: (1) members of the general public, (2) people who serve or have served in the military, and (3) family members to those who serve(d). Inferring service or family status requires examining user names (such as “ArmyMom”); thus, we likely misclassify some military and military family members as the general public. But those we identify as military family members are very active and disproportionately likely to leave comments.

While less information is available on Facebook users than on Twitter users, it is possible to compare total page likes and to calculate the average number of likes per day (since page creation) across Facebook accounts. Table 4 compares Facebook pages for three different services. (Each service has a primary page, as well as secondary page such as GoArmy.) In terms of primary pages, USArmy’s Facebook averages more likes than those of the Navy or Marines. In terms of secondary pages, GoArmy’s Facebook page receives more likes on average than AmericasNavy’s page, but fewer than MarineCorps’s page. The difference between USArmy’s and GoArmy’s page may indicate that the Army is effective at separating the potential recruit and outreach audience from the larger audience. On the other hand, it may be the case that MarineCorps is more effective at inspiring enthusiasm compared with GoArmy, despite being a recruiting page.

Typical Engagement: Characterizing Posts that Engage the Audience

To better quantify which post content generates audience engagement, we first applied text-mining methodologies to identify themes covered on the

TABLE 4

Comparison of Likes Per Day for U.S. Military Service Branches Facebook Pages

As of July 1, 2018	Total Page Likes	Total Page Followers	Founding Date	Days Since Founding	Likes Per Day
USArmy (main)	4,672,453	4,499,416	January 8, 2009	3,462	1,350
GOArmy	1,151,227	1,107,995	August 17, 2009	3,241	355
USNavy (main)	3,063,610	2,949,622	April 23, 2009	3,357	913
AmericasNavy	699,469	679,671	February 18, 2010	3,056	229
Marines (main)	3,419,067	3,288,249	February 23, 2010	3,051	1,121
MarineCorps	4,324,694	4,091,766	June 26, 2008	3,658	1,182

GoArmy Facebook page. Our approach involved identifying sets of words that tend to co-occur in the same posts and comments.⁴⁰ Through this method, we identified 23 distinct themes nested in six broad subjects that are particularly well-represented in posts and comments:

- careers and education
- history and politics
- military vocabulary
- sports and exhibitions
- holidays
- family.

Figure 11 reports the prevalence of each topic in GoArmy posts and comments from users, respectively. Since multiple topics can be present in a given post/comment, we divided each post by the number of topics represented when percentage scores are calculated, so that each topic gets credit for a fraction of that post.⁴¹

GoArmy posts generally fall into a narrower range of topics than comments: 100 percent of posts mention at least one of the six topics, compared with only 44 percent of comments.⁴² For this reason, in Figure 11 we show the breakdown of the comments that can be classified (“FB Classifiable Comments”) as well as the breakdown of all Facebook comments, including those that cannot be classified. The middle bar (“FB Classifiable Comments”) shows only the 44 percent of all comments that can be categorized as one of the six topics, and it allows us to compare the content of posts (top bar) with comments. The bottom bar, representing all comments, shows the large proportion of comments that cannot be

classified as being about the military, careers, sports, history, holidays, or family.

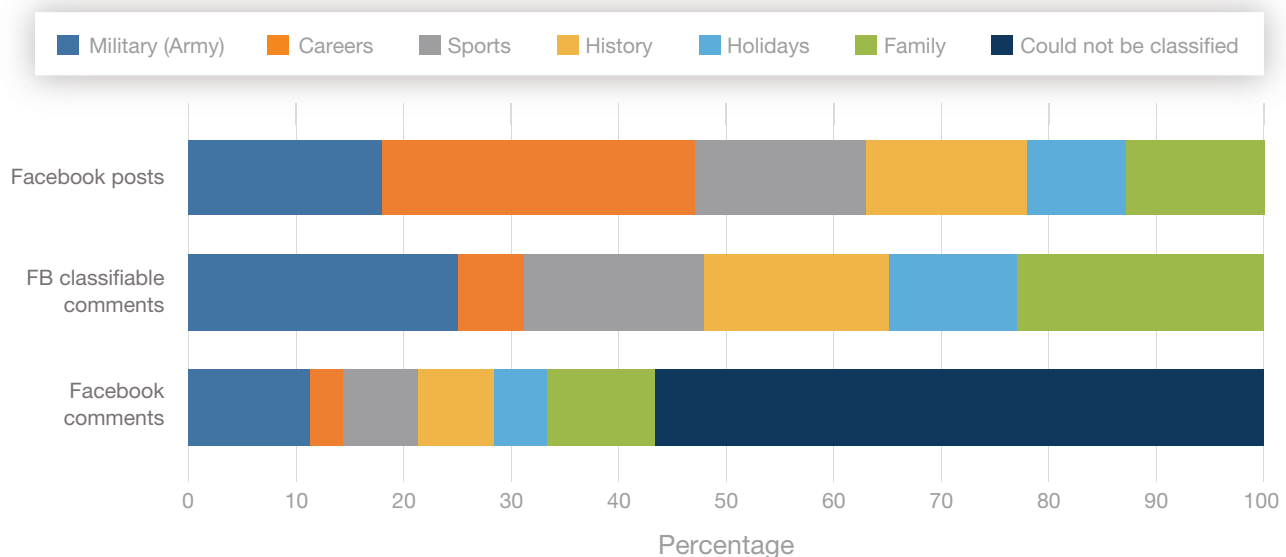
In general, GoArmy discusses careers and education (posts labeled “Careers”) far more than their audience comments.⁴³ In contrast, the most represented topics among GoArmy comments are related to the Army; many of these comments relate to specific military units and installations. Comments relating to family are also overrepresented among all comments.

In short, many GoArmy posts focus on Army career opportunities, while followers are more likely to write about how the Army touches their lives specifically through the people that serve (family) and the circumstances of everyday Army life (military vocabulary).⁴⁴ Other topics—sports, history, and holidays—appear at a slightly higher percentage in Facebook posts but, in general, are equally represented in posts and comments.

Typical Engagement: Examples of Highly Engaging Posts

To make this discussion more concrete, we identified (and illustrate in Figure 12) posts that were among the top catalysts for positive interaction. For this exercise, we defined a “successful” post as one that generates high volumes of all types of user interactions that are not inherently negative—likes, shares, and comments. The “successful” posts shown in Figure 12 all registered above 90 percent for all three kinds of positive interactions.

FIGURE 11
Topical Distribution of Posts Versus Comments



SOURCE: Authors' tabulations using data from GoArmy Facebook activity, January 2014–September 2016.

NOTES: The top bar (Facebook posts) shows how the content of posts made by the GoArmy account are classified as being about the military, careers, sports, history, holidays, and family. The middle and bottom bars show how comments to GoArmy posts are classified. The middle bar only represents 56 percent of all comments that can be classified into the same six topics. This bar can be directly compared with the top bar. The bottom bar in the figure includes the 44 percent of comments that cannot be classified as one of these topics.

Post 1. Providing Space for Patriotic Expression

On an Independence Day Saturday morning, GoArmy posted a photo of a bald eagle with an American flag superimposed on its head.⁴⁵ The text in the photo read

Happy Independence Day!
Celebrating life, liberty, and the pursuit of
happiness, forged and protected by America's
first team.
#myindependence

The post text read

Celebrating life, liberty, and the pursuit of
happiness . . .
How are you celebrating today?
#myindependence #independenceday #july4th

This post exemplifies how GoArmy can harness the natural inclinations of its users. Many GoArmy users see themselves as patriotic. This post articulates American values ("life, liberty, pursuit of happiness"), contextualizes the Army as a deep part of that tradition ("America's first team"), and

provides users with the opportunity to express their personal patriotism ("#myindependence" "How are you celebrating today?"). Encouraging patriotic expression could serve to engage potential recruits.

Post 2. Personifying American Values

On a Saturday in June, GoArmy posted a picture of a veteran in civilian clothes holding an American flag.⁴⁶ The text in the post read,

My family immigrated from Jamaica in the mid 70's, moving to England and then to the United States. As a child, I can still remember the excitement of landing at JFK airport and feeling the exhilaration of being in a new country, not just any country, but the United States of America. Since arriving, the opportunities for me and my family have been limitless. From being a college grad, Veteran, military spouse and Army Civilian, I can say I am the American dream and I live in a Country that has made it all possible!
What does independence mean to you? Share using #myindependence

FIGURE 12
Example Posts that Generated Positive Impact



This post exemplifies a strong blend of appeals to patriotism and assurances that service is a smart life choice. It uses a personal testimonial to underscore America's role as a proud paragon ("not just any country, but the United States"), highlights core American values (the "American Dream"), and then demonstrates the Army's role in making American values a reality. It mixes a celebration of American values with a concrete demonstration of a quality Army career path, including postservice opportunities. The post also creates an opportunity for its audience to act on their patriotic identity through comments pertaining to the #myindependence theme.

Post 3: Elevating the Meaning of Service

On a Tuesday in May, GoArmy posted a black-and-white close-up of the American flag on the shoulder of a combat uniform, with the unit insignia partially visible near the bottom of the image.⁴⁷ The text reads,

Old glory on your sleeve, the U.S. Army over your heart. These aren't just symbols, they are a visible reminder of the promise every Soldier makes and has made since 1775 -- This we will defend.

Learn more at www.goarmy.com/team
#ArmyTeam

This post exemplified how the Army can elevate the meaning of service, making clear how service is a crucial component of American ideals ("this we will defend"), and a rich tradition ("since 1775").

Post 4: Supporting Significant Service Members

On Thanksgiving, GoArmy posted a picture of a meal ready-to-eat (MRE) with Thanksgiving ingredients, surrounded by autumn leaves, with text overlay that read "Thankful for my soldier."⁴⁸ The text in the post read

Share this photo or tag your Solider in this post to show your thanks! #Thanksgiving

Families of service members are the most-engaged audiences on GoArmy. This group has strong feelings about their service members and is actively searching for opportunities to express these

feelings. The post responds to the reality that family members are emotionally invested and channels these feelings in a constructive and fulfilling way. For the potential recruit, it emphasizes that the Army is a vibrant, tight-knit community and that joining the Army means belonging to this community. Moreover, family members of soldiers likely play a key role as influencers.

