



Research Report

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Army Enlistment Options Optimizer

Research Approach, Findings, and Implications

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About This Report

This report documents research and analysis conducted as part of a project entitled *Army Career Options Optimizer*, sponsored by U.S. Army Training and Doctrine Command. The purpose of the project was to develop an enlistment options optimizer (EOO) concept that creates bundles of enlistment options valued by both prospective recruits and the Army and a strategy to implement it.

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Summary

Enlistment Options Optimizer Background

When Army recruiting prospects consider enlisting, they think about which job to select and how long to enlist for. These choices depend on the jobs offered and the incentives for them. Some Army jobs offer a bonus, and its amount depends on the urgency of filling the job, the recruit's education level and Armed Forces Qualification Test (AFQT) score, and the chosen term length. Given these factors, job bonus is the same for every recruit at a given point in time, though the bonus amount varies over time depending on recruiting conditions. The Army must set the bonus high enough to attract the marginal recruit needed to meet the job's manning requirement. The willingness to join the Army differs among recruits, however, and many recruits would have accepted a lower bonus amount than that needed for the marginal recruit. The difference between the bonus paid and the bonus amount the recruit would have accepted is termed *economic rent*, and it can be 80–90 percent or more of the Army's enlistment bonus expenditures (see Knapp et al., 2018, p. 63).

Although economic rent is a well-known feature of bonuses, it cannot be avoided for several reasons: Prospects have no reason to reveal their willingness to accept a lower bonus, legal issues and enlistee dissatisfaction could possibly arise from offering different bonuses to equally qualified enlistees into the same job and term length, and there is no opportunity for enlistees to trade off the bonus against non-bonus incentives. Today, non-bonus incentives tend to be offered individually at fixed terms, which limits the prospect's opportunity to tailor the enlistment package by making trade-offs—e.g., choosing a lower bonus in exchange for a preferred non-bonus incentive. In addition, some aspects of military service may be valued by the prospect but are not currently offered as a non-bonus incentive.

The Army Enlistment Options Optimizer Concept

The idea underlying the enlistment options optimizer (EOO) is to give potential recruits a menu of enlistment incentive options of the types the Army offers and allow them to choose the option they prefer. Consistent with Army policy, the menus will differ by the Army's need to fill a given job type; recruit education and aptitude level (quality); and, within a menu, by enlistment term length. As is true today, the options and bonus amounts will vary with recruiting conditions and the number of recruits needed.

The types of options offered in menus include stand-alone bonuses and additional options such as college student loan repayment (via the Loan Repayment Program [LRP]), choice of region of assignment location, and guaranteed job interviews with private-sector companies after leaving the Army (Partnership for Your Success [PaYS]). The incentives can be offered singly or in pairs and usually are accompanied by a supplemental bonus that is less than the stand-alone bonus.

Research Approach

This research addresses the noted limitations of the Army's current incentive approach by using surveys to explore the responsiveness of prospective recruits to enlistment choice sets (menus) designed to permit trade-offs between bonus and non-bonus options. As discussed above for the general EOO concept, the options

we asked about in a choice set differed by job type, recruit aptitude level, and term length, and they included bonuses and non-bonus incentives. As noted, the options with non-bonus incentives often came with a supplemental bonus that was less than the stand-alone bonus, in effect trading off some of the stand-alone bonus for the non-bonus incentive. In addition, choice sets were created for average recruiting conditions and difficult recruiting conditions, the latter having higher bonuses. Defining choice sets in this way could enable the Army to reduce recruiting cost to the extent that the non-bonus incentives, along with their supplemental bonuses, cost less than the bonuses that otherwise would be paid. Prospective recruits could benefit from the opportunity to choose among option sets with various offers of bonus and non-bonus incentives, term lengths, and stand-alone or supplemental bonuses, allowing a closer and therefore more highly valued match to personal taste. In addition, an improved match might decrease attrition before entering the Army and during the first term and might increase retention, though we did not study attrition and retention.

The choice sets were built from incentives that exist today and a choice that had not been offered until recently: the choice of job location. The Army has begun allowing some recruits to choose the post at which they will serve. The types of incentives we considered include the enlistment bonus, LRP, PaYS, and choice of region of location. Today, the Army offers enlistment bonuses for skills considered critical or difficult to fill at amounts varying with the difficulty of recruiting conditions, term length, and recruit quality (as indicated by AFQT level and whether the individual has a high school diploma [or more] or its equivalency). Bonuses over \$10,000 are paid in installments during the first term of service. Under LRP, student loan debt principal existing at the time a recruit enlists into the Regular Army is paid up to some limit, currently \$65,000. Payments to the lender are made in installments during the first term. PaYS guarantees the recruit an interview with a leading corporation or public agency when leaving the Army after the first term. Many recruits receiving an enlistment bonus have also opted for PaYS. Choice of job location in our analysis was a commitment to station the recruit at an Army post in a region of choice in the United States or overseas during the first term. As mentioned, the non-bonus options have been offered piecemeal, whereas our research assembled them into choice sets, or menus, with varying levels of bonus amount and student loan repayment limits.

The creation of menus was a key component for exploring the viability of allowing the individual to tailor the recruiting package to personal taste. Because the options in a menu comprise a constrained choice set, the menu provides a means of eliciting the individual's valuation of non-bonus options, including the non-dollar options of choice of location and postservice interview, as compared with the traditional incentive of stand-alone bonuses. If choices were not constrained, an individual offered a bonus could freely add non-bonus incentives—interview, location, or student loan repayment—as perks, and the value to the individual of the non-bonus incentives would be unrecognized and could not be used to trade off against stand-alone bonus dollars. A related aspect is that non-bonus options might have limited supplies: Only a certain amount is budgeted for student loan repayment, some locations might not always be available, and (though less likely) the number of interviews with large organizations might be limited—e.g., during a recession. In a menu, the supplemental bonuses tied to non-bonus incentives can be increased or decreased to regulate demand relative to supply.

Consistent with Army recruiting practice, we allowed the choice sets to differ depending on the type of Army job, length of enlistment, recruit quality, and recruiting conditions, as represented generically by whether no enlistment bonuses were offered, enlistment bonuses were at their historical average values over fiscal year (FY) 2001–FY 2019, or bonuses were at their maximum values over that period. As mentioned, supplemental bonuses were often attached to the non-bonus options of student loan repayment, post-service interview after leaving the Army, and choice of location. The supplemental bonuses were set to make the non-bonus options as attractive as the stand-alone bonus, or approximately so, providing the prospect with a menu of roughly equally appealing alternatives. An alternative approach might have been to create menus with options of equal cost to the Army, but such an approach has less promise because the interview and

location options have a near-zero marginal cost. Making them cost-equivalent to the stand-alone bonus would require setting their supplemental bonuses at a level nearly as large as the stand-alone bonus, defeating the possibility of saving cost. For the same reason, an equal-cost approach would not have the potential to elicit information about an individual's willingness to trade off a stand-alone bonus for a non-bonus option with a smaller supplemental bonus.

The use of surveys was advantageous. A randomized controlled trial (RCT) would have been lengthy and costly and would have raised such administrative issues as how to set recruiting goals when some recruiting stations offered choice sets and others did not. It seemed better first to conduct a proof-of-concept study using surveys. Surveys are faster, less expensive to implement, and provide flexibility to employ choice sets for different job types and bonus levels while controlling for recruit quality. Insights from the survey analysis could be useful in designing a pilot study if the survey analysis found the EOO concept to be viable.

We limited the surveys to individuals who expressed some interest in enlisting in the Army (as opposed to zero interest) among those 18–27 years of age. (Ninety-five percent of active-duty Army enlistees are 18–27.) We could not see whether offering a menu of options induced some of those with zero interest to have a positive interest, but among respondents with some interest we could see whether the non-bonus options (with their supplemental bonuses) were less attractive than, more attractive than, or equally attractive as the stand-alone bonuses in a menu.

The first research challenge was to construct menus with options expected to be equally attractive, which required estimates of the relative value of non-bonus options compared with stand-alone bonuses. Using such information, we could construct choice sets having non-bonus options approximately on par with stand-alone bonuses by adding supplemental bonuses. The supplemental bonus was set such that the relative value of the non-bonus option plus the supplemental bonus approximately equaled the relative value of the stand-alone bonus.

We used data from an initial survey, Survey 1, to estimate the relative value of incentives. In nearly all cases, the incentives included in Survey 1 were based on our assessment of FY 2001–FY 2019 enlistment contracts. In total, we asked about 19 enlistment incentives and their associated first-term contract length requirement. In some cases, we combined non-bonus incentives with enlistment bonuses. Asking a respondent to rank 19 incentives at once would have likely produced information overload. To avoid this, we used an experimental design in which the 19 incentives were formed into eight versions of 19 randomly created triplets (a set of three incentives), and each option appeared approximately three times (2.94 times) in each version of 19 triplets. A respondent saw 19 triplets, one at a time, from a randomly drawn version. For each triplet, the respondent identified the most preferred and the least preferred option, and these data enabled estimation of the relative values of the incentives.

Using relative value estimates, we created 24 menus. These were for the types of jobs shown on the Army recruiting website, goarmy.com (six types); respondent quality as indicated by AFQT score (either at or above the 50th percentile [the national median] or below it); and enlistment bonus condition (average historical value, maximum historical value). We included enlistment terms of three years and four or more years with their associated incentives as alternatives in each menu. An elaboration of this would have been to offer alternative menus within each job type, quality level, or bonus condition by dropping or adding options or changing the amount of the supplemental bonuses. Such an elaboration would have been in line with the design of an RCT, but our budget ruled this out. We could not, therefore, estimate what happens to the probability of enlisting when an option is dropped from or added to a menu. We could see which option was chosen from a given menu. Also, we introduced randomness in the amount of the stand-alone bonus, which allowed estimation of the causal effect of bonus amount.

We used the 24 menus in a second survey, Survey 2. In this survey, we asked respondents about four different job types, three of which were drawn randomly from the six types in equal proportions. After asking

about the three job types, we asked respondents to rank the job types in order of their preference, then asked about the highest-ranked job type they had not yet been asked about. This ensured that all six job types would have adequate sample sizes and guaranteed that one of the four jobs would be the respondent's top-ranked job type. Using questions at the beginning of the survey, we predicted a respondent's AFQT score in real time, and respondents were shown menus conditional on their quality level. Respondents selected their most preferred option in a menu, then were asked their chances of joining the active-duty Army in the next few years given that they would receive their preferred option. Respondents also were asked about their chances of joining the Army in the absence of any incentive for a term of three years and a term of four or more years, which provided a measure of their willingness, or propensity, to join.

Options for non-bonus incentives in a menu often included a supplemental bonus that was less than the stand-alone bonus for the same term length. This allowed a respondent to trade off a stand-alone bonus versus a non-bonus incentive plus its supplemental bonus. Recruiting costs might decrease to the degree to which the non-bonus incentives, with their supplemental bonuses, if any, had lower costs than the stand-alone bonuses that otherwise would be paid. We used the results from the specific menus we offered to calculate whether they produced cost savings relative to relying on stand-alone bonuses. Different menus could lead to different cost savings estimates.

Key Results from Survey 1

The primary questions that we addressed in the first survey included respondents' desired job characteristics and their perceptions of the likelihood of finding these characteristics in Army jobs, as well as their concerns about Army jobs; their likelihood of actively considering serving in the Army, both before and after being given information on Army jobs, compensation, and benefits; and their preference for enlistment incentive types that could be offered in EOO enlistment option menus.

Survey 1 had 800 respondents. The Survey 1 results have implications for Army recruitment marketing and for the design of the second survey. Our respondents generally had a favorable impression of the Army overall. However, they perceived some important mismatches between job characteristics that they considered important and what they believed they were likely to find in Army jobs, specifically pay levels and work-life balance. They also expressed concerns about Army jobs, some of which did not match the reality of Army jobs. These ratings were provided before respondents received information on the variety of jobs the Army offers and on service member pay and benefits. We found that providing such information significantly increased respondents' willingness to actively consider serving. This suggests that the Army should provide such information to young adults and their influencers early in recruitment marketing efforts to increase interest in serving in the Army.

In Survey 1, we found the relative value of the non-bonus options to be in the range of \$10,000 to \$15,000 bonuses. This is important because it suggests the possibility of improving the match of enlistment options with prospective enlistees' preferences while saving the Army money at the same time. There were two additional important findings in the Survey 1 analysis: (1) Adding bonuses to non-bonus options increased their appeal, and (2) the bonus amount needed to reach a given preference level was less than the amount needed if it were offered as a stand-alone bonus. Specifically, we found that adding a \$15,000 bonus to the non-bonus incentives of choice of job, job location, PaYS, or a \$35,000 LRP incentive created a combined relative value analogous to that of \$20,000 to \$30,000 stand-alone bonuses. Again, this result is noteworthy because it suggests the opportunity to improve the match of enlistment options with prospective enlistees' preferences while simultaneously saving the Army money through lower bonus costs. We also found that the relative appeal of job choice, location choice, and PaYS was similar for many subgroups. However:

- LRP and HIGRAD (a smaller bonus for college education we asked about in Survey 1) were more attractive to respondents who were “high quality” (defined by the Office of the Secretary of Defense as a person with a traditional high school diploma who scores in the upper half of the AFQT distribution), were students, expected to complete more education, or came from higher-income families.
- Bonuses were more attractive to respondents who were lower quality, were not students, or came from lower-income families.

Importantly, this suggests that higher-quality prospects may be more amenable to trade-offs of non-bonus incentives with bonus incentives.

Key Results from Survey 2

We designed Survey 2 to learn about (1) young adults’ preferences among enlistment options that include non-bonus options, often with supplemental bonuses, and stand-alone bonuses that vary with term of enlistment and job type and (2) the relationships between preferred enlistment options and the chances of enlisting in the active-duty Army in the next few years. We used responses to background questions at the beginning of the survey to predict the respondent’s AFQT score from a regression that we estimated. Respondents with a predicted AFQT score of 50 or higher were deemed high AFQT, and those with a predicted score below 50 were low AFQT. Using their AFQT designation, respondents were asked questions about enlistment options that differed by high or low AFQT and job type.

Key analysis questions for Survey 2 included the following: (1) When respondents chose their preferred option from a menu of equal-value enlistment options, what did they choose? How did this vary by job type, AFQT, gender, and race/ethnicity? (2) What was the association between the chosen option and the stated probability of joining the Army in the next few years? (3) Would a menu of stand-alone bonuses and non-bonus options (with supplemental bonuses) be more or less costly than a menu of stand-alone bonuses?

Survey 2 had 1,007 respondents. For high-AFQT respondents, relative to a stand-alone enlistment bonus for a three-year term, all but one of the alternative options were chosen significantly (statistically) more often at the historical average bonus level, and all but two options were chosen significantly more often at the maximum bonus level. Furthermore, non-bonus options as a set were chosen more often than stand-alone bonus options, implying that respondents perceived non-bonus options, with their supplemental bonuses, to be more valuable than stand-alone bonuses. Because supplemental bonuses are smaller than stand-alone bonuses, this result supported the possibility of bonus cost savings. At the same time, the loan repayment options involve an added cost—the direct cost of paying the student debt—that operated against cost savings.

Compared with high-AFQT respondents, low-AFQT respondents were more likely to opt for an enlistment bonus. At the average bonus level, 44 percent of low-AFQT respondents chose a stand-alone enlistment bonus with either a three-year or a four-or-more-year term, compared with 20 percent of high-AFQT respondents. At the maximum bonus level, the percentages were 24 percent for low-AFQT respondents and 15 percent for high-AFQT respondents.

At a given AFQT level, stand-alone bonuses were chosen more often at the average bonus level than at the maximum bonus level. Stand-alone bonuses at the maximum bonus level might have been chosen less often because supplemental bonuses were relatively larger for the options involving enlistments for four or more years. Another factor is that there are more options to choose from at the maximum bonus level because more combinations of nonmonetary options, paired with supplemental bonuses, are possible.

Our main findings about option choice can be summarized as follows:

- The options chosen were similar across job types when similar choice sets were offered. Chosen options also were similar by gender and, generally, by race/ethnicity.
- Non-bonus options competed well with stand-alone bonuses and were chosen more frequently overall. This suggests that, if the EOO approach were used in the field by recruiters, non-bonus options would be attractive if included in a menu of enlistment options. The attractiveness of non-bonus options depended in part on the supplemental bonuses offered with them. Supplemental bonus amounts were set based on analysis of Survey 1 data and the initial responses to Survey 2. Stand-alone bonuses were based on amounts set by the Army during FY 2001–FY 2019 to attract the required quantity and quality of recruits.
- Low-AFQT respondents were more likely than high-AFQT respondents to choose stand-alone bonuses. This is consistent with a greater preference for money relative to the non-bonus incentives of student loan repayment, post-Army job interview, and choice of location, plus their supplemental bonuses. Low-AFQT respondents might have placed less value on student loan repayment because they did not have, or did not expect to have, as much student loan debt as the high-AFQT respondents—i.e., they would not benefit as much from loan repayment. At the average bonus level, 29 percent of low-AFQT respondents chose a student loan repayment option versus 41 percent of high-AFQT respondents. At the maximum bonus level, 41 percent of low-AFQT respondents chose an option including student loan repayment, in some cases paired with location of assignment or post-service job interview, versus 55 percent of high-AFQT respondents.
- Bonus amount had a positive and statistically significant effect on the probability that an option was chosen. Changes of several thousand dollars in enlistment or supplemental bonuses could shift the distribution of chosen options toward or away from stand-alone bonus options. The potential for changes in bonus amount to change the attractiveness of enlistment options is important because the non-bonus incentives of student loan repayment, interview, and location have fixed characteristics and by themselves would probably not be competitive with stand-alone enlistment bonuses, especially when recruiting is difficult and enlistment bonuses are set higher. Supplemental bonuses provide the compensating differential required to bring the non-bonus options up to par with enlistment bonuses and can serve as a policy lever to move prospects toward, or away from, non-bonus options.

Analysis of the Stated Probability of Joining the Army

For each job type shown to the respondent, Survey 2 asked the respondent to rate the chances of joining the active-duty Army in the next few years with a three-year term when no incentives were offered; to rate the chances of joining for a term of four or more years with no incentives; to (1) choose an enlistment option from the menu at the average bonus level, given the job type and the respondent's AFQT level (high or low), and (2) rate the chances of joining, assuming that the respondent received the chosen option; and, analogously, to choose an enlistment option at the maximum bonus level and then rate the chances of joining if given the chosen option. The chances of joining were rated on a scale from zero to 100.

Our probability analysis estimated the relationship between the option chosen and the rated probability of joining the active-duty Army in the next few years, controlling for the bonus amount in the option and the propensity to enlist. At the historical average bonus level, a stand-alone bonus with a three-year term was associated with a higher stated probability of enlisting than expected from propensity alone. The predicted probability from propensity alone was 28 percent for high-AFQT respondents and 29 percent for low-AFQT respondents. The probability was 5.4 points higher for high-AFQT respondents and 9.7 points higher for

low-AFQT respondents who chose the stand-alone bonus with a three-year term. The stand-alone bonus for a term of four or more years added still another 3.7 points for high-AFQT and 5.3 points for low-AFQT respondents. The other options—loan repayment, interview, and location, with terms of either three years or four or more years—were all statistically significant for high-AFQT respondents (except for choice of location for a three-year enlistment) and added about 3 to 5 points to the rated probability of joining the active-duty Army, beyond the 5.4 points from the bonus with a three-year term. That is, respondents choosing those options had higher stated probabilities of joining than those choosing a three-year stand-alone bonus. In contrast, for low-AFQT respondents, the other options were not statistically significant, except for location for a four-or-more-year term; for low-AFQT respondents, the options attracted respondents with a stated probability of joining that was no higher, or lower, than that for those choosing a three-year stand-alone bonus. Bonus amount was not statistically significant in the probability regressions. Although bonus amount affected the choice of option, it did not affect the rated probability of enlisting given the chosen option.

These results were largely robust to variants of the model. High-AFQT men and women had similar results at the average bonus level; low-AFQT women had a lower stated probability of enlisting than men, but they had higher coefficients—i.e., a higher probability of joining given the option chosen. Black or African American respondents and respondents in the Other category were statistically like white respondents, while Hispanic respondents had higher coefficients for options with terms of four or more years. Last, job type and the respondent's ranking of the job type were not statistically significant in nearly all cases.

Enlistment options at the maximum bonus level were a wider and more generous range of options than at the average bonus level. Because stand-alone bonuses were higher at the maximum bonus level, the options for loan repayment, interview, and location options were paired higher supplemental bonuses. In addition, these options could be offered in pairs, although with a smaller supplemental bonus.

At the maximum bonus level, a three-year stand-alone bonus was associated with an 8-point-higher stated probability of joining the Army for both high- and low-AFQT respondents than implied by propensity alone. Moreover, there were no negative, statistically significant coefficients; hence, those choosing options other than a three-year stand-alone bonus were no less likely to join.

We also found that several options chosen by high-AFQT respondents were associated with a further increase in the stated probability of joining the Army of 4.5 to 6.5 percentage points. These options, all with a term of four or more years, were loan repayment of \$35,000, loan repayment of \$65,000, choice of location, and the pairs \$35,000 loan repayment and interview and \$35,000 loan repayment and location.

For low-AFQT respondents, several of the chosen options were statistically significant and added 4 to 8 points to the probability of joining. They included stand-alone bonus, \$35,000 loan repayment, choice of location, and \$35,000 loan repayment and interview. The \$35,000 loan repayment option had a term of three years, while the others had terms of four or more years.

The significant options for high-AFQT respondents traced to women; men had only one significant option—location with a four-or-more-year term. The women who chose these options had a higher stated probability of joining than did women choosing a three-year bonus. By comparison, men who chose these options had no higher probability of joining than those choosing a three-year stand-alone bonus.

Potential Cost Savings Under an EOO System

The assessment of cost savings is based on the menus offered in Survey 2. We compared the cost of the menu of options at the historical average bonus level with the cost of stand-alone bonuses (by themselves and without the non-bonus options) for a given accession goal and mix of high- and low-AFQT recruits. We used three alternative distributions of chosen options that were based on the percentage taking a student loan repayment option. First, the loan repayment take rates at the average bonus level ranged from 25 to 59 percent,

depending on job type and AFQT level. Survey 2 indicated that many respondents were interested in loan repayment for their student debt that existed at the time of enlisting. Second, the historical rate was far lower, at 6 percent among eligible recruits. The historical rate indicates that most recruits either did not have sufficient eligible debt to take this option (the debt must be existing debt from a school or loan organization) or were not entering an occupational specialty that qualified for loan repayment (the specialty was not deemed a critical skill at that time). Third, we allowed for a higher rate than historical. This reflected a hypothetical effort to increase the number of recruits coming from the college market, and we assumed a 15-percent take rate. In all three cases, the cost to the Army was assumed to be \$15,000 for a loan repayment option with a limit of \$35,000 and \$50,000 for a loan repayment option with a limit of \$65,000. These assumptions are consistent with recruit loan debt being high enough to make the loan repayment option more attractive than a stand-alone bonus; otherwise, there would be no incentive to choose loan repayment.

The Army has programs for loan repayment (LRP), interview when leaving the Army (PaYS), and choice of location, and we assumed that a menu including these options involved no additional administrative cost.

As the probability analysis showed, for high-AFQT respondents, the menu options were often associated with a higher stated probability of joining the Army than a three-year bonus. The higher probability for loan repayment, interview, and location, all with a term of four or more years, was even slightly greater than that for a stand-alone bonus with a term of four or more years. When the costing exercise removes these options and the boost they provide to the probability of joining, stand-alone bonuses would need to be increased to sustain the same quantity and quality of recruits. On net, excluding the possibility of higher administration costs might make cost savings estimates too high, while omitting a possible increase needed in stand-alone bonuses might make them too low.

With the menus in Survey 2 and at historical average bonus levels, we estimated that recruiting costs would increase by \$18 million annually under Survey 2 LRP take rates, would decrease by \$121 million annually at the 6-percent loan repayment take rate, and would decrease by \$85 million annually at the 15-percent rate. Therefore, EOO has the potential to decrease cost, depending on LRP take rates and repayment costs.

Survey 2 also collected information on options chosen at the maximum bonus level. This can be used to consider whether cost savings would be higher or lower when bonuses—both stand-alone and supplemental—are paid at higher levels than the historical average. We again compared the menu of options with the alternative of stand-alone bonuses only. We computed the cost change per person and compared it with figures at the average bonus level. The results differed by AFQT level. At Survey 2 loan repayment take rates, the estimated cost change per person rose from a savings of \$1,278 at the average bonus level to a cost increase of \$1,631 at the maximum bonus level for low-AFQT respondents. For high-AFQT respondents, the cost per person fell from \$1,322 to \$783. These changes tended to offset one another, so the impact on total cost depends on the percentage of high- and low-AFQT recruits who receive a bonus, which is not known.

By comparison, at the 6-percent and 15-percent take rates, the cost savings grew larger at the maximum bonus level. At 6 percent, the estimated cost savings for low-AFQT respondents increased from \$3,827 to \$5,358, and the cost savings for high-AFQT respondents increased from \$5,069 to \$7,393. At 15 percent, the estimated cost savings grew from \$2,883 to \$3,712 for low-AFQT respondents and \$3,494 to \$5,884 for high-AFQT respondents. These estimates reinforce the finding that the menu approach might be able to achieve cost savings, depending on the loan repayment take rate. Again, though, we used the menus offered in Survey 2, and different menus could lead to different cost savings.

Closing Thoughts

Our research indicates that offering an EOO-type menu of option choices is feasible and could yield recruiting cost savings at reasonable assumptions about LRP take rates. Menus give recruits greater agency to obtain

enlistment options they prefer—options other than stand-alone bonuses were always chosen more often than stand-alone bonus options in Survey 2, particularly for high-AFQT respondents. We found that those choosing the non-bonus options had a stated probability of joining the Army that was at least as high as the joining probability of those choosing stand-alone bonus options, and at the average bonus level it was often higher. Furthermore, recruiting cost savings are likely to increase when more recruits are eligible for the larger bonuses that the Army has historically offered during difficult recruiting periods.

Based on these results, menus such as those developed in this research could offer a new way to attract additional, more-satisfied recruits. Working through a recruiter, a prospect might prequalify his or her education and AFQT level, choose a job and preferred option available for that job, and reserve it temporarily online pending his or her Military Entrance Processing Station visit and meeting with an Army job counselor.

Student loan repayment was attractive in our surveys, but, historically, the low take rates of LRP suggest that relatively few recruits had student loan debt that would qualify for LRP. The Army should determine effective ways to market this option to increase Army enlistment consideration in the college market and the extent to which such marketing is optimal.

Potential recruiting cost savings under an EOO menu approach depend on administrative costs, bonus costs, student loan repayment costs, and conceivable efficiency gains from avoiding the need for higher levels of enlistment bonuses to meet a recruiting requirement.

If the Army chooses to proceed with the EOO concept, we recommend a pilot test to quantify its effects in an operational setting on outcomes including prospect menu choices, costs, lead and contract production, Delayed Entry Program loss rates, and, over the longer term, first-term attrition and retention, as compared with those outcomes under the current system.

Contents

About This Report	iii
Summary	v
Figures and Tables	xvii
 CHAPTER 1	
Introduction	1
 CHAPTER 2	
Design of Survey 1	5
 CHAPTER 3	
Analysis of Survey 1	9
Selected Demographics from Survey 1	9
Impressions of the Army	12
Consideration of Serving in the Active-Duty Army	14
Ratings of Enlistment Incentives	15
Key Takeaways from Survey 1	16
 CHAPTER 4	
Design of Survey 2	21
Guidelines for Survey 2 Design	22
Survey 2 Demographics	22
Job Types and Enlistment Options for Survey 2	23
Summary	26
 CHAPTER 5	
Analysis of Survey 2	31
Introduction	31
Analysis of Option Choice	32
Empirical Results on Option Choice	34
Analysis of the Stated Probability of Joining the Army	41
Summary	49
 CHAPTER 6	
Potential Cost Savings	53
Summary	56
 CHAPTER 7	
Conclusion	57
What Have We Learned?	57
Closing Thoughts	59

APPENDIXES

A. Survey 1 Questions and Responses	61
B. Survey 1 Regressions on “How Likely Is It That You Would Actively Consider Serving in the Army in the Next Few Years?”	83
C. Analysis of Survey 1 Best-Worst Data with a Logit Choice Probability Model.....	89
D. Predicting Respondent AFQT Score	93
E. Average and Maximum Enlistment Bonuses by Job.....	97
F. Constructing Equal-Value Enlistment Options.....	105
G. Expected Sample Sizes by Job Type.....	109
H. Survey 2 Questions and Responses	113
I. Logit Choice Regressions by Gender and AFQT	129
J. Logit Choice Regressions by Job Type and AFQT	131
Abbreviations.....	135
References	137

Figures and Tables

Figures

3.1.	Most Respondents Have a Favorable Overall Impression of the Army.....	12
3.2.	Respondents' Desired Job Characteristics: Nearly All Are Rated Highly.....	13
3.3.	Job Flexibility, Work-Life Balance, Compensation, and Opportunities Were Perceived to Be Less Present in Army Jobs Than Respondents Desired.....	14
3.4.	Concerns About Army Jobs Relate to Risks Inherent to Defense and to Compensation	15
3.5.	Association of Respondent Demographics and Labor Force Status with Their Willingness to Actively Consider Serving in the Army	16
3.6.	Information About Army Jobs, Pay, and Benefits Raises Consideration of Serving	17
3.7.	Non-Bonus Options Compare Well with Bonus Options in Attractiveness.....	18
3.8.	Adding a Bonus to Other Incentives Increases Their Appeal to the Level of a Larger Stand-Alone Bonus	19
4.1.	Choice Set Table.....	25
5.1.	Chosen Option by Job Type: Average Bonus Level, High AFQT Score	39
5.2.	Chosen Option by Job Type: Maximum Bonus Level, High AFQT Score	40
5.3.	Chosen Option by Job Type: Average Bonus Level, Low AFQT Score	41
5.4.	Chosen Option by Job Type: Maximum Bonus Level, Low AFQT Score	42
5.5.	Chosen Option by Gender and AFQT: Average Bonus Level.....	43
5.6.	Chosen Option by Gender and AFQT: Maximum Bonus Level.....	44
5.7.	Chosen Option by Race/Ethnicity and AFQT: Average Bonus Level.....	45
5.8.	Chosen Option by Race/Ethnicity and AFQT: Maximum Bonus Level.....	46
A.1.	Attractiveness of Job and Location Choice Are the Same for High-Quality and Low-Quality Respondents.....	80
A.2.	Attractiveness of Job and Location Choice Are Mostly Similar for Students and Nonstudents.....	80
A.3.	Large Bonuses Are More Attractive to Low-Quality Respondents	81
A.4.	Large Bonuses Are More Attractive to Nonstudents	81
A.5.	LRP and HIGRAD Are More Attractive to High-Quality Respondents, and PaYS Is Equally Attractive	82
A.6.	LRP and HIGRAD Are More Attractive to Students Than to Nonstudents.....	82

Tables

2.1.	Enlistment Incentives in Survey 1.....	6
3.1.	Age Distribution for Survey 1.....	9
3.2.	Gender Distribution for Survey 1	10
3.3.	Education Completed Among Nonstudent Respondents in Survey 1	10
3.4.	Current Year of Education Among Student Respondents in Survey 1	10
3.5.	Labor Force Status of Survey 1 Respondents.....	11
3.6.	Size of Towns or Cities in Which Survey 1 Respondents Lived	11
3.7.	Race and Ethnicity of Survey 1 Respondents	11
4.1.	Enlistment Options for Average Bonus Condition, High AFQT Score	27

4.2.	Enlistment Options for Maximum Bonus Condition, High AFQT Score	28
4.3.	Enlistment Options for Average Bonus Condition, Low AFQT Score	28
4.4.	Enlistment Options for Maximum Bonus Condition, Low AFQT Score	29
5.1.	Logit Estimates: Average Bonus Level, High AFQT Score	35
5.2.	Logit Estimates: Maximum Bonus Level, High AFQT Score	35
5.3.	Logit Estimates: Average Bonus Level, Low AFQT Score	36
5.4.	Logit Estimates: Maximum Bonus Level, Low AFQT Score	36
5.5.	Predicted Probability of Choosing an Enlistment Bonus	38
5.6.	Probability of Joining the Army in the Next Few Years—OLS Estimates: Average Bonus Level, High AFQT Score	46
5.7.	Probability of Joining the Army in the Next Few Years—OLS Estimates: Maximum Bonus Level, High AFQT Score	47
5.8.	Probability of Joining the Army in the Next Few Years—OLS Estimates: Average Bonus Level, Low AFQT Score	47
5.9.	Probability of Joining the Army in the Next Few Years—OLS Estimates: Maximum Bonus Level, Low AFQT Score	48
6.1.	Estimated Change in Cost Under Menus at the Average Bonus Level	55
A.1.	Responses to Survey 1 Questions	72
A.2.	Enlistment Incentives in Survey 1	79
B.1.	“Before” Regression	85
B.2.	“After” Regression	86
B.3.	“Change” Regression	87
C.1.	Relative Value of Enlistment Incentives	92
D.1.	AFQT Regression	94
E.1.	Direct, Indirect, and Final Estimates for Job 11X Average Bonus	98
E.2.	Average Enlistment Bonus (in dollars) by Army Job, FY 2001–FY 2019	99
E.3.	Maximum Enlistment Bonus (in dollars) by Army Job, FY 2001–FY 2019	100
E.4.	Army Job Codes, Job Titles, and Percentage of Jobs by Job Type	102
F.1.	Average and Maximum Bonus (in dollars) by Army Job Type	106
F.2.	Relative Impact of Enlistment Incentives	107
G.1.	Expected Sample Size Calculation	111
H.1.	Survey 2, Launch 3 Questions and Responses	125
I.1.	Logit of Chosen Option by Gender: Average Bonus Level (Standard Errors)	129
I.2.	Logit of Chosen Option by Gender: Maximum Bonus Level (Standard Errors)	130
J.1.	Logit of Chosen Option by Job Type: Average Bonus Level, High AFQT Score (Standard Errors)	131
J.2.	Logit of Chosen Option by Job Type: Average Bonus Level, Low AFQT Score (Standard Errors)	132
J.3.	Logit of Chosen Option by Job Type: Maximum Bonus Level, High AFQT Score (Standard Errors)	133
J.4.	Logit of Chosen Option by Job Type: Maximum Bonus Level, Low AFQT Score (Standard Errors)	134

Introduction

Army recruiting prospects make several choices when they consider enlisting, and foremost are selecting an Army job and deciding for how long to enlist. These choices depend on the jobs available and the incentives that come with a job for a given length of enlistment. Some Army jobs offer a bonus, and its amount depends on the urgency of filling the specific job, the recruit's education, Armed Forces Qualification Test (AFQT) score, and chosen term length. The Army pays the same Military Occupational Specialty (MOS) bonus to every recruit into an Army job at a given point in time, given the recruit's education, AFQT score, and term length, and the Army must set the bonus high enough to attract the marginal recruit needed to meet the job's manning requirement. However, the willingness to join the Army differs among recruits, and many recruits would have accepted a lower bonus amount than that needed for the marginal recruit.