Methodological Findings: Procedure for Conducting Facebook A/B Testing, Results from Experiment

Next, we discuss an experiment focused on testing and measuring audience reaction to various images. The information detailed in this section reveals patterns in GoArmy's Facebook posts and in the audience responses to these posts. More detailed analyses of these data are possible (as we discuss in a later section). But posts can also be crafted to test specific hypotheses or ideas about audience response; we discuss the results of such an experiment in this section.

The origin of this experiment was a desire expressed by AMRG staff to better understand audience reactions to images of female soldiers. Some staff members expressed a concern that these images could be viewed negatively. The experiment was designed to obtain more rigorous information than could be gleaned from scanning the comments. The experiment uses A/B testing; in marketing, A/B testing is the process of exposing random subsets of an audience to content with slightly different aspects, then measuring how reactions to the content differed. For example, one might send two different coupon mailers to randomized halves of a mailing list, then calculate which one catalyzed a higher number of store purchases. In this case, we modified the process slightly to work with the GoArmy Facebook account. To begin, we identified posts featuring female soldiers, as opposed to male soldiers, as a post feature suited to A/B testing. In operationalizing the idea, we focused on posts about soldiers who happened to be female (rather than on posts about being a woman in the Army per se). Because family is an important topic for the GoArmy

audience and can evoke particularly strong reactions on the subject of gender, the Army included posts featuring soldiers in settings involving family. Figure 13 presents posts that, while otherwise typical of GoArmy content, varied on key features. No post was specifically about femininity, but each has soldiers-that-happen-to-be-female features in the text or photo.

Notably, these posts actually deviate slightly from standard A/B procedure. In the standard procedure, posts would be exactly the same, aside from the targeted feature. However, this is not practical for social media because posts are widely shared; this means that there is no easy way to completely isolate audience A from audience B. Instead of exact duplicates, we crafted posts to follow standard “recipes,” such as depictions of daily life or samples from the variety of career paths available to soldiers.

Our previous analysis demonstrated that audience engagement varies over time, as well as across different kinds of posts. Taking steps to control these complications is crucial for comparing engagement across different posts. The Army published each post at the same time of day and same day of the week, spacing them exactly one week apart. Additionally, the post just before the experimental post was consistent in timing (an hour before) and format (ASVAB practice question) to prevent the previous post from complicating engagement with our experimental posts and to track overall audience engagement levels. We found no evidence of substantial variations in audience engagement across the experimental posts.

Finally, we identified comparable posts, which were formulated in the same way but did not have female soldiers; we then compared measures of engagement (likes, shares, comments) between experimental posts and other comparable posts during the same time period. This careful identification of comparable posts allows for a more precise comparison of engagement than would be possible with quasi-experimental data including all posts.

Experimental Finding: How Do the Army Marketing Research Group’s Facebook Followers Respond to Posts Featuring Women Soldiers?

We examined Facebook posts published to the GoArmy Facebook page between July 1, 2017, and September 10, 2017. Our data included the exact text of all posts and comments and statistics on audience reactions to posts.⁴⁹ In total, we captured data on 48 posts, but we excluded three posts pertaining to special events from our quantitative analysis.⁵⁰ Interspersed among those posts were seven experimental posts designed to feature relatively generic content, while systematically varying the representation of female soldiers.⁵¹ Some experimental posts included pictures of female soldiers while others did not; posts might or might not contain text that suggested that the pictured soldier was a woman or might or might not depict scenes of family interacting with female soldiers.⁵²

Results of the Experiment

The typical post received 515 likes, 29 comments, and 106 shares.⁵³ About 61 percent of commenters were inferred (based on user name) to be male, and about 12 percent of comments contained “stock” supportive phrases such as “thank you,” “god bless,” “proud,” or the U.S. flag emoji.⁵⁴ Twenty percent of posts accounted for 43 percent of likes, 73 percent of comments, and 48 percent of shares.

Different kinds of posts evoked different kinds of reactions. For example, sample ASVAB question posts generated an unusually large number of comments, because audience members wrote in with their answers to the question. Table 5 reports on the typical reaction that experimental, ASVAB, and other posts received during our study period.

The main purpose for including the ASVAB posts prior to each experimental post was to ensure that the overall audience was roughly comparable each day; we found no evidence of unusual audience levels of engagement on any of the days including a test post. Compared with other non-ASVAB posts, experimental posts received fewer likes, nearly the same number of comments, and about one-half

FIGURE 13
Screenshots of Six Primary Experimental Posts

**GOARMY.COM**

July 14, 2017 · 🌐

No limitations: From engineering to medicine, the 150+ U.S. Army careers are an opportunity for you to follow your passion.
www.goarmy.com/careers



Like Comment Share

1.1K

Top Comments ▾

333 Shares

28 Comments

**GOARMY.COM**

July 21, 2017 · 🌐

On our team, there's always someone willing to lend a hand.
U.S. Army Staff Sgt. [REDACTED] secures a vehicle to a flatbed trailer at [REDACTED] to support an United States Air Force training exercise.



Like Comment Share

447

Top Comments ▾

70 Shares

12 Comments

**GOARMY.COM**

August 4, 2017 · 🌐

At all times, #ArmyTeam Soldiers stand ready to defend the Nation.



Like Comment Share

1.1K

Top Comments ▾

149 Shares

40 Comments

**GOARMY.COM**

August 11, 2017 · 🌐

For these U.S. Army Soldiers, serving the Nation is a family affair.
Capt. [REDACTED], senior brigade physician assistant, and her son Spc. [REDACTED], a behavioral health technician, are currently serving with U.S. Army Central at [REDACTED]



Like Comment Share

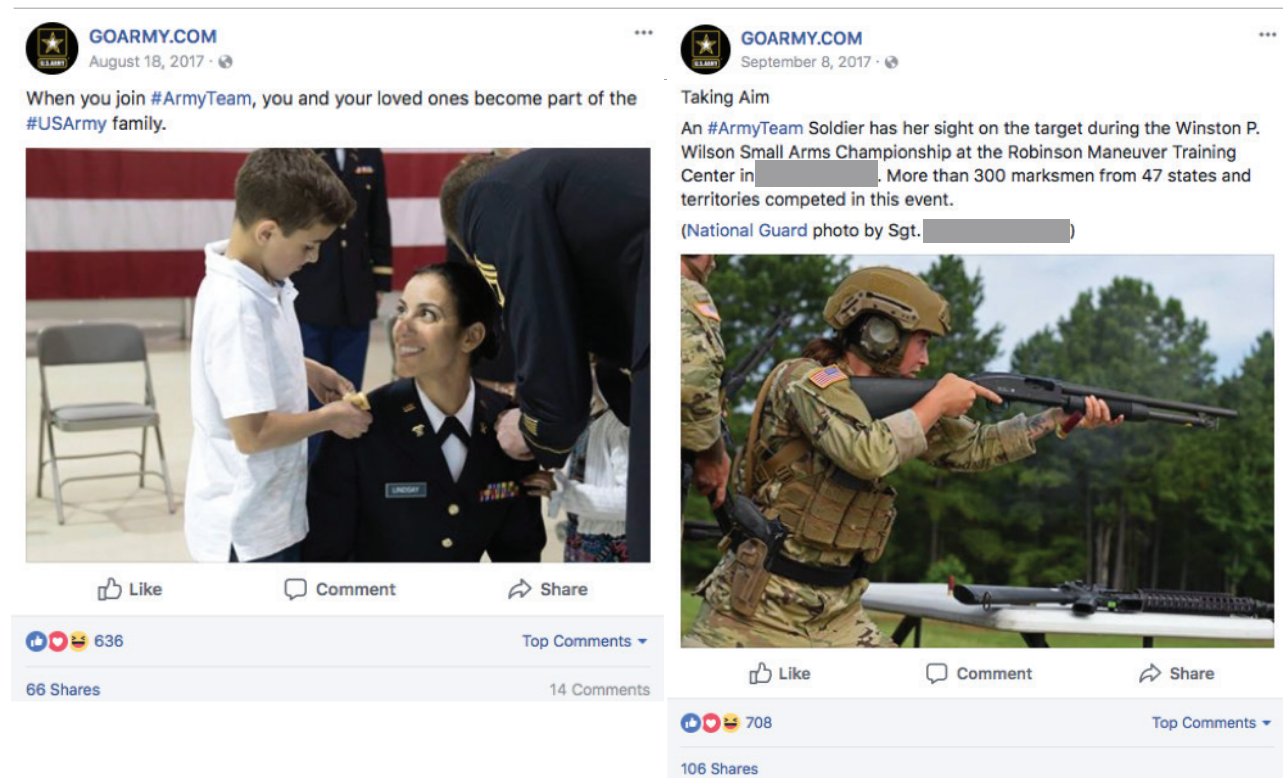
1.1K

Top Comments ▾

75 Shares

53 Comments

FIGURE 13—CONTINUED



NOTES: The six posts were categorized in the following way:

July 14, 2017: Female soldier in photo: yes; text mentions female soldier: no; depicts family: no
 July 21, 2017: Female soldier in photo: no; text mentions female soldier: yes; depicts family: no
 August 4, 2017: Female soldier in photo: no; text mentions female soldier: no; depicts family: no
 August 11, 2017: Female soldier in photo: yes; text mentions female soldier: yes; depicts family: yes
 August 18, 2017: Female soldier in photo: yes; text mentions female soldier: no; depicts family: yes
 September 9, 2017: Female soldier in photo: yes; text mentions female soldier: yes; depicts family: no.

TABLE 5
Typical Reactions to GoArmy Posts, by Type of Post

	Likes on Posts	Comments on Posts	Shares on Posts	"Stock" Positive Comments	Male Commenters
Experimental posts	619	21	70	14%	58%
ASVAB questions	312	284	79	1%	74%
Other posts	705	26	142	18%	60%

the number of shares. Some of these differences are to be expected. The experimental posts were tightly standardized to ensure that the effect of experimentally manipulated characteristics would be apparent. In essence, they were designed to emulate the most generic ideal of an Army post, except for their differences in gender representation. In other words, while experimental and nonexperimental posts contain material with both female and male soldiers, the experimental posts are standardized in

a way that diminishes the novelty of the posts, and, therefore, we might expect they would generate less interest than the typical GoArmy posts. Next, we discuss our analyses of aspects of each post.

Experimental Posts: Features and Reactions

All the experimental posts had some version of three characteristics: a picture of a recognizably female soldier, text that subtly indicates the gender of a female soldier, or a post that depicts female

soldiers interacting with family. Table 6 displays how users responded to certain features of these posts. The comparison we are making is the second type described earlier, where we compare experimental posts with a certain feature (i.e., a gendered photo) with the remaining experimental posts without that feature (in this case, a nongendered photo).⁵⁵ Compared with other experimental content, photos with recognizably female soldiers evoked more likes and comments but fewer shares. Posts with gender-indicative text evoked more likes, comments, and stock positive phrases but fewer shares. Posts that depicted female soldiers interacting with family evoked more likes, comments, stock positive phrases, and commenters who were women but fewer shares. Note that it is possible for all three attributes (gendered photo, gendered text, female soldier with family) to receive the same relative reaction (positive or negative) from followers, and a single post can have more than one of these attributes (for instance, female soldiers with families were classified as gendered photos and as photos depicting female soldiers with families), but all attributes performed positively.

None of the differences in Table 6 were statistically significant. This could be a consequence of the small sample sizes involved in the experiment and the wide variation in reactions that GoArmy posts routinely receive.⁵⁶ However, the results do not appear to support the notion that the depiction of female soldiers discourages audience engagement.

There were no statistically significant differences between baseline and female variants of the experimental posts. Next, we discuss some of the other lessons learned during our analyses.

Lessons Learned: Social Media Posts and Experiments

We discovered several lessons when we examined social media data on engagement and carried out the experiment on Facebook. The first two are relevant for all social media posts and experiments; the third is relevant only for experiments or other situations in which statistical testing will be used.

Need for cultural translation. First, the Army has a complex culture that can be very inaccessible to nonmilitary audiences. This can lead to AMRG posts that do not make sense to a nonmilitary audience. For example, during our observation period, GoArmy released a high-production-value video celebrating Women’s Equality Day that illustrated both the strengths of GoArmy’s social media strategy and the challenges in crafting content that is also relevant to a civilian audience. The video was highly effective at generating audience reaction—7,601 likes, 408 comments, and 10,476 shares. Comment characteristics were 32 percent stock positive phrases, 55 percent came from female audience members (40 percent is more typical), and at least three commenters reported tearing up while watching it. There were also a very high number of shares,

TABLE 6
Bivariate Differences Between Experimental Posts with and Without Key Features (All Figures Relative to Baseline)

	Likes	Comments	Shares	Stock Positive	Males
Content did not feature female soldier	0% (baseline)	0% (baseline)	0% (baseline)	0% (baseline)	0% (baseline)
Photo depicted female soldier	36%	26%	–21%	–28%	23%
Text referred to female soldier	11%	58%	–53%	26%	39%
Female soldier and family	34%	83%	–49%	133%	–23%

NOTES: Each row compares test posts with that attribute with test posts without that attribute. For instance, the top row compares the number of likes, comments, and shares on gendered photo posts to nongendered photo posts. A single post may have more than one attribute, as described in Figure 12. Results with a negative sign indicate that test posts with that attribute had fewer of the result shown. For instance, photos of female soldiers with their family received 23 percent fewer comments from male followers than did photos not showing family members. Results without a negative sign indicate that those posts received more of that particular response.

The general sentiment was that a video showing women being “Army Strong” inspires a deep amount of pride—for the family of women who serve, from women veterans, from women currently serving, and from those looking to see the Army exemplify their conceptions of American principles.

suggesting that this video had considerable outreach potential.

The words “strong” and “proud” were used more in comments on this post than any other during our observation window. The general sentiment was that a video showing women being “Army Strong” inspires a deep amount of pride—for the family of women who serve, from women veterans, from women currently serving, and from those looking to see the Army exemplify their conceptions of American principles. This post appears to be an example of how to represent women in such an outlet. It combines representation with an emotionally salient narrative that makes it personally meaningful, which allowed it to garner substantial positive audience response.

Despite all its positive features, the Women’s Equality Day video does not sufficiently translate some important points for a nonmilitary audience. The video celebrates the promotion of GEN Ann E. Dunwoody to the rank of four-star general, but does not contextualize the significance: There have been fewer than 200 four-star generals since 1947, and only ten currently serving in the Army. In contrast, there are 50 times as many Fortune 500 CEOs as Army four-star generals. The video also celebrates MAJ Lisa Jaster’s successful completion of Army Ranger school, but does not provide the contextual significance: One-third of male students fail within the first four days. And finally, the video presents a series of historical milestones; however,

of the 13 post–World War II events presented, seven occurred between 1970 and 1980, and six occurred between 2008 and 2016. This invites questions about the 27 years between these periods—questions that are, at least partly, answerable if one understands the congressional acts, Executive Orders, and other milestones surrounding those events. The existing research on social media engagement suggests that engaging material is much more effective; lack of context or use of unfamiliar vocabulary are likely to decrease the levels of engagement.⁵⁷ Although the video created a large and positive reaction, providing additional context might have created an even larger and more positive reaction.

Many likely recruits come from families with many service members or locations with a large concentration of service members. Such persons have an advantage in understanding the significance and context of GoArmy posts. However, there is a much larger population of *potential* recruits that do not have this background, and generating recruits from these segments of the population is likely to require more, or more effective, outreach.

Issues with audience outrage. Second, GoArmy posts are vulnerable to a particular kind of activity, in which audience members become outraged over perceived deviations from Army regulations and drag conversations on such posts down into arguments. For example, during our observation period, GoArmy posted a picture of a prone soldier aiming her rifle. The caption included the line

“Here, an #ArmyTeam Soldier has her sight on the target during rifle marksmanship training at US Army Fort Benning.” The post provoked a fierce debate in the comments. Critical commenters cited their experience, the “train how you fight” adage, and their understanding of the regulations; some specific critiques of the soldier focused on her form and equipment. Others defended her, citing their understanding of the regulations, recent changes in procedure, and their experience. Some claimed that the photo was staged, others said that it was mislabeled.

Such interactions diminish the positive impact of posts, discourage more positive discussions, and do not help potential recruits make informed decisions (in the case of the post above, AMRG staff hid the post to halt the conversation). While the effects of such interactions are difficult to measure, it is possible to measure who chooses to comment on controversial posts. One way of measuring post controversy is to divide the number of comments by the number of likes. Usually, a post will generate many likes, but fewer comments. This happens because those who like posts do not often comment, but people who comment almost always like as well. If the ratio of comments per like starts to climb, it means that people are commenting on a post they do not also like—a clear sign of contentious commenting.⁵⁸ When examining the data from the posts during the period covered by our experiment, we found that the five most controversial posts all had a commenter population that is median or above median male. One interpretation of these results is that controversy discourages female commenters, and/or attracts male commenters.⁵⁹ In either case, contentious discussions may work against efforts to make the GoArmy audience base more inclusive and representative of the population as a whole.

Noisy data. Finally, one of our findings is more relevant to experimental posts. We found that audience engagement is inherently “noisy,” with significant swings in engagement on relatively similar posts. A likely explanation for this is found in the exponential nature of engagement. As people share and comment, additional people are drawn into the conversation; this can lead to small differences in initial engagement resulting in large changes in

GoArmy’s Facebook page has a large and diverse following made up of service members, family members of current soldiers or veterans, and members of the general public.

subsequent engagement on a particular post. For this reason, higher-than-expected volumes of data must be gathered to achieve statistically significant results. In this case, we had only seven experimental posts, and the difference in engagement between experimental posts and others was small. In such a situation, a large number of posts would be needed to discern a statistically significant result. However, the relationship between engagement and outcomes of interest is unknown. Therefore, it is not clear exactly what size difference in engagement is meaningful. One likely interpretation of our results is that the levels of engagement were very similar between the experimental posts and the other posts. These results also suggest that further exploring quasi-experimental data could be helpful—accounts such as GoArmy have made very large numbers of posts over the last few years, and using more or all of them would provide more statistical power.

Key Takeaways

GoArmy’s Facebook page has a large and diverse following made up of service members, family members of current soldiers or veterans, and members of the general public. Facebook pages present an opportunity to analyze audience reactions to posts and comments.

Social media platforms offer many opportunities for learning more about users who search for and respond to information, but many platforms are relatively new, and most are continually evolving. For this reason, there are few well-established measures of effectiveness, and those that do exist are not often linked to longer-term outcomes of interest.

- The GoArmy account posts heavily about careers and sports, but followers comment on a wider range of topics, including sports, family, and life in the military. The content of comments is rarely about careers.
- Facebook pages offer an ideal place to conduct experiments by varying content and aspects of posts in a controlled manner. We developed and AMRG implemented an experiment featuring images of female soldiers. Posts depicting women as “Army strong” and those showing women soldiers with their families generated, on the whole, positive responses.
- We also identified challenges that are relevant for all social media posts. First, some members of the audience are virulently critical over what they view as deviations from Army protocol in posts; these responses appear to shut down some potential comments, especially from women. Second, an incomplete translation of the Army’s distinct vocabulary and culture can make posts less meaningful to potential recruits (who may not fully understand the significance of what they are seeing).
- Facebook pages produce a tremendous volume of information; this information could be used as quasi-experimental data to test a variety of hypotheses and to develop

a better understanding of how social media engagement translates into outcomes of interest (such as contracts or the likelihood that an influencer will recommend Army service). This capacity represents an especially valuable aspect of social media data.