This economic rent is a well-known feature of bonuses, but it cannot be avoided because prospects have no reason to reveal their willingness to accept a lower bonus, possible legal issues and enlistee dissatisfaction could arise from offering different bonuses to equally qualified enlistees into the same job and term length, and there is no opportunity for enlistees to trade off the bonus against non-bonus incentives. Today, non-bonus incentives tend to be offered individually at fixed terms, which limits the prospect's opportunity to tailor the enlistment package by making trade-offs—e.g., choosing a lower bonus in exchange for a preferred non-bonus incentive. In addition, some aspects of military service may be valued by the prospect but are not currently offered as a non-bonus incentive.

This research addresses these limitations by using surveys to explore the responsiveness of prospective recruits to enlistment choice sets designed to permit trade-offs between bonus and non-bonus incentives. The options in a choice set differ by job type, estimated recruit aptitude level, and term length, and they include bonuses and non-bonus incentives. The non-bonus incentives often come with a supplemental bonus that is less than the stand-alone bonus, in effect trading off some of the stand-alone bonus for the non-bonus incentive. Expanding choices in this way could enable the Army to reduce recruiting cost to the extent that the non-bonus incentives, along with their supplemental bonuses, are attractive and cost less than the bonuses that otherwise would be paid. Prospective recruits could benefit by having the opportunity to choose among options with various combinations of bonus and non-bonus incentives, allowing a closer and therefore more highly valued match to personal taste. This might also work in the Army's favor by possibly decreasing attrition prior to entering the Army and during the first term and increasing retention, but these aspects are not studied here.

There is no prior research on menus involving enlistment option choices to our knowledge, though there are studies of enlistment bonuses. The enlistment bonus experiment done in the mid-1980s (Polich, Dertouzos, and Press, 1986) found, in brief, that increasing the enlistment bonus by 60 percent (from \$5,000 to \$8,000) for high-quality recruits in hard-to-fill specialties caused recruits to choose longer terms, increased high-quality recruits overall by 4.1 percent, and channeled more of these recruits into the hard-to-fill specialties.¹

¹ The two components of *high quality* according to the Office of the Secretary of Defense are being a high school graduate (versus having passed the General Educational Development test [GED] or being a dropout) and having an AFQT percentile score of at least 50.

While bonuses are effective, the marginal cost per high-quality recruit is substantial. Asch et al. (2010) estimated it to be \$44,900 over 2004–2009, for instance. Knapp et al. (2018), using a model of recruiting resource allocation, found that increasing a \$12,000 bonus by 10 percent would increase high-quality enlistment contracts by 0.9 percent, implying that more than 90 percent of the bonus dollars were paid to enlistees who would have joined without the increased bonus (Knapp et al., 2018, p. 63).

The choice sets in our analysis are built from incentives that exist today, as well as a choice that had not been offered in the past: the choice of job location at the regional level. The types of incentives are enlistment bonus, Loan Repayment Program (LRP), Partnership for Your Success (PaYS), HIGRAD bonus (a smaller bonus for college education completed), and choice of job location.² Enlistment bonuses are offered for skills deemed critical or hard to fill and vary in amount depending on recruiting conditions, term length, and recruit quality; amounts over \$10,000 are paid in installments during the first term. Under LRP, student loan debt existing at the time of enlistment into the Regular Army (RA) is paid by the Army up to some limit, currently \$65,000, through installment payments during the first three years of service. Eligibility for LRP requires an enlistment of three or more years, an AFQT score of 50 or higher, a high school diploma or more, and enlistment into a job designated as critical (MyArmyBenefits, 2022a). We did not impose these eligibility conditions, though, because we were interested in the appeal of LRP more broadly. PaYS guarantees the recruit an interview with a leading corporation or public agency when leaving the Army. The recruit signs up for PaYS when enlisting, and the recruiter identifies two employers with jobs requiring skills related to those needed in the job selected by the recruit (MyArmyBenefits, 2022b). The PaYS incentive has often been combined with an enlistment bonus (Asch et al., 2010). HIGRAD is a bonus for college credit, payable in addition to an MOS bonus or a quick-ship bonus, with the total bonus amount not to exceed \$40,000.³ Choice of job location in our analysis is a commitment to station the recruit at an Army post in a region of choice in the United States or overseas during the first term. The U.S. Army Recruiting Command (USAREC) endorsed exploring the appeal of this incentive and recently has offered station of choice in certain occupations and at certain posts.

As mentioned, non-bonus options have been offered piecemeal, and our research assembled them into choice sets with varying levels of bonus and generosity of student loan repayment. In line with Army recruiting, we allowed the choice sets to differ depending on the type of Army job, length of enlistment, recruit quality, and recruiting conditions, as represented by whether no enlistment bonuses were offered, enlistment bonuses were at their average nominal value over fiscal year (FY) 2001–FY 2019, or they were at their maximum value over that period.

The use of surveys was advantageous for our purposes. The enlistment options optimizer (EOO) concept studied here has not been implemented, and there are no data on its performance. A randomized controlled trial (RCT) would have been lengthy and costly and would have raised such issues as how to set recruiting goals when some recruiting stations offered choice sets and others did not. Surveys were faster, were less expensive to implement, and provided flexibility to employ choice sets to ask about different job types while controlling for recruit quality.

The survey responses reflected a *stated preference*—that is, a willingness to choose a particular enlistment option or a willingness to join the Army if given the chosen option. This differs from *revealed preference*, which is an actual commitment to an option or to enlistment given the option. Although stated preferences

² The passage of the Post-9/11 GI Bill in 2008 made generous educational benefits available to service members in all services and, in effect, displaced Army educational benefit supplements (“kickers”) as an enlistment incentive. For this reason, Army educational benefits were not included in the enlistment incentives we considered.

³ The Army recently increased the maximum enlistment bonus to \$50,000 for enlistments of six years in selected specific cases.

are nonbinding, they are useful for exploring responsiveness over a range of options that might not have been implemented. Our Survey 1 asked about respondents' preferences for bonuses and non-bonus options of different generosity and combinations, producing information useful in designing Survey 2. An important aspect of the enlistment decision is choosing an MOS—a job. A recruiting prospect cannot choose any job but selects among those offered by the Army, and the jobs offered depend on job fill rates and prospect qualifications. Survey 2 explored all six Army job types. Each respondent saw four of the six types, one at a time, with three chosen at random and the fourth factoring in the respondent's most preferred job type. It would be difficult to have this flexibility in an RCT.

To design sets of enlistment options related to the willingness to enlist, we needed information on the value of non-bonus incentives relative to bonuses as perceived by individuals who would consider joining the Army. We obtained this information through Survey 1. We were then able to construct choice sets (menus) with stand-alone bonus and non-bonus options, where the latter had values about on par with stand-alone bonuses. Survey 1 also provided information about demographics, labor force status, student status, job preferences, perception of jobs in the Army, and other factors, such as family income, marital status, parents' education, and number of siblings. Chapter 2 describes the design of Survey 1, and Chapter 3 discusses findings from it and the estimated relative value of incentives.

We employed the relative value estimates from Survey 1 to design choice sets for the menus used in Survey 2, as described in Chapter 4. We created choice sets by job type (six types, as shown on the Army recruiting website, goarmy.com), respondent quality level (AFQT score predicted to be at or above the 50th percentile, the national median, or below it), and enlistment bonus condition (average or maximum), for a total of 24 choice sets (24 menus). Each option in a choice set was composed of three elements: the term length of enlistment, three years or four or more years; the type of incentive—e.g., an enlistment bonus, loan repayment program, choice of location, job interview when leaving the Army; and bonus amount. Respondents were asked about four job types, three drawn at random in equal proportions and one that was the type they most preferred based on their ranking of job types but had not yet been asked about. This guaranteed that respondents were asked about enlisting into their most preferred job type. AFQT score was predicted in real time from questions at the beginning of the survey, and respondents saw choice sets conditional on their quality level. For each choice set, respondents first selected their most preferred option in the choice set, then were asked their chances of joining the Army in the next few years if they received the chosen option.⁴ Respondents were also asked about their chances of joining in the absence of any incentive for a term of three years and a term of four or more years.

Chapter 5 presents analyses of data from Survey 2. The chapter describes the methodology used to analyze option choice and the probability of joining the active-duty Army in the next few years given the chosen option. Option choice involves optimizing behavior, which is modeled with a random utility model and estimated with a logit model. A linear probability model is then estimated to determine the statistical association between the chosen option and the probability of joining. The option choice analysis makes use of random

⁴ This is a subjective probability conditional on the respondent's preferred option, and we expected it to provide a more accurate estimate of the enlistment probability than would come from an unconditional probability. Hudomiet et al. (2020) asked survey respondents their chance of being in good health at age 70. They were then asked, "What are your chances of working at age 70, given that you expect to be in good [not good] health at age 70?" The unconditional probability of working at age 70 was computed as $\Pr(\text{work at 70}) = \Pr(\text{good health}) \Pr(\text{work at 70} \mid \text{good health}) + \Pr(\text{not good health}) \Pr(\text{work at 70} \mid \text{not good health})$. This estimate was quite close to the unconditional probability observed in the data. In contrast, when respondents were asked about joint probabilities ("What are the chances of being in good [not good] health at age 70 and working at age 70?"), the unconditional probability produced by summing the joint probabilities was much greater than the actual unconditional probability. Although our research focused on different questions, we took from this research the idea that it was easier for respondents to process questions posed in a specific context—here, the chances of enlisting conditional on receiving the most preferred option.

variation built into the stand-alone bonus in the design of Survey 2, enabling estimation of the causal effect of the bonus amount on option choice.

Chapter 6 presents a cost analysis based on the menus offered in Survey 2. The analysis draws on the distribution of chosen options, their bonus amounts, and information about the Army's targets for the number and quality of recruits to estimate the change in recruiting cost owing to the menu of options versus the alternative of using only stand-alone bonuses.

Chapter 7, the concluding chapter, reviews the motivation for the EOO concept and the challenges in transforming the concept into feasible menus of options, recaps the main results of the Survey 1 and Survey 2 analyses, and offers closing thoughts on the potential benefits and remaining uncertainties related to pursuing the EOO approach for recruiting.

Additional information is provided in ten appendixes. Appendix A shows the Survey 1 questions and responses. Appendix B describes the Survey 1 regressions on "How likely is it that you would actively consider serving in the Army in the next few years?" Appendix C shows our analysis of Survey 1 most preferred-least preferred enlistment incentive data. Appendix D presents our regression model of AFQT scores. Appendix E shows the average and maximum enlistment bonuses by job type used in our analyses. Appendix F discusses constructing equal-value enlistment options. Appendix G provides detail on expected sample size by job type. Appendix H presents the Survey 2 questions and responses. Appendixes I and J show regressions on option choice by gender and job type, for subgroups of high and low AFQT and average and maximum bonus level.

Design of Survey 1

An objective of this research was to assess how specific enlistment incentives relate to the willingness to enlist. This requires a basis for choosing the incentives and assessing their appeal to young adults who would consider joining the active-duty Army—individually, relative to each other, and in combination, and, specifically, on the perceived value of non-bonus incentives relative to more costly bonus incentives. After analyzing the Army’s use of bonus and non-bonus incentives during FY 2001–FY 2019 singly and in combination (see Appendix E) and discussing our results with Army recruiting subject-matter experts, we chose a set of incentives and obtained information from young adults 18–27 years of age on the relative value of the incentives through an initial survey, Survey 1. This survey also provided information about favorability toward the Army and one’s likelihood of actively considering serving in the Army (on a 0 to 10 scale); respondent demographics, including age, gender, race/ethnicity, and education completed and planned; labor force status; desired job characteristics and perceived fit with Army jobs; concerns about serving in the Army; preferences for 19 different enlistment incentives; and other factors, such as past family income, parents’ education, and number of siblings. In an auxiliary analysis, AFQT score was estimated using the demographic information based on a model we developed through analysis of National Longitudinal Survey of Youth (NLSY) data (see Appendix D).

In some cases, we assessed the appeal of non-bonus incentives with a supplemental bonus that was less than some of the stand-alone bonus incentives, in effect trading off some of the stand-alone bonus for the non-bonus incentive. Expanding choices in this way could enable the Army to reduce recruiting costs to the extent that the non-bonus incentives, with their supplemental bonuses in some cases, cost less than the bonuses that otherwise would be paid. At the same time, enlistees could benefit by having greater choice of their enlistment options through their preferred combinations of available bonus and non-bonus incentives. In addition, the Army could tailor the options available to enlistees based on their education and aptitude level, term of enlistment chosen, and MOS selected.

In nearly all cases, the incentives we included in Survey 1 were based on our FY 2001–FY 2019 assessment period, with the addition of one incentive that provided choice of job location at the regional level. The types of incentives included in Survey 1 were enlistment bonus, LRP, PaYS, HIGRAD, and choice of region of job location in the United States or overseas. Enlistment bonuses are paid after completion of initial entry training and in installments of up to \$10,000 during the first term of service for amounts over \$10,000. Existing college loan debt is paid in equal installments over the first three years of an enlistment.¹ Table 2.1 provides

¹ Under current policy, the Army will repay one-third of the outstanding principal balance on qualifying student loans up to \$65,000, less the greater amount of taxes on the loans or \$1,500, following completion of each year of service for up to three years in total. Loans cannot be in default before or after entering active duty. Payments are made to the lender. The first payment is made after the completion of one year of service, including completion of all initial entry training. To maintain their eligibility, service members must remain qualified in their original MOS during their term of service. Service members who do not fulfill their obligated enlistment term lose their eligibility for LRP. To receive LRP, recruits must decline participation in the Montgomery GI Bill. For additional detail, see United States Army Human Resources Command, 2022.

TABLE 2.1
Enlistment Incentives in Survey 1

Number	Incentive	Term Length
1	\$5,000 signing bonus	3+ years
2	\$15,000 signing bonus	3+ years
3	\$30,000 signing bonus	3+ years
4	\$10,000 signing bonus	4+ years
5	\$20,000 signing bonus	4+ years
6	\$40,000 signing bonus	4+ years
7	Your choice of job to serve in	3+ years
8	Your choice of job to serve in <i>and</i> a \$15,000 signing bonus	3+ years
9	Your choice of an overseas area (e.g., Europe) or a region of the United States to serve in	3+ years
10	Your choice of an overseas area (e.g., Europe) or a region of the United States to serve in <i>and</i> a \$15,000 signing bonus	3+ years
11	Your choice of job and an overseas area (e.g., Europe) or a region of the United States to serve in	3+ years
12	Up to \$65,000 to repay an existing college loan	3+ years
13	Up to \$35,000 to repay an existing college loan	3+ years
14	Up to \$65,000 to repay an existing college loan <i>and</i> a \$15,000 signing bonus	3+ years
15	Up to \$35,000 to repay an existing college loan <i>and</i> a \$15,000 signing bonus	3+ years
16	An education bonus of \$10,000 for having completed at least two years of college	3+ years
17	An education bonus of \$10,000 for having completed at least two years of college <i>and</i> a \$15,000 signing bonus	3+ years
18	A guaranteed job interview with a major company after leaving the Army	3+ years
19	A guaranteed job interview with a major company after leaving the Army <i>and</i> a \$15,000 signing bonus	3+ years

a list of the 19 enlistment incentives we asked about in Survey 1 and the associated first-term contract length required.

Survey 1 used varying levels of bonuses for enlistments of at least three or at least four years and incentives that combined a \$15,000 enlistment bonus with non-bonus incentives for enlistments of at least three years. Using an experimental design, respondents chose their most and least preferred options from 19 sets of three options each²—i.e., 19 triplets. Each respondent was shown 19 triplets one at a time, and the 19 triplets

Our incentive descriptions put LRP payouts on equal terms with enlistment bonus payouts, and, in some cases, our option choices offered different maximum LRP values and incentive combinations with LRP for longer enlistment terms and for high-AFQT respondents. The three-year payout LRP policy would encourage recruits enlisting for four or more years to take LRP if the amount of their loan debt exceeded \$30,000 and they could receive a similar value of a stand-alone enlistment bonus. The reason is that they could get the payout in three years instead of four years. Conversely, the LRP policy would discourage those enlisting for three years to take it if their debt were \$20,000 or less and they could receive a stand-alone bonus of similar value over a period of two years.

² This is referred to as *Best/Worst* or *MaxDiff* methodology and is discussed in Appendix C.

were constructed such that each option appeared three times—i.e., in three separate triplets. The design also ensured that approximately equal numbers of respondents saw each combination of three options.

Survey 1 was fielded online in August 2021. Its target population was young adults who would actively consider serving in the Army, were of ages 18–27, and were in high school or were high school diploma graduates with no more than three years of college. This is the key enlistment population for the Army and represents about 90 percent of enlistees. Survey 1 was completed by 800 respondents. We excluded those with less than high school education, GEDs, or with four or more years of college (308); those currently serving or who had served in the active or reserve components (106); and those who indicated zero chance of considering serving in Army (810; 31 percent of potential male respondents and 53 percent of potential female respondents). Sample-size targets were established for gender and age to ensure that we had the desired representation across categories.

Prospective respondents were provided through an online consumer panel managed by Forsta, a market research company. Potential participants were recruited from multiple online channels, primarily the major social media platforms, such as Facebook and Instagram. Social media is used regularly by 84 percent of 18- to 29-year-olds (Pew Research Center, 2021). Participants were verified using a double opt-in process (email and text). The potential respondents were invited to participate via email. The invitation wording was generic to eliminate response bias.³ Panel participants were randomly selected based on the survey screening criteria (balanced to represent census distributions). The data for Survey 1 were collected from August 9 through August 23, 2021.

Participants could earn reward points for participating in surveys. Reward points could be redeemed for cash through PayPal or through more than 100 companies (offering gift cards) and charitable organizations. The number of points awarded per survey varied based on several factors, including the length of the survey, predicted response rates, and the incidence of participants who met survey screening criteria.

³ The invitation read, “Thank you very much for taking our survey. The survey begins with some background questions followed by questions related to jobs, compensation, and benefits in today’s Army. As always, your responses are completely confidential. It will take about 20 minutes to complete the questionnaire.”

Analysis of Survey 1

In this chapter, we begin by showing demographic characteristics of our survey respondents. We then discuss respondents' ratings of the job characteristics they desire, their perceptions of and concerns about Army jobs, and their willingness to actively consider serving in the Army in the next few years before and after being given background information on the variety of jobs the Army offers and on pay and benefits for service members.

Selected Demographics from Survey 1

Table 3.1 shows the age distribution for Survey 1. We set targets of 40 percent for ages 18–21, 30 percent for ages 22–24, and 30 percent for ages 25–27. In setting these targets, we balanced our desire to provide adequate subsample sizes for our analyses with the actual distribution of Army enlistee ages, which is largest for the youngest group. As seen in the table, these targets were achieved. This also resulted in a relatively uniform distribution by age within each of the three subgroups.

TABLE 3.1
Age Distribution for Survey 1

Age	Percentage
18	11%
19	9%
20	9%
21	11%
22	11%
23	10%
24	9%
25	11%
26	11%
27	8%

Table 3.2 shows the gender distribution for Survey 1. We set targets of 75 percent for men and 25 percent for women. In setting these targets, we again balanced our desire to provide adequate subsample sizes for our analyses with the actual distribution of Army enlistee gender. As seen in the table, these targets were achieved (within one percentage point).

Table 3.3 shows the level of completed education for nonstudent respondents. Eighty percent of the nonstudent respondents did not report postsecondary education. The remaining 20 percent had completed some college or vocational school but not more than three years of postsecondary education. This corresponds to the education distribution of Army enlistees.

Table 3.4 shows the current year of school for student respondents. Eighteen percent of the student respondents were in high school. The remaining 82 percent were in years one to three of college or vocational school. This corresponds to the education distribution of Army enlistees.

TABLE 3.2
Gender Distribution for
Survey 1

Gender	Percentage
Male	76%
Female	24%

TABLE 3.3
Education Completed Among Nonstudent Respondents in Survey 1

Completed Education Among Nonstudent Respondents	Percentage
High school graduate with diploma	80%
More than high school: some college or vocational school but less than four years of college	20%

NOTE: 46 percent of the 800 respondents were nonstudents.

TABLE 3.4
Current Year of Education Among Student Respondents
in Survey 1

Current Year for Student Respondents	Percentage
In high school	18%
In year 1–3 of college or vocational school	82%

NOTE: 54 percent of the 800 respondents were students.

Table 3.5 shows the current labor force status for the respondents to Survey 1. About half were working. About two-thirds of the remaining half were unemployed and looking for work. The remaining 16 percent were out of the labor force.

Table 3.6 shows the size of the towns or cities in which respondents to Survey 1 lived. Some 16 percent lived in towns with populations of 4,999 or fewer. About an equal number lived in towns with between 5,000 and 9,999 residents. More than 40 percent lived in towns with 10,000 to 99,999 residents. About 13 percent lived in larger areas with 100,000 to 499,999 residents, and about the same number lived in areas with 500,000 or more residents.

Table 3.7 shows the race and ethnicity of respondents to Survey 1. Seventy-five percent were white. Fourteen percent were African American, and about an equal number described themselves as American Indian

TABLE 3.5
Labor Force Status of Survey 1 Respondents

Status	Percentage
Working	49%
Unemployed and looking for work	35%
Not employed and not looking for work	16%

TABLE 3.6
Size of Towns or Cities in Which Survey 1 Respondents Lived

Town or City Size	Percentage
Under 1,000	6%
1,000 to 4,999	10%
5,000 to 9,999	17%
10,000 to 99,999	42%
100,000 to 499,999	13%
500,000 to 1,000,000	7%
More than 1,000,000	5%

TABLE 3.7
Race and Ethnicity of Survey 1 Respondents

Race/Ethnicity	Percentage
White	75%
Black or African American	14%
American Indian or Alaska Native	5%
Asian	4%
Native Hawaiian or other Pacific Islander	1%
Other	5%
Hispanic/Latino ethnicity	19%

or Alaska Native, Asian, Native Hawaiian or other Pacific Islander, or Other. Four percent described themselves as multiracial, which is why the percentages total to 104 percent. Across all racial groups, 19 percent of the respondents characterized themselves as Hispanic.

Impressions of the Army

Figure 3.1 indicates that the young adults in our sample generally had a favorable impression of the Army overall. The most common response was 8 on a 0 to 10 scale, and more than three-fourths had a positive impression (i.e., ratings of 6 to 10).

At the same time, Figures 3.2 and 3.3 together indicate that while young adults rated all of the 16 job characteristics we asked about as desirable, they perceived some important mismatches with what they would find in Army jobs. Specifically, Army pay and matters related to work-life balance were believed to be less present in Army jobs than desired. This can be seen clearly in the bars extending to the left of the vertical line at zero difference in Figure 3.3. Only the opportunity to travel was seen as considerably more present in Army jobs than respondents' rating of its importance in a job. As shown in Figure 3.4, respondents also expressed concerns about Army jobs. While some of the concerns involve risks inherent to national defense jobs (such as involuntary transfer and the possibility of living in undesirable places), evidence shows that others are unrealistic (such as high risk of injury or death, low salary relative to civilian employment—see, for example, Hosek et al., 2018—or poor benefits [including leave, holidays, and sick days]). Similarly, the perceived job characteristic mismatches regarding compensation and work-life balance issues, such as holiday or vacation policy, do not accord with the reality of Army jobs. All of these ratings were made prior to the respondents receiving details on Army jobs, pay, and benefits.

FIGURE 3.1
Most Respondents Have a Favorable Overall Impression of the Army

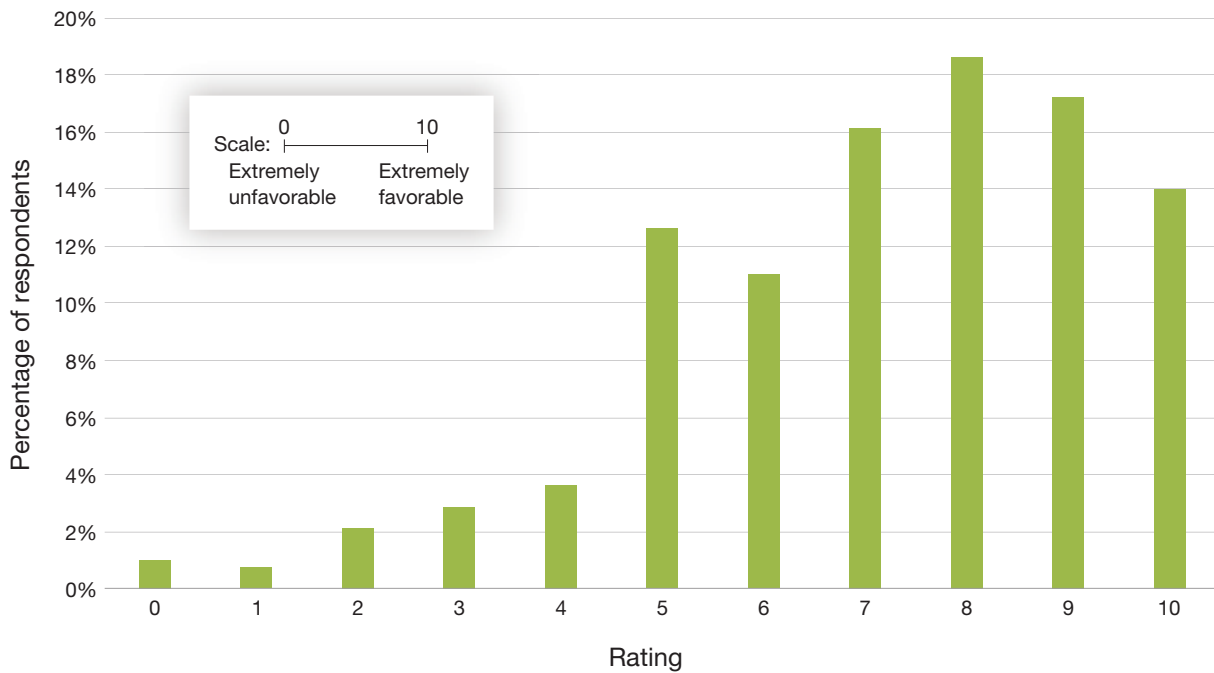


FIGURE 3.2

Respondents' Desired Job Characteristics: Nearly All Are Rated Highly

FIGURE 3.3
Job Flexibility, Work-Life Balance, Compensation, and Opportunities Were Perceived to Be Less Present in Army Jobs Than Respondents Desired


NOTE: Job characteristic importance scale: 0 = Not at all important; 10 = Extremely important.

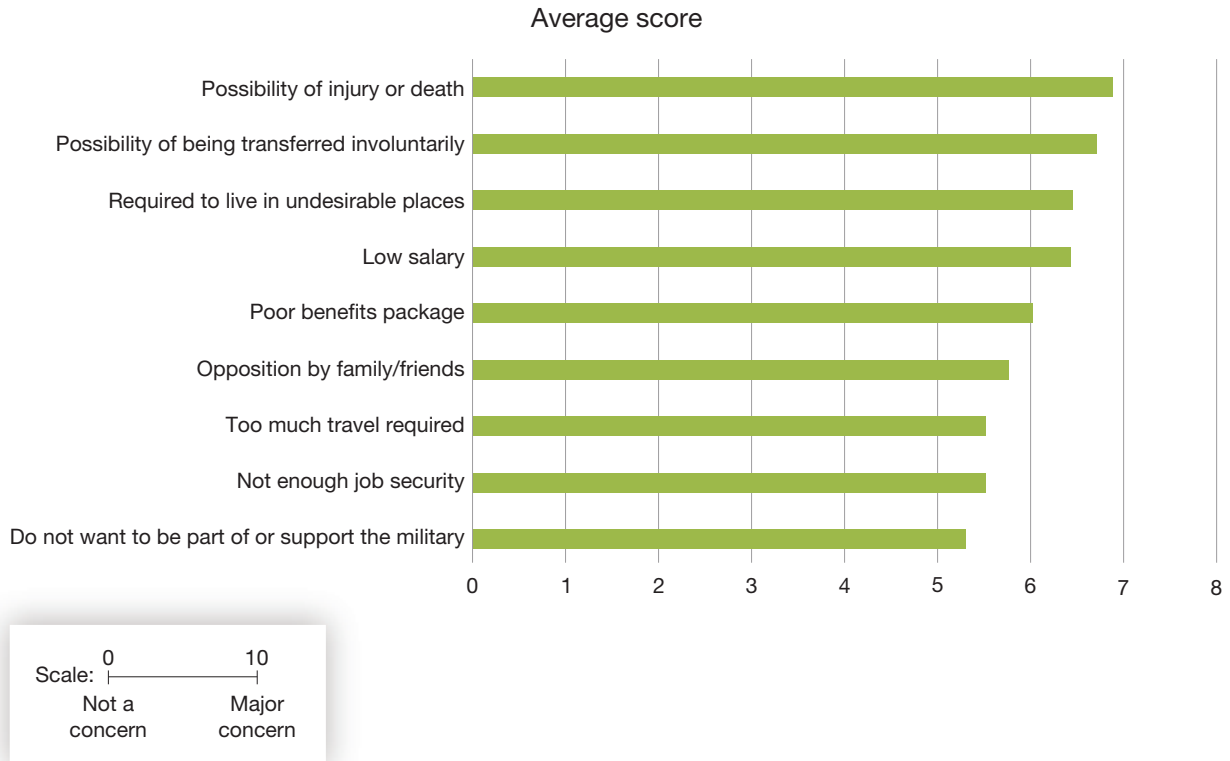
Perception of finding characteristic in active-duty Army job: 0 = Poor; 10 = Excellent.