Conclusions and Recommendations

We examined the U.S. Army’s use of the internet and social media in this report. We focused on GoArmy.com and the Facebook and Twitter Army accounts designed for outreach and other purposes; we refer to these three sources of information as *platforms*. Given the rapid expansion in online and social media use among youth, these platforms have the potential to connect with America’s youth *and* with others who are interested in the Army (influencers, parents, soldiers and their families, veterans). We find evidence that users of these platforms include all of these groups, serving an outreach function for potential recruits and for others. Our research focused on understanding the size of the audience on each platform and on understanding more about the online material that engages audiences.

Social media platforms offer many opportunities for learning more about users who search for and respond to information, but many platforms are

relatively new, and most are continually evolving. For this reason, there are few well-established measures of effectiveness, and those that do exist are not often linked to longer-term outcomes of interest. For example, we do not know how engagement on Facebook translates into changing sentiment toward the Army or changing propensity to enlist. Understanding these relationships is a key next step; without such an understanding, it is not possible to estimate key metrics such as the cost-effectiveness of social media efforts.

A similar point is that, to date, the relationships between the different platforms are not well understood. We do know that some aspects of the audiences differ—this implies that different people sometimes use different platforms to interact with the Army. However, there is some overlap between the audiences; understanding more about this overlap could help the Army further refine its message.

A central thesis of this research is that social media platforms offer many opportunities to experiment with engagement and to learn more about the audience. We offer specific suggestions in the next sections. First, we discuss the results from each platform.

GoArmy.com's audience is large; the website was viewed more than 40 million times during the two-year period included in our data, and a typical viewer looked at three or four pages.

GoArmy.com

Websites produce relatively rich data, including measures of the audience size, pages viewed, and time spent viewing these pages. GoArmy.com's audience is large; the website was viewed more than 40 million times during the two-year period included in our data, and a typical viewer looked at three or four pages. We examined the pages that were viewed most frequently as a measure of engagement. These pages frequently featured information about Army careers and benefits, but pages that explained the process of enlistment were also viewed frequently.

We linked website data to U.S. Census data and contract data to understand more about the audience. The findings suggest that GoArmy.com clearly serves several audiences—potential soldiers and those seeking information about the Army as well as current soldiers, their families, and perhaps even influencers. The relationship between visits and contracts is small. However, the website is used especially intensely in densely populated areas as well as in areas with more diversity and more foreign-born residents. Many such areas also produce more contracts than would be expected, suggesting that GoArmy.com offers relevant information to these individuals.

Twitter

Twitter operates quite differently than the Army's website. The Army posts content on Twitter; users who follow the account can *like* the content or *retweet* it to their followers. Other users can also mention @GoArmy in their own tweets, which further broadens the reach and visibility of the Army's account. The bidirectional nature of interactions between @GoArmy's Twitter account and its followers—and even communication between followers—allows for several measures of engagement. The @GoArmy Twitter audience appears smaller than the audiences of other, somewhat comparable Twitter accounts, but the audience is quite active, and return on content is quite high. During our two-year window of observation, each original post by GoArmy generated approximately ten retweets and shares by other users. Some Twitter

Recent research suggests that content that produces high-arousal emotions (e.g., awe, anger, or anxiety) tends to be more viral than content evoking low-arousal (e.g., sadness) emotions.

activity drives people to GoArmy.com, but because the link is not posted frequently in tweets (especially by the Army), this has not been a productive mechanism for creating website traffic.

The content that @GoArmy posts to its Twitter account covers a wide variety of topics—with Army, social media, and career being among the most common. The posts that generate the most user response (retweets and shares) are those related to sports and history. Given the clear interest in these topics, additional participation in these discussions would serve to market the Army brand, and by adding recruitment language to replies and retweets on these topics, this could increase the numbers of potential recruits. Including more aspects of organizational values in the tweets (as other organizations appear to do) also should serve to promote the Army brand. Examples include Army benefits, skills, careers, and Army values generally. Providing additional opportunities to connect with a recruiter by providing more links to GoArmy.com could also help to achieve the Army's goals. In summary, our recommendation is that tweets be more sharply focused on a smaller number of topics; those deemed most relevant to the audience and to the Army's goals.

To reach more people, @GoArmy can leverage other accounts with more followers, such as @USArmy, and by retweeting @USArmy's messages and getting @USArmy to retweet @GoArmy's. Increasing the amount of shareable content could also help with visibility by increasing the number of active followers engaging with @GoArmy. Linking to GoArmy.com could help to relay more specific content and could increase the effectiveness of GoArmy.com. Recent research suggests that content that produces high-arousal emotions (e.g., awe, anger, or anxiety) tends to be more viral than content evoking low-arousal (e.g., sadness) emotions.⁶⁰ Shareable content also tends to be novel and exciting.⁶¹ Given that what is shareable varies among users, a reasonable strategy would be to incorporate the audience's key issues and resonant themes with some of these techniques. Finally, the high volume of retweet activity by followers of the @GoArmy account around holidays such as Independence Day and Veterans Day provides an opportunity for the Army to engage with followers and broaden its reach at those times.

Facebook

Like website visitors and the @GoArmy audience, followers of GoArmy's Facebook page come from a wide range of backgrounds. They appear to include people who are potentially interested in joining the Army, soldiers, veterans, family members of soldiers and veterans, recruiters, and people from the general public who may be interested in the Army. People in all of these categories may also serve the important role of influencer to someone who is interested in enlistment.

The Army, through posts and shares, communicates with its followers, and, in turn, followers may *like* the content, comment on it, or share it with their own followers. Through these Facebook functions, GoArmy's content may reach an even broader audience than just those to whom pages are presented. Our analysis showed that family members are a particularly active group, so this presents opportunities to involve them in discussions to keep the GoArmy Facebook follower community active and engaged and to find ways to highlight the positive aspects of being in the Army, which

may, in turn, impact the message they, as potential influencers, share with the youth populations. The most powerful content on GoArmy is likely to consist of posts that enable people to express themselves. Indeed, the content of comments differs substantially from that of posts. GoArmy Facebook posts frequently focus on career-related topics; comments are much more likely to concern specific units or experiences. This, too, suggests members of the audience have a desire to express their individual experiences.

Social media offers many ways to learn more about an audience and the reactions to specific types of content. In our study, AMRG ran an experiment on GoArmy's Facebook page to determine how the audience responded to posts that featured images and/or text about soldiers who were women. In general, the audience responses were positive; there were few differences in audience size for posts with women soldiers. There also were some indications that the posts increased engagement by women in the audience. The audience response to images of women in the Army with their family members was especially positive.

This suggests that featuring images of diverse soldiers runs few risks of alienating the audience and can, in some cases, increase engagement.

Cross-Platform Recommendations

Several of our recommendations have implications for each platform we examined.

First, in each case, *gaining a better understanding of the audience* will pay dividends. This will allow content to be tailored more closely to audience interests. This is likely to increase engagement and could even pay dividends in terms of producing additional recruits or increasing positive sentiment toward the Army. While we have provided some information on the Army's audiences, we recommend additional analyses of engagement, as well as using call-to-action-type posts to learn more about the audience (e.g., asking audience members about their preferences in terms of content or their capacity to serve as influencers).

Continuing to build the follower base on each platform will pay dividends, especially if the Army

Social media offers many ways to learn more about an audience and the reactions to specific types of content.

uses cross-postings to steer audience members from one platform or audience to another. This could be done by including additional links to GoArmy.com in Facebook or Twitter posts or by cross-posting between @GoArmy and @USArmy Twitter accounts. The @GoArmy Twitter audience is engaged—but small—compared with other somewhat similar accounts. Focusing on the content that the audience finds most engaging also should help achieve this goal. Especially in the case of the @GoArmy Twitter account, the audience activity level varies by day and time of the year; continuing to track and respond to these differences should increase engagement. Beginning to think of the platforms as a group could also help to build the follower base—Twitter and Facebook users can be steered to GoArmy.com through posts, and the effectiveness of these efforts can be tracked.

Finally, *developing additional metrics to measure communication effectiveness* will pay dividends, as it allows the Army to better target its message on each platform. We provide some metrics throughout this report, but we recommend continued efforts to develop metrics, as well as to learn about the metrics that other organizations find effective. Metrics linked to longer-term real-world outcomes—such as enlistment, awareness, Army activities and opportunities, changes in propensity, or willingness to recommend Army service—will be the most valuable guides in message targeting. Surveys are an effective mechanism for gathering this type of information from followers.

We stress that social media platforms create a unique source of data. This contrasts with more traditional advertising venues, which measure focus on potential exposure to the message but not often on measures of engagement. Social media platforms create an enormous amount of information (e.g., pages viewed, time on page, likes, shares, comments), which can be analyzed to determine audience engagement with content. We provide some examples of such analyses in this report, but there are many other possible avenues to explore. Therefore, *we recommend viewing social media platforms as sources of valuable and detailed data about the Army's audience and messaging.* Similar to the way that analysts have developed models of recruiting that include measures of population demographics, data from social media platforms could be combined with other sources of data in models that focus on a variety of outcomes. Our model of GoArmy.com information and Army contracts is only one example of such a model.

Closing Thoughts

Over the last two decades, the ways in which people seek information have changed dramatically, and the changes in terms of platforms, devices, and audiences are likely to continue in the near future. Such rapid changes pose a challenge to the Army; remaining current will require continued monitoring of broader trends and of audience interaction with the Army's platforms. These changes have important implications for the way the Army provides information to potential recruits, soldiers, family members, influencers, and others with an

interest in the Army as an institution. Similar to other large organizations, the Army will be forced to continue investing in new platforms and updating communications strategies.