Chart shows difference: Army job characteristic response minus job characteristic importance response.

Consideration of Serving in the Active-Duty Army

As can be seen in Figure 3.5 for selected factors, respondents' demographics and labor force status affected their likelihood of actively considering serving in the Army (the regressions underlying these results are in Appendix B). The figure shows the predicted likelihood of considering active-duty Army service before being given information about Army jobs, pay, and benefits on a 1 to 10 scale (recall that persons indicating zero chance were excused from the survey). As seen in Figure 3.6, respondents' willingness to actively consider serving increased notably after being given information about Army jobs, pay, and benefits, from 5.5 on average to 6.5, or nearly a 20-percent increase. These results suggest that the Army should provide such information to young adults and their influencers very early in the first phase of Army recruiting marketing (generating awareness) to increase consideration of and interest in acquiring more-detailed information about serving in the Army. Such information would also help to address misperceptions about Army jobs and service conditions. We found that active consideration level increased more following the information for women than for men. We also found that the increase was smaller for those who were in high school, unemployed, or out of the labor force. Given that Survey 1 was fielded in August, it is possible that the high school students were focused more on their upcoming academic year than on looking for a job. Persons out of the labor force are, by definition, not looking for work.

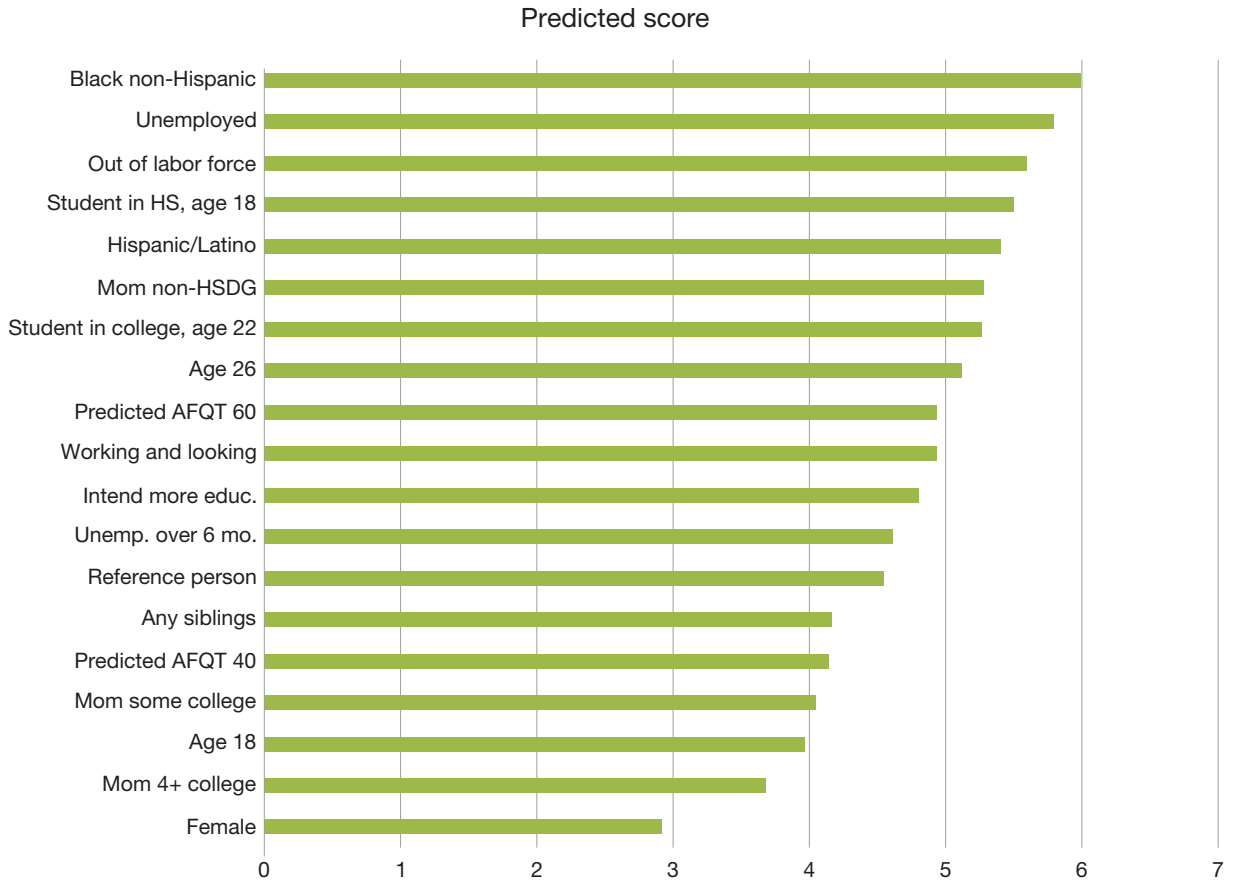
Appendix B also provides a regression of the change in respondents' ratings after being given information about Army jobs, pay, and benefits versus prior to being given that information.

FIGURE 3.4**Concerns About Army Jobs Relate to Risks Inherent to Defense and to Compensation**

Ratings of Enlistment Incentives

Figure 3.7 shows the estimated ratings of being selected as the best choice for the 12 (of 19) enlistment incentives that did not include supplemental bonuses with non-bonus incentives or the more limited bonus for completing at least two years of college. The estimates are generated by the regression procedure discussed in Appendix C. We note the important result for the Army that the non-bonus options compare well with the bonus options in the range of \$10,000 to \$15,000. This key result suggests the possibility of improving the match with prospective enlistees' preferences while saving the Army money at the same time.

Figure 3.8 further indicates two important results: (1) Adding bonuses to non-bonus options increases their appeal, and (2) the amount of the bonus needed to reach a given preference level is less than the bonus would need to be if offered alone. The second point can be seen by comparing the preference ratings in Figure 3.8 with the values of the preference ratings in Figure 3.7 for the stand-alone bonus incentives. Specifically, adding a \$15,000 bonus to the choice of job, job location, PaYS, or a \$35,000 LRP incentive increases the ratings for the most preferred choice to the 6- to 7-percent range in Figure 3.8, whereas it takes bonus values of \$20,000 to \$30,000 to reach these levels in Figure 3.7. Again, this is noteworthy because it suggests the possibility of improving the match with prospective enlistees' preferences while saving the Army money at the same time.

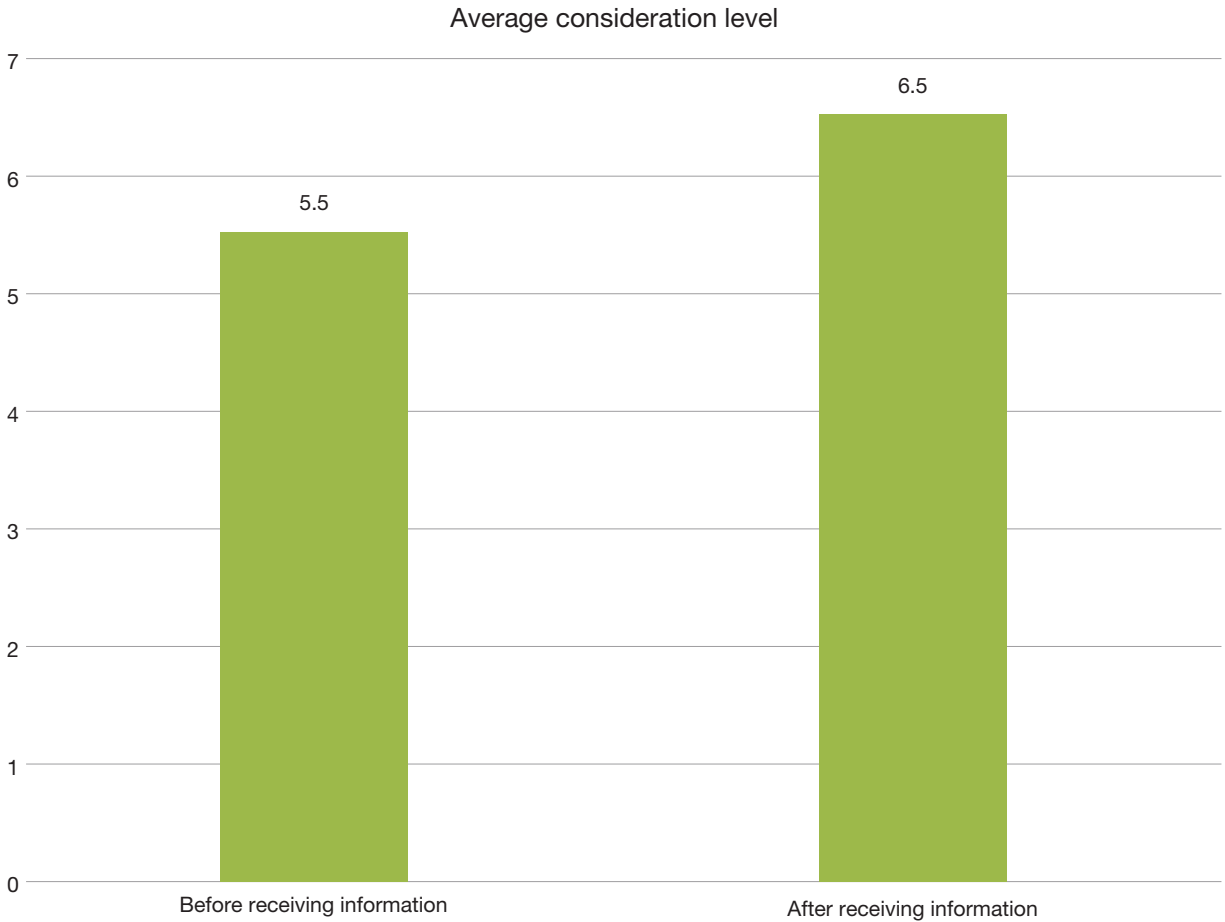
FIGURE 3.5
Association of Respondent Demographics and Labor Force Status with Their Willingness to Actively Consider Serving in the Army


NOTE: Scale: 0 = Extremely unlikely; 10 = Extremely likely.

Reference: male, age 22, predicted AFQT 50, working, not currently a student, not intending more education, working and not looking for another job, single, no kids, not Hispanic, not Black non-Hispanic, no siblings, middle income, mom high school diploma graduate (HSDG).

Key Takeaways from Survey 1

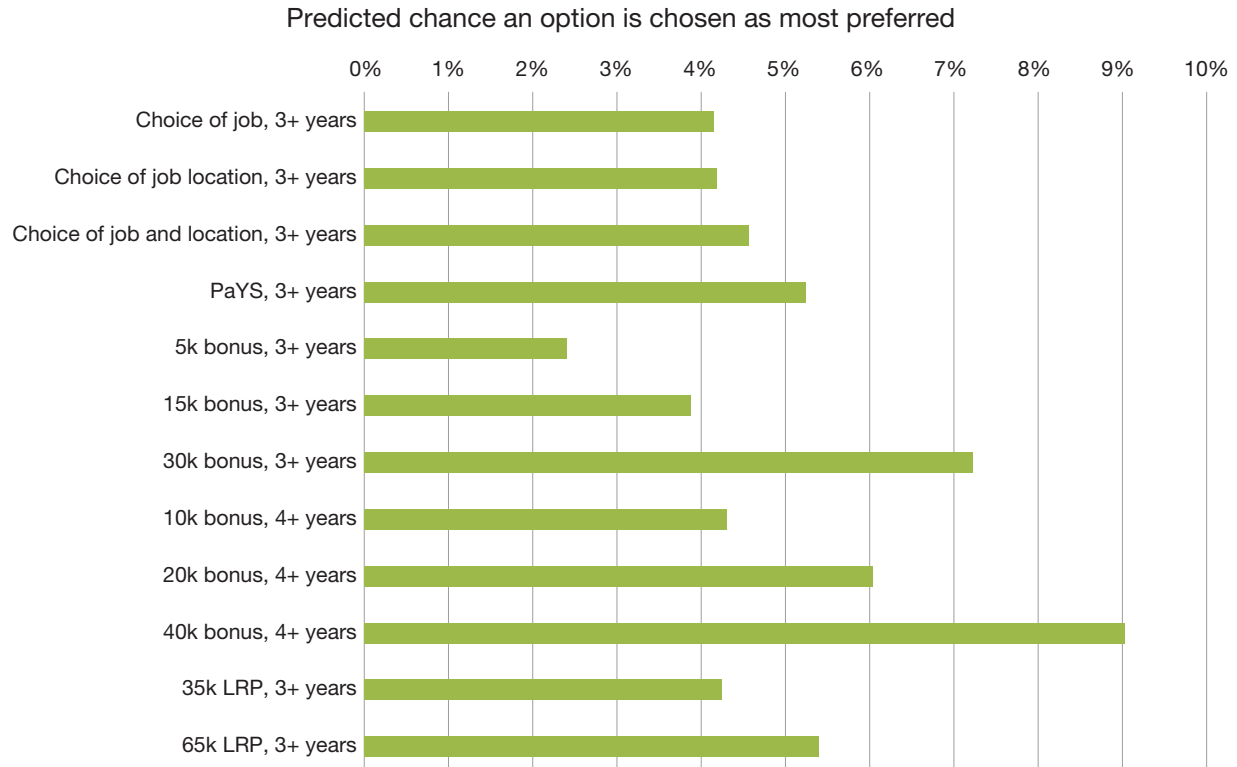
The results from Survey 1 have implications for Army recruiting marketing and for the design of the second survey. We found that the young adults in our sample generally had a favorable impression of the Army overall, with the most common response being 8 on a 0 to 10 scale, and with more than three-fourths of the respondents choosing a positive rating of 6 to 10. At the same time, our respondents perceived there to be some important mismatches between job characteristics they considered to be important and what they would find in Army jobs. Specifically, they believed good pay and aspects related to work-life balance to be less present in Army jobs than desired. Respondents also expressed concerns about Army jobs. Some of the concerns involve aspects inherent to national defense jobs; however, evidence shows that other concerns are unrealistic (such as high risk of injury or death, low salary relative to civilian employment, or poor benefits [including leave, holidays, and sick days]). Analogously, the perceived job characteristic

FIGURE 3.6**Information About Army Jobs, Pay, and Benefits Raises Consideration of Serving**

NOTE: Scale: 0 = Extremely unlikely; 10 = Extremely likely.

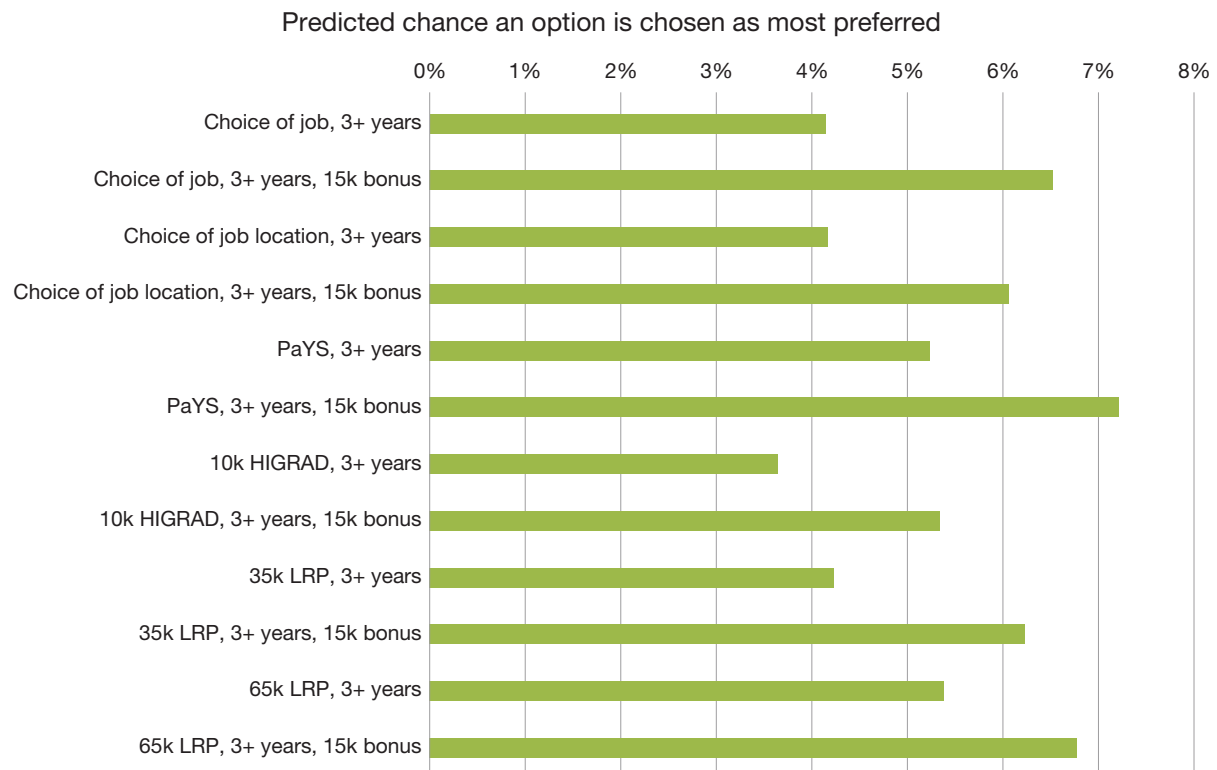
mismatches regarding compensation and work-life balance issues (such as holiday and vacation policy) do not accord with the reality of Army jobs. Respondents provided the concern and job characteristic ratings before they received information on the variety of jobs the Army offers and on service member pay and benefits. Respondents' demographics and labor force status affected their likelihood of actively considering serving in the Army (the regressions underlying these results are shown in Appendix B). We found that providing such information increased respondents' willingness to actively consider serving in the Army significantly, from 5.5 to 6.5 on the 1 to 10 scale on average. These results suggest that the Army should provide such basic information to young adults and their influencers early in the awareness (first) phase of recruitment marketing to increase interest in and additional information seeking about serving in the Army.

The second survey (described in the next chapter) collected information on subjective enlistment probabilities for specific and varying job groups under no incentive, average incentive, and generous incentive

FIGURE 3.7
Non-Bonus Options Compare Well with Bonus Options in Attractiveness


conditions. Here, we briefly summarize some of the key takeaways for the enlistment incentives; additional results from Survey 1 are also shown in Appendix A:

- Nonmonetary options compared well with bonuses of \$10,000–\$15,000.
 - This creates an opportunity for the Army to save on bonuses and to better satisfy recruit preferences.
- Adding bonuses to nonmonetary incentives increased their attractiveness.
 - The bonus amount can be lower than when offered alone.
- The relative appeal of job choice, location choice, and PaYS did not differ for many subgroups, but
 - LRP and HIGRAD were more attractive to respondents who were high quality, were students, expected to complete more education, or came from higher-income families.
 - Bonuses were more attractive to respondents who were lower quality, were not students, or came from lower-income families.
 - This suggests that higher-quality prospects may be more amenable to trade-offs of non-bonus incentives with bonus incentives.

FIGURE 3.8**Adding a Bonus to Other Incentives Increases Their Appeal to the Level of a Larger Stand-Alone Bonus**

NOTE: In FY 2001–FY 2019, a bonus was paid along with PaYS 48 percent of the time; along with HIGRAD 99 percent of the time; and along with LRP 74 percent of the time.

In Figure 3.7, the \$20,000 bonus was chosen 6 percent of the time, and the \$30,000 bonus was chosen 7 percent of the time.

Design of Survey 2

The purposes of Survey 2 were to learn about preferences for enlistment options and the relationship between the preferred enlistment option and the chances of enlisting in the active-duty Army in the next few years. Survey 2 was designed in winter and spring 2022 and administered from March 24 to May 4, 2022. The survey had 542 male and 465 female respondents.¹

Implementing the EOO concept in Survey 2 required the creation of menus of enlistment options. To be meaningful, the menus needed to contain both stand-alone bonuses (the foremost traditional enlistment incentives) and non-bonus options. To anchor the stand-alone bonuses in a realistic range, we based them on historical data, using the average bonus level and the maximum bonus level. These were computed by occupational specialty, term length, and recruit quality level, then aggregated to the job type appropriate to the specialty. There were six job types, the same as used in *goarmy.com*—i.e., mechanics and engineering, science and medicine, signal and intelligence, support and logistics, ground forces, and aviation and aerial defense. The non-bonus options included student loan repayment up to either \$35,000 or \$65,000, an interview with a major organization when leaving the Army, and the choice of region to serve in during the first term. To place the non-bonus options on par with stand-alone bonuses, the non-bonus options were in most cases paired with a supplemental bonus. The supplemental bonuses were smaller than the stand-alone bonuses; they could be smaller because of the intrinsic value of the non-bonus incentives, as revealed through the analysis of Survey 1 data. Tables 4.1 through 4.4 contain the amounts of the stand-alone and supplemental bonuses by bonus level (average or maximum) and AFQT level (high or low),² by job type.

We faced several additional challenges in constructing Survey 2. First, because the menus were conditioned on AFQT level, it was necessary to predict the respondent's AFQT score in real time. We used responses to questions at the beginning of Survey 2 as inputs to a regression that we estimated to predict AFQT score and classify the respondent as high or low AFQT. We estimated the regression from the most recent longitudinal survey used to re-norm the AFQT: the 1997 NLSY and its waves through 2019–2020 (Appendix D). Second, we needed to inform the respondents about the Army in general and the jobs available in each job type. For general information about the Army, we used the same descriptive material as in Survey 1. For information about the jobs in each job type, we computed the percentage of positions (slots) for each job in a job type and showed the respondent a listing of the jobs comprising 90 percent of the job slots and the percentage of positions each job accounted for. Finally, we needed to create a format to display the menus that would work on a smartphone screen yet display as many as 13 separate options. Figure 4.1 displays the table format we devised

¹ The survey plan was to obtain a sample of 800 respondents, with 160 women and 640 men. As discussed later in this chapter, we focused our analyses on the data collected in the third launch of Survey 2, following two limited soft launches used to examine initial response patterns. The final gender split also was affected by a survey data collector misunderstanding, reversing the objective to be 640 women and 160 men. When this misunderstanding was detected, there were 465 female respondents in the third launch. The final total for men in the third launch was 542 respondents. Our analysis does not include the respondents in the two soft launches.

² Our survey respondents were all high school graduates or were soon to be graduates. Therefore, our high-AFQT group represents high-quality recruits.

to address this issue. Preliminary testing indicated that the format worked well and, equally important, that the time needed to complete the survey was acceptable.³ The following sections describe the elements of Survey 2 in more detail, and Chapter 5 concerns the analysis of Survey 2.

Guidelines for Survey 2 Design

We used similar sample selection criteria as for Survey 1. For Survey 2, we targeted 25 percent each for ages 18–19, 20–21, 22–24, and 25–27. The age distribution balanced sufficient sample size for the subgroups with their actual representation in enlistment cohorts.

We moved background questions to the first portion of the survey to enable us to predict AFQT score from initial survey questions in real time so that it could be used in determining the enlistment options offered to each respondent.

We asked respondents to indicate their likelihood of joining the active-duty Army under three conditions for a given job group: no bonus or other incentives, historical average bonus level, and historical maximum bonus level. We first asked about enlisting for three years and for four or more years without enlistment incentives. We then asked about enlisting for stand-alone bonus amounts set according to the historical average level and historical maximum level by job type and upper-half or lower-half AFQT score, or for options of similar value based on the Survey 1 results. We used the six job types featured on goarmy.com (mechanics and engineering, science and medicine, signal and intelligence, support and logistics, ground forces, and aviation and aerial defense).

The likelihood of joining the active-duty Army was recorded on a probability scale, specifically a slider bar ranging from 0% to 100%. The response is termed a stated preference because the intended action, joining the Army, is hypothetical rather than actual.

Bonus amounts were computed from a database for the RA (RA Analyst), which has information at the individual enlistee level on the receipt of stand-alone bonuses and other enlistment options. We used the RA Analyst records for the period from FY 2001 through FY 2019. Our tabulations of stand-alone bonuses at the historical average level and the historical maximum accounted for the occupational specialty, the enlistment term length, and the AFQT level. We then aggregated the bonus amounts into the six job types. Given the bonus level, the respondent could select either a stand-alone bonus with a term of three years or a stand-alone bonus with a term of four or more years, or could select from equal-value options built using the values of non-bonus and bonus options estimated with Survey 1 data. The trade-offs are of bonus amounts with term length and/or choice of region of job location and/or a specified maximum LRP value and/or PaYS. Last, we asked analogous questions at the maximum bonus level. The derivation of the bonus amounts and similarly valued options is discussed in detail in Appendix E.

Survey 2 Demographics

As was true for Survey 1, Survey 2 respondents were aged 18 to 27. Five percent of the respondents were high school juniors, and 19 percent were high school seniors. The remainder had completed high school and might have had some college or vocational school but were not college seniors or college graduates. Only those respondents who expressed some willingness to actively consider serving in the Army in the next few years were included, as was also the case in Survey 1. That is, Survey 2 selected those who did not answer 0 on a

³ One-third of respondents completed the survey within six minutes, two-thirds within ten minutes, and 90 percent within 18 minutes.

0 to 10 scale in response to the question “How likely is it that you would actively consider serving in the Army in the next few years?” Survey 2 also screened out those who were serving or had ever served in the military, either on active duty or reserve.

Like Survey 1, Survey 2 asked about age, gender, student status, year of school if a student, last level of education completed if not a student, intention to get more education, marital status, whether respondents lived with a spouse or partner, state of residence, size of the town or city of residence, whether they were a parent with children living with them, number of siblings, whether they were Spanish/Hispanic/Latino, race, month and year of birth, parent income when respondent was age 18, mother’s level of education, and father’s level of education. Table H.1 contains Survey 2 questions and summarizes the responses. Because the responses are similar to those in Survey 1, as described in Chapter 3, they are not described here.

Responses to questions at the beginning of the survey were used as inputs to the AFQT regression (Table D.1) to predict the respondent’s AFQT score and whether the respondent was high or low quality—i.e., had a predicted score of 50 or higher or a predicted score below 50.⁴ Sixty-nine percent had a predicted score of 50 or higher, and 31 percent had a predicted score below 50. Given that we only surveyed young adults who had at least a high school diploma or who were expected to complete a high school diploma, this means that over two-thirds of the respondents were predicted to be both high aptitude and high quality. This is about 10 to 15 percentage points higher than the Army’s recent high-quality recruit rates (though close to that of other services). Predicted quality was used to channel the respondent to questions about enlistment options that were constructed to differ by quality and job type.

Job Types and Enlistment Options for Survey 2

As a prelude to questions about enlistment, the survey briefly described Army compensation, benefits, and training, then listed the six job types used on the Army recruiting website, goarmy.com. As mentioned, the job types were mechanics and engineering, science and medicine, signal and intelligence, support and logistics, ground forces, and aviation and aerial defense.

The remainder of the survey consisted of questions about enlistment options and the chances of enlisting in the next few years. Respondents were asked questions for each of four job types that were seen sequentially. Three job types were drawn at random. After these questions, the respondent was asked to rank the six job types. The fourth job type shown to the respondent was the highest-ranked job type that we had not yet asked about. This approach guaranteed that one of the four job types would be the respondent’s top-ranked job and, in many cases, that the four types also would include the second most preferred type. At the same time, drawing the first three job types at random ensured an ample number of responses across all job types, an outcome that might not have occurred if respondents had been allowed to freely select the job types and if most respondents had the same two or three favorite types.

For each of the four job types, the respondent was first shown a table listing specific jobs in the job type. The listed jobs accounted for 90 percent of the job slots in the job type, and the percentage of job slots was displayed for each individual job. This gave the respondent an idea of the likelihood that specific jobs would be available in the job type at the time of joining the Army.

⁴ The two components of *high quality* according to the Office of the Secretary of Defense are being a high school graduate (versus having passed the GED or being a dropout) and having an AFQT percentile score of at least 50. Just under 90 percent of our survey participants were high school graduates, and 9.5 percent were soon-to-graduate seniors, while only 2.5 percent were soon to complete their junior year. Thus, among our respondents, *high AFQT* and *high quality* are essentially synonymous.

After seeing the jobs within the job type, the respondent answered questions about enlistment options and the chances of joining the active-duty Army in the next few years. The first two questions asked about the chances of joining in the next few years for a term of three years, and, separately, for a term of four or more years, when there were no enlistment incentives. Second, the respondent was shown a table that included options for both three- and four-or-more-year terms. The anchor items in the table were the job type's historical average enlistment bonus for a three-year term and for a four-or-more-year term, conditional on respondent quality. These bonuses were computed by job type from the bonuses for low- and high-quality recruits accessing into the Army during FY 2001–FY 2019 (Tables F.1 and F.2). The other options, referred to as *non-bonus options*, were constructed to be approximately equal in value to the bonuses. They included a choice of \$35,000 LRP, regional location of assignment, and job interview, though in some cases these options were not present, and when they were present, they were often accompanied by a supplemental bonus that was included as part of the option. The respondent indicated the most preferred option in the table of enlistment options, and the respondent was then asked the chances of enlisting in the next few years assuming that the most preferred option would be offered. For instance, the respondent might have chosen an option with a four-or-more-year term, \$35,000 student loan repayment, and \$5,000 bonus. The respondent then gave his or her subjective probability of joining the active-duty Army in the next few years assuming the preferred option would be available.

The next questions used the historical maximum bonuses as the anchor items (Tables F.3 and F.4). These questions paralleled those for the average bonus, though the maximum bonuses were, of course, larger. Options offering a choice of \$35,000 LRP, location, or job interview often included a now-larger supplemental bonus to bring the option roughly up to par with the maximum bonus. In some cases, a \$65,000 LRP was offered. Also, because the larger maximum bonuses enabled more trade-offs with non-bonus incentives, some options allowed the respondent to choose not one but two of \$35,000 LRP, location, and job interview, and these double choices, too, might have had a supplemental bonus, though smaller than that paired with an option that included only one of the three non-bonus options.

To gain insight into the attractiveness of the enlistment bonus relative to the other options, Survey 2 randomized the value of the enlistment bonus in the following way. Enlistment bonuses of \$5,000 or less were left unchanged. Bonuses greater than \$5,000 but less than \$25,000, a range covering most average bonuses, were decreased by \$3,000, left unchanged, or increased by \$3,000, depending on a random draw from a uniform distribution, providing a \$6,000 range of variation in bonus amount. Enlistment bonuses of \$25,000 and higher, a range covering maximum bonuses, were decreased by \$5,000, left unchanged, or increased by \$5,000, depending on the same random draw, providing a \$10,000 range of variation in bonus amount. Supplemental bonuses were not randomized.

Randomizing the enlistment bonuses served two purposes. First, expanding the range of bonus variation associated with any given set of non-bonus options increased the potential for estimating the marginal effect of bonus dollars. Second, although we took steps to decrease measurement error in the bonus estimates by averaging across estimates (see Appendix E) and we drew on Survey 1 estimates of the relative values of non-bonus incentives, nearly all of which were statistically precise, there was still uncertainty about whether the pairing of bonuses and non-bonus options would prove to be in a range where the respondent was willing to make trade-offs when considering the chances of enlisting in the next few years. Expanding the range of bonus variation helped to hedge against this uncertainty.⁵

⁵ Given the different purposes of Survey 1 (see Chapter 3) and Survey 2 (as described in this chapter), there were differences in the individual enlistment incentives and incentive combinations offered in the two surveys. Specifically, in Survey 2, the incentives were bundled into menus of options that included separate options for enlistment terms of three years and four or more years, varied by job type and predicted respondent AFQT category, and, in most cases, were paired with supplemental bonuses of varying amounts. In Survey 1, respondents rated their most and least preferred incentives from 19 sets of three

The survey was designed to be taken online, and its format had to be suitable for the screen of a smart-phone. This raised the question of how to display the enlistment options. There were too many options to list on a single screen for many of the job types, especially at the maximum bonus level, which had as many as 13 options. To address this issue, the options were presented in a table as shown in Figure 4.1. The “3” and “4+” in the table refer to term length. For instance, the respondent might choose the row with a three-year term, \$35,000 student loan repayment, job interview, choice of location, and signing bonus of \$10,000. Then, in a follow-up question, the respondent might designate job interview as the preferred option among the alternatives of \$35,000 student loan repayment, job interview, and choice of location. Figure 4.1 provided an example to show the respondent how to choose an option. After seeing the example, the respondent moved on to questions about four job types, shown sequentially, in which similar-looking tables were tailored according to the job type, respondent’s predicted AFQT (low or high), and bonus level (average or maximum).

We did a soft launch to determine whether the survey responses were sensible. In a soft launch, the survey is paused after some number of respondents to permit a review of the data. The data from the soft launch of 100 respondents indicated some inconsistencies—e.g., for some job types, there were limited differences in the chances of enlisting for options at the average bonus level versus the maximum bonus level, or at the no-bonus level versus the average bonus level, and there were some illogical answers—e.g., the chances of enlistment were higher at the average bonus level than at the maximum bonus level. Also, our initial assessment found fewer respondents choosing the non-bonus options than expected given that they had been constructed from Survey 1 estimates of relative value (Table F.2). Had the options been equally appealing, the chance that an option was most preferred would have been similar across all options, given job type and respondent quality.

FIGURE 4.1
Choice Set Table

In the table below, **each row is a different option** that includes **one or more** enlistment incentives. Incentives that are **not shaded** are **always included** as part of the listed option. **In addition:** when an option includes shaded incentives:

- You will be able to **choose the one incentive you prefer among orange-shaded incentives.**
- You will be able to **choose the two incentives you prefer among blue-shaded incentives.**

Please select one row based on the option you most prefer.

		Student Loan Repayment	Job Interview	Choice of Location	Signing Bonus	
☐	3	\$65,000				
☐	3	\$35,000	Yes	Yes	\$10,000	
☐	3				\$20,000	
☐	4+	\$65,000			\$10,000	
☐	4+	\$35,000	Yes	Yes	\$12,500	
☐	4+	\$35,000	Yes	Yes	\$20,000	
☐	4+				\$30,000	

Choose One

Choose Two

incentives each. When non-bonus options were paired with bonuses, the amount was \$15,000, and the number of alternative stand-alone bonus values was smaller than in Survey 2. We also dropped the bonus for two or more years of college because of its limited value, appeal, and percentage of potential qualifying Army enlistees.

In response to these concerns, we did a second soft launch. Supplemental bonuses were added or increased, often by \$5,000 at the average bonus level and up to \$10,000 at the maximum bonus level, although the size of the increase varied in accordance with historical patterns for the job group, term length, and prospective recruit quality level. The initial choice sets were used only in the first soft launch, with the revised choice sets being used after that.

The second soft launch included another 100 respondents. There were now fewer inconsistencies, though still some, as might be expected given the small sample sizes in the soft launches. In reviewing the second soft launch data, we wondered whether there were “fill-in” and recall problems that might contribute to the chances of enlisting being similar across the choice sets for the bonus levels (no bonus, average bonus, and maximum bonus). Fill-in occurs when, absent a concrete context, the respondent mentally fills in a context. Just before the questions on enlistment options, wording in the survey mentioned that the Army might offer enlistment incentives, wording that could have prompted the respondent to assume that incentives would be present. Reinforcing this concern, the first questions at the no-bonus level did not explicitly state that incentives were absent. To address concern about fill-in, wording for the no-bonus questions was changed to the following: “First, we want to ask you about the chances that you will join the active-duty Army in the next few years if no enlistment incentives are offered to you.” Wording for the average and maximum bonus level questions was revised to recall the previous response. For example, when going from no bonus to average bonus, the new wording was, “As a reminder, in the last question where the Army did not offer an incentive, you gave your chances of joining the Army in the next few years as [insert percentage] for three years and [insert percentage] for four or more years.” The decision to insert these changes weighed the risk of biasing the respondent always to enter a higher value than before because there were more, and more generous, enlistment options as the respondent progressed to average bonus and then to maximum bonus, against the likelihood that the wording change would prevent errors from forgetting or inattention.

Recapping, we increased the presence and generosity of supplemental bonuses after the first soft launch, and we altered the survey wording after the second soft launch. No further changes were made after this. Our analysis used only data from the third (and final) launch.

Tables 4.1–4.4 summarize the option sets by job type and quality level. Tables 4.1 and 4.2 show the options at the average and maximum bonus level for high-quality respondents, and Tables 4.3 and 4.4 show the same for low-quality respondents. For instance, for job type 3, signal and intelligence, the respondent would be shown a list of jobs in signal and intelligence before seeing the options. The respondent would then see tables, such as in Figure 4.1, containing bonus options that can be read here from the “Type 3” column in Table 4.1: three-year term and \$12,500 enlistment bonus; three-year term, \$35,000 LRP, and \$5,000 bonus; three-year term, job interview, and \$5,000 bonus; three-year term, choice of location, and \$5,000 bonus; four-or-more-year term and \$17,500 enlistment bonus; and so forth. In cells where “0” appears in the tables, the incentive was offered but without a supplemental bonus—i.e., the supplemental bonus was zero. In cells where “NA” appears, the option was not offered, and the bonus amount was not applicable.

Summary

This chapter described the components that went into the design of Survey 2. Because the survey’s main intent was to elicit information about the appeal of a menu of options across a range of Army jobs, recruiting conditions, and prospect quality as reflected by AFQT, we needed to develop a set of menus satisfying these criteria. Overall, we developed 24 menus representing the combinations of six Army job types, average and difficult recruiting conditions (i.e., at average and maximum bonus levels), and high and low AFQT. To gain insight into the effect of bonus amount on option choice, we randomized the amount of the stand-alone

TABLE 4.1

Enlistment Options for Average Bonus Condition, High AFQT Score

Option		Bonus Amount by Job Type					
Term	Incentive	Type 1	Type 2	Type 3	Type 4	Type 5	Type 6
3 years	Bonus	12,500	2,500	12,500	15,000	15,000	15,000
3 years	\$35,000 LRP	5,000	NA	5,000	5,000	5,000	5,000
3 years	Interview	5,000	NA	5,000	5,000	5,000	5,000
3 years	Location	5,000	NA	5,000	5,000	5,000	5,000
4+ years	Bonus	15,000	12,500	17,500	20,000	20,000	22,500
4+ years	\$35,000 LRP	7,500	5,000	10,000	10,000	10,000	12,500
4+ years	Interview	7,500	5,000	10,000	10,000	10,000	12,500
4+ years	Location	7,500	5,000	10,000	10,000	10,000	12,500
4+ years	\$65,000 LRP	NA	NA	NA	0	0	0

NOTE: The "Bonus" incentive was randomized as follows: Bonuses of \$5,000 or less were left unchanged; bonuses greater than \$5,000 but less than \$25,000 were decreased by \$3,000, left unchanged, or increased by \$3,000, depending on a random draw from a uniform distribution; and bonuses of \$25,000 or more were decreased by \$5,000, left unchanged, or increased by \$5,000, depending on the same random draw. Bonuses that supplemented the non-bonus incentives were left unchanged. Job Type 1 = mechanics and engineering; Job Type 2 = science and medicine; Job Type 3 = signal and intelligence; Job Type 4 = support and logistics; Job Type 5 = ground forces; and Job Type 6 = aviation and aerial defense. A cell entry of "0" means that the incentive was offered but without a supplemental bonus. "NA" (not applicable) means that the incentive was not offered; hence, no bonus was offered.

bonus by decreasing the amount; leaving it unchanged at the average or maximum level, respectively; or increasing the amount, which in effect increased the number of menus from 24 to 72. A hallmark of each menu was the inclusion of stand-alone bonuses and non-bonus incentives plus a supplemental bonus large enough to put the value of the non-bonus option on par with the stand-alone bonus. Also, the options in a menu were for three-year terms of enlistment and four-or-more-year terms of enlistment. We devised a concise way of displaying the options (Figure 4.1), and soft launches of the survey indicated that the display worked effectively, as did the follow-on questions about the specific option chosen and the chances of joining the Army in the next few years. The next chapter focuses on analyzing the data collected through Survey 2.

TABLE 4.2
Enlistment Options for Maximum Bonus Condition, High AFQT Score

Option		Bonus Amount by Job Type					
Term	Incentive	Type 1	Type 2	Type 3	Type 4	Type 5	Type 6
3 years	Bonus	20,000	5,000	22,500	20,000	22,500	20,000
3 years	\$35,000 LRP	10,000	NA	5,000	10,000	12,500	10,000
3 years	Interview	10,000	NA	5,000	10,000	12,500	10,000
3 years	Location	10,000	NA	5,000	10,000	12,500	10,000
3 years	\$65,000 LRP	0	NA	0	0	0	10,000
4+ years	Bonus	35,000	25,000	35,000	35,000	35,000	32,500
4+ years	\$35,000 LRP	22,500	15,000	25,000	25,000	25,000	22,500
4+ years	Interview	22,500	15,000	25,000	25,000	25,000	22,500
4+ years	Location	22,500	15,000	25,000	25,000	25,000	22,500
4+ years	\$65,000 LRP	10,000	7,500	10,000	10,000	10,000	10,000
4+ years	\$35,000 LRP and location	15,000	10,000	17,500	17,500	17,500	15,000
4+ years	\$35,000 LRP and interview	15,000	10,000	17,500	17,500	17,500	15,000
4+ years	Interview and location	15,000	10,000	17,500	17,500	17,500	15,000

NOTE: The "Bonus" incentive was randomized as follows: Bonuses of \$5,000 or less were left unchanged; bonuses greater than \$5,000 but less than \$25,000 were decreased by \$3,000, left unchanged, or increased by \$3,000, depending on a random draw from a uniform distribution; and bonuses of \$25,000 or more were decreased by \$5,000, left unchanged, or increased by \$5,000, depending on the same random draw. Bonuses that supplemented the non-bonus incentives were left unchanged. Job Type 1 = mechanics and engineering; Job Type 2 = science and medicine; Job Type 3 = signal and intelligence; Job Type 4 = support and logistics; Job Type 5 = ground forces; and Job Type 6 = aviation and aerial defense. A cell entry of "0" means that the incentive was offered but without a supplemental bonus. "NA" means that the incentive was not offered; hence, no bonus was offered.

TABLE 4.3
Enlistment Options for Average Bonus Condition, Low AFQT Score

Option		Bonus Amount by Job Type					
Term	Incentive	Type 1	Type 2	Type 3	Type 4	Type 5	Type 6
3 years	Bonus	7,500	2,500	10,000	10,000	10,000	12,500
3 years	\$35,000 LRP	NA	NA	2,500	2,500	2,500	5,000
3 years	Interview	NA	NA	2,500	2,500	2,500	5,000
3 years	Location	NA	NA	2,500	2,500	2,500	5,000
4+ years	Bonus	12,500	7,500	15,000	15,000	17,500	17,500
4+ years	\$35,000 LRP	5,000	NA	5,000	5,000	7,500	10,000
4+ years	Interview	5,000	NA	5,000	5,000	7,500	10,000
4+ years	Location	5,000	NA	5,000	5,000	7,500	10,000

NOTE: The "Bonus" incentive was randomized as follows: Bonuses of \$5,000 or less were left unchanged; bonuses greater than \$5,000 but less than \$25,000 were decreased by \$3,000, left unchanged, or increased by \$3,000, depending on a random draw from a uniform distribution; and bonuses of \$25,000 or more were decreased by \$5,000, left unchanged, or increased by \$5,000, depending on the same random draw. Bonuses that supplemented the non-bonus incentives were left unchanged. Job Type 1 = mechanics and engineering; Job Type 2 = science and medicine; Job Type 3 = signal and intelligence; Job Type 4 = support and logistics; Job Type 5 = ground forces; and Job Type 6 = aviation and aerial defense. A cell entry of "0" means that the incentive was offered but without a supplemental bonus. "NA" means that the incentive was not offered; hence, no bonus was offered.

TABLE 4.4

Enlistment Options for Maximum Bonus Condition, Low AFQT Score

Option		Bonus Amount by Job Type					
Term	Incentive	Type 1	Type 2	Type 3	Type 4	Type 5	Type 6
3 years	Bonus	15,000	5,000	12,000	17,500	20,000	17,500
3 years	\$35,000 LRP	5,000	NA	5,000	10,000	10,000	10,000
3 years	Interview	5,000	NA	5,000	10,000	10,000	10,000
3 years	Location	5,000	NA	5,000	10,000	10,000	10,000
3 years	\$65,000 LRP	NA	NA	NA	NA	0	NA
4+ years	Bonus	22,500	17,500	22,500	27,500	30,000	27,500
4+ years	\$35,000 LRP	12,500	10,000	12,500	17,500	20,000	17,500
4+ years	Interview	12,500	10,000	12,500	17,500	20,000	17,500
4+ years	Location	12,500	10,000	12,500	17,500	20,000	17,500
4+ years	\$65,000 LRP	0	NA	0	5,000	7,500	5,000
4+ years	\$35,000 LRP and location	NA	NA	NA	10,000	12,500	10,000
4+ years	\$35,000 LRP and interview	NA	NA	NA	10,000	12,500	10,000
4+ years	Interview and location	NA	NA	NA	10,000	12,500	10,000

NOTE: The "Bonus" incentive was randomized as follows: Bonuses of \$5,000 or less were left unchanged; bonuses greater than \$5,000 but less than \$25,000 were decreased by \$3,000, left unchanged, or increased by \$3,000, depending on a random draw from a uniform distribution; and bonuses of \$25,000 or more were decreased by \$5,000, left unchanged, or increased by \$5,000, depending on the same random draw. Bonuses that supplemented the non-bonus incentives were left unchanged. Job Type 1 = mechanics and engineering; Job Type 2 = science and medicine; Job Type 3 = signal and intelligence; Job Type 4 = support and logistics; Job Type 5 = ground forces; and Job Type 6 = aviation and aerial defense. A cell entry of "0" means that the incentive was offered but without a supplemental bonus. "NA" means that the incentive was not offered; hence, no bonus was offered.

Analysis of Survey 2

Introduction

The analysis of Survey 2 focuses on the choice of enlistment option and the subjective probability of enlisting in the next few years given the chosen option. One might expect the probability of enlisting to depend directly on the option set, but that omits the key step of selecting the option from the choice set. The enlistment decisionmaking process is therefore addressed in two parts. The respondent first chooses an option from the choice set, where the choice set is conditional on job type, individual quality (high or low predicted AFQT score), and bonus level (average or maximum). The chosen option is the most preferred option and is therefore associated with a probability of enlisting that is expected to be as high and perhaps higher than if a different option were assigned to the respondent. This choice is at the heart of the EOO concept: The individual chooses the most preferred option from a menu of options and thereby optimizes. Underlying EOO is the innovation of presenting a menu of choices. The menu has non-bonus options composed of incentives (student loan repayment, choice of region of location, and opportunity for a job interview when leaving the Army) paired with supplemental bonuses that together have a value roughly on par with stand-alone bonuses. In choosing an option from the menu, the prospect in effect trades off stand-alone bonus dollars for supplemental bonus dollars plus the paired non-bonus incentive. After choosing an option, the respondent reports the chances of joining the active-duty Army in the next few years if offered jobs in that job type and given the chosen option.

In this chapter, we first discuss option choice, then the probability of joining the Army given the chosen option. We modeled option choice with a random utility model. The individual optimizes by choosing the most preferred option from the menu offered. Under the model's assumptions, the probability of an option being chosen as the most preferred has a logit form. Empirically, an option is described by an indicator variable for the kind of incentive and its term length and a variable for the bonus amount. The probability model quantifies the association between the chosen option and the stated probability of joining the Army. The coefficients on the chosen-option indicators in the probability model do not indicate a purely causal effect, as might be the case if options had been randomly assigned. Instead, the respondents choosing a particular option might have a higher, or lower, probability of enlisting than those who chose a different option. In choosing an option, respondents sort themselves into bins for each option, and the regression coefficient shows whether the probability of enlisting is higher or lower for respondents in a bin relative to other bins. The estimated coefficient reflects both the sorting effect and the causal effect of the option. For instance, an option perceived to be highly attractive might cause the probability of joining the Army to increase, while at the same time those respondents choosing the option might have a higher, or lower, inclination to join than respondents choosing other options.

Survey 2 randomized the bonus amount attached to the stand-alone bonus options. Also, most results are based on data pooled across job types given recruit quality and bonus level, and pooling is another source of variation in bonus amount. For option choice, variation in bonus amount is exogenous to the individual, and this allows estimation of the causal effect of bonus amount on option choice. That is not the case for the

probability of joining. The individual has selected the option and therefore selected the bonus amount, and respondents who have chosen an option form a selected sample, as mentioned. As a result, the bonus amount coefficient embeds both the bonus effect and the selection effect; the bonus effect is not separately identified. The probability model is estimated by ordinary least squares (OLS).

The motivation for our approach to implement the EOO concept through menus lies in the fact that menus create a constrained choice set and require the individual to consider trade-offs when choosing an option from the menu, whereas an a la carte approach in which the individual can choose any or all the options would not. For Survey 2, we constructed a single menu for each job type, AFQT level, and bonus level, and only the single menu was offered to a respondent of a given AFQT level when asked about a given job type at the average bonus level or, alternatively, at the maximum bonus level. The single menu meant that options within the menu were not varied apart from random variation in the stand-alone bonus amount (described in more detail later in this chapter). Because options in the menu were not varied, there was no variation in the presence or absence of an option, precluding analysis of the effect of adding or dropping an option. (An expanded study could include alternative menus.)

Offering a single menu had implications for data analysis. Visualize a probability model for an RCT where options are varied exogenously and the probability of enlisting in response to an option x_i can be written $p(e|x_i) = \beta$. In contrast, in Survey 2 the respondent was offered a menu that can be denoted by the set $\{x_i\}$, $i = 1, \dots, k$, so the corresponding equation is $p(e|\{x_i\})$. Because only a single menu was offered, if this equation were estimated, the right-hand side would simply be a constant term indicating the menu offered. Our analysis expanded on this by recognizing that respondents first chose an option from the menu, then expressed their willingness to enlist assuming they were given their preferred option. This can be written as a multiplicative expression of the probability of enlisting given the chosen option multiplied by the probability of choosing the option given the menu, $p(e|\{x_i\}) = p(e|x_i)p(x_i|\{x_i\})$. The menu $\{x_i\}$ is offered exogenously, and the individual selects an option x_i from the menu. The respondents selecting x_i create a selected sample, which is true for each option in the menu, $x_1, x_2, \dots, x_k$. We estimated the probability of enlisting conditional on the selected option. Because the option indicators reflect selected samples, we are careful not to claim that we have estimated the causal effect of an option on the probability of enlistment. Rather, the coefficient on an option reflects the average probability of enlistment for the selected sample choosing the option, inclusive of its causal effect, relative to the omitted option (reference option) and its selected sample. As will be shown later in this chapter, we found that the non-bonus options, which typically include a supplemental bonus, often had coefficients as large or larger than the stand-alone bonus options.

Analysis of Option Choice

The utility of option j for individual n is expressed as

$$V_{nj} = \eta_j + \epsilon_{nj}$$

Here, ϵ_{nj} is an error term, and η_j represents an indicator for option j and the amount of its bonus. (The choice is made for a given job type, but the subscript for job type is omitted.)

$$\eta_j = \alpha_j I(option)_j + \beta Bonus_j$$

An option has three elements:

- term length (three years, or four or more years)
- an incentive from the set {enlistment bonus, \$35,000 LRP, job interview, choice of location, \$65,000 LRP, \$35,000 LRP and job interview, \$35,000 LRP and location, job interview and location}
- bonus amount of the incentive.

The coefficient on the option indicator is the net effect of its term length and incentive, and β_{Bonus_j} is the effect of its bonus. The bonus effect is assumed to be the same regardless of option—that is, there is no subscript j on β . There are two sources of bonus variation. First, as discussed earlier, Survey 2 randomizes the option's enlistment bonus; in the range from \$5,000 to \$25,000, \$3,000 is added to or subtracted from the bonus, or the bonus is unchanged, depending on a draw from a uniform distribution, and at \$25,000 and up this amount is \$5,000. (For a given menu [i.e., for a job type, quality level, and recruiting condition], the supplemental bonuses are fixed in amount and therefore provide no variation in bonus amount.) Second, stand-alone and supplemental bonuses can differ by job type, and this contributes to bonus variation when data are pooled across job types for a given quality level and recruiting condition.

Under the assumption that the error term is distributed Type 1 extreme value, the probability that respondent n chooses option j among k options has the following logit form:

$$P_{nj} = \frac{e^{V_{nj}}}{\sum_k e^{V_{nk}}}$$

If the only variables in the option choice model were indicator variables, the probability predictions from the estimated model would equal the sample distribution of chosen options. This is useful to know because the observed distribution of chosen options conveys much the same information as logit model predictions of the distribution. However, the logit estimates provide more information than tabulations of the choice distribution. The added information is the relative values of the options, as indicated by the coefficients on the options (as discussed in Chapter 4), the precision of the coefficients (i.e., their standard errors), and the effect of the bonus amount. We present logit estimates in the following sections and in the appendixes, and we also present graphics using the sample distribution of chosen options (e.g., by job type, gender, race/ethnicity, and AFQT level).

We first estimated option choice models by job type for four subgroups defined by high or low AFQT and average or maximum bonus level. The results, reported in Appendix J, show that coefficients vary by job type and are typically within two standard errors of one another. Coefficient standard errors depend on sample size, and the sample sizes were on average 473 for high-AFQT respondents and 199 for low-AFQT respondents. We reasoned that pooling the data across job types might give a more accurate picture of the preference for options. Pooling runs the risk of biasing the coefficient estimates and overstating their precision, but not pooling runs the risk of estimates and standard errors affected by small sample size. Another factor was highly relevant. Sample distributions show that option choice is similar across job types that have menus with the same number and kind of options, as seen in Figures 5.1–5.8. These figures show the distribution of option choice by job type and AFQT level and by job type, gender, and AFQT level. As mentioned, the logit coefficients would exactly reproduce the distributions if the model were limited to indicators for the options; also, adding the bonus amount variable did little to detract from that point, as seen by the good fit of the model compared with the sample distribution. Thus, the distribution similarity was evidence of commonality in option choice decisions across job types with similar menus, supporting the decision to pool.

The choice sets differ between groups defined by average or maximum bonus level and high or low AFQT, and to some extent between job types 1 and 2 versus types 3, 4, 5, and 6 (Tables 4.1–4.4 show the choice sets in the menus). We estimated separate logit models by AFQT and bonus level, and within these subgroups we

pooled job types 1, 3, 4, 5, and 6 for high AFQT and job types 3, 4, 5, and 6 for low AFQT. The omitted job types offered fewer options, and, if they had been included, the estimates would have been affected by the logit model property of independence from irrelevant alternatives (IIR).¹ Under this property, the odds ratio of any two options is independent of the presence or absence of other options (Train, 2009). Side analysis confirmed that model fit was worse when the omitted job types were included or when data were pooled by AFQT level.

Empirical Results on Option Choice

Tables 5.1 and 5.2 show the logit coefficient estimates for high-AFQT respondents at the average and maximum bonus levels, and Tables 5.3 and 5.4 have corresponding results for low-AFQT respondents. The estimation pools data across selected job types, as mentioned. Appendixes I and J present logit coefficients by gender and by job type.

In Tables 5.1–5.4, the models fit the data well. This is seen in the rightmost columns by comparing the predicted probability that an option was chosen with its frequency in the sample. An option's bonus amount was used along with its indicator to compute the probability. The predicted probability and the sample percentage are equal to three decimals in most cases. A good fit is not surprising because, as mentioned, the estimated model would reproduce the sample distribution if the option indicators were the only explanatory variables. That said, including the bonus variable had little adverse effect on the fit.

For the bonus options, it is helpful to distinguish between the coefficient on the bonus incentive and the coefficient on bonus amount. In Table 5.1, for instance, Bonus 4+, a stand-alone bonus with a term of four or more years, has a negative coefficient, -0.879 , relative to the coefficient on Bonus 3, the reference incentive, which is set to 0. Other things equal, the negative coefficient implies that the probability of choosing Bonus 4+ is less than the probability of choosing Bonus 3, yet the bonus amount for Bonus 4+ is \$5,000 to \$7,500 greater than the bonus amount for Bonus 3 (see Table 4.1). However, this does not imply that offering a larger bonus leads to a lower probability. Bonus 4+ requires a commitment of four or more years, while Bonus 3 has a commitment of three years, and the longer commitment makes Bonus 4+ less attractive. That said, the bonus amount variable has a positive, significant coefficient: A higher bonus increases the probability that the option is chosen. The higher value of the bonus offered by Bonus 4+ increases the probability that it is chosen relative to Bonus 3. Despite this incremental increase, Bonus 4+ is chosen less often than Bonus 3. The rightmost columns in Table 5.1 present the predicted probability that an option is chosen and the sample frequency of the option. The predicted probability for Bonus 3 is 0.130 (sample frequency 0.130), and the predicted probability for Bonus 4+ is 0.064 (sample frequency 0.064).

As seen from the tables, the coefficients for high-AFQT respondents are statistically significant more often than the coefficients for low-AFQT respondents. For high AFQT, all coefficients but one were statistically significant at the average bonus level, and eight of the 13 coefficients were significant at the maximum bonus level. For the enlistment option indicators, significance means that the perceived value to respondents differs from that of the reference option, Bonus 3. As seen, most non-bonus options were more attractive than

¹ Suppose menu 2 had three options and menus 1, 3, 4, 5, and 6 had eight options, including the three in menu 2. Suppose the options in menus 1, 3, 4, 5, and 6 were equally likely to be chosen, and the options in menu 2 had frequencies of 2/3, 1/6, and 1/6. Under IIR, if five options of the eight options were dropped and three remained—the same three as in menu 2—the probabilities of the three options would rise to 1/3. These probabilities differ from the probabilities in menu 2. Pooling all menus would result in estimates that were a weighted average affected by the IIR property. If probit were used for the same exercise, the results would depend on whether the normality assumption was appropriate and error covariances were precisely estimated. Probit does not have the IIR property, but still the predicted probabilities for the options in menu 2 conditional on dropping the other five options again could differ from the true probabilities in menu 2.

TABLE 5.1

Logit Estimates: Average Bonus Level, High AFQT Score

Option	Estimate	Standard Error	Pr(> z)	Significance	Predicted	Sample
Bonus 3	0	--	--		0.130	0.130
\$35,000 LRP 3	0.539	0.162	0.001	***	0.163	0.163
Interview 3	-0.443	0.175	0.011	*	0.061	0.061
Location 3	0.341	0.163	0.037	*	0.134	0.134
Bonus 4+	-0.879	0.127	0.000	***	0.064	0.064
\$35,000 LRP 4+	0.412	0.100	0.000	***	0.170	0.170
Interview 4+	-0.552	0.119	0.000	***	0.065	0.065
Location 4+	0.158	0.104	0.129		0.132	0.132
\$65,000 LRP 4+	0.643	0.251	0.010	*	0.081	0.081
Bonus (000s)	0.035	0.017	0.027	*	--	--

NOTE: Estimates for job types include mechanics and engineering, signal and intelligence, support and logistics, ground forces, and aviation and aerial defense. Science and medicine is omitted. For identification, the coefficient of Bonus 3 is assumed to be 0. Prediction is made at the average bonus level for the included job types. Bonus amount is in thousands of dollars (000s), and a one-unit change in Bonus (000s) represents a bonus increase of \$1,000, which increases the probability of choosing a stand-alone bonus, either Bonus 3 or Bonus 4+. Significance: *** = 0.001, ** = 0.01, * = 0.05, + = 0.10.

TABLE 5.2

Logit Estimates: Maximum Bonus Level, High AFQT Score

Option	Estimate	Standard Error	Pr(> z)	Significance	Predicted	Sample
Bonus 3	0	--	--		0.093	0.093
\$35,000 LRP 3	0.398	0.171	0.019	*	0.102	0.102
Interview 3	-0.581	0.190	0.002	**	0.038	0.038
Location 3	0.244	0.173	0.158		0.087	0.087
\$65,000 LRP 3	0.437	0.277	0.115		0.083	0.083
Bonus 4+	-0.881	0.202	0.000	***	0.055	0.055
\$35,000 LRP 4+	0.011	0.101	0.911		0.102	0.102
Interview 4+	-1.135	0.139	0.000	***	0.032	0.032
Location 4+	-0.144	0.104	0.165		0.087	0.087
\$65,000 LRP 4+	0.058	0.171	0.734		0.074	0.074
\$35,000 LRP and interview 4+	-0.307	0.122	0.012	*	0.061	0.061
\$35,000 LRP and location 4+	0.401	0.106	0.000	***	0.123	0.123
Interview and location 4+	-0.252	0.121	0.037	*	0.064	0.064
Bonus (000s)	0.026	0.012	0.032	*	--	--

NOTE: Estimates for job types include mechanics and engineering, signal and intelligence, support and logistics, ground forces, and aviation and aerial defense. Science and medicine is omitted. For identification, the coefficient of Bonus 3 is assumed to be 0. Significance: *** = 0.001, ** = 0.01, * = 0.05, + = 0.10.

TABLE 5.3
Logit Estimates: Average Bonus Level, Low AFQT Score

Option	Estimate	Standard Error	Pr(> z)	Significance	Predicted	Sample
Bonus 3	0	--	--		0.226	0.228
\$35,000 LRP 3	0.152	0.257	0.554		0.132	0.131
Interview 3	-0.169	0.264	0.522		0.096	0.095
Location 3	0.004	0.260	0.987		0.114	0.113
Bonus 4+	-1.553	0.223	0.000	***	0.080	0.082
\$35,000 LRP 4+	-0.789	0.193	0.000	***	0.161	0.160
Interview 4+	-0.293	0.174	0.092	+	0.072	0.072
Location 4+	0.006	0.165	0.972		0.119	0.118
Bonus (000s)	0.092	0.029	0.001	***	--	--

NOTE: Estimates for job types include signal and intelligence, support and logistics, ground forces, and aviation and aerial defense. Mechanics and engineering and science and medicine are omitted. For identification, the coefficient of Bonus 3 is assumed to be 0. Prediction is made at the average bonus level for the included job types. Significance: *** = 0.001, ** = 0.01, * = 0.05, + = 0.10.