But while social media and technology bring new challenges to the Army, they also provide a platform for experimentation; changing the message is often fairly straightforward, and while the metrics of success are not yet well established, social media platforms offer many potential ways to experiment and measure the success of various messages. In this way, the Army can hone and target messages in a manner that could be far more effective than what would be possible with more traditional advertising efforts alone. A few examples of potential experiments include similar posts with differing photo or video content, posts with different types of language, posts at different times of the day or week, and posts with various types of user-developed content. The experiment that was conducted as part of this study, focusing on women in the Army, illustrated the types of findings that might emerge: if and how the language and images resonate with the followers of an account, as measured by their likes, shares, and comments. In many cases, similar experimentation could occur on multiple platforms. Measuring the effects of these experiments would provide helpful information in terms of the effectiveness of communication efforts, but these experiments could also provide useful information on potential metrics. In summary, changing technology offers many challenges but also unique opportunities for the Army to connect with its audience.

Appendix A. Additional Results and Methodological Details

Additional Details for “Introduction”

Tables in the main text include a variety of information on the Army’s main webpage (GoArmy.com) and on the Army’s social media platforms. Here, we include detailed information describing the analytic techniques used to produce this information.

Characterizing followers is an imperfect process. Characterization of followers is done using lexical analysis for Twitter and by examining the commenter’s name for connections to the Army, such as “Sergeant,” “ArmyMom,” or “Army Recruiting Battalion.” In the Facebook analysis, users were characterized as family members of soldiers or veterans, members of the general public, or service members. *Family members* is a category that captures a wide range of relationships, including spouse, child, parent, cousin.

The Twitter data used to produce the measures in the text was obtained through the GoArmy Brandwatch social media monitoring account. The number of Twitter followers was as of November 3, 2016.

The ages of followers are estimated based on Social Security Administration lists of baby names. Although all names are scrambled to protect user privacy, we were able to use publicly available data to estimate the probability that a commenter with a given name will be a man or a woman, as well as his or her approximate age. Our estimate of the percentage of male commenters on a given post is the average of the *maleness* probability across all commenters. For example, imagine a post received three comments from an Andrew, Addison, and Angel. We would first calculate the probability that each is male, based on their names (99 percent, 7 percent, 70 percent, respectively), and then average those probabilities to score the post (59 percent male). The probability that the user was under 25 years old is based on their first name, also using the Social Security Administration list of popular baby names published each year since 1879. These probabilities are less precise than gender inference. For example, Liam is one of the top ten baby names given to male babies between 2012 and 2015. George was one of

the top ten baby names given to male babies between 1900 and 1937. Statistically speaking, a randomly sampled Liam in the U.S. population is unlikely to be older than a randomly sampled George. However, there are a few names that do not permit this kind of inference. For example, Michael has been a top baby name for male babies born every year since 1943. However, we believe this approach still produces fairly accurate results baby names trend over time.

Additional Details for “The Army’s Primary Website, GoArmy.com”

We organize all information in this section by DMA and month.⁶² The United States is divided into 210 DMAs.⁶³ DMAs are smaller than states, but like states, they vary on many dimensions, such as population density, average education level, and labor market conditions. While data from GoArmy.com are anonymous, the site captures information on general geographic location of the visitor and the date of the visit. Table A.1 includes regression results cited in the main text.

In alternate models, we found that the relationship between other measures of website use (new visitors, page views, session duration) and contracts is quite similar to the relationship between page views and contracts. This is not surprising, given the high level of correlation between the website use measures.

DMA, fiscal year, and month together explain the vast majority of the variation in contracts. This suggests that factors specific to the DMA (such as population), as well as factors related to times of the year and to specific fiscal years are strongly associated with the number of contracts, while website use has a far weaker association with contracts. Finally, the relationship between GoArmy.com visitors and high-quality contracts is even smaller than that between visitors and all contracts. The relationship between contracts and *thank you* pages is also small. These results suggest that the variation in contracts is explained by factors outside GoArmy.com visits or sessions.⁶⁴

In many cases, contracting and enlistment happen over a period of time. Therefore, we also looked at the relationship between website use in

TABLE A.1

Regression Results: Models of GoArmy.com Usage, Contracts, Total Contracts at the Designated Marketing Area Level

DMA Characteristics	GoArmy.com Use (Sessions)	Contracts	High-Quality Contracts
Youth population	+	+	+
Percentage non-Hispanic black	+	+	
Percentage foreign born	+	+	+
Recruiters per 10,000	+	–	–
Internet access	+		
Percentage veterans	+	+	+
Northeast		–	–
South	+	+	+
West	–		

SOURCE: American Community Survey, “2010–2014 ACS 5-Year Estimates,” webpage, November 24, 2015.

NOTES: Marginal effects calculated from linear regression models. Dependent variable: total sessions per DMA. Regressions also include controls for the percentage of the population with a college degree, the percentage with less than a high school education, and the percentage of households with income below the poverty line. Standard errors adjusted using Huber-White methodology (“robust”).

+ = coefficient is positive and statistically significant at the 5-percent level or better; +* = coefficient is positive and statistically significant but at the 10-percent level; – = coefficient is negative and statistically significant at the 5-percent level or better; blank fields indicate coefficient is not statistically significant (and thus, the relationship may have occurred by chance).

one month and contracts in *later* months. Again, we found very small effects of visitors on contracts. There were similar results when we substituted other measures of website use. However, some of our lagged indicators were positive and statistically significant, up to at least six months. This suggests that website use does precede contracting in some cases, as we would expect.

Because some of the information available on GoArmy.com is likely used by current soldiers and possibly those in the DEP, we also tested for a relationship between contracts (as well as high-quality contracts) in one month and users or sessions in later months. Current contracts seem to be related to later use of GoArmy.com, most often two to five months in the future. While the size of the effect is somewhat smaller than that found between website use today and later contracts, this does suggest that GoArmy.com serves as a source of information both for those who are considering enlistment and for those who have enlisted recently.

Figure 3 grouped the top 100 visited pages into nine categories. Figure A.1 details the specific titles and total page views of the 30 GoArmy.com pages

that had the largest numbers of visitors during the period of time covered by our data.

Additional Details for “Army Marketing Research Group’s Twitter Account”

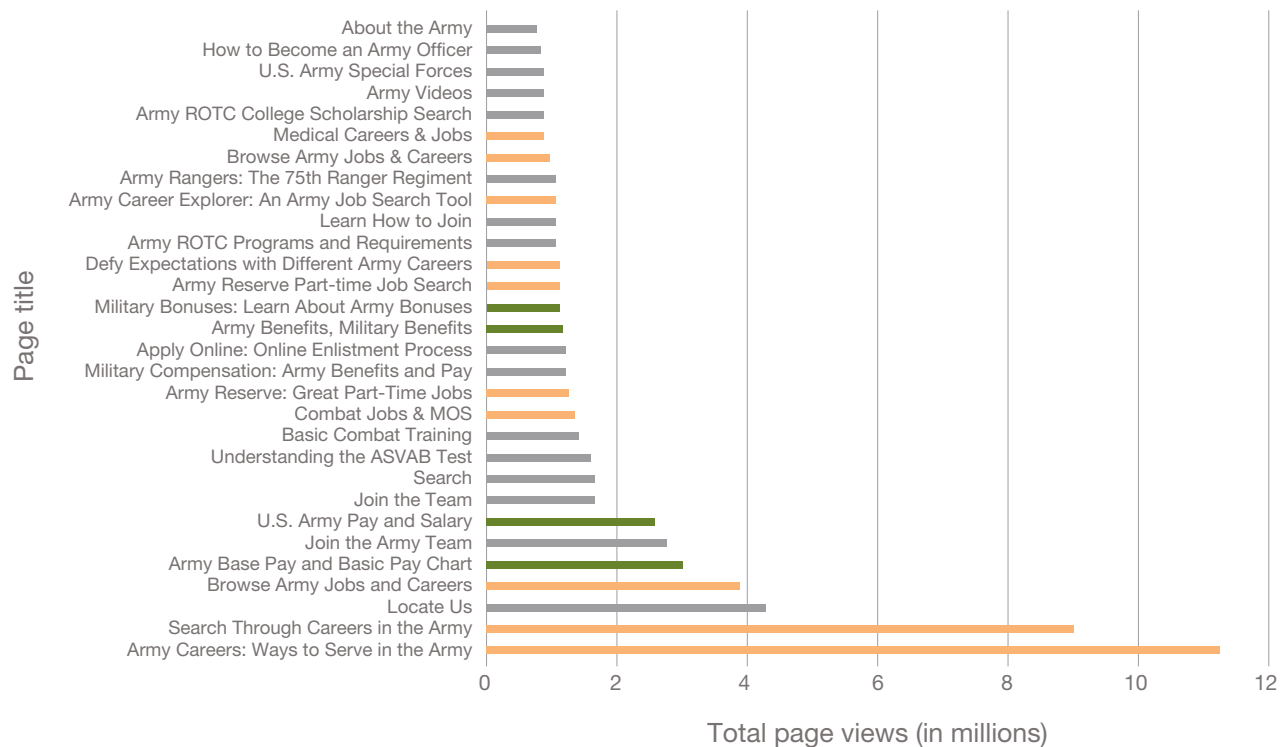
Methods Used in the Lexical Analysis

To conduct a lexical analysis of the @GoArmy Twitter stream, we began by searching a historical archive of the Twitter firehose.

We used text analysis software (RAND-Lex) to get a big-picture view of @GoArmy’s Twitter stream, specifically three different sets of content: original tweets (posts) and retweets (shares) from @GoArmy, mentions of @GoArmy by other users, and retweets of @GoArmy tweets. We looked for what was characteristic of the stream when compared with a representative sample of Twitter data, as well as word pairings that help point to abstractions and relationships. To do this characterization, we used a variety of tests, including keyword analysis and collocate extraction to show what is most distinct about the text from @GoArmy but also what is most ubiquitous. Both views are important, because

FIGURE A.1

Total Page Views Among Most Viewed Pages on GoArmy.com



SOURCE: RAND Arroyo Center analysis using data from GoArmy.com, July 2014–July 2016.

humans are consciously attentive to the distinct and unusual but also unconsciously use what is most common in language.

We extracted *keywords* from the @GoArmy Twitter stream (original tweets and retweets) to get a holistic sense of what the account talks about. In this case, keywords are not words we came up with a priori or simple frequency rankings. Keywords are words that show up at higher-than-random amounts—for example, if the keywords extracted from a data set include “base,” “football,” “pitch,” “field,” “interception,” “puck,” and so on, the data are talking about sports and likely comes from a collection of sports reporting. This kind of inductive analysis is important, because what we think we are emphasizing in our talk is not always the same as what we actually do in practice. We also extracted the most distinct word pairs and word triplets (collocates), because consistent connections between words can highlight meaningful relationships and abstractions (e.g., proper names, places names,

abstract concepts). Table A.2 shows the top ten results from each of these tests.

Table A.3 shows examples of keywords and collocates used in the lexical analysis categories (the bar charts shown under the “Army Marketing Research Group’s Twitter Account” section).

Additional Details for “Army Marketing Research Group’s Use of Facebook”

Characterizing the Discussion in Posts and Comments

There are at least two ways to examine the content of posts and comments. The first method focuses on the subjects discussed, and the second method focuses on the language used to discuss the subject. These two methods can overlap when a specific subject is typically discussed using specialized jargon. We identified 23 topics that tend to come up in GoArmy posts and devised sets of keywords that tend to be used to talk about these topics (e.g., “touchdown”

TABLE A.2
Lexical Analysis of @GoArmy Tweets

Keywords	Most Frequent	
	Word Pairs	Word Triplets
#armyteam	lt col	sgt 1st class
career	snapchat <emoji>	on snapchat <emoji>
today's	1 st class	snapchat <emoji> for
#potd	follow <emoji>	us on snapchat
https://t.co/kaxgn10t4g	Follow snapchat	follow us on
day	<emoji> https://t.co/kaxgn10t4g	<emoji> for more
soldiers	staff sgt	the #armyracing team
#independenceday	fitness challenge	today's @ usarmyreserve career
#armymudder	us <emoji>	to becoming an
hooah	obstacle course	a training exercise

or “tackle” tend to come up in sports discussions). We then counted how often keywords for each topic tended to occur in each post and comment and used those counts to score them for the presence of those topics. Finally, we grouped the 23 topics into six broad subjects to understand the topics popular on GoArmy. While some words were keywords for multiple topics, the keywords for each subject did not overlap. The six subjects were as follows:

Careers and Education

- ASVAB: language associated with standardized testing, including practice questions
- education: language associated with the educational system, including Reserve Officers' Training Corps (ROTC), scholarship programs, and various Army educational outreaches
- joining requirements: language associated with the technical requirements to join the Army, such as legal residence requirements⁶⁵

- career pathways: language associated with different Army professions, including MOS codes, and professional titles
- training: language associated with military training, such as boot camp.

History and Politics

- battles: names of places associated with major battles or wars, such as Normandy, Ticonderoga, and the Persian Gulf
- events: dates pertaining to years between 1775 and 2000⁶⁶
- presidents: names of U.S. presidents, including common abbreviations (e.g., FDR, JFK) but excluding common names
- veterans: language associated with Veterans Affairs services or reminiscence on past service
- hotspots: names of places associated with current security challenges
- foreign countries: names of foreign countries
- political leaders: names or titles of U.S. office holders, including both civilian and military figures, but excluding U.S. presidents, who fall into their own category.

Military Vocabulary

- activity words: language associated with military operations, such as sustainment or mission
- equipment: names of military equipment, especially model numbers and acronyms
- bases: names of large military bases, either taken from lists of large military bases or found inductively in our search of the data⁶⁷
- ranks: Army ranks, especially the abbreviations typically used when referring to specific soldiers
- services: references to the other branches of the U.S. military
- special operators: references to the various special operation units within the U.S. military
- units: terminology associated with various units of organization (e.g., battalion), as well specific units (e.g., 1st airborne).

Sports and Exhibitions

- general sports terminology: language typically associated with sports, especially sports where the Army has a strong, direct presence⁶⁸
- names of Army exhibition and major events, such as the All-American Bowl, Golden Knights, Army NHRA team, Tough Mudder challenge, and Army Zone Tour.

Family

- titles describing family relations, such as son or wife.

Holidays

- names of U.S. holidays,⁶⁹ as well as standard holiday greetings.

We also identified eight types of language frequently used in GoArmy posts. While the six subjects we identified described what was discussed, these language types described how it was discussed. The eight language styles we examined are as follows:

- Positive: Language typically indicative of a positive, encouraging, or congratulatory reaction. Examples include “hooah,” “congrats,” “amazing,” “impressive,” and “wow.”
- Tributary: Language typically used to express respect, gratitude, and admiration for military personnel. Examples include “brave,” “hero,” “sacrifice,” “valor,” and “selfless.”
- Amused: Language typically associated with laughter and humor, such as “lol,” “haha,” and “jk.”
- Patriotic: Language referencing American ideals or suggesting personal affiliation with the United States. Examples include “liberty,” “freedom,” “dignity,” and “our country.”
- Tenacious: Language typically associated with challenges and determination to overcome them. Examples include “overcome,” “tough,” “hard,” “dedication,” and “challenge.”
- Religious: Language typically associated with religious (primarily Christian) ways of speaking. Examples include “prayers,” “thee,” “faith,” “angels,” and “almighty.”

- Safety: Language typically associated with a desire for the safe return of military personnel or acknowledging that safe return did not occur. Examples include “stay safe,” “take care,” “harm,” “condolences.”
- Negative: Language associated with allegations of public corruption or profane language. Examples include “corrupt,” “shameful,” and “waste money,” as well as a varied assortment of profanities and profane abbreviations.

Facebook Experiment

Table A.4 presents our roster of experimental posts.

TABLE A.3

Example Keywords and Co-Locates in Lexical Analysis Categories

@GoArmy posts + shares	Army	#armyteam, soldiers, hooah
	Career	career, specialist, 1 st class, staff sgt
	Time	today's, day
	Social media	#potd, follow snapchat, follow us
@GoArmy mentions	Sport	skate lingo, @nissanusa #100blackmen, award:west bball
	Army	@goarmy, @tradoc, #armyaviation maintenance
	Recruit	newest drill sergeants, infantry recruit 11x
	Movie	@independenceday, cast, times square
@GoArmy retweets	Army	@goarmy, #armyteam, #armyrotc100
	Career	career, 25d, 29e, 36a financial manager
	History	100 year existence, allied, #dday
	Fitness	#fitnessgoals, #beattheheat, #summertraining
@USArmy posts + shares	Army	#usarmy, soldiers, #armybdy trivia, armed forces
	Army news	#standto, hot topics, news relating, guide news
	Army leaders	@secarmy, #meetyourarmy, #15thsma dailey
	General	person, more, says, no longer
@USArmy mentions	Army	@usarmy, @101staaltdiv's #bestrike
	Commercial	@airforce_tech @uscoastlaser, @brrr_cool @carhartt
	Politics	@realdonaldtrump, #electionyear
	General	you, #beerbourbonbbq
@USMarineCorps posts + shares	Marines	marine, corps, drill, training, #usmc
	Values	discipline, leadership, confidence, win battles
	Recruit	recruit, enlist, #whythemarines, yellow footprints, discuss opportunities
	Action	request, learn, learn more about
@GoPeaceCorps posts + shares	Values	volunteers, #letgirlslearn, community, health, extraordinary unexpected
	Time	can't wait, depart feb 2017, by October 1
	Action	host, win trip, don't miss out, let us know
	Recruit	apply, #applypc, connect recruiter, any questions

TABLE A.4
Roster of Experimental Posts

Date	Type	Post ID	Snippet	Photo Depicts Women	Text Refers to Women	Depicts Family
July 14	ASVAB	10154891641388752	Think you've got the answer to this #ASVAB question?	No	No	No
July 14	Test	10154997145753752	No limitations: From engineering to medicine, the 150+ U.S. Army careers are an opportunity for you to follow your passion. www.goarmy.com/careers	Yes	No	No
July 21	ASVAB	10154891641623752	Comment on this post with your answer.	No	No	No
July 21	Test	10154997148993752	On our team, there's always someone willing to lend a hand. U.S. Army Staff Sgt. Jennifer Largen secures a vehicle to a flatbed trailer at Joint Base Elmendorf-Richardson JBER (official), Alaska] to support a United States Air Force training exercise.	No	Yes	No
July 28	ASVAB	10154891642138752	Tell us how you would answer this question.	No	No	No
July 28	Test	10154997150943752	"I am what my country expects me to be: the best-trained Soldier in the world." Here, an #ArmyTeam Soldier has her sight on the target during rifle marksmanship training at US [sic] Army Fort Benning.	Yes	Yes	No
August 4	ASVAB	10154891656318752	Put your knowledge to the test with this #ASVAB question.	No	No	No
August 4	Test	10154997152008752	At all times, #ArmyTeam Soldiers stand ready to defend the Nation.	No	No	No
August 11	ASVAB	10154891657623752	Comment on this post with your answer.	No	No	No
August 11	Test	10154997153683752	For these U.S. Army Soldiers, serving the Nation is a family affair. Capt. Andrea Wolfe, senior brigade physician assistant, and her son Spc. Kameron Wideman, a behavioral health technician, are currently serving with U.S. Army Central at Camp Buehring, Kuwait.	Yes	Yes	Yes
August 18	ASVAB	10154891658578752	Here is your practice #ASVAB question of the week.	No	No	No
August 18	Test	10154997156103752	When you join #ArmyTeam, you and your loved ones become part of the #USArmy family.	Yes	No	Yes
August 21	Test (De Facto)	10155124686503752	T-minus three hours until #Eclipse2017 reaches the West Coast. \U0001f318\n\nHere's a look at the U.S. Army installations and The National Guard readiness centers that will be able to experience a total eclipse: https://www.army.mil/article/192464/	Yes	No	No
August 22	Test (De Facto)	10155127377798752	#ArmyTeam includes doctors, aviators, engineers, mechanics, firefighters, veterinarians and innovators who make a difference. Browse 150+ U.S. Army career options by visiting http://www.goarmy.com/careers .	No	No	No
September 8	ASVAB	10155154321763752	Post a comment with your answer to this #ASVAB practice question.	No	No	No

Table A.4—Continued

Date	Type	Post ID	Snippet	Photo Depicts Women	Text Refers to Women	Depicts Family
September 8	Test	10155168085098752	Taking Aim. An #ArmyTeam soldier has her sight on the target during the Winston P. Wilson Small Arms Championship at the Robinson Maneuver Training Center in Little Rock, AR. More than 300 marksman [sic] from 47 states and territories competed in this event.	Yes	Yes	No

Notes

¹ For time trends, see Smith, 2017. There are some differences in technology use by other characteristics (such as education level, ethnicity, and urban or rural), but these differences generally have grown smaller over time and are nearly indistinguishable today (see Perrin, 2015).