TABLE 5.4
Logit Estimates: Maximum Bonus Level, Low AFQT Score

Option	Estimate	Standard Error	Pr(> z)	Significance	Predicted	Sample
Bonus 3	0	--	--		0.125	0.126
\$35,000 LRP 3	0.216	0.330	0.513		0.077	0.076
Interview 3	0.043	0.337	0.898		0.064	0.064
Location 3	0.457	0.323	0.157		0.097	0.097
\$65,000 LRP 3	1.546	0.680	0.023	*	0.035	0.035
Bonus 4+	-1.395	0.389	0.000	***	0.073	0.076
\$35,000 LRP 4+	-0.446	0.189	0.018	*	0.080	0.080
Interview 4+	-1.056	0.232	0.000	***	0.043	0.043
Location 4+	-0.691	0.204	0.001	***	0.063	0.062
\$65,000 LRP 4+	0.922	0.440	0.036	*	0.108	0.107
\$35,000 LRP and interview 4+	0.151	0.312	0.628		0.077	0.076
\$35,000 LRP and location 4+	0.104	0.314	0.739		0.073	0.073
Interview and location 4+	0.259	0.308	0.401		0.085	0.085
Bonus (000s)	0.086	0.032	0.007	**	--	--

NOTE: Estimates for job types include support and logistics, ground forces, and aviation and aerial defense. Mechanics and engineering, science and medicine, and signal and intelligence are omitted. For identification, the coefficient of Bonus 3 is assumed to be 0. Significance: *** = 0.001, ** = 0.01, * = 0.05, + = 0.10.

a three-year enlistment bonus. In the cases where there was no statistical difference, the results mean that non-bonus options were chosen as frequently as Bonus 3. It is also notable that non-bonus options as a set were chosen more often than bonus options, implying that respondents perceived non-bonus options to be valuable alternatives. Furthermore, non-bonus options' supplemental bonuses were smaller than stand-alone bonuses, which raises the prospect of bonus cost savings for the Army. We present estimates of bonus cost savings in the next chapter.

Compared with high-AFQT respondents, low-AFQT respondents were more likely to opt for an enlistment bonus. The regression for low-AFQT respondents at the average bonus level (Table 5.3) has a predicted probability of 23 percent for choosing a bonus with a three-year term and 8 percent for choosing a bonus with a four-or-more-year term, for a combined percentage of 31 percent. (The regression excludes two job types, mechanics and engineering and science and medicine, for reasons above. When these job types are included in a simple tabulation for a gross estimate, the percentage of low-AFQT respondents choosing a bonus is 44 percent.²) By comparison, the regression for high-AFQT respondents at the average bonus level (Table 5.1) predicts that 13 percent choose a bonus with a three-year term and 6 percent choose a bonus with a four-or-more-year term, for a combined percentage of 19 percent. (When all job types are included, a simple tabulation finds the percentage of high-AFQT respondents choosing a bonus to be 20 percent.) At the maximum bonus level, the predicted percentages of choosing a bonus were 20 percent for low-AFQT respondents (Table 5.4) and 15 percent for high-AFQT respondents (Table 5.2). (The percentages when all job types are included are 24 percent for low-AFQT respondents and 15 percent for high-AFQT respondents.)

The results show that at a given AFQT level, bonuses were chosen more often at the average bonus level than at the maximum bonus level. This does not necessarily imply a diminishing preference for bonus options relative to non-bonus options. While that could be true, another factor mitigating that possibility is the relatively higher supplemental bonuses at the maximum bonus level for the options involving a term of four or more years, which make the non-bonus options more attractive than at the average bonus level. At the average bonus level, supplemental bonuses were often less than half the enlistment bonus. At the maximum bonus level, in contrast, a supplemental bonus for a four-or-more-year term for high AFQT might be \$25,000 versus a stand-alone bonus of \$35,000, and a similar pattern is seen for low AFQT. Also, there are more non-bonus options to choose from at the maximum bonus level.

The bonus amount coefficients are statistically significant and provide a basis for counterfactual calculation. Table 5.5 shows the effect on the predicted probability of choosing an enlistment bonus when the supplemental bonuses at the average bonus level are increased by 50 percent. The aim of doing this is to see how much of the difference between the probability of choosing an enlistment bonus at the average bonus level versus the maximum bonus level is eliminated when supplemental bonuses at the average bonus level are boosted to levels like those at the maximum bonus level.

The 50-percent increase in supplemental bonuses causes the probability of choosing an enlistment bonus to decrease by about two percentage points for high AFQT and five percentage points for low AFQT, or decrease by 9 percent and 15 percent, respectively. This is closer to but still higher than the probabilities at the maximum bonus level. Therefore, the difference in supplemental bonuses relative to stand-alone bonuses accounts for only part of the difference between the probability of choosing an enlistment bonus at the average versus the maximum level.

Table 5.5 also shows the impact of decreasing supplemental bonus at the maximum bonus level by 50 percent. This increases the probability of choosing an enlistment bonus. The probability rises from 0.148 to

² This difference of 44 percent versus 19 percent can be attributed to the different menus for different job types. In particular, few non-bonus options were offered to low-AFQT respondents for the science and medicine job type, so they mostly had only bonuses to choose from.

TABLE 5.5
Predicted Probability of Choosing an Enlistment Bonus

Bonus Level	High AFQT	Low AFQT
Average bonus level		
Initial	0.194	0.306
Increase supplemental bonuses by 50 percent	0.176	0.260
Maximum bonus level		
Initial	0.148	0.198
Decrease supplemental bonuses by 50 percent	0.172	0.281

0.172 for high AFQT and from 0.198 to 0.281 for low AFQT, or 16 percent and 42 percent, respectively. The 50-percent increase in supplemental bonuses at the average level and 50-percent decrease at the maximum bonus level makes the bonus-taking probability about equal at 0.17 for high AFQT. For low AFQT, the 50-percent decrease at the maximum bonus level overshoots the mark—the bonus-taking probability rises to 0.281, which is more than the 0.260 at the average bonus level.

Broadly speaking, raising supplemental bonuses at the average bonus level by 50 percent roughly brings them into line with supplemental bonuses at the maximum bonus level, but the increase is not enough to drop the bonus-taking probability to the level seen at the maximum bonus level. Other factors then must account for the lower bonus-taking probability at the maximum bonus level—individuals may be attracted by the wider array of non-bonus options. With more to choose from, expected consumer surplus is higher. Only when supplemental bonuses at the maximum bonus level are cut by 50 percent, along with the 50-percent increase in these bonuses at the average bonus level, are the bonus-taking probabilities about the same at the average and maximum bonus levels.

Another implication is that, given the logit functional form and the assumption in our regression specification that the bonus effect is the same for supplemental bonuses as for enlistment bonuses, it can be shown that an across-the-board increase in stand-alone enlistment bonus amounts of x percent has the same effect on the probability of choosing an enlistment bonus as an across-the-board decrease of x percent in all supplemental bonus amounts. Overall, the counterfactual example illustrates the power of supplemental bonuses to shift choices toward or away from stand-alone enlistment bonuses, and vice versa.

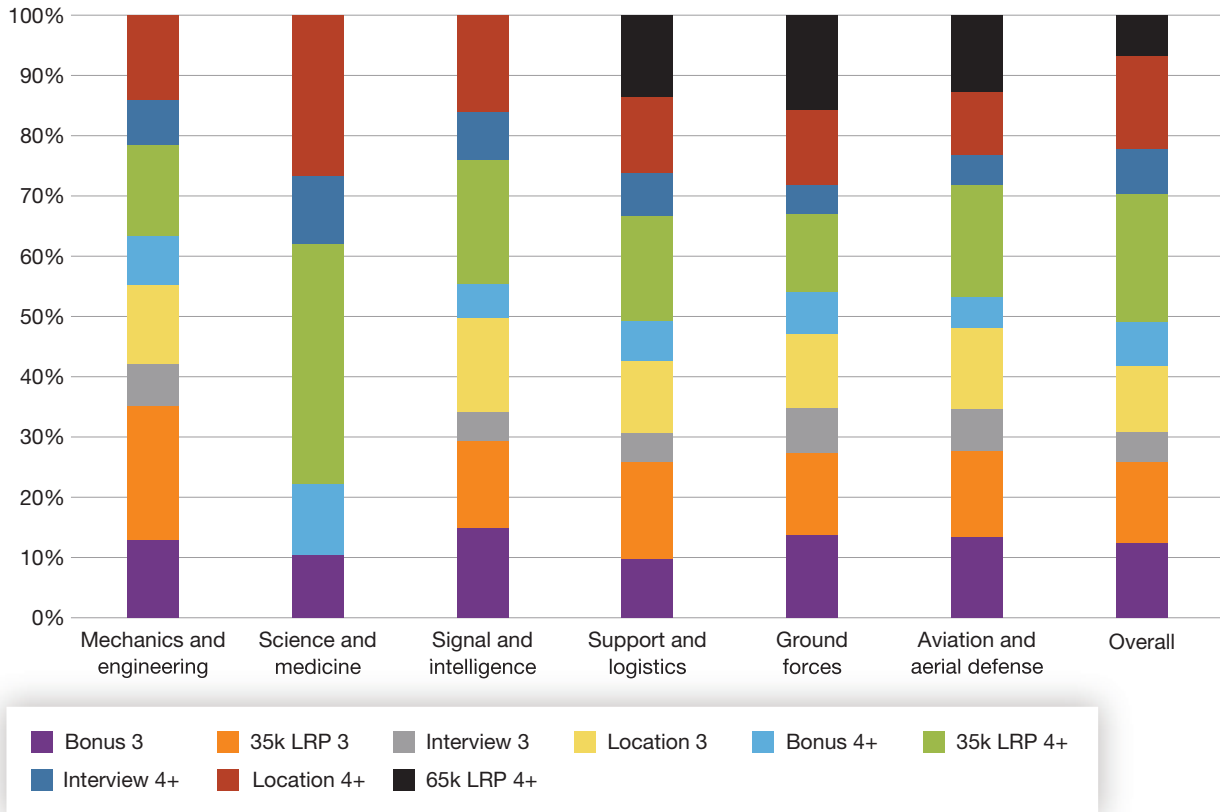
Figures 5.1–5.8 depict the distribution of chosen options by job type, gender, and race/ethnicity, all by AFQT level. The figures provide visual comparisons across these dimensions and confirmation of the similarity in choices for job types with similar offer sets. Offer sets are similar, or nearly the same, when the same pattern of colors appears in the distributions.

Summarizing the main findings about option choice:

- Chosen options were similar across job types when similar choice sets were offered. Science and medicine offered fewer options, and, as seen in Figure 5.1 for high-AFQT respondents at the average bonus level, the \$35,000 LRP 4+ option was chosen much more frequently compared with other job types. By comparison, support and logistics, ground forces, and aviation and aerial defense offered the same options and had the same distribution of chosen options. Chosen options were also similar by gender and, though somewhat less so, by race/ethnicity. A relatively high percentage of high-AFQT Black or African American respondents chose \$35,000 LRP, for instance, while a relatively high percentage of high-AFQT white respondents chose Location 4+.

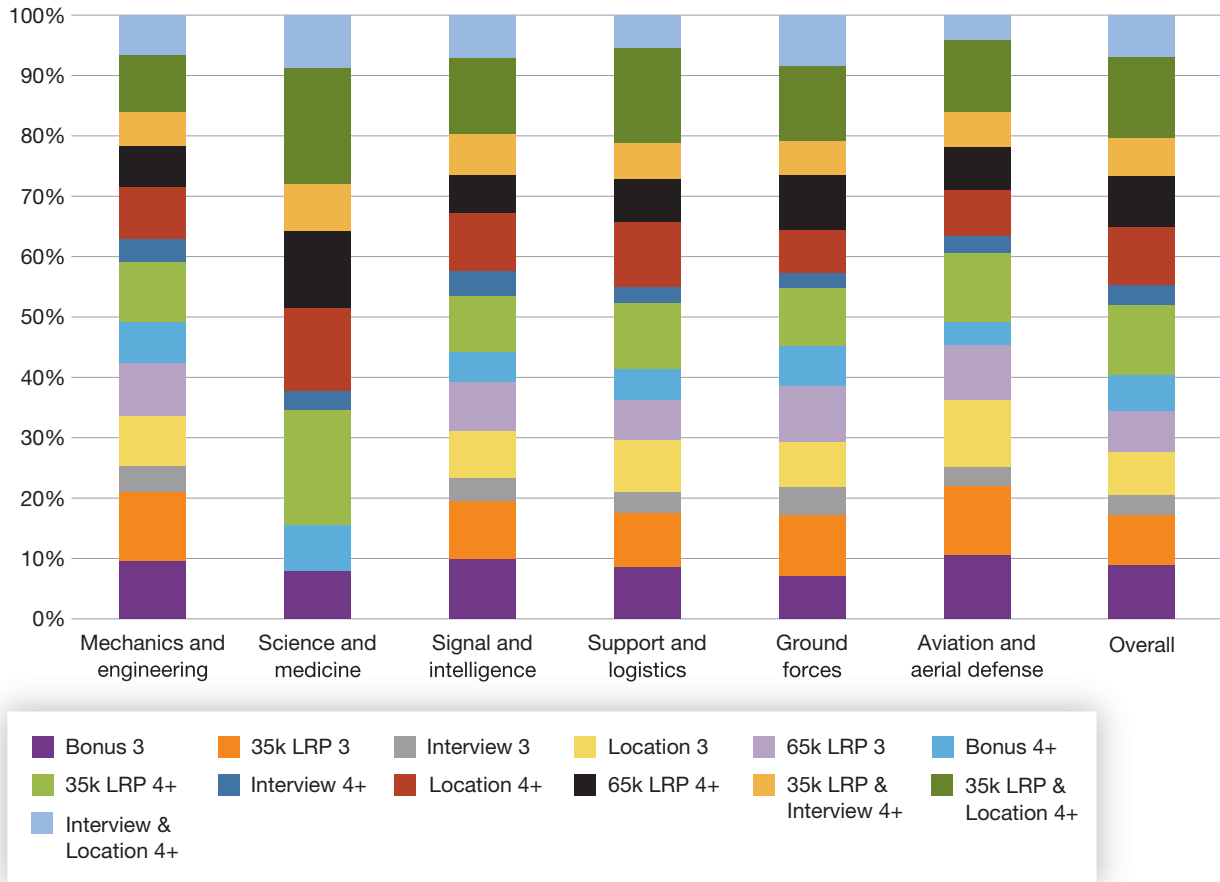
FIGURE 5.1

Chosen Option by Job Type: Average Bonus Level, High AFQT Score



- Non-bonus options were chosen more frequently overall than stand-alone bonus options. This provides assurance that non-bonus options would be attractive if included in a menu of options. The attractiveness of non-bonus options depended in part on their supplemental bonuses.
- Low-AFQT respondents were more likely than high-AFQT respondents to choose stand-alone bonuses. This indicates a greater preference for money relative to the non-bonus options. Low-AFQT respondents may have placed less value on student loan repayment because they did not have, or did not expect to have, as much student loan debt as high-quality respondents and therefore would not benefit as much from loan repayment. At the average bonus level, 29 percent of low-AFQT respondents chose a student loan repayment option³ when offered versus 41 percent of high-AFQT respondents. At the maximum bonus level, 41 percent of low-AFQT respondents chose an option with student loan repayment, in some cases paired with location or interview, versus 55 percent of high-AFQT respondents.
- Bonus amount had a positive and statistically significant effect on the probability that an option was chosen. Changes of several thousand dollars in enlistment bonuses, or, alternatively, in supplemental bonuses, can shift the distribution of chosen options toward options with relatively higher bonuses. The potential for bonuses to change the attractiveness of enlistment options is important because the

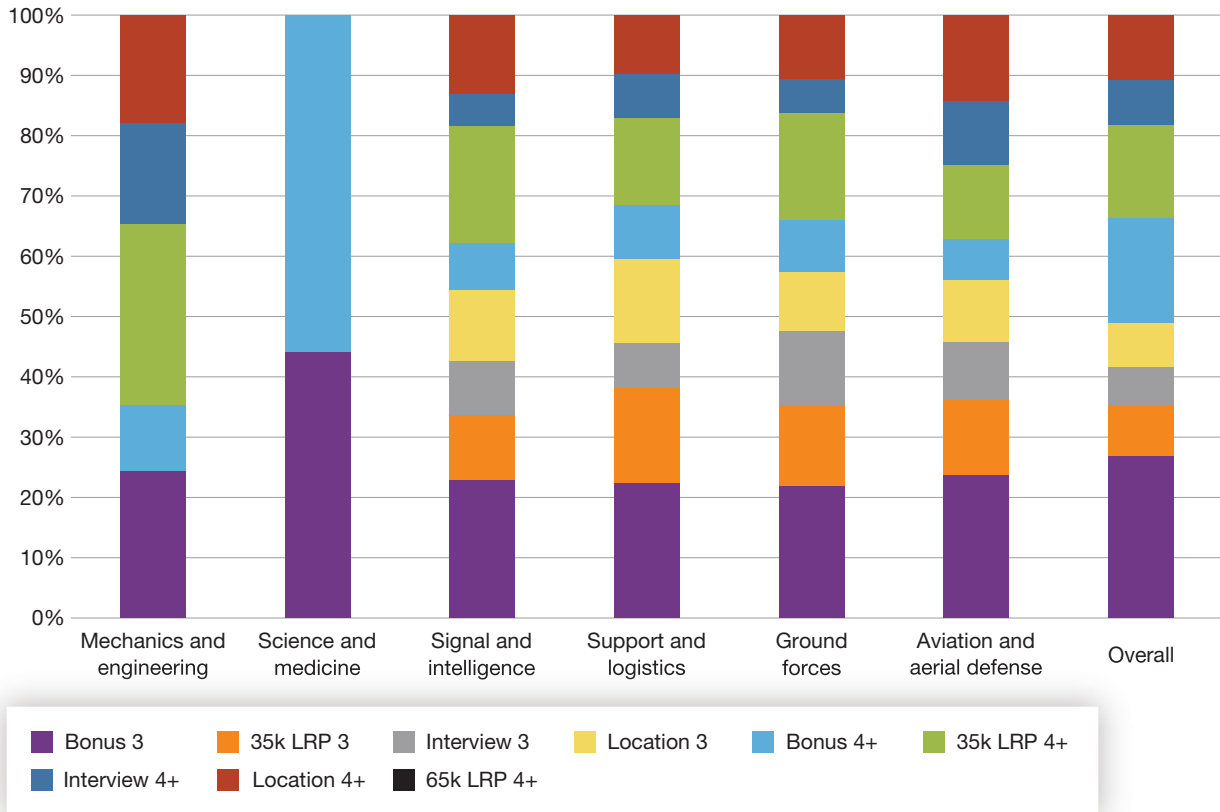
³ The 29 percent figure excludes job type 2, science and medicine, which did not offer LRP options to low-AFQT respondents; therefore, LRP options could not have been selected. The other percentages, those for high AFQT at the average bonus level and for high and low AFQT at the maximum bonus level, include all job types.

FIGURE 5.2
Chosen Option by Job Type: Maximum Bonus Level, High AFQT Score


non-bonus incentives of student loan repayment, interview, and location have fixed characteristics, and by themselves they probably would not be competitive with enlistment bonuses, especially when recruiting is difficult and enlistment bonuses are set higher. Supplemental bonuses are the compensating differential bringing non-bonus options up to par with stand-alone bonuses. Because supplemental bonuses are smaller than stand-alone bonuses, this creates the potential to reduce costs at the same time.

We also computed option distributions and ran logit regressions for high- and low-AFQT respondents at the average and maximum bonus levels conditional on whether the propensity to join the Army was above or below the median as measured by the stated probability of joining for a term of three years without enlistment incentives. The results, not displayed here, show similar distributions. The chief result was that high-propensity respondents were more likely than low-propensity respondents to select a \$35,000 LRP with a four-or-more-year term, 18 percent versus 16 percent for respondents with high AFQT and 21 percent versus 10 percent for those with low AFQT.

FIGURE 5.3

Chosen Option by Job Type: Average Bonus Level, Low AFQT Score

Analysis of the Stated Probability of Joining the Army

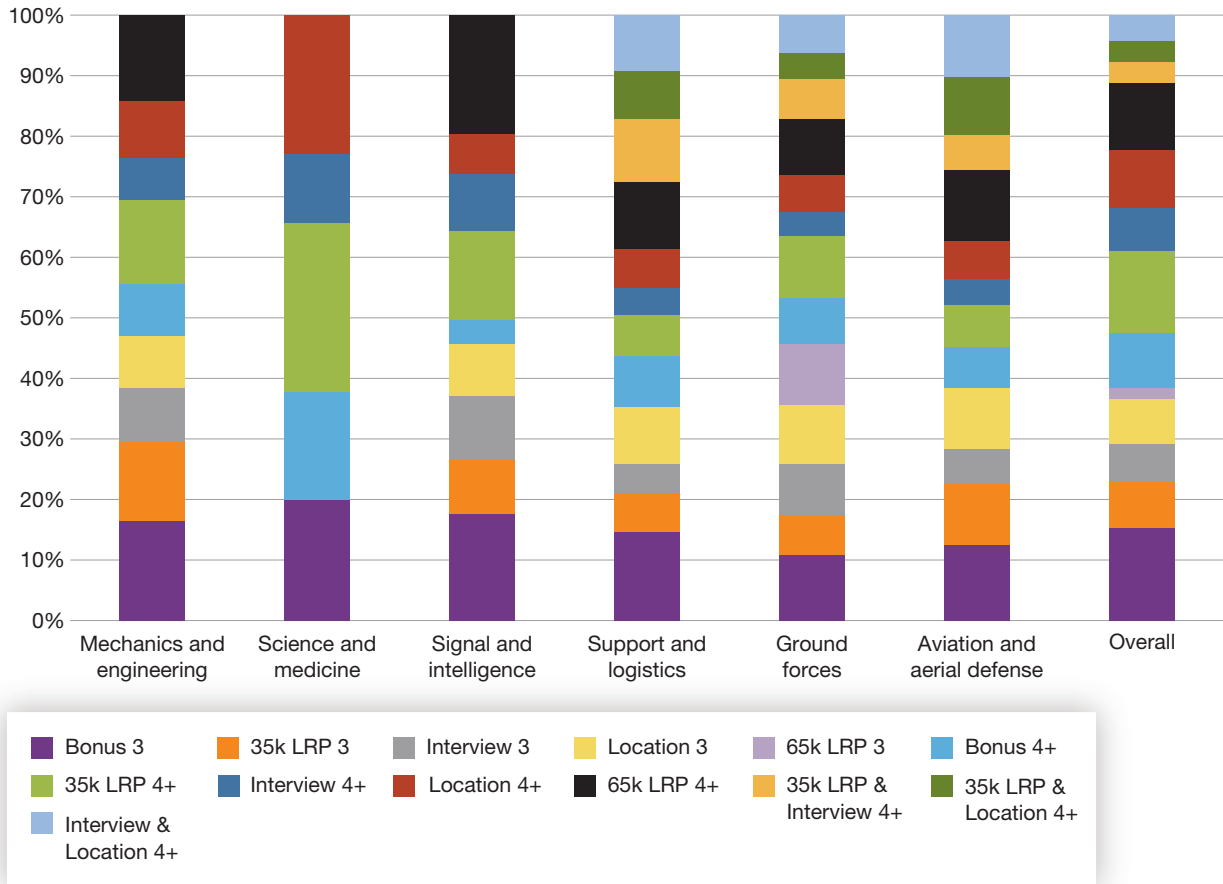
For each of the four job types shown to the respondent, Survey 2 asked the respondent to rate the chances of joining the active-duty Army in the next few years with a three-year term when no incentives were offered; to rate the chances of joining for a term of four or more years when no incentives were offered; to choose an enlistment option from the menu at the average bonus level, given the job type and the respondent's AFQT level (high or low), and to rate the chances of joining, assuming that the respondent received the chosen option; and, similarly, to choose an enlistment option at the maximum bonus level and to rate the chances of joining, assuming that the respondent received the chosen option. The chances of joining were recorded on a scale of 0 to 100, and we use the term *probability of joining* to mean the same as *chances of joining*, all the while mindful that this is a stated probability rather than actual enlistment behavior.

We used two questions about joining the Army when no incentives were offered to control for the propensity to join the Army: the probability of joining for a term of three years or for a term of four or more years. The responses to the questions were highly correlated (0.95),⁴ and we used the three-year probability. Controlling for propensity is essential for obtaining accurate estimates for the options because propensity may be correlated with option choice. If propensity were not controlled, the option coefficients would depend on

⁴ Regressing the probability of joining for three years on the probability of joining for four or more years had a coefficient of 0.946, and reverse regression had a coefficient of 0.945. The R-squared in both cases was 0.89.

FIGURE 5.4

Chosen Option by Job Type: Maximum Bonus Level, Low AFQT Score



the “true” association between the option and the probability of joining, and the indirect association from the influence of propensity on option choice. The stated probability of joining the Army for a term of three years reflects the respondent’s willingness to join in the absence of enlistment incentives and therefore can be used to control for propensity. It is not mediated by demand-limiting factors as would exist if the Army had already filled its quota for a job type. Controlling for propensity makes the coefficient on the option indicator more likely to be causal, but the control may be incomplete and the coefficient on the option indicator might still harbor some selection effect owing to the propensity to choose the option rather than the broader propensity to join for a term of three years, as represented by *Prob3*.

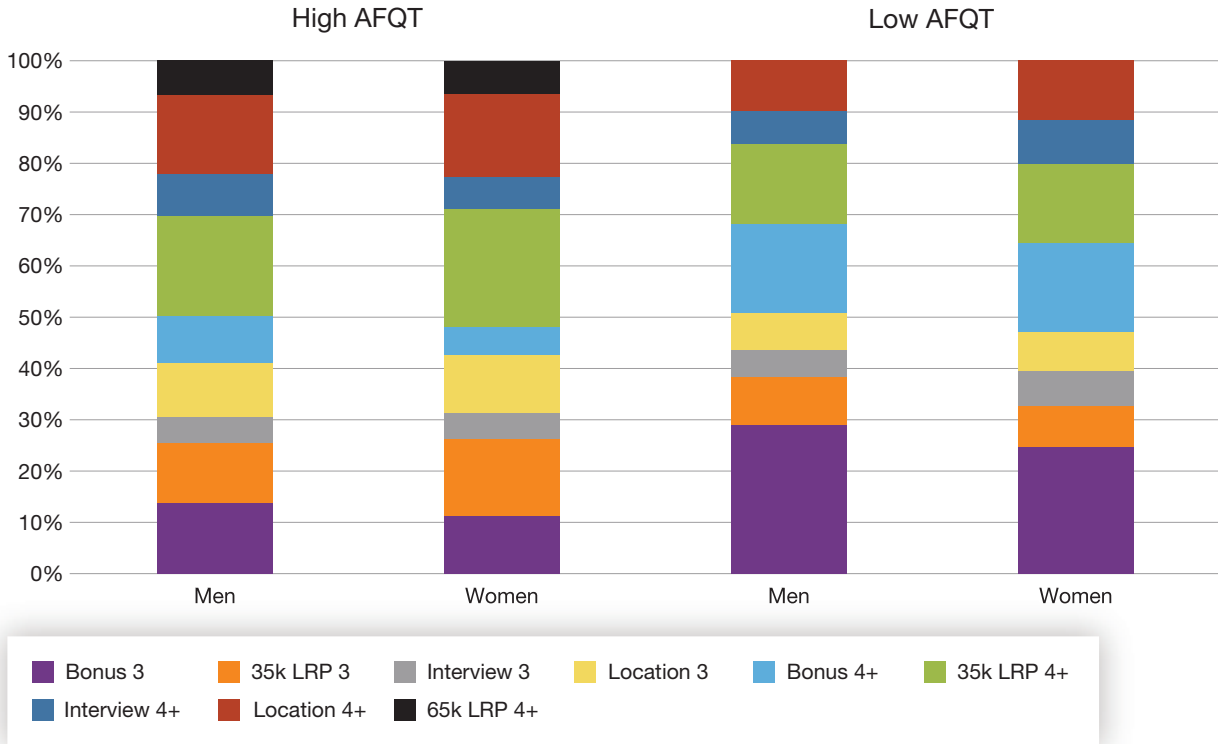
We used a linear probability model with the following specification (omitting the subscript for job type):

$$\Pr(\text{join})_n = \text{Intercept} + \sum \gamma_j I(\text{option})_{jn} + \gamma \text{Bonus}_{jn} + \gamma_p \text{Prob3}_n + \varepsilon_n$$

Respondent n ’s probability of joining the active-duty Army in the next few years in job type t is a function of the intercept, the option j chosen by the respondent, the option’s bonus amount, the respondent’s propensity to join the Army in job type t , and an error term.⁵ The intercept is for the left-out option, a stand-alone bonus

⁵ In an auxiliary analysis, we ran a specification in which the dependent variable was the change in probability, $\Pr(\text{join})_n - \text{Prob3}_n$. The change models had a lower R-squared, fewer coefficients were significant, some coefficients were negative, and

FIGURE 5.5
Chosen Option by Gender and AFQT: Average Bonus Level

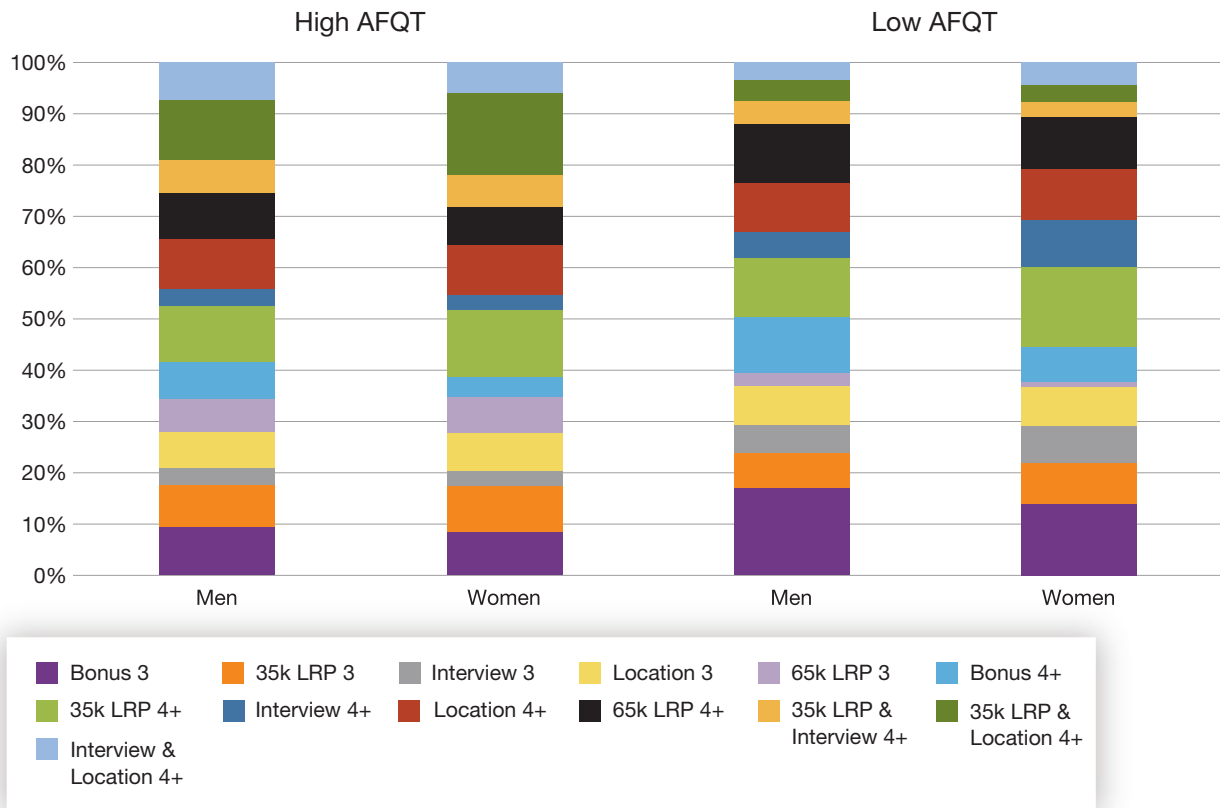


with a three-year term of service. The chosen-option indicator, $I(option)_{jn}$, is 0 for options not chosen by the respondent and 1 for the option chosen. The coefficient γ_j indicates whether a chosen option has a larger or smaller association with the probability of joining than the left-out option. The term $\gamma Bonus_{jn}$ parallels the bonus term in the option choice specification. Survey 2 randomized the bonus amount for a stand-alone bonus, given the job type and the respondent's AFQT level, but here the respondent has chosen an option; hence, the bonus comes with it. Therefore, bonus variation is no longer purely exogenous, and the coefficient γ reflects both causal effect and selection. $Prob3_n$ controls for propensity to join for a term of three years in the absence of any enlistment incentives.