² Mark Hoelzel, “A Breakdown of the Demographics for Each of the Different Social Media Networks,” *Business Insider*, June 29, 2015.

³ This does not mean that technological change will negate the effectiveness of all other types of outreach, only that technology platforms offer new opportunities for outreach.

⁴ Conversations with Army Marketing Research Group (AMRG), project sponsor.

⁵ AMRG also maintains Instagram, Snapchat, and other accounts, but we focused on the accounts above because of budget and data limitations.

⁶ We cannot differentiate between visits and unique visitors on any of the platforms. It is likely that some individuals visit the GoArmy website multiple times, so the number of unique visitors is less than the total number of visits and sessions. However, the difference between visits to GoArmy.com and Facebook and Twitter followers is so large, we are confident the website has more unique visitors as well. This finding is true even with the date ranges used across the platforms. We have 33 months of Facebook data, 28 months of Twitter data, and only 24 months of GoArmy.com data.

⁷ See Priceonomics, “What Are the Most Popular Websites by Demographic?” *Forbes*, July 26, 2017.

⁸ Salar Jahedi, Jennie W. Wenger, and Douglas Yeung (*Searching for Information Online: Using Big Data to Identify the Concerns of Potential Recruits*, Santa Monica, Calif.: RAND Corporation, RR-1197-A, 2016) demonstrate that search queries are correlated with the proportion of Army recruits who meet a high quality standard and also demonstrate that search data can be used to identify potential recruits’ concerns. See also Michael Ettredge, John Gerdes, and Gilbert Karuga (“Using Web-Based Search Data to Predict Macroeconomic Statistics,” *Communications of the ACM*, Vol. 48, No. 11, November 2005, pp. 87–92), who examine search data and unemployment rates; Jeremy Ginsberg, Matthew H. Mohebbi, Rajan S. Patel, Lynnette Brammer, Mark S. Smolinski, and Larry Brilliant (“Detecting Influenza Epidemics Using Search Engine Query Data,” *Nature*, Vol. 457, No. 7232, February 19, 2009, pp. 1012–1014) use search data to improve predictions of real-time flu outbreaks; Thomas Dimpfl and Stephan Jank (“Can Internet Search Queries Help to Predict Stock Market Volatility?” *European Financial Management*, Vol. 22, No. 2, March 2016, pp. 171–192) find that the search volume of the leading stock market index a day earlier is positively related to the volatility of that index the next day. All of these studies used data from Google searches.

⁹ GoArmy.com, like similar websites, records information on which pages within the website are visited, how long visitors spend on each page, and, in basic terms, how visitors arrived to the site (e.g., searching for terms using Google or being directed to the page from advertisements). While these data include rich information describing website use, information about the user

is anonymous—there are no individual details about the visitor. However, the visitor’s general location is recorded. Our data include information on website visits between July 2014 and July 2016.

¹⁰ The sample size of page views is quite large; there were about 150 million total page views on GoArmy.com during the period included in this data set (July 2014–July 2016).

¹¹ See Figure 3 and the appendix for the titles and page views of the 30 most visited pages on GoArmy.com.

¹² The titles of these two pages are “Army Careers: Ways to Serve in the Army” and “Search Through Careers in the Army.” Although the second page includes the word search in the title, we categorized it as a career page because of the clear focus on Army jobs and careers.

¹³ We also calculated the total time spent on pages in each category; the ranking of page types by time spent on the page was nearly identical to what is shown in Figure 3. The largest difference was in the search pages; these pages make up about 8 percent of all page views (among the top 100 pages), but users spend about 11 percent of their time within GoArmy.com on these pages.

¹⁴ High-quality contracts are defined as contracts with individuals who possess a high school diploma and score at or above the mean on the Armed Forces Qualifying Test (AFQT).

¹⁵ This fixed effects regression model allows us to isolate the relationship between website use and contracts, holding constant fiscal year, month of the year, and DMA. We use a series of dummy variables to control for DMA; by doing so, we control for all factors that vary between DMAs but do not vary across time. While we do not interpret the coefficients on these variables, they allow us simultaneously to hold constant a variety of factors such as youth population and education level; to the extent that advertising varies by time or location, this model allows us to hold constant advertising spending as well. If website use is not related to contracts, then we would expect the two to vary in an unrelated manner; in that case, the coefficient on website use in a model explaining contracts would be small and insignificant. Finally, this is a reduced form model—we do not specifically model the entire process of enlistment; rather, we simply test the hypothesis that website use is related to contracts. However, note that we did test several different specifications; for example, we experimented with first-time users as well as number of sessions and length of sessions in place of total number of visits. We also ran separate models for high-quality contracts. In each case, the results were substantively similar. See appendix.

¹⁶ In our data set that includes DMA-level monthly observations (July 2014–July 2016), the correlations between these measures generally exceed 0.90; within a single month, the correlations are also generally greater than 0.90; even within a single DMA across months, the correlations frequently exceeded 0.90, although, in some cases, the correlation between session duration and the other use measures is somewhat lower.

¹⁷ Another option for tracking website use or visits is to use factor analysis to form a single combined measure from all website measures. While this option may be an appropriate focus of future research, in this case, the advantage offered is likely to be modest because the measures are so highly correlated.

¹⁸ In technical terms, coefficients on the lagged indicators we added to our models were positive and statistically significant up to five to six months.

¹⁹ While the ACS data we use covers 2010–2014, the measures are combined across years to increase precision. Therefore, in the analyses presented in this section, we have only one measure per DMA.

²⁰ Youth population includes those ages 18–24.

²¹ The largest Army installations include Fort Benning, Fort Bragg, Fort Campbell, Fort Carson, Fort Drum, Fort Hood, Fort Jackson, Fort Knox, Fort Leonard Wood, Fort Lewis (Joint Base Lewis-McChord), Fort Sill, and Fort Stewart.

²² These results holds in a simple regression model including youth population, percentage black or Hispanic, number of recruiting stations, internet access, veteran population, and region. After holding constant other factors, both internet access and access to recruiters are correlated with website use. The results also indicate that DMAs with more recruiters per 10,000 young people have higher levels of website visits, but fewer contracts. Finally, both contracts and high-quality contracts are higher in areas where more of the population is foreign-born.

²³ Jahedi, Wenger, and Yeung, 2016.

²⁴ In Table 3, we compare @GoArmy activity to other military and service accounts. In general, the @GoArmy account generates about as much content as the more general @USArmy account. By contrast, the U.S. Marine Corps recruiting account posted slightly more than half the number of times (342 posts compared with @GoArmy's 581 between May 1, 2016, and July 31, 2016), and the Peace Corps recruiting account posted 20 percent more (750 posts versus 581).

²⁵ New Year's Day is a high volume day on Twitter, regardless of topic or population.

²⁶ RAND has access to the full firehose of Twitter content, both historical and real-time, through a contract with GNIP, a social media aggregation company.

²⁷ For this lexical analysis, we used all tweets that are from or include a mention of the following accounts: @USArmy, @GoArmy, @usairforce, @USAFRecruiter, @USMC, @USMarineCorps, @USNavy, @AmericasNavy, @PeaceCorps, and @GoPeaceCorps, resulting in a total of 592,222 tweets (139,016 posts and 453,206 retweets).

²⁸ The "General" category includes such words as "an," "is," "the," "visit," "during," and "visit." The "Army" category includes, for example, "#armyteam," "soldiers," and "hooah." "Other" groups words and phrases from smaller categories containing less than 3 percent of the content, including other services, emoji, value, and movie. Table A.2 in the appendix provides additional example keywords and co-locates in the lexical analysis categories shown in Figure 7.

²⁹ Our findings are somewhat complex because of the networked nature of the medium. Twitter is a communication channel that depends on and enables maximizing connections, which means that one user can drag another into his or her conversation through a mention. So, in some of our tests, the most distinct features were spam (both commercial and charitable) and political conversations that had no visible connection to the

@GoArmy account beyond including a mention of the @GoArmy account.

³⁰ Note that when a user retweets content, he or she has the ability to add a comment above the retweet, so new themes (such as value) may emerge in retweets that were not evident in the original content.

³¹ Note that this number is derived from all tweets that contain a link to GoArmy.com, not just those that mention or retweet the @GoArmy account. Many such tweets contain no mention of the @GoArmy account. During the same period in 2015, there was only one tweet from @GoArmy that included a link to the website and 46 retweets, compared with approximately 1,100 total tweets from other users that linked to the site. Thus, the percentage of tweets with a link originating from @GoArmy has increased from approximately 4 percent to 23 percent from 2015 to 2016.

³² The @USArmy Twitter account is verified as the "Official Twitter page of the U.S. Army," with www.army.mil listed in its bio as the website.

³³ One way to increase return on content is to increase the number of followers, so that there is higher potential for more people to share content. However, quantity alone is not sufficient—if these followers are not particularly active, return on content will not significantly increase. Figure 9 demonstrates this.