Several options involve the student loan repayment program, LRP, with limits of either \$35,000 or \$65,000. Survey respondents were asked the chances of joining the Army in the next few years assuming that they were given the chosen option. In the case of LRP, there is a complication: Receipt of LRP requires having existing, qualifying student loan debt at the time of enlisting, and this is how the option was explained in the survey (see Appendix H and Appendix A). Survey respondents were not required to have such debt at the time of the survey. We assumed that respondents choosing LRP believed they would qualify for it based on acquiring qualifying loan debt prior to the time they enlisted.

most coefficients were positive like those in the levels model but somewhat smaller. We also tried a specification in which the probability of joining was regressed on indicators for the incentives, an indicator for whether an incentive required a term of four or more years, and bonus amount. The specification did not fit the data as well as the one above in which the incentive variable embeds the direct effects of the incentive and term length and their interaction.

FIGURE 5.6
Chosen Option by Gender and AFQT: Maximum Bonus Level



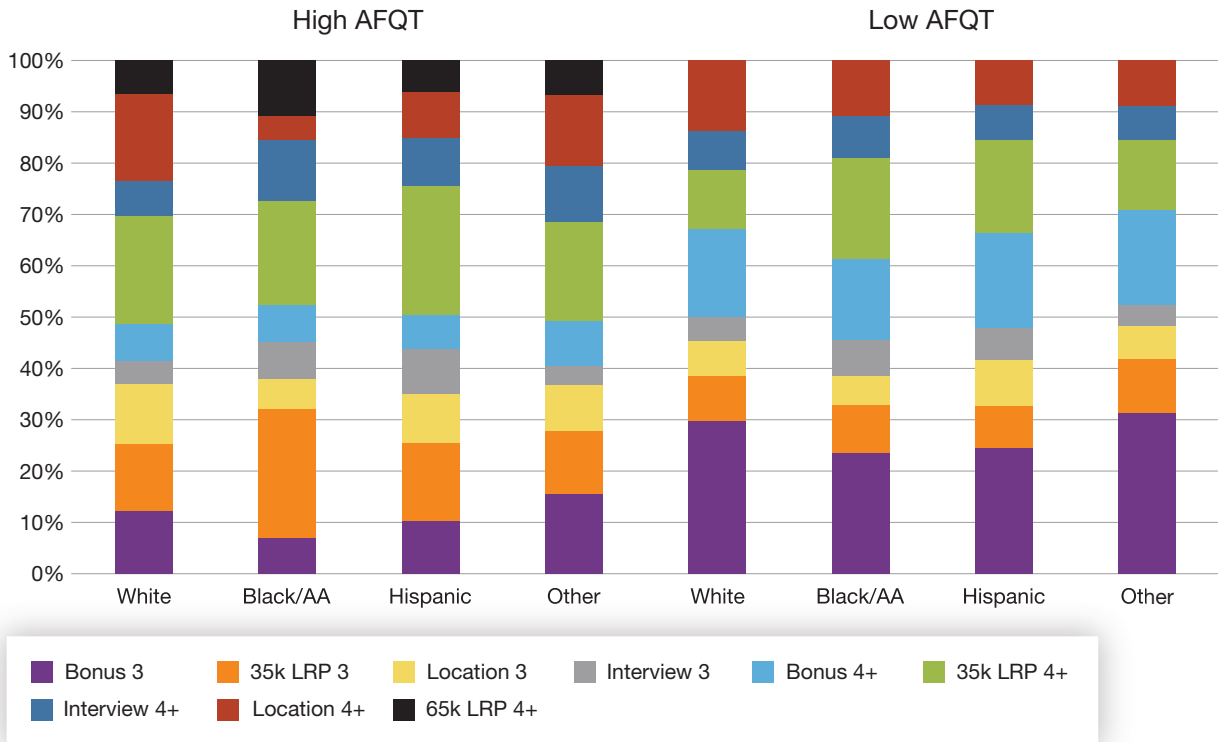
We estimated the model by OLS. We first estimated models by job type given AFQT level and bonus level. The estimates were statistically similar (within two standard errors) across the regressions, and we pooled data across job types as before. This again involved considering the risk of biasing the true estimates by job type and making estimates appear too precise, versus showing estimates by job type, rather than pooled, that might be misleading because of small sample size. We also ran sensitivity analyses, summarized in the following text, to see whether coefficients on the chosen options and bonus amount were affected.

Table 5.6 shows the OLS regression estimates for the probability of joining the active-duty Army in the next few years, for chosen options at the average bonus level for high-AFQT respondents. The omitted option is a stand-alone bonus for a three-year term of enlistment, and its association with the probability is captured in the intercept. At the average bonus level, the intercept adds 5.4 percentage points to the probability of enlisting beyond what would be expected from the propensity to join, represented by *Prob3*, the probability of enlisting when there are no incentives. The contribution of *Prob3* is 27.6 ($= 0.812 \times 34.04$, the coefficient multiplied by the average value of *Prob3*). Respondents choosing other options, such as a \$35,000 loan repayment, an interview, or choice of location, had probabilities of joining that were 3 to 5 percentage points higher than the intercept, except for Location 3 (choice of region of location for a three-year term), and these coefficients are statistically significant.

Recall that bonus amount had a positive, statistically significant effect on the chance than an option would be chosen. In Tables 5.6–5.9, in contrast, bonus amount in thousands of dollars (\$000s) has a coefficient of zero to three decimal places. These findings imply that bonuses are influential in directing respondents

FIGURE 5.7

Chosen Option by Race/Ethnicity and AFQT: Average Bonus Level

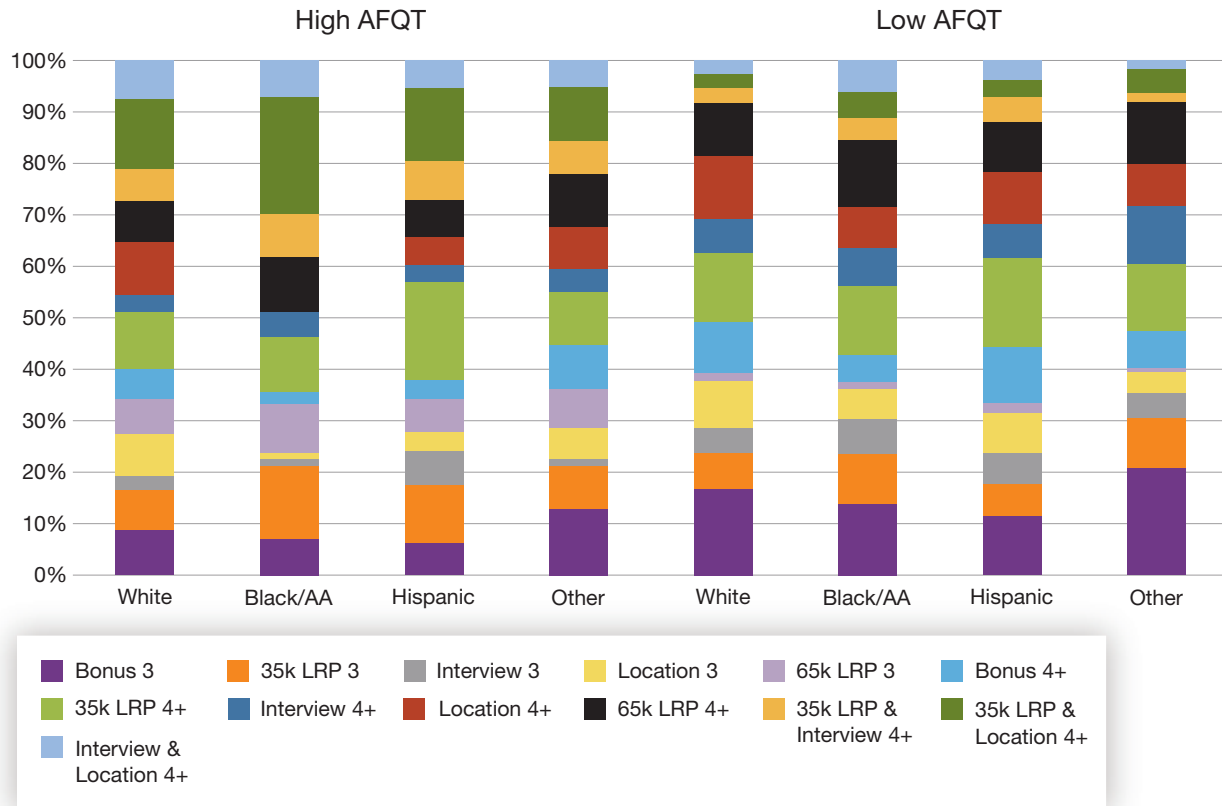


NOTE: AA = African American.

toward an option but, given the chosen option and the bonus that was seen to come with it, bonuses play no additional role in explaining the probability of joining the Army. When choosing an option, respondents apparently sort themselves such that, although there exist differences in bonus amount across the bins, the impact of bonus amount is absorbed into the indicator for the chosen option and bonus amount has no further influence.

Regression estimates at the maximum bonus level for high-AFQT respondents are in Table 5.7. The intercept, again a stand-alone bonus for a three-year term, raises the probability of joining by 8.0 percentage points relative to the probability at no incentives, which is 26.2 ($= 0.771 \times 34.04$). None of the coefficients for options having a three-year term of enlistment are significant, but most of the coefficients for options having a term of four or more years are significant and add roughly three to six more percentage points to the probability of joining. The coefficient on bonus amount is again zero.

Tables 5.8 and 5.9 are for low-AFQT respondents at the average and maximum bonus levels, respectively. The contribution of *Prob3* is 28.9 ($= 0.757 \times 38.17$) at the average bonus level and the same at the maximum bonus level. The intercept (Bonus 3) at the average bonus level adds 9.7 percentage points to the stated probability of joining, and the coefficients for a stand-alone bonus and a choice of location, both with a term of four or more years, add another 5 and 4 more points beyond the 9.7 points. The coefficients for the other options are not significant—i.e., they do not add to or decrease the probability of joining beyond the intercept. The story is similar at the maximum bonus level. The intercept adds 8.1 percentage points beyond the 28.9 points contributed by *Prob3*. Chosen options with a three-year term are not significant except for the \$35,000 loan repayment, while several options with terms of four or more years are significant and add 5 to 8 percentage points beyond the three-year bonus intercept to the probability of joining.

FIGURE 5.8
Chosen Option by Race/Ethnicity and AFQT: Maximum Bonus Level


NOTE: AA = African American.

TABLE 5.6
Probability of Joining the Army in the Next Few Years—OLS Estimates: Average Bonus Level, High AFQT Score

Option	Estimate	Standard Error	Pr(> z)	Significance	Predicted	Sample
(Intercept)	5.408	1.443	0.000	***	33.05	31.38
\$35,000 LRP 3	3.069	1.305	0.019	*	36.12	36.79
Interview 3	2.826	1.643	0.085	+	35.88	33.75
Location 3	1.346	1.355	0.320		34.40	28.50
Bonus 4+	3.686	1.398	0.008	**	36.74	39.89
\$35,000 LRP 4+	4.729	1.075	0.000	***	37.78	42.07
Interview 4+	4.954	1.375	0.000	***	38.00	44.25
Location 4+	4.973	1.140	0.000	***	38.02	38.16
Bonus (000s)	0.000	0.000	0.169		--	--
Prob3	0.812	0.011	< 2e-16	***	--	--

NOTE: R-squared: 0.69. Observations: 2,648. Omitted option is Bonus 3. “\$35,000 LRP 3” denotes an indicator variable for a \$35,000 LRP with a three-year term, “Bonus 4+” denotes an indicator variable for a stand-alone bonus with a term of four or more years, etc. Predicted values are at the average values of Bonus (000s) and Prob3, which are 8.483 and 34.04. \$65,000 LRP 4+ did not estimate because of singularity. Significance: *** = 0.001, ** = 0.01, * = 0.05, + = 0.10.

TABLE 5.7

Probability of Joining the Army in the Next Few Years—OLS Estimates: Maximum Bonus Level, High AFQT Score

Option	Estimate	Standard Error	Pr(> z)	Significance	Predicted	Sample
(Intercept)	8.010	1.945	0.000	***	34.25	31.06
\$35,000 LRP 3	2.785	1.778	0.117		37.03	41.42
Interview 3	-0.666	2.305	0.773		33.58	36.54
Location 3	0.979	1.836	0.594		35.23	32.75
Bonus 4+	3.733	2.322	0.108		37.98	41.57
\$35,000 LRP 4+	6.453	1.566	0.000	***	40.70	45.33
Interview 4+	2.529	2.196	0.250		36.78	43.97
Location 4+	6.590	1.629	0.000	***	40.84	41.25
\$65,000 LRP 4+	5.838	1.788	0.001	**	40.09	44.31
\$35,000 LRP and interview 4+	4.542	1.891	0.016	*	38.79	44.72
\$35,000 LRP and location 4+	4.946	1.577	0.002	**	39.20	40.46
Interview and location 4+	2.117	1.856	0.254		36.37	37.01
Bonus (000s)	0.000	0.000	0.232		--	--
Prob3	0.771	0.013	0.001	***	--	--

NOTE: R-squared: 0.61. Observations: 2,369. Omitted option is Bonus 3. Predicted values are at the average values of Bonus (000s) and Prob3, which are 16.671 and 34.04. \$65,000 LRP 3 did not estimate because of singularity. Significance: *** = 0.001, ** = 0.01, * = 0.05, + = 0.10.

TABLE 5.8

Probability of Joining the Army in the Next Few Years—OLS Estimates: Average Bonus Level, Low AFQT Score

Option	Estimate	Standard Error	Pr(> z)	Significance	Predicted	Sample
(Intercept)	9.743	1.848	0.000	***	38.65	35.04
\$35,000 LRP 3	3.559	2.176	0.102		42.21	42.52
Interview 3	-3.063	2.431	0.208		35.59	27.03
Location 3	2.785	2.286	0.223		41.44	38.14
Bonus 4+	5.290	1.649	0.001	**	43.94	47.53
\$35,000 LRP 4+	1.548	2.059	0.452		40.20	45.84
Interview 4+	1.373	3.084	0.656		40.03	42.72
Location 4+	4.040	2.406	0.094	+	42.69	41.56
Bonus (000s)	0.000	0.000	0.954		--	--
Prob3	0.757	0.021	< 2e-16	***	--	--

NOTE: R-squared: 0.58. Observations: 997. Omitted option is Bonus 3. Predicted values are at the average values of Bonus (000s) and Prob3, which are 6.777 and 38.17. \$65,000 LRP 4+ did not estimate because of singularity. Significance: *** = 0.001, ** = 0.01, * = 0.05, + = 0.10.

TABLE 5.9

Probability of Joining the Army in the Next Few Years—OLS Estimates: Maximum Bonus Level, Low AFQT Score

Option	Estimate	Standard Error	Pr(> z)	Significance	Predicted	Sample
(Intercept)	8.114	2.282	0.000	***	37.01	34.85
\$35,000 LRP 3	6.115	2.542	0.016	*	43.13	43.36
Interview 3	1.744	2.658	0.512		38.76	35.99
Location 3	-0.371	2.522	0.883		36.64	33.80
Bonus 4+	5.670	2.919	0.052	+	42.68	45.76
\$35,000 LRP 4+	4.908	2.078	0.018	*	41.92	47.05
Interview 4+	0.129	2.515	0.959		37.14	35.31
Location 4+	8.012	2.266	0.000	***	45.02	47.03
\$65,000 LRP 4+	4.431	2.897	0.126		41.44	45.16
\$35,000 LRP and interview 4+	7.321	3.658	0.046	*	44.33	46.39
\$35,000 LRP and location 4+	2.392	3.558	0.502		39.40	40.26
Interview and location 4+	1.287	3.396	0.705		38.30	39.45
Bonus (000s)	0.000	0.000	0.564		--	--
<i>Prob3</i>	0.757	0.022	< 2e-16	***	--	--

NOTE: R-squared: 0.56. Observations: 1,050. Omitted option is Bonus 3. Predicted values are at the average values of Bonus (000s) and *Prob3*, which are 11.820 and 38.17. \$65,000 LRP 3 did not estimate because of singularity. Significance: *** = 0.001, ** = 0.01, * = 0.05, + = 0.10.

We explored whether chosen-option and bonus amount coefficients were affected by including other variables. When added, indicators for job type and whether the job type was top ranked were not significant.⁶ Demographics caused little change in the option and bonus amount coefficients. The demographics included age, gender, student year of study (high school, first year of college, second or higher year of college), highest level of education completed for nonstudents (less than two years of college, two or more years of college), whether the respondent intended to get further education, marital and children-present status, town size, family income level when the respondent was age 18, mother's educational level, Black or African American, and Hispanic.

We estimated regressions separately for men and women and for racial/ethnic groups (Black or African American, Hispanic, Other, white). Men and women had similar coefficients for high-AFQT respondents at the average bonus level. At low AFQT, women had a lower intercept but higher coefficients, implying that they were less likely to join the Army but more responsive to alternate options. Black or African American respondents and respondents in the Other category were not statistically different than white respondents. Hispanic respondents had a lower coefficient on *Prob3* but had higher coefficients on the options with terms of four years or more. Overall, while there were differences, these results were consistent with the estimates in Tables 5.6 and 5.8.

⁶ The indicator for job type 2, science and medicine, was significant when all job types were pooled. But, paralleling the choice analysis, job type 2 was omitted for the results reported in Table 5.6. Similarly, Tables 5.7–5.9 follow the same pooling as in the choice models.

At the maximum bonus level, with few exceptions, the coefficients for respondents in the Black or African American, Hispanic, and Other categories were not statistically different from those of white respondents. However, there were differences by gender. For men, coefficients on the chosen options were not statistically significant—i.e., the chosen options had little if any additional contribution to the probability of joining beyond the intercept (three-year bonus). For women, the coefficients for options with terms of four or more years were mostly positive and significantly different than men's coefficients for high AFQT. Women who chose these options had a higher probability of joining, holding constant their propensity to join.

Finally, we checked how omitting the control for propensity, *Prob3*, affected the estimates. This led to a large change in the estimates. For instance, in the probability regression at the average bonus level for high AFQT (Table 5.6), the coefficient on \$35,000 loan repayment with a three-year term changed from 3.069 to 6.151, and the coefficient on the same incentive with a four-or-more-year term changed from 4.729 to 11.092. These changes indicated a strong correlation between propensity and the chosen options. The coefficients on other options were similarly affected, particularly options with terms of four or more years. If propensity had not been controlled, the estimates would have had a large upward bias, exaggerating the relationship between the chosen options and the probability of joining.

Summary

First, a quick review of the setting for this chapter: Survey 2 was designed to probe respondents' interest in enlistment incentives extending beyond stand-alone bonuses and including student loan repayment, an interview with a major organization when leaving the Army, and the choice of location at the regional level. These incentives were specified with respect to terms of service of either three years or four or more years. Also, two versions of student loan repayment were offered: repayment of debt existing at enlistment up to a limit of \$35,000 or \$65,000. All incentives other than stand-alone bonuses were typically paired with a supplemental bonus. The supplemental bonuses were less than the stand-alone bonus, and the difference reflected to a degree the implicit value to prospective recruits of loan repayment, interview, and location. An incentive, its term of service, and its bonus amount together represented an enlistment option. Supplemental bonus amounts were chosen such that the incentive plus the supplemental bonus had approximately the same value to respondents as the stand-alone bonus. Given that stand-alone bonuses anchored the value of the options, we developed option sets at two bonus levels, historical average bonus amounts and historical maximum bonus amounts. Option sets were developed separately for the bonus levels, and, at each bonus level, we created option sets for six job types and two AFQT levels, high and low. Each respondent saw four job types sequentially. Three job types were randomly drawn, and the fourth job was the respondent's highest-ranked job type that had not yet been shown. This guaranteed that one of the four job types was the respondent's highest-ranked job type. For each job type, the respondent first reported the probability of joining the active-duty Army in the next few years for a term of three years with no enlistment incentives and a term of four or more years with no enlistment incentives. At the average bonus level, the respondent selected an option from the option set for the job type and the respondent's quality level, then reported the probability of joining the Army. An analogous procedure was followed at the maximum bonus level.

The analysis focused on two questions: What option did the respondent choose, and what was the relationship between the chosen option and the probability of joining the Army? A main finding from the option analysis was that stand-alone bonuses were chosen only 20 percent of the time by high-AFQT respondents and 44 percent of the time by low-AFQT respondents at the average bonus level, and at respectively lower percentages at the maximum bonus level. Related to this finding, the choices of non-bonus options were diffuse. Respondents did not bunch up around certain options, and the diversity of chosen options can be interpreted

as diversity in the way respondents valued the options. By implication, a menu of choices had greater intrinsic value than stand-alone bonuses by themselves.

Bonus amount affected option choice—for instance, an increase in supplemental bonuses was predicted to decrease the percentage choosing a stand-alone bonus. Option choices were similar for men and women, similar across job types that offered comparable option sets, and similar across racial/ethnic groups, though with Black or African American respondents having a higher preference than other groups for student loan repayment at the average bonus level, and respondents with high AFQT who intended to get further education more likely to choose loan repayment than those not so intending.

The probability analysis estimated the relationship between the chosen option and the probability of joining the active-duty Army in the next few years, controlling for bonus amount and propensity to enlist. At the average bonus level, a stand-alone bonus with a three-year term was associated with a higher probability than expected from propensity by itself. The probability was 5.4 percentage points higher for high-AFQT respondents and 9.7 points higher for low-AFQT respondents. The stand-alone bonus with a term of four or more years added another 3.7 percentage points for the high-AFQT group and 5.3 more points for the low-AFQT group. The other options—loan repayment, interview, and location with either terms of three years or four or more years—were all statistically significant for high-AFQT respondents, except for Location 3, and added 3 to 5 points to the probability of enlisting. In other words, the respondents choosing those options had a higher probability of joining than those choosing a three-year stand-alone bonus. In contrast, for low-AFQT respondents, the other options were not statistically significant, except for Location 4+. That is, the options attracted respondents with a probability of joining that was no higher, or lower, than those choosing a three-year stand-alone bonus. These findings were often robust to different variants of the model. Adding a large set of demographic variables to the regression caused little change in the option and bonus amount coefficients. Men and women with high AFQT had similar results at the average bonus level, though at low AFQT women had a lower baseline probability than men but higher coefficients—i.e., a greater change in the probability of joining given the option chosen. Black or African American respondents and respondents in the Other category were statistically like white respondents, while Hispanic respondents had higher coefficients for options with terms of four or more years. The bonus amount variable was not statistically significant and was zero. Thus, although bonus amount affected the choice of option, it did not affect the probability of joining the Army given the chosen option. Finally, job type and the respondent's ranking of the job type were not statistically significant.

Option sets at the maximum bonus level allowed exploration of respondent behavior under a wider and more generous set of options than at the average bonus level. Stand-alone bonuses were higher at the maximum bonus level, which provided an opportunity to pair loan repayment, interview, and location with higher supplemental bonuses and to offer options with these incentives in pairs at a somewhat smaller supplemental bonus level. We found that the intercept, again based on a three-year stand-alone bonus, was associated with an 8-point-higher probability of joining the Army for both high- and low-AFQT respondents. Also, there were no statistically significant, negative coefficients; those choosing an option other than a three-year bonus were no less likely to join. Relative to the 8 points coming from the three-year bonus, several options chosen by high-AFQT respondents were associated with a further increase of 4.5 to 6.5 percentage points in the stated probability of joining the Army. These options all came with a term of four or more years and were loan repayment of \$35,000, loan repayment of \$65,000, choice of location, and the pairs \$35,000 loan repayment and interview and \$35,000 loan repayment and location. For low-AFQT respondents, several of the chosen options were statistically significant and added 4 to 8 percentage points to the probability of joining the Army. One of these options had a term of three years—\$35,000 loan repayment—and the others had a term of four or more years: stand-alone bonus, \$35,000 loan repayment, choice of location, and \$35,000 loan

repayment and interview. Further analysis showed that the significant options for high-AFQT respondents traced to women, and men had only one significant option, location with a four-or-more-year term. The women who chose these options had a higher probability of joining than did women who chose a three-year bonus. By comparison, men who chose these options (and others) had no higher or lower probability of joining than men who chose a three-year bonus.

Potential Cost Savings

We assessed the potential cost savings from the EOO approach under the menus we offered by comparing the cost of the menu of options at the historical average bonus level with the cost of stand-alone bonuses for a given accession goal and mix of high- and low-AFQT recruits. Cost savings can be expected to differ if other menus are offered, though the approach for estimating potential cost savings described here can be used.

The computation of cost savings is based on the following steps:

- Using the distribution of chosen options for each job type and AFQT level, compute the weighted average of bonuses. The chosen options involve both stand-alone and supplemental bonuses, and the weights in the weighted average are the proportions choosing the options. The result is the average cost per person given the job type and AFQT level. The cost includes the cost of bonuses and, for the student loan repayment option, the direct outlay for it. As explained below, we use three alternative assumptions about the distribution of chosen options that depend on the percentage taking a student loan repayment option.
- Compute an overall weighted average of these costs by using the historical proportion of Army recruits in each job type over FY 2001–FY 2019. Using the historical proportion of recruits by job type ensures that the weighted average reflects the actual manpower structure of entrants into the Army. The result is an average cost per person across job types at a given AFQT level (high or low).
- As a counterfactual, assume that only stand-alone bonuses for terms of three years and four or more years were offered. Reallocate the proportion not taking a stand-alone bonus with a term of three years to a stand-alone bonus with a term of three years, and similarly for the proportion not taking a stand-alone bonus with a term of four or more years. Using the stand-alone bonus amounts by job type and high or low AFQT level that are given in the menu of options, compute the average bonus by job type, then the average bonus across job types, as above. In doing these computations, a shift from a loan repayment option to a stand-alone bonus also eliminates the direct outlay for the loan repayment. The result is an average cost per person across job types at a given AFQT level (high or low), assuming that only stand-alone bonuses for terms of three years or four or more years are paid and adjusting for not having to pay a direct outlay for the loan repayment option.
- Compute the change in cost per person by taking the difference between the average cost per person under the menu approach versus the counterfactual.
- Using the change in the cost per person, scale up to numbers reflecting the Army's recruiting target and quality goals. In recent years, Army recruits have totaled about 60,000, and 54 percent have been high quality.
- Not all recruits receive bonuses, and those receiving bonuses form the group to whom menus would be offered. We use the historical percentage of recruits receiving a bonus, which is 60 percent for high-quality recruits and 21 percent for low-quality recruits.

As discussed earlier, high quality in recruiting refers to both a high school diploma or equivalent and scoring in the upper half of the national AFQT distribution. In Survey 2, as noted, all respondents are either

high school graduates or are seniors or juniors in high school, and those in high school are mostly seniors and can be expected to graduate. We assumed that high- and low-AFQT respondents in Survey 2 were a close proxy for high- and low-quality recruits. We recognized that some juniors and seniors might not complete a high school diploma but had a high predicted AFQT score, and they would properly be classified as low quality, but we expected this to be a negligible number.

We used several alternative assumptions about the distribution of chosen options that pivot on the percentage taking a student loan repayment option. The loan repayment take rates in Survey 2 ranged from 25 percent to 59 percent, depending on job type, AFQT, and bonus level, whereas the historical rate was far lower, at 6 percent among eligible recruits. Survey 2 indicates that many respondents were interested in loan repayment for their student debt that existed at the time of enlisting, yet the historical take rate indicates that most recruits either did not have eligible debt (the debt must be existing principal debt from a school or loan organization—e.g., a bank, not debt from a family loan) or sufficient debt to lead them to take this incentive in lieu of other incentives, or were not entering an occupational specialty that qualified for loan repayment (the specialty was not deemed a critical skill at that time). For costing, we used three loan repayment take rates: Survey 2 rates, 6 percent, and 15 percent, the last reflecting a hypothetical effort to increase the number of recruits coming from the college market, some of whom would likely have student loan debt.

When loan repayment rates were reduced from Survey 2 take rates to 6 percent or 15 percent, the displaced takers were allocated to other options. We allocated the displaced takers proportionally to each of the other options, keeping their ratios to each other constant, including the ratio of stand-alone bonus takers to non-bonus option takers. We did not know what the actual take rates would be, and the proportionality assumption was a placeholder. The stand-alone bonus amounts were not changed, nor were the supplemental bonus amounts. Because supplemental bonus amounts were the same for loan repayment, interview, and location, given the term length, job type, and AFQT level, shifting takers from loan repayment to interview and location had no effect on bonus cost per person. In contrast, shifting takers from loan repayment to stand-alone bonuses caused bonus cost per person to increase because stand-alone bonuses were larger than supplemental bonuses, while, at the same time, outlays for loan repayment decreased. If takers shifted more than proportionally to stand-alone bonuses, bonus cost savings would be lower. Alternatively, if LRP takers shifted more than proportionally to non-bonus options, bonus cost savings would be higher.

We assumed that the direct cost to the Army of a loan repayment option up to a maximum of \$35,000 was \$15,000, and the direct cost to the Army of a loan repayment option up to a maximum of \$65,000 was \$50,000. These cost estimates are consistent with recruit loan debt being high enough to make the loan repayment option more attractive to the recruit than a stand-alone bonus. For instance, if a \$10,000 bonus were available and a prospective recruit had \$15,000 in debt, the prospect would opt for the loan repayment, but if debt were near \$10,000, the bonus would be chosen because it would be paid after training completion versus over three years. Similar logic applies with smaller loan debt. There were no parallel assumptions about outlays for interview and location because implementing them does not involve a payment other than the supplemental bonus, which was already incorporated in the costing.

There were two other assumptions behind the costing. First, the Army already had (and has) programs for loan repayment (LRP), job interview when leaving the Army (PaYS), and choice of location, and the costing assumed that shifting to a menu of options would involve no additional cost of administering these programs. Second, as the probability analysis showed, menu options were often associated with a higher probability of joining the Army for high-AFQT respondents than a three-year bonus. The higher probability for loan repayment, interview, and location, all with a term of four or more years, was even slightly higher than that for a stand-alone bonus with a term of four or more years (Table 5.6). When the costing exercise takes away these loan repayment, interview, and location options, the Army would presumably have to increase its stand-alone bonus amounts to achieve the same quantity and quality of recruits. Excluding the possibly

higher administrative costs of loan repayment, interview, and location makes estimates of cost savings possibly too high, while omitting the need for stand-alone bonus increases makes such estimates too low.