³⁴ We also analyzed audience interactions with these accounts. While these results are excluded for brevity, we did find some differences between the posts/shares and the audience reactions (mentions, retweets). In particular, the @USArmy audience mentions were less Army-specific than the account's posts and tweets.

³⁵ When we examined the audience reaction to @USArmy (mentions and retweets), we found that the reaction was more varied than what we see in terms of tweets and shares; while Army-specific topics were still quite common, posts related to other topics, such as politics or international topics, were mentioned disproportionately. The difference likely reflects the large number of followers (more than 900,000) and the high profile of the account. These analyses are excluded for brevity.

³⁶ Figure 10 combines posts containing career and recruiting themes. Among the 25 percent of posts on this topic by the @GoPeaceCorps account, 5 percent were career posts, and the remaining 20 percent were about recruiting. All 26 percent of the @USMarineCorps posts in this category were categorized as recruiting.

³⁷ This difference can probably be attributed to the different goals of the accounts and who operates them, recruiting for @GoPeaceCorps and branding and marketing for @GoArmy.

³⁸ In an email dated August 11, 2016, to RAND Corporation authors, the AMRG stated that the Army Value Proposition is as follows:

The U.S. Active Army is for those who want more than a job; they want to make a difference, every day, for themselves, their families, and the Nation. Through shared values and training that develops their potential, these men and women take pride in their ability to adapt, respond and prevail in complex environments at home and abroad

(cited in Todd C. Helmus, S. Rebecca Zimmerman, Marek N. Posard, Jasmine L. Wheeler, Cordaye Ogletree, Quinton Stroud, and Margaret C. Harrell, *Life as a Private: A Study of the Motivations and Experiences of Junior Enlisted Personnel in the U.S. Army*, Santa Monica, Calif.: RAND Corporation, RR-2252-A, 2018).

³⁹ A page “serve” count enumerates the total unique users who had at least one opportunity to view a post, either by visiting the GoArmy page or because the post appeared in their Facebook feed.

⁴⁰ We looked for sets of words that occurred at statistically elevated rates, then used Ward’s Minimum Variance Hierarchical Clustering to group them.

⁴¹ For example, imagine a collection containing only two posts, post A and post B. Imagine that topic 1 was found in both posts, while topic 2 was only found in post B. Topic 1 would be counted having been found in 1.5 posts, while topic 2 would have been counted as having been found in 0.5 posts. The collection would be scored as 75 percent topic 1, and 25 percent topic 2.

⁴² About 55 percent of comments are less than eight words long, so many comments contain very little analyzable content. This is a partial explanation for the high proportion of comments that cannot be classified by topic.

⁴³ This percentage goes up if we count practice Armed Services Vocational Aptitude Battery (ASVAB) answers in the category of careers and education. Even with this categorization, however, careers and education comments remain underrepresented compared with the posts. Practice ASVAB answers account for about 10 percent of all comments and consist of an A, B, C, or D response to a post containing a practice ASVAB question.

⁴⁴ In this context, the term military vocabulary especially refers to the names of specific units and installations.

⁴⁵ GoArmy.com, Facebook post, July 4, 2015.

⁴⁶ GoArmy.com, Facebook post, June 13, 2015.

⁴⁷ GoArmy.com, Facebook post, May 26, 2015.

⁴⁸ GoArmy.com, Facebook post, November 27, 2014.

⁴⁹ We accessed this data through Brandwatch, a third-party commercial website that gathers publicly accessible data from Facebook. Brandwatch’s repository is not 100 percent complete. However, we verified that the data on our posts of interest were generally correct and augmented the data as needed with direct observations of the GoArmy page.

⁵⁰ Independence Day, Hurricane Harvey relief, and Women’s Equality Day.

⁵¹ One experimental post from July 28, 2017, received a backlash of negative comments, so AMRG hid the post after five days. Given the time that comments are typically made relative to the post date, we believe that we captured the vast majority of activity on that post. The number of comments received after day five is usually in the single digits. We also included two additional post in our analysis. While these posts were not designed specifically for the experiment, they had identical features. For more information on these posts, see the appendix.

⁵² See Table A.4 in the appendix for additional details about the posts.

⁵³ Most of the analysis in this section involves either qualitative assessment of posts or standard descriptive statistics. However, we use two specialty methodologies to augment those analyses; each is discussed in the appendix.

⁵⁴ We excluded posts pertaining to special events from this analysis; these posts were extremely popular, garnering two to four times as many likes and ten times as many shares compared with even the most popular of the posts we examine here. Also, special events posts are not comparable with our experimental posts in the timing of the posting.

⁵⁵ It is possible for all comparisons to be positive or for all of them to be negative. As shown, gendered photos received more comments than nongendered photos; posts with gendered text received more comments than posts without gendered text. And posts featuring a female soldier with her family received more comments than posts that did not show a female soldier’s family. That implies that a post showing a recognizably female soldier, with her family, with accompanying gendered text would garner the most comments.

⁵⁶ Among the “other” posts, the standard deviation of the numbers of likes, comments, and shares was larger than the average number of likes, comments, and shares. In such a very dispersed sample, and given the small difference in likes, comments, and shares between the “other” posts and the experimental posts, the difference is not statistically significant. The sample size would have been sufficient to find a statistically significant difference if the responses between the experimental and “other” posts had been substantially larger and had the standard deviations been smaller. At the outset of the experiment, we did not know how large the differences would be.

⁵⁷ For information on content that consumers find engaging, see, among others, Keith A. Quesenberry, *Social Media Strategy: Marketing and Advertising in the Consumer Revolution*, Lanham, Md.: Rowman and Littlefield, 2016.

⁵⁸ There are exceptions to this rule. Call-to-action posts and ASVAB posts tend to draw a lot of comments, but the types of comments left by users are probably not negative or contentious (for instance, we know that multiple-choice ASVAB questions generate a lot of single-letter responses). In addition, posts that generate a lot of stock comments might also have a lot of likes; for instance, a post about the Army’s birthday on June 14 would probably generate a lot of likes as well as many “happy birthday” stock comments.

⁵⁹ It is possible that such controversy is more likely to emerge in posts that feature female soldiers, but it is also possible that controversy generally emerges in posts that feature soldiers taking part in key activities. Understanding more about the sources of controversy and contentious commenting is beyond the scope of this effort, but would be possible in future efforts. Such information could be helpful as the Army continues to craft messages for its audience.

⁶⁰ Jonah Berger and Katherine Milkman, “Social Transmission, Emotion, and the Virality of Online Content,” 2010.

⁶¹ Andy Sernovitz, *Word of Mouth Marketing: How Smart Companies Get People Talking*, New York: Kaplan Business, November 1, 2006.

⁶² It is possible to track webpage usage more precisely; for example, we know the day of each visit. But because contracts are goaled by month and because contracting does not happen immediately, we aggregate this information to the month.

⁶³ DMAs have advantages over some other location measures. In particular, they are generally smaller and somewhat more similar in size than states. Each area of the United States is part of a DMA; in contrast, most rural areas are not located in metropolitan statistical areas. However, DMAs still vary quite a bit in terms of land mass and population. Also, while the DMA location data appear accurate (in the sense that they are generally reflective of the population distribution), in some cases, the information may be imprecise. For example, a web visitor who lives in one DMA could seek information using a cell phone while visiting a different DMA; in such an instance, the query could be considered to have originated from either location depending on the IP address of the mobile carrier or the relevant WiFi network or the cell tower location; see “About Targeting Geographic Locations,” support.google.com, undated. DMA boundaries and data, while available for use by others in certain circumstances, are owned by the Nielsen Company.

⁶⁴ The coefficient on the number of visitors is statistically significant, an indication that the relationship is unlikely to have occurred by chance. However, together, DMA, fiscal year, and month explain the vast majority of the variation in contracts and high-quality contracts (with adjusted R-squared values in the region of 0.95). This suggests that population, and perhaps other characteristics that vary across DMAs, drive contracts. This is completely consistent with other research (see Beth J. Asch, Paul Heaton, and Bogdan Savych, “Recruiting Minorities: What Explains Recent Trends in the Army and Navy?” Santa Monica, Calif.: RAND Corporation, MG-861-OSD, 2009).

⁶⁵ While the keywords pertaining to the educational requirements for joining overlapped somewhat with the keywords for education, the overlap was relatively narrow—joining requirements tend to focus more on basic high school education, while the education topic tended to focus more on specialized professional, vocational, and college-level education.

⁶⁶ We specifically look for dates before 9/11, as the line between historical and current events blur when discussing events in the era of the Global War on Terror.

⁶⁷ Specifically, we searched for the presence of marker words such as “Ft,” “Fort,” “Base,” and “Camp,” as well as the names of the largest (by total base personnel) bases. We also augmented our base list with any bases that were present to a statistically conspicuous extent in our data set—that is, those proper names especially likely to co-occur with such words as “assigned,” “stationed,” and “Fort.” The base names that made the final cut were Benning, Bliss, Bragg, Campbell, Carson, Dix, Gordon, Grafenwoehr, Hood, Irwin, Jackson, Knox, Lee, Leonard Wood, Lewis (i.e., Joint Base Lewis-McChord), Liggett, McClellan, Ord, Polk, Riley, Stewart, and Sill. Because base names often tend to be common proper names, we do not search comprehensively for every U.S. military base. It is too easy for computerized analysis to mistake a discussion of people for the names of the many small military bases.

⁶⁸ Racing and football scored most strongly.

⁶⁹ Some ambiguity exists about the term Independence Day because it (and hash tag) typically reference the U.S. holiday, but it sometimes referred to the action movie during the latter half of our study period.

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About This Report

This report documents research and analysis conducted as part of a project titled *Leveraging Technology to Enhance the Effectiveness of Army Recruiting by Connecting with America's Youth*, sponsored by the Assistant Secretary of the Army for Manpower and Reserve Affairs. The purpose of this project was to improve the effectiveness of recruiting resources and the Army's ability to communicate with the youth population by identifying ways in which it can make more creative use of technologies.

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