Table 6.1 shows the change in cost as computed for loan repayment take rates at those of Survey 2 and at 6 percent and 15 percent. At Survey 2 rates, estimated cost increased by \$18 million annually under historical average bonus levels. At the 6-percent loan repayment take rate, estimated cost decreased by \$121 million annually, and, at the 15-percent rate, cost decreased by \$85 million annually. Therefore, the menu approach has the potential to decrease cost.

Survey 2 also obtained information on options chosen at the maximum bonus level. These results, along with the approach to costing used above, can be used to consider whether cost savings would be higher or lower when bonuses—both stand-alone and supplemental—were paid at higher levels than the historical average, as might be the case under difficult recruiting conditions.

At Survey 2 loan repayment take rates, the cost change per person for low-AFQT respondents rose from –\$1,278 to \$1,631, an increase of about \$3,000. In contrast, for high-AFQT respondents, the cost change per person fell from \$1,322 to \$783, a decrease of about \$550. These changes work in opposite directions, and the impact on total cost will depend on the percentage of high- and low-AFQT recruits who receive a bonus. This percentage is not known, but about six high-AFQT recipients are needed to nullify the cost increase from one low-AFQT recipient.

Table 6.1 also shows cost savings at loan repayment take rates of 6 percent and 15 percent. In this range, the cost savings grew larger at the maximum bonus level as compared with the average bonus level. Therefore, the overall cost savings were likely to be greater. Put differently, as recruiting conditions shift from average to difficult, the use of a menu-based set of enlistment options as studied here would likely produce increased cost savings versus offering stand-alone bonuses by themselves. At a 6-percent loan repayment take rate, the cost savings for low-AFQT respondents increased from \$3,827 to \$5,358 per person, and the cost savings for those with high AFQT scores increased from \$5,069 to \$7,393 per person. At 15 percent, the cost savings for low-AFQT respondents grew from \$2,883 to \$3,712 per person, and the cost savings for high-AFQT respondents grew from \$3,494 to \$5,884 per person.

TABLE 6.1
Estimated Change in Cost Under Menus at the Average Bonus Level

Loan Repayment Take Rate	Cost Change per Person	Recruits	Assumed Percentage of Recruits with Bonus	Cost Change (millions of dollars)
Survey 2 rates				
Low AFQT	(\$1,278)	27,600	21%	(\$7)
High AFQT	\$1,322	32,400	60%	\$26
Total				\$18
6 percent				
Low AFQT	(\$3,827)	27,600	21%	(\$22)
High AFQT	(\$5,069)	32,400	60%	(\$98)
Total				(\$121)
15 percent				
Low AFQT	(\$2,883)	27,600	21%	(\$17)
High AFQT	(\$3,494)	32,400	60%	(\$68)
Total				(\$85)

NOTE: Numbers in parentheses indicate a decrease in cost.

Summary

The cost analysis produced two main findings. First, the menu approach can achieve cost savings, depending on the loan repayment take rate. If the take rate was in the range of its historical average—i.e., 6 percent—cost savings were projected at about \$120 million annually. At a take rate of 15 percent, annual cost savings were estimated to be somewhat lower, at around \$85 million. Second, relative to the sole use of stand-alone bonuses, annual cost savings from the menu approach would likely be even greater as recruiting conditions worsened from average to difficult, again assuming take rates in the 6- to 15-percent range. Cost savings also would be greater if larger enlistment bonuses were needed to achieve the same increase in enlistment contracts that we found in our estimated join rates for respondents choosing non-bonus options. At the same time, the findings depend on the true cost to the Army of loan repayment; we assumed a cost of \$15,000 for a \$35,000 LRP and \$50,000 for a \$65,000 LRP option. These numbers, along with the option choice rates more generally, should be checked against Army data when available and monitored if the menu approach is pursued.

Conclusion

What Have We Learned?

The purpose of this research was to explore the potential viability of the EOO concept. The essence of the concept is to provide recruits with greater opportunity to tailor the features of their enlistment contract to their personal taste while, at the same time, recognizing that personal valuation of certain features might differ and might potentially be higher than the Army's cost of providing those features. If so, gains from trade would be possible: The recruit and the Army would both be better off by effecting a better match between the attributes sought and the attributes offered. The Army might also benefit from potential cost savings and, though not studied here, possibly lower first-term attrition and higher retention.

The task of converting the EOO concept into a workable approach raised the question of which incentives to include and how to portray them in a meaningful way. To decide on which incentives, we reviewed RA Analyst records on recruiting incentives that had been offered to recruits in the period FY 2001–FY 2019. It was clear that enlistment bonuses would remain a fundamental tool of recruiting. In addition, the Army offered educational incentives. In the 1980s and 1990s, educational benefit “kickers” came on top of benefits available through the GI bill. The kickers gave the Army a needed edge in recruiting over the other services because of its much larger accession goal. However, with the passage of service-wide, enhanced educational benefits in the 2000s, especially the Post 9/11 GI Bill, kickers became redundant. An alternative to those education benefits, which pay for education after leaving the military, was to provide for the repayment of student debt incurred before entering the military. The Army offered this incentive through the LRP, and, because it is an existing program, it could easily be included as an EOO incentive. Another existing Army program, PaYS, could likewise be included. PaYS guarantees an interview with a major organization when a soldier leaves the Army and so is a stepping stone to employment in the private or public sector. A third incentive, more recently introduced by USAREC, was the choice of the Army post to which a soldier would be assigned in the first term. This, too, was included as an EOO incentive, though in a way that gave the Army flexibility in assigning personnel by describing the incentive as the choice of location at the regional level within the United States, Europe, or other Army overseas location rather than the choice of a specific post. The four different incentives—enlistment bonuses, repayment of student loan debt, interview when leaving the Army, and choice of location—were different in nature and might appeal to prospects whose preferences differed, and the incentives were built on programs the Army already used.

A second question was how to portray these incentives to prospective recruits. A simple possibility, soon rejected, was to offer them a *la carte*—i.e., to allow the prospect to pick any, or perhaps all, of the non-bonus incentives along with receiving whatever enlistment bonus the Army offered. But the *la carte* approach did not recognize the resource costs and limits entailed by the incentives: Loan repayment required an outlay to cover the loan debt up to a limit, and the Army had limits on how many soldiers (by occupational specialty) it could assign to a region (or post) that derived from strategic basing decisions. Furthermore, the approach did not capitalize on the value of the non-bonus incentives to the individual versus their cost to the Army. Interview and location were valuable to at least some prospects and did not entail a cost to the Army, and

although loan repayment did involve an outlay, it would be valuable to prospects who might not otherwise have funds or access to credit to repay their debt, and that value might be greater than the cost to the Army. To address these concerns, we constructed menus of enlistment options. As discussed in earlier chapters, an option had three parts: term of service (three years or four or more years), type of incentive (stand-alone bonus, loan repayment [up to \$35,000 or up to \$65,000], interview, or location), and amount of bonus (the stand-alone bonus had its own amount, and the other incentives usually had a supplemental bonus smaller than the stand-alone bonus). The supplemental bonuses were set at a level to make the option roughly equal in value to the stand-alone bonus for the respondents, given job type, term length, and upper- or lower-AFQT category. In turn, this meant that the stand-alone bonus had to be set at some level, and we drew on historical data to compute the average bonus level and, alternatively, the maximum bonus level. For each bonus level, option menus were designed for six different job types—the same job types as on the goarmy.com website—and two quality levels, high and low AFQT. An alternative approach might have been to create menus with options of equal cost to the Army, but such an approach had less promise because the interview and location options have a near-zero marginal cost. Making them cost-equivalent to the stand-alone bonus would require setting their supplemental bonuses at a level nearly as large as the stand-alone bonus, defeating the possibility of saving cost. For the same reason, an equal-cost approach would not have the potential to elicit information about an individual's willingness to trade off a stand-alone bonus for a non-bonus option with a smaller supplemental bonus.

With the approach we took, the recruiting prospect could choose among the options offered, and the options were compatible with Army recruiting practice. Because loan repayment, interview, and location came with supplemental bonuses that were smaller than stand-alone bonuses, choosing one of these options in effect meant trading off stand-alone bonus dollars for supplemental bonus dollars plus the incentive itself. This enabled the prospect to express his or her tastes by choosing the most preferred option, and it allowed the Army the opportunity to regulate access to these options by raising or lowering the amount of the stand-alone bonus relative to the supplemental bonus. Furthermore, by creating option menus at the maximum bonus level, we could probe the potential interest using a wider range of options and with higher supplemental bonuses. Thus, the menus constructed for this research met the EOO concept goals of providing more choice to recruiting prospects while also being mindful of Army resource costs and constraints.

We learned from Survey 1 about the importance of providing information on Army jobs, pay, and benefits to our respondents and the value they placed on the non-bonus incentives relative to bonuses of various amounts: Non-bonus incentives compared well with some stand-alone bonuses. This information was crucial to designing the options for Survey 2. We learned from Survey 2 that non-bonus options that included loan repayment, interview, or location were chosen more often than stand-alone bonuses, particularly for high-AFQT respondents. At the average bonus level, 80 percent of the high-AFQT respondents chose non-bonus options versus 20 percent who chose stand-alone bonuses. Among low-AFQT respondents, 56 percent chose non-bonus options, while 44 percent chose stand-alone bonuses. We found that the distribution of chosen options was much the same for men and women and was largely similar across racial/ethnic groups, holding AFQT level constant. We found that high-AFQT respondents were more likely than low-AFQT respondents to choose loan repayment, while low-AFQT respondents were more likely to choose stand-alone bonuses—perhaps because these respondents were less likely to have student loan debt and potentially benefit from loan repayment. We discovered that bonus amount was a statistically significant factor in option choice, but, given the chosen option, it had virtually no effect on the stated probability of joining the Army in the next few years. In robustness checks, we found that the results relating option choice to the probability of joining changed little when demographic characteristics were included in the regression. Finally, we learned that the relationship between chosen options and the probability of joining was never statistically lower, and always as high or higher, for the loan repayment, interview, and location options as for the stand-alone bonus options.

With respect to possible cost savings from the EOO approach as implemented here, we learned that the results depend on the extent to which the loan repayment options are offered and chosen. If they are taken at levels in the range of the historical take rate of 6 percent, or, alternatively, at a rate of 15 percent to potentially increase recruits from the college market, there could be significant annual cost savings at the average bonus level, and the cost savings would grow larger at the maximum bonus level. But if take rates were at the higher rates of 25 percent to 59 percent seen in Survey 2, cost could increase.

A basic question is whether the Army would attract more recruits if it offered EOO. There is reason to expect that the enlistment response to the kind of menus studied here, which include both stand-alone bonuses and non-bonus options, would be comparable to or perhaps better than stand-alone bonuses by themselves. However, the research design offers only a partial answer to that question. Only a single menu was offered for a given job type, quality level, and recruiting condition. For the given menu (or for data pooled across job types with similar choice sets, as we have done), the analysis showed that the respondents selecting non-bonus options were as likely, or more likely, to join as those selecting a stand-alone bonus included in the same menu. However, the analysis did not compare alternative menus—e.g., a menu consisting solely of stand-alone bonuses versus a menu of stand-alone bonuses plus non-bonus options. Furthermore, the samples in Surveys 1 and 2 excluded potential respondents who reported zero chance of actively considering joining the Army. The menu approach might or might not be more effective at inducing some of these persons to join, but the samples provide no data on that. Granted these limitations, the results of the analysis provide evidence of the viability of the EOO concept and the value of a subsequent pilot study. The logic of utility maximization indicates that expected utility increases with the number of choices.

Closing Thoughts

On net, the findings of this research support the feasibility of creating menus of enlistment options in a way that is attractive to prospective recruits, flexible for the Army, and potentially cost-saving. A menu gives recruits greater agency to obtain enlistment options that they want.

Based on these results, a menu of options for a given job and recruit quality level could be a new way to attract additional and more-satisfied recruits into the Army. Working through a recruiter, prospects might prequalify their education and AFQT level; choose a job and preferred option available for that job; make a temporary reservation for that job and training date online with the recruiter, pending the prospect's visit to a Military Entrance Processing Station and official aptitude, physical, and other checks; and, if qualified, meet with an Army job counselor. Alternatively, qualified prospects could be offered a choice from a menu of options offered by the job counselor at the Military Entrance Processing Station.

The composition of recruits under a menu approach will depend on menu design (what options are included), bonus generosity, and outreach and marketing steps that the Army might take to make prospective recruits aware of the options in the menu, especially the student loan repayment option (LRP). Sample respondents were highly interested in LRP compared with the historical usage rate of LRP. We think that this difference relates to LRP eligibility requirements: LRP applies to existing, qualified loan debt. Respondents may not have had qualifying loan debt at the time they took the survey, but in the survey, they could express an interest in the LRP option if they expected to acquire such debt before enlisting. With that in mind, the Army might want to advise enlistment prospects that if they go to college for a year or two and take out student loans, those loans can be paid off by the Army.¹ The Army should determine effective ways to market

¹ Over 70 percent of Survey 2 respondents were interested in obtaining further education, and the LRP options in the menus did not require respondents to have existing, qualified student loan debt at the time of the survey. The historical usage of LRP

this option to increase Army enlistment consideration in the college market and the extent to which such marketing is optimal.

Potential cost savings under an EOO menu approach depend not only on administrative costs and actual costs of loan-repayment options but also on efficiency gains from avoiding the need for higher levels of enlistment bonuses to meet a recruiting requirement and (though not studied here) possibly lower attrition through increased recruit satisfaction and greater retention. Given these considerations, together with the fact that our results are derived from survey responses rather than actual recruiting prospect behavior in the operational setting, if the Army chooses to proceed toward using the EOO concept in its recruiting efforts, we recommend a pilot test to quantify its effects in an operational setting on prospect menu choices, costs, lead and contract production, Delayed Entry Program loss rates, and, over the longer term, first-term attrition and retention, as compared with those outcomes under the current system.

Our survey respondents selected an option from the menu of options offered and expressed a willingness to enlist if provided the preferred option. Although the survey-based analysis indicated the viability of the EOO approach, a pilot test would be needed to obtain information on actual choices. Refining the analysis done here, the design of the pilot could consider optimizing the options in a menu with respect to some objective function, such as the marginal cost of recruits or the marginal cost of recruits subject to a minimum number or percentage of high-AFQT recruits or recruits with education levels of high school or more.

was around 6 percent, much lower than the rates in the survey, 25 to 59 percent. Assuming that the historical rates persist, the Army might not have to constrain the availability of LRP. But given the appeal of LRP, the Army might want to develop a proactive campaign to inform prospective recruits that LRP can help pay for student loan debt.

Survey 1 Questions and Responses

Survey 1 Questions

Below we provide the Survey 1 questionnaire, the responses to the questions for our sample, a list of the enlistment options we asked about, and additional results on the appeal of those options to our respondents.

Quotas

Total N	800
Female	200
Male	600
Hispanic (Q29=1)	144
Black or African American (Q29=2 + Q30=2)	96
White (Q29=2 + Q30=1)	480
Other (Q29=2 + Q30>2)	80
Age 18–19	160
Age 20–21	160
Age 22–24	240
Age 25–27	240

Introduction

Thank you very much for taking our survey. The following questions focus on your near- and longer-term career plans. They cover several topics, including what you value in employment. We are asking people about what they think it would be like to work for different types of organizations, including the United States Army.

As always, your responses are completely confidential. It will take about 20 minutes to complete the questionnaire.

(If Smartphone/Tablet):

Turn your device horizontally for the best view.

(Show this icon)



We are asking you these first questions for classification purposes.

1. How old are you? (Insert drop-down box with categories: Under 18, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, Over 27)
(Terminate if under 18 or over 27)

2. What is your gender?

Male	1
Female	2

3. Are you currently a student?

Yes	1
No	2

4. (If Q3=1) What year are you in?

High School Junior	1
High School Senior	2
College/Vocational School: 1st year	3
College/Vocational School: 2nd year	4
College/Vocational School: 3rd year	5
College/Vocational School: 4th year or more	6 TERMINATE

5. (If Q3=2) What was the last level of education that you completed?

Less than high school or GED	1 TERMINATE
High school graduate with diploma	2
More than high school (college or vocational school) but less than four years of college	6
Four or more years of college	5 TERMINATE

6. Do you intend to get further education?

Yes	1
No	2

7a. Do you currently serve in the military or have you ever served in the military (Army, Navy, Air Force, Marine Corps, Coast Guard; active or reserve)?

Yes	1 TERMINATE
No	2

7b. How likely is it that you would actively consider serving in the Army in the next few years? (Insert 0–10 scale: 0=Extremely Unlikely; 10=Extremely Likely) TERMINATE if 0. (Bold labels)

8. What is your current work status?

Working	1
Unemployed and looking for work	2
Not employed and not looking for work	3

(Working: If Q8=1)

9. On average, how many hours do you usually work in a week?

Usual hours per week (Insert text box) hours

(Working: If Q8=1)

10. How long have you worked for your current employer? (If you hold more than one job, use the employer you've been with the longest.)

6 months or less	1
7–12 months	2
13–18 months	3
19–24 months	4
More than 24 months	5

(Working: If Q8=1)

11. Overall, how satisfied are you with your current job?

(Insert 0–10 scale: 0=Extremely Dissatisfied; 10=Extremely Satisfied) (Bold labels)

(Ask if Q8=1)

12. Are you currently looking for another job?

Yes	1
No	2

(Employed and not currently looking for another job: If Q12=2)

13. What is the likelihood that you will look for another job in the next 12 months? (Answer between 0% and 100%. Insert slider bar with endpoints labeled 0% and 100%) (Bold labels)

(Unemployed: If Q8=2)

14. How many weeks have you been unemployed and looking for work?

Less than 5 weeks	1
5 to 14 weeks	2
15 to 26 weeks	3
27 weeks and over	4

Job Characteristic Preferences

15. Now we want to know about your preferences for the type of job you would like to have. Please rate each of the following characteristics on a scale of 0 to 10 in terms of its importance to you.

(Insert 0–10 scale: 0=Not at all important; 10=Extremely important) (Bold labels and item text)

Randomize

Attractive pay level	1
Generous benefits (health insurance, retirement, etc.)	2
Opportunity to learn new skills	3
Opportunity to travel	4
Opportunity to use your talents and abilities	5
Strong job security	6
Opportunity for career advancement	7
Good work-life balance	8
Flexible work schedule	9
Belief that your work will make a difference	10
Collaboration among co-workers	11
Colleagues you enjoy working with	12
Exciting job-related challenges	13
Opportunity to do great things with your life	14
Opportunity to work with people like you	15
Generous holiday/vacation policy	16

16. (If you have never worked skip this question.) Overall, how does your current or most recent job measure up to your job preferences? (Insert 0–10 scale: 0=Extremely Dissatisfied; 10=Extremely Satisfied) (Bold labels)

Moving on to another topic, we are interested in people's thoughts about different branches of the armed forces, and we are going to ask you about the Army.

17. We want you to think about what it might be like to work for the Army as an active-duty member. Rate the Army as an employer on the following characteristics. If you don't have any direct knowledge, just give us your impressions. (Insert 0–10 scale: 0=Poor; 10=Excellent) (Bold labels and item text)

Randomize

Attractive pay level	1
Generous benefits (health insurance, retirement, etc.)	2
Opportunity to learn new skills	3
Opportunity to travel	4
Opportunity to use your talents and abilities	5
Strong job security	6
Opportunity for career advancement	7
Good work-life balance	8
Flexible work schedule	9
Belief that your work will make a difference	10
Collaboration among co-workers	11
Colleagues you enjoy working with	12
Exciting job-related challenges	13
Opportunity to do great things with your life	14
Opportunity to work with people like you	15
Generous holiday/vacation policy	16

18. We would like your overall impression of the Army. Using the scale below, give us your overall impression of the Army. (Insert 0–10 scale: 0=Extremely Unfavorable; 10=Extremely Favorable) (Bold labels)

19. Now here are some reasons people have given for not wanting to work in the Army as an active-duty member. These reasons are based on their perceptions and may not reflect the reality of being in the Army.

Look at each reason in the list below and tell us how much it would concern you personally if you were considering joining the Army. (Insert 0–10 scale: 0=Not a Concern; 10=Major Concern) (Bold labels and item text)

Randomize

Possibility of injury or death	1
Possibility of being transferred involuntarily	2
Required to live in undesirable places	3
Opposition by family/friends	4
Not enough job security	5
Too much travel required	6
Low salary	7
Poor benefits package	8
Do not want to be part of or support the military	9

Next, please read the paragraph below. It gives some facts about the Army.

More than 485,000 men and women are on active duty in the Army. Army pay includes basic pay and allowances for housing and subsistence, and there are special pays for deployment and high skill, e.g., a foreign language. (In some instances, service members may be deployed overseas in support of military operations.) Basic pay and allowances together total more than pay earned by most workers (85 percent) of comparable age and education, and special pays add to that. Some occupations also offer enlistment (signing) bonuses. For these occupations, bonuses of up to \$10,000 are paid upon successful completion of initial entry training—basic training and job training. Recruits who enlist for cash bonuses totaling more than \$10,000 receive their initial payment of \$10,000 upon successful completion of initial entry training and the remaining bonus amount is paid in annual increments of up to \$10,000 a year until the bonus is paid in full.

The Army has family support programs and provides health care, retirement benefits, 30 days of paid leave per year, and educational benefits. These include generous GI Bill benefits to fund education and living expenses after serving and that are transferable to spouses and children, as well as funding for continuing your education while serving. Initial training of two to three months is followed by training for your specific job. Job training is a few months to a year or more long depending on the job; the average is three to four months.

The Army has a wide range of available jobs and provides training for each. Each of the following six screens shows different types of jobs offered by the Army. Please read each screen carefully.

Mechanics and Engineering Jobs: carpentry/masonry; interior electrician; plumber; diver; concrete/asphalt equipment operator; vehicle repairer; construction equipment repairer; chemical equipment repairer; power generation/distribution; ensuring equipment, materials and systems are available for missions; combat system maintainer; air defense system repairer; test measurement and diagnostic equipment maintenance

Science and Medicine Jobs: animal care; veterinary food inspection; dental; operating room; practical nursing; combat/special forces medic; medical laboratory; optical laboratory; pharmacy; physical therapy; nutrition care; preventive medicine; patient administration; petroleum laboratory; water treatment

Signal and Intelligence Jobs: computer/detection systems; cryptologic cyberspace analyst; signals intelligence analyst; geospatial intelligence imagery analyst; cyber operations; electronic warfare; information technology; microwave systems operator-maintainer; military intelligence systems maintainer/integrator; multichannel transmission systems operator-maintainer; radar repairer; radio and communications security repairer; radio operator-maintainer; satellite communication systems operator-maintainer; interpreter/translator; counterintelligence agent; psychological operations; public affairs communications

Support and Logistics Jobs: ammunition; ammunition stock control; automated logistics; cargo; chemical, biological, radiological, and nuclear; petroleum supply; parachute rigger; culinary; human resources; mortuary affairs; paralegal;

financial management; religious affairs; chaplain; firefighter; military police; military working dog handler; motor transport operator; watercraft operator; railway operations crewmember; transportation management coordinator; unit supply; utilities equipment repairer; visual information equipment operator-maintainer; multimedia illustrator; musician

Ground Forces Jobs: cannon crew; tank crewman; field artillery firefinder radar operator; indirect fire (e.g., artillery); infantryman; joint forces fire support; fire control; multiple launch rocket system crewmember; explosive ordnance disposal; cavalry scout; special forces; civil affairs

Aviation and Aerial Defense Jobs: Helicopter armament/electrical/avionic systems repairer; helicopter repairer (pneudraulics, powerplant, powertrain, structure); air traffic control equipment repairer; patriot missile fire control operator/maintainer; patriot launching station operator/maintainer; aviation operations; air traffic control operator; air and missile defense crewmember; air defense battle management system operator; air defense early warning system operator; unmanned aircraft systems operator; unmanned aircraft systems repairer

20a. Now we want to know what types of enlistment options would appeal to you if you joined the active-duty Army.

On each of following screens you will see three possible enlistment options you could receive if you joined the active-duty Army. Each option shows what you would receive and the minimum number of years you would be agreeing to serve to receive that option. In the example below, you would receive a \$5,000 signing bonus if you agreed to serve for at least 3 years.

\$5,000 signing bonus	
3+ yrs.	

On each screen, please select which one of the three options would be most appealing to you if you were to seriously consider serving in the Army and which one would be least appealing to you.

(Insert Max Diff screens) (Include this text at the top of the first Max Diff screen) Please select the option that would be most appealing to you if you were to seriously consider serving in the Army and the option that would be least appealing to you. You will select 2 options, the most appealing and the least appealing.

(Programmers: insert variable to capture time spent on Max Diff)

20b. Now that you have learned about the types of jobs the Army offers and the type of enlistments that might be available, how likely is it that you would actively consider serving in the Army in the next few years? **(Insert 0–10 scale: 0=Extremely Unlikely; 10=Extremely Likely) (Bold labels)**

Demographics

We have a few final questions, so we can learn a bit more about you.

21. What is your marital status?

Never Married	1
Married	2
Separated	3
Divorced	4
Widowed	5

(If Q21 NE 2)

22. Do you live with a spouse/partner? (If Q21=2 auto-code as Yes, "1")

Yes	1
No	2

(If Q22=1)

23. Is your spouse/partner employed?

Yes	1
No	2

(If Q22=1)

24. Has your spouse/partner ever served in the U.S. military?

Yes, currently serving	1
Yes, but not currently	2
No	3

(If Q24=1,2)

25. Which service?

Randomize

Army	1
Air Force	2
Navy	3
Marine Corps	4
Coast Guard	5

26. What state do you live in? (Add drop-down box)

(Programmers: create variable coding states into 9 census regions)

27. About how many people live in your city, town, or village? If you don't know for sure, use your best guess.

Under 1,000	1
1,000 to 4,999	2
5,000 to 9,999	3
10,000 to 99,999	4
100,000 to 499,999	5
500,000 to 1,000,000	6
Over 1,000,000	7

28. Are you the parent of any children that live with you in your household?

Yes	1
No	2

28a. How many brothers and sisters do you have? (Insert dropdown box with numbers 0–10)

29. Are you Spanish/Hispanic/Latino?

Yes	1
No	2

30. What is your race? (Mark one or more races to indicate what you consider yourself to be.)

Randomize

White	1
Black or African American	2
American Indian or Alaska Native	3
Asian	4
Native Hawaiian or Other Pacific Islander	5
Other	6

31. What month and year were you born in? (Insert drop-down boxes for month and year. Year range: 2005–1990)

(Programmers: add variable to flag if year born does not match age category in Q1)

32. Please provide your best estimate of your parent(s)' income when you were 18 years old.

\$25,000 or less	1
\$26,000–\$40,000	2
\$41,000–\$60,000	3
\$61,000–\$75,000	4
\$76,000–\$95,000	5
\$96,000–\$125,000	6
\$126,000 or more	7

33. Which of these options best describes the grades you received in high school?

Mostly A's	1
Mix of A's and B's	2
Mostly B's	3
Mix of B's and C's	4
Mostly C's	5
Mix of C's and D's	6
Mostly D's	7
Mix of D's and F's	8
Mostly F's	9

34. As far as you know, which of these options best describes your high school class rank? If you aren't sure, use your best guess.

Top 10%	1
Top 20%	2
Top 50%	3
Not in top 50%	4

35. What is your mother's level of education? If you are not sure, use your best guess.

Less than high school	1
Some high school	2
High school graduate	3
Some college/vocational school	4
4 or more years of college	5

36. What is your father's level of education? If you are not sure, use your best guess.

Less than high school	1
Some high school	2
High school graduate	3
Some college/vocational school	4
4 or more years of college	5

37. Have your parents ever served in the U.S. military?

Yes, currently serving	1
Yes, but not currently serving	2
No	3

(If Q37=1,2)
38. Which service?

Randomize

Army	1
Air Force	2
Navy	3
Marine Corps	4
Coast Guard	5

That completes our questionnaire. Thank you very much for your time.

Survey 1 Results

Table A.1 summarizes the responses to the Survey 1 questions. The survey was designed in spring and early summer 2021 and administered in August 2021. There were 800 respondents. The respondents consisted of individuals aged 18 to 27 who were high school juniors or seniors or had completed high school. Many respondents had some college or vocational school but were not college seniors or college graduates. All respondents expressed some willingness to actively consider serving in the Army in the next few years. Questions at the beginning of the survey screened out those who were under age 18 or over age 27; students in their fourth or more year of college or vocational school; nonstudents who had not completed high school or had a GED or who had four or more years of college or vocational school; those who were serving or had ever served in the military, either active duty or reserve; and those who answered “0” on a 0–10 scale in response to the question “How likely is it that you would actively consider serving in the Army in the next few years?”

As can be seen earlier in this appendix, Survey 1 included questions about age, gender, race/ethnicity, geographic location, family income, and parents’ education. The survey also asked about labor force status, job preferences, satisfaction with current job, perceptions of Army job characteristics, and overall impression of the Army. Respondents were also asked how likely it was that they would actively consider serving in the Army in the next few years, with responses on a scale of 0–10, 0 being extremely unlikely and 10 being extremely likely. This question was asked twice, at the beginning of the survey and later after the individual had been told about the jobs, pay, training, and benefits offered by the Army.

The survey also asked about enlistment incentives. The objective was to obtain information about the relative values of the incentives—i.e., their relative attractiveness to the respondents. Nineteen items were included in the set of incentives (Table A.2). In designing the incentive questions, we employed an experimental design in which triplets of the items were created by random draws and for each triplet the respondent would identify both the most preferred option and the least preferred option. Each respondent saw 19 triplets, and each of the 19 incentives appeared in three different triplets. Eight versions of the set of 19 triplets were created, and the version shown to a respondent was randomly selected, hence it was independent of respondent demographics, job preferences, willingness to consider joining the Army, etc. In creating the triplets, we imposed rules to ensure that the triplets contained meaningful choices. For instance, a triplet that might have contained a \$5,000 bonus, a \$20,000 bonus, and a third item was ruled out because the respondent would never choose the smaller bonus. Similarly, a triplet could not contain both a \$35,000 student loan repayment and a \$65,000 student loan repayment, or the choice of job plus a \$15,000 bonus versus the choice of job by itself, or the choice of location plus a \$15,000 bonus versus the choice of location by itself. If there had been no rules constraining the combinations of incentives, 19 incentives taken three at a time would have produced 969 triplets. Imposing the rules reduced the number of valid triplets to 565. Details of these rules, the computation of the number of valid triplets, and the eight versions of the 19 triplets are available from the authors.

TABLE A.1
Responses to Survey 1 Questions

No.	Question	Percentage or Mean
1	How old are you?	
	18	11%
	19	9%
	20	9%
	21	11%
	22	11%
	23	10%
	24	9%
	25	11%
	26	11%
	27	8%
2	What is your gender?	
	Male	76%
	Female	24%
3	Are you currently a student?	
	Yes	54%
	No	46%
4	If so, what year are you in?	
	Junior	4%
	Senior	14%
	1st year	34%
	2nd year	32%
	3rd year	16%
5	If not, what was the last level of education that you completed?	
	High school degree graduate	80%
	Some college/vocational school	20%
6	Do you intend to get further education?	
	Yes	77%
	No	23%
7a	Do you currently serve in the military or have you ever served in the military (Army, Navy, Air Force, Marine Corps, Coast Guard; active or reserve)?	
	Yes	0%
	No	100%

Table A.1—Continued

No.	Question	Percentage or Mean
7b	How likely would you actively consider serving in the Army in the next few years? (0–10 scale: 0 = Extremely Unlikely; 10 = Extremely Likely)	5.52
8	What is your current work status?	
	Working	49%
	Unemployed	35%
	Out of labor force	16%
9	If working, on average how many hours do you usually work in a week?	37.1
10	If working, how long have you worked for your current employer? (If you hold more than one job, use the employer you've been with the longest.)	
	6 months or less	31%
	7–12 months	26%
	13–18 months	16%
	19–24 months	8%
	More than 24 months	20%
11	If working, how satisfied are you with your current job overall? (0–10 scale: 0 = Extremely Unsatisfied; 10 = Extremely Satisfied)	7.25
12	If working, are you currently looking for another job?	
	Yes	38%
	No	63%
13	If working and not looking, what is the likelihood that you will look for another job in the next 12 months? (Answer between 0% and 100%.)	40%
14	If unemployed, how many weeks have you been unemployed and looking for work?	
	Less than 5 weeks	22%
	5 to 14 weeks	42%
	15 to 26 weeks	21%
	27 weeks and over	15%
15	Please rate each of the following characteristics on a scale of 0 to 10 in terms of its importance to you.	
	Attractive pay level	8.26
	Generous benefits (health insurance, retirement, etc.)	7.90
	Opportunity to learn new skills	8.00
	Opportunity to travel	6.81
	Opportunity to use your talents and abilities	8.02
	Strong job security	7.97
	Opportunity for career advancement	8.06
	Good work-life balance	8.23

Table A.1—Continued

No.	Question	Percentage or Mean
	Flexible work schedule	7.95
	Belief that your work will make a difference	7.59
	Collaboration among co-workers	7.37
	Colleagues you enjoy working with	7.96
	Exciting job-related challenges	7.47
	Opportunity to do great things with your life	8.08
	Opportunity to work with people like you	7.63
	Generous holiday/vacation policy	7.61
16	Overall, how does your current or most recent job measure up to your job preferences? (0–10 scale: 0 = Extremely Dissatisfied; 10 = Extremely Satisfied)	7.05
17	Rate the Army as an employer on the following characteristics. If you don't have any direct knowledge, just give us your impressions. (0–10 scale: 0 = Poor; 10 = Excellent)	
	Attractive pay level	7.31
	Generous benefits (health insurance, retirement, etc.)	7.77
	Opportunity to learn new skills	8.07
	Opportunity to travel	7.86
	Opportunity to use your talents and abilities	7.48
	Strong job security	7.85
	Opportunity for career advancement	7.79
	Good work-life balance	6.47
	Flexible work schedule	6.18
	Belief that your work will make a difference	7.85
	Collaboration among co-workers	7.71
	Colleagues you enjoy working with	7.25
	Exciting job-related challenges	7.56
	Opportunity to do great things with your life	7.73
	Opportunity to work with people like you	7.30
	Generous holiday/vacation policy	6.72
18	We would like your overall impression of the Army. (0–10 scale: 0 = Extremely Unfavorable; 10 = Extremely Favorable)	7.14
19	How much would the following concern you if you were considering joining the Army? (0–10 scale: 0 = Not a Concern; 10 = Major Concern)	
	Possibility of injury or death	6.87
	Possibility of being transferred involuntarily	6.70
	Required to live in undesirable places	6.45

Table A.1—Continued

No.	Question	Percentage or Mean
	Opposition by family/friends	5.77
	Not enough job security	5.51
	Too much travel required	5.52
	Low salary	6.43
	Poor benefits package	6.02
	Do not want to be part of or support the military	5.30
20a	19 separate questions with triplets of 19 enlistment options (see Appendix C)	
20b	Now that you have learned about the types of jobs the Army offers and the type of enlistments that might be available, how likely is it that you would actively consider serving in the Army in the next few years? (0–10 scale: 0 = Extremely Unlikely; 10 = Extremely Likely)	6.52
21	What is your marital status?	
	Never Married	87.1%
	Married	10.6%
	Separated	1.0%
	Divorced	1.1%
	Widowed	0.1%
22	Do you live with a spouse/partner?	
	Yes	31%
	No	69%
23	If yes, is your spouse/partner employed?	
	Yes	73%
	No	27%
24	Has your/spouse partner ever served in the U.S. military?	
	Yes, currently serving	9%
	Yes, but not currently	6%
	No	85%
25	Which service?	
	Army	63%
	Air Force	11%
	Navy	8%
	Marine Corps	11%
	Coast Guard	8%

Table A.1—Continued

No.	Question	Percentage or Mean
26	What state do you live in? (Summarized by region)	
	New England	4%
	Mid-Atlantic	14%
	East-North-Central	13%
	West-North-Central	5%
	South Atlantic	23%
	East-South-Central	6%
	West-South-Central	10%
	Mountain	10%
	Pacific	15%
27	About how many people live in your city, town, or village?	
	Under 1,000	6%
	1,000 to 4,999	10%
	5,000 to 9,999	17%
	10,000 to 99,999	42%
	100,000 to 499,999	13%
	500,000 to 1,000,000	7%
	Over 1,000,000	5%
28	Are you the parent of any children that live with you in your household?	
	Yes	15%
	No	85%
28a	How many brothers and sisters do you have?	2.24
29	Are you Spanish/Hispanic/Latino?	
	Yes	19%
	No	81%
30	What is your race? (Mark one or more to indicate what you consider yourself to be.)	
	White	72%
	Black or African American	14%
	American Indian or Alaska Native	5%
	Asian	4%
	Native Hawaiian or Other Pacific Islander	0%
	Other	5%

Table A.1—Continued

No.	Question	Percentage or Mean
31	What month were you born in?	
	January	8%
	February	6%
	March	10%
	April	8%
	May	12%
	June	10%
	July	9%
	August	7%
	September	10%
	October	8%
	November	6%
	December	7%
32	Please provide your best estimate of your parent(s)' income when you were 18 years old	
	\$25,000 or less	20%
	\$26,000–\$40,000	17%
	\$41,000–\$60,000	17%
	\$61,000–\$75,000	12%
	\$76,000–\$95,000	21%
	\$96,000–\$125,000	10%
	\$126,000 or more	3%
33	Which of these options best describes the grades you received in high school?	
	Mostly A's	15%
	Mix of A's and B's	42%
	Mostly B's	15%
	Mix of B's and C's	19%
	Mostly C's	3%
	Mix of C's and D's	5%
	Mostly D's	1%
	Mix of D's and F's	1%
	Mostly F's	1%

Table A.1—Continued

No.	Question	Percentage or Mean
34	Which of these best describes your high school class rank?	
	Top 10%	22%
	Top 20%	39%
	Top 50%	29%
	Not in top 50%	10%
35	What is your mother's level of education?	
	Less than high school	4%
	Some high school	12%
	High school graduate	37%
	Some college/vocational school	27%
	4 or more years of college	19%
36	What is your father's level of education?	
	Less than high school	7%
	Some high school	13%
	High school graduate	36%
	Some college/vocational school	22%
	4 or more years of college	22%
37	Have your parents ever served in the U.S. military?	
	Yes, currently serving	3%
	Yes, but not currently serving	12%
	No	85%
38	Which service?	
	Army	54%
	Air Force	13%
	Navy	15%
	Marine Corps	12%
	Coast Guard	7%

TABLE A.2
Enlistment Incentives in Survey 1

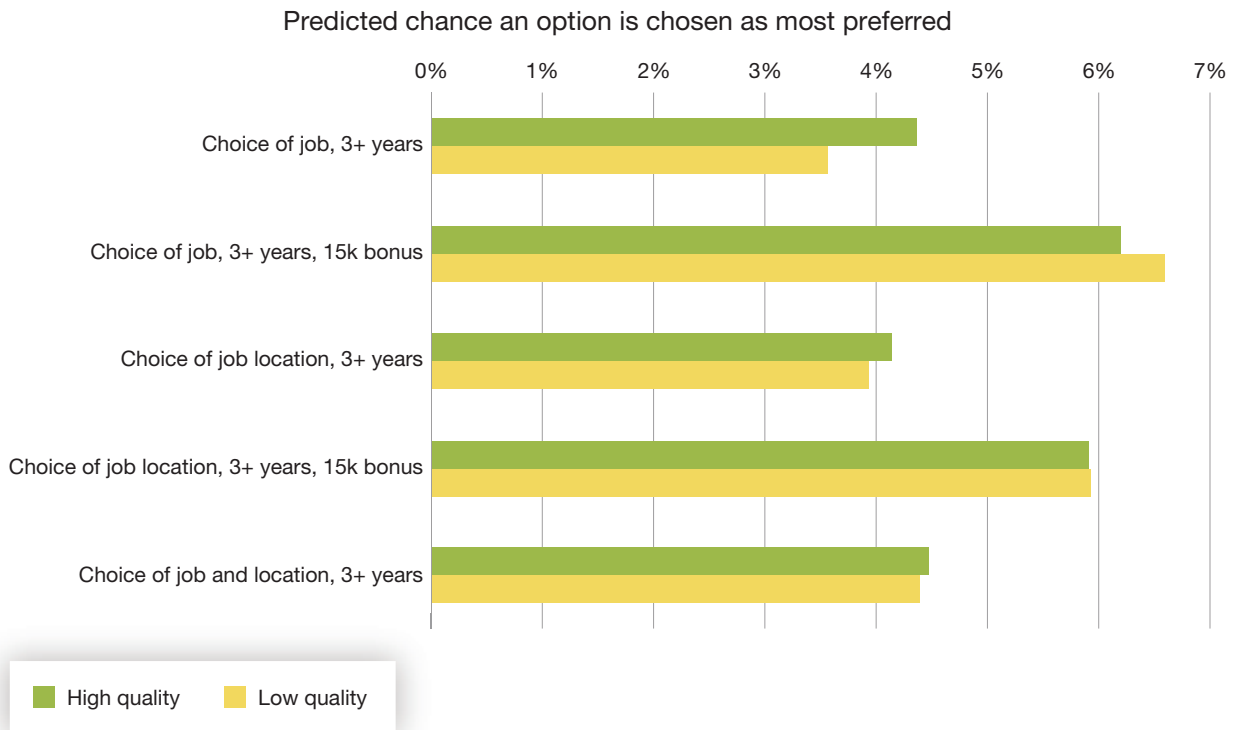
Number	Incentive	Term Length
1	\$5,000 signing bonus	3+ years
2	\$15,000 signing bonus	3+ years
3	\$30,000 signing bonus	3+ years
4	\$10,000 signing bonus	4+ years
5	\$20,000 signing bonus	4+ years
6	\$40,000 signing bonus	4+ years
7	Your choice of job to serve in	3+ years
8	Your choice of job to serve in <i>and</i> a \$15,000 signing bonus	3+ years
9	Your choice of an overseas area (e.g., Europe) or a region of the US to serve in	3+ years
10	Your choice of an overseas area (e.g., Europe) or a region of the US to serve in <i>and</i> a \$15,000 signing bonus	3+ years
11	Your choice of job <i>and</i> an overseas area (e.g., Europe) or a region of the US to serve in	3+ years
12	Up to \$65,000 to repay an existing college loan	3+ years
13	Up to \$35,000 to repay an existing college loan	3+ years
14	Up to \$65,000 to repay an existing college loan <i>and</i> a \$15,000 signing bonus	3+ years
15	Up to \$35,000 to repay an existing college loan <i>and</i> a \$15,000 signing bonus	3+ years
16	An education bonus of \$10,000 for having completed at least two years of college	3+ years
17	An education bonus of \$10,000 for having completed at least two years of college <i>and</i> a \$15,000 signing bonus	3+ years
18	A guaranteed job interview with a major company after leaving the Army	3+ years
19	A guaranteed job interview with a major company after leaving the Army <i>and</i> a \$15,000 signing bonus	3+ years

Additional Results on Attractiveness of Options in First Survey

Figures A.1–A.6 present additional results on incentive choice in Survey 1. With some exceptions, as shown in some of the figures, we found that the attractiveness of the enlistment incentives was much the same within many subgroups: men versus women, white non-Hispanic versus nonwhite or Hispanic, working versus not working, ages 18–22 versus ages 23–27, high school students versus college students, and job satisfaction above median versus below median.

FIGURE A.1

Attractiveness of Job and Location Choice Are the Same for High-Quality and Low-Quality Respondents



NOTE: High-quality respondents have a predicted AFQT score greater than or equal to 50 and are HSDGs or more.

FIGURE A.2

Attractiveness of Job and Location Choice Are Mostly Similar for Students and Nonstudents

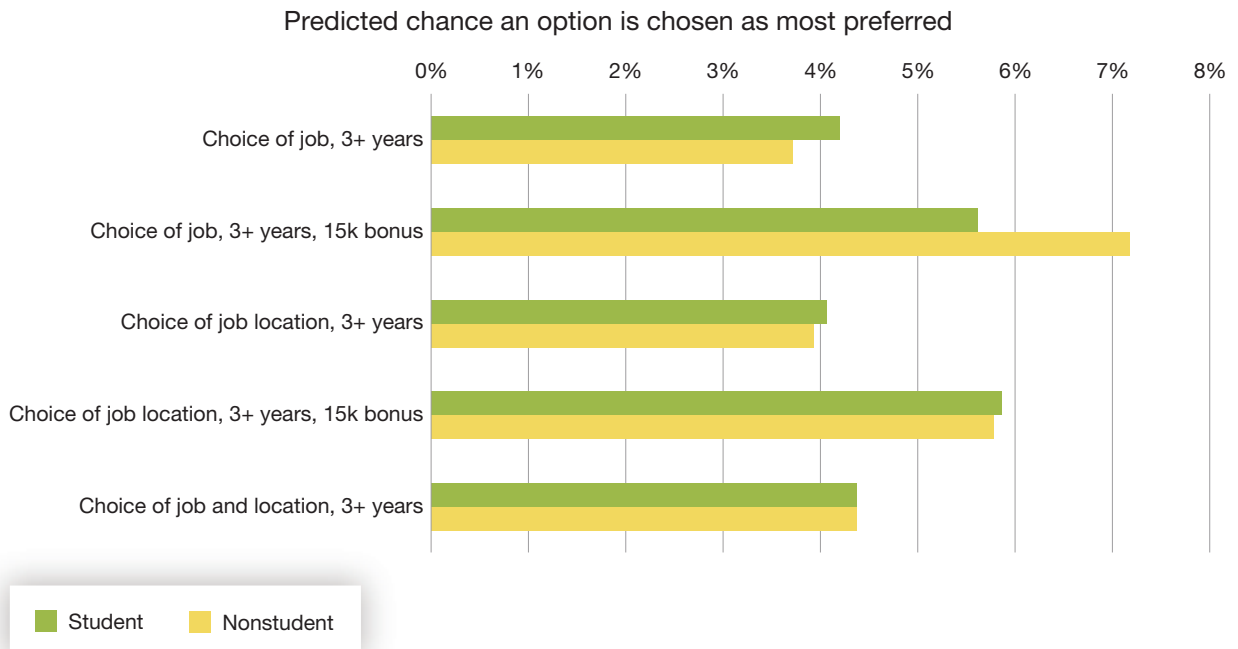


FIGURE A.3

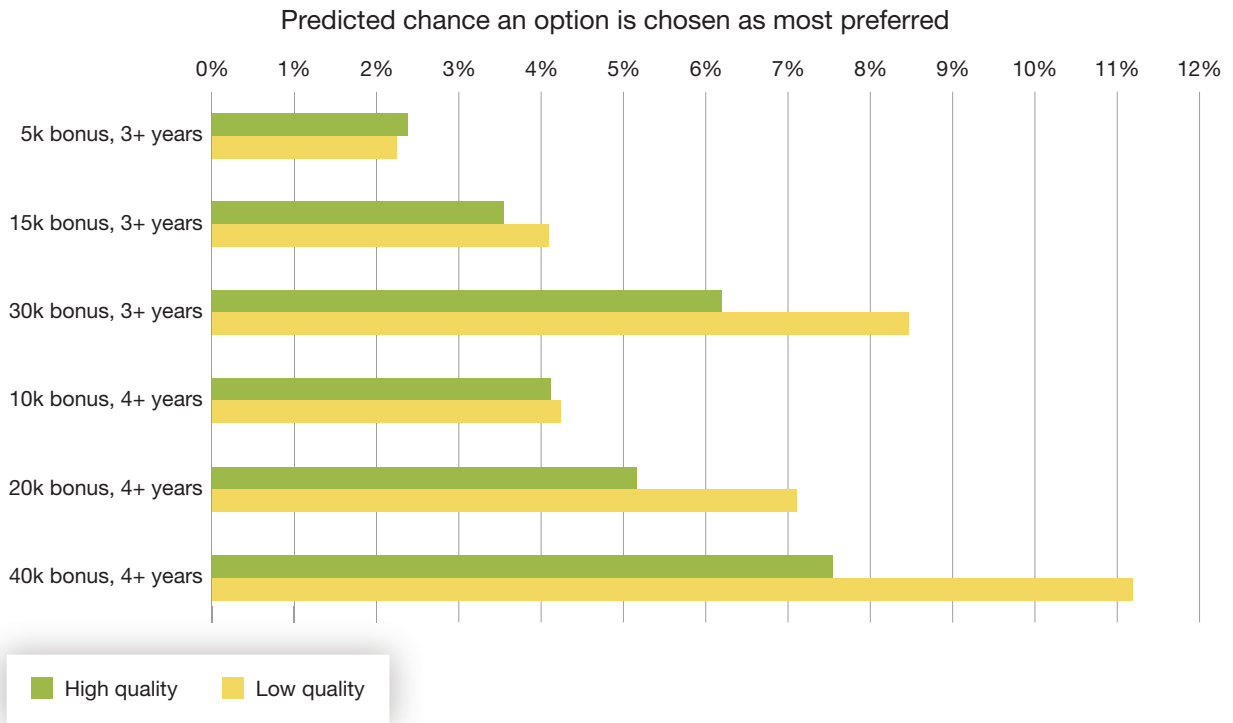
Large Bonuses Are More Attractive to Low-Quality Respondents

FIGURE A.4

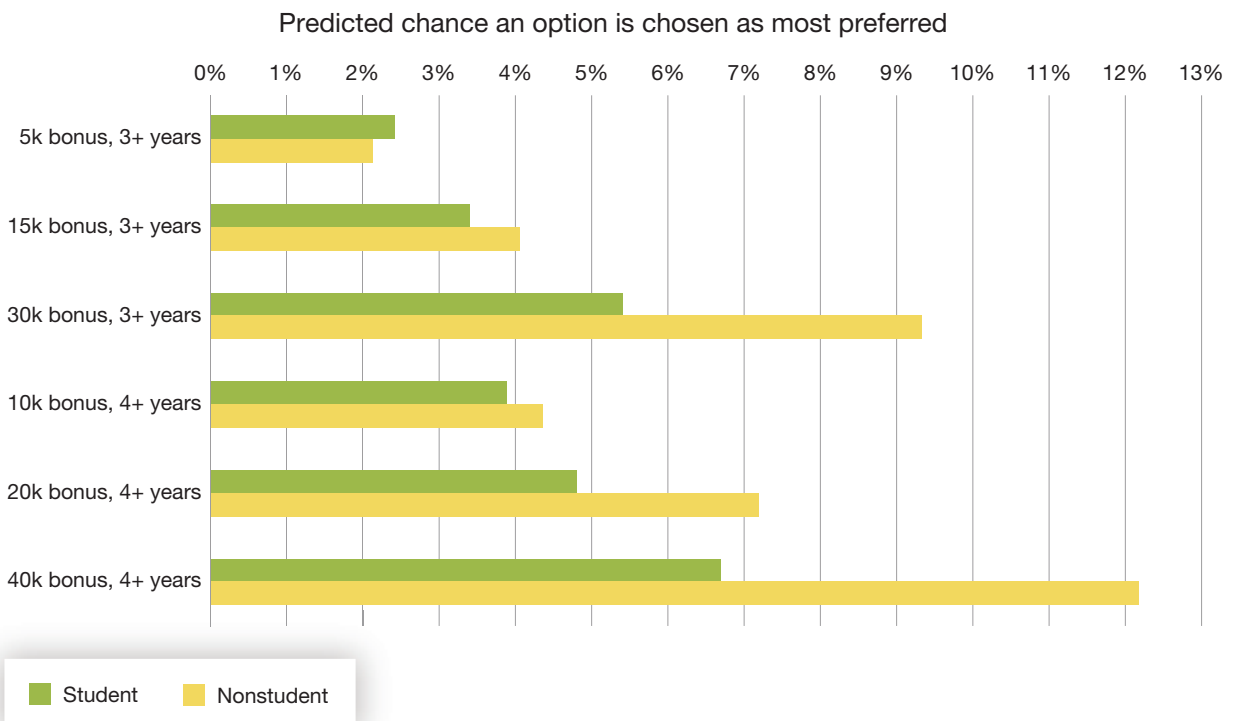
Large Bonuses Are More Attractive to Nonstudents

FIGURE A.5

LRP and HIGRAD Are More Attractive to High-Quality Respondents, and PaYS Is Equally Attractive

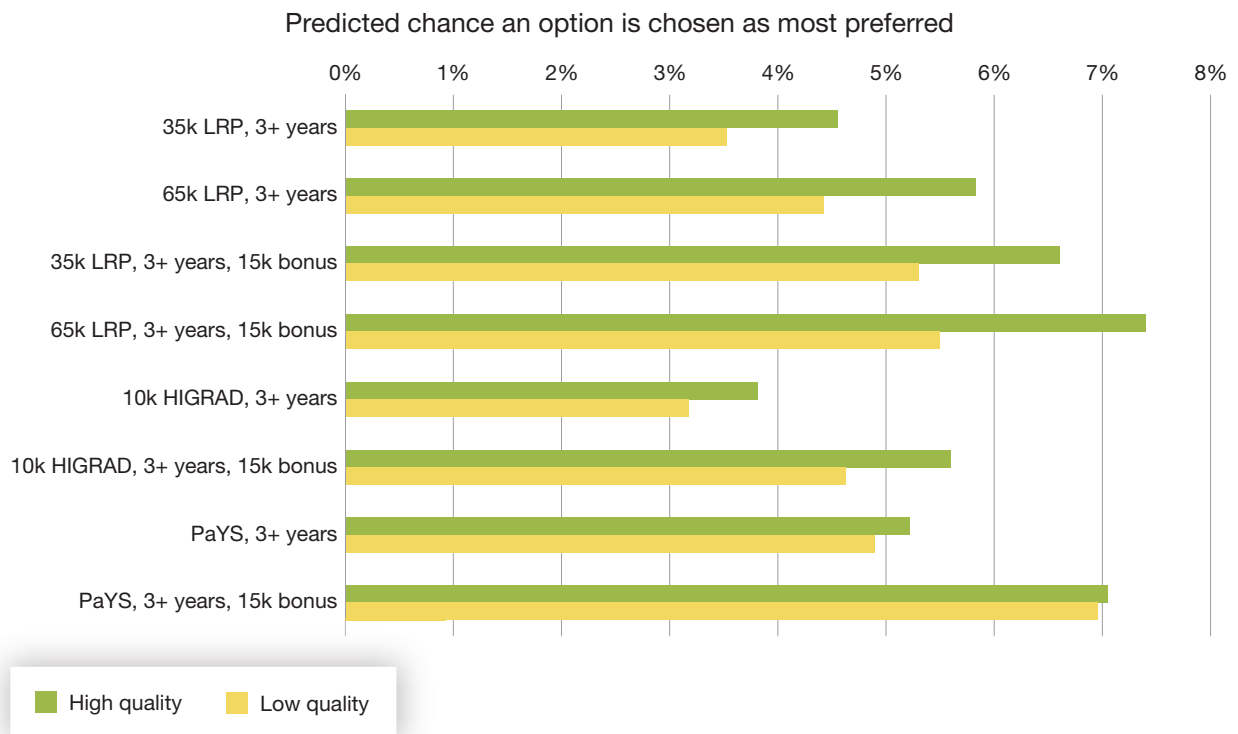
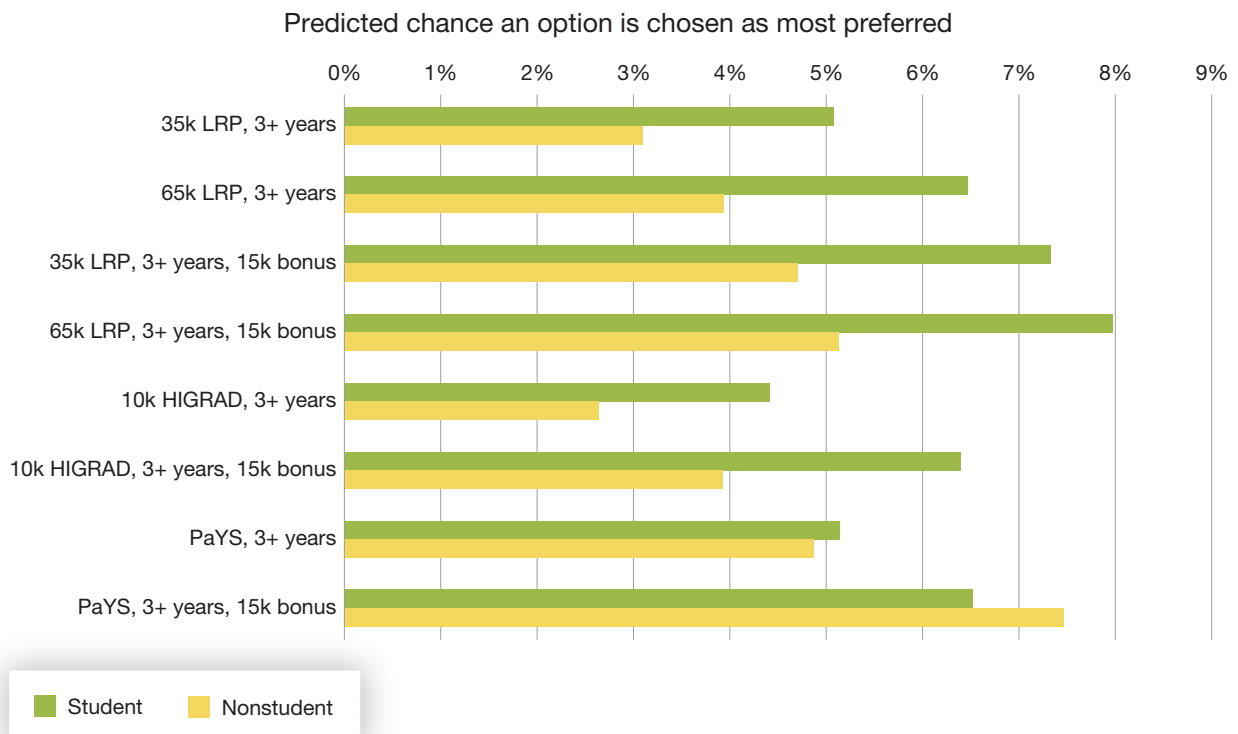


FIGURE A.6

LRP and HIGRAD Are More Attractive to Students Than to Nonstudents



Survey 1 Regressions on “How Likely Is It That You Would Actively Consider Serving in the Army in the Next Few Years?”

Survey 1 asked about a respondent’s interest in serving in the Army both before and after the respondent was given information about the Army. Near the beginning of the survey, respondents answered the question “How likely is it that you would actively consider serving in the Army in the next few years?” on a 0–10 scale, with 0 = extremely unlikely and 10 = extremely likely. Those who indicated that there was zero chance they would consider serving were excused from the remainder of the survey. This question was followed by questions about labor force status; looking for work; preferences for job characteristics; perceptions about how the Army jobs rated relative to those characteristics; concerns about reasons people have given for not wanting to join the Army; descriptive information about Army, pay, training, benefits, and the type of jobs available in the Army; and a series of 19 questions asking the respondent about enlistment incentives shown three at a time, where the respondent chose the most preferred and the least preferred of each set of three incentives. At this point, the respondent was asked, “Now that you have learned about the types of jobs the Army offers and the type of enlistments that might be available, how likely is it that you would actively consider serving in the Army in the next few years?” Responses were recorded on a 0–10 scale as before. For brevity, we refer to the responses to these questions as “before” and “after,” meaning whether respondents would actively consider serving the Army in the next few years before being informed about the Army and after.

We specified regression models in which the explanatory variables included age, gender, predicted AFQT score, student status, intention to get more education, labor force status, whether living with a spouse or partner, whether own children were present, race/ethnicity, whether any siblings, and mother’s education. Appendix D describes how the questions for the AFQT regression were drawn from the 1997 NLSY and presents the AFQT regression. The regression was used to predict the AFQT score.

We explored including indicators for family income at age 18 (low, mid, high), but these were never significant and were dropped. We also created a variable for the respondent’s preference for an Army job relative to the respondent’s preferred job characteristics by summing the responses to Q15 and Q17 (Table A.1) and taking the difference (sum Q17 minus sum Q15). We suspected that this variable was endogenous because it was based in part on the respondent’s perception of what an Army job would be like and so could be correlated with unobserved attitudes about joining the Army. Although the results reported here exclude this variable, including it produced little change in the other coefficients, and its coefficient was negative and significant.

The regressions for before and after have the same explanatory variables. The explanatory variables can be expected to capture only a portion of the respondent’s willingness to actively consider serving in the Army, and an unobserved portion of the preference to actively consider joining the Army enters the error term in each regression—though the unobserved portion is not necessarily the same in the after regression as in the before regression because information about the Army might have caused a change. Still, we expected the

error terms in the before and after regressions to be correlated and took advantage of this by treating the two equations as a system and estimating them by the method of seemingly unrelated regressions. This increased the precision with which the coefficients were estimated.¹ It also provided an estimate of the error correlation between the equations. The correlation coefficient was estimated to be 0.61, a large, positive value.

We also estimated a third equation where the dependent variable was the change in the respondent's answer (i.e., after minus before). Each coefficient in the change regression equals the difference between the coefficients in the after and before regressions. As a result, the change coefficients could be derived simply by differencing the after and before coefficients. But the change regression shows the difference directly and tells which coefficient changes were statistically significant.

Tables B.1, B.2, and B.3 have the results for the before, after, and change regressions estimated by OLS. The results are described in the body of the report.

¹ We expected the improvement in precision to be small, however. In a two-equation system, the improvement is greater the greater the error correlation and the extent to which the variables in one equation relate to the residuals of the other equation via regressions of the residuals in the other equation on the explanatory variables in the own equation (Powell, undated). Because the dependent variables in the before and after regressions are similar in nature (both ask about willingness to actively consider serving in the Army) and are regressed on the same explanatory variables, and because each equation assumes its error term to be statistically independent of those explanatory variables, it is likely that the error term in the other equation is nearly independent of the variables in the own equation. As a result, the coefficients in a regression of the residuals in the other equation on the explanatory variables in the own equation are likely to be small. This, in turn, makes the gain in precision small.

TABLE B.1
“Before” Regression

	Estimate	Standard Error	t value	Pr(> t)	Significance
Intercept	-0.6715	0.9883	-0.68	0.4971	
Age	0.1464	0.0311	4.71	0.0000	***
Female	-1.6270	0.1960	-8.30	0.0000	***
Predicted AFQT score	0.0399	0.0137	2.92	0.0036	**
Currently a student	1.5288	0.3533	4.33	0.0000	***
College student	-0.8838	0.2968	-2.98	0.0030	**
Intend to get more education	0.2758	0.2012	1.37	0.1708	
Working and looking	0.3879	0.2349	1.65	0.0991	
Unemployed	1.2388	0.2202	5.62	0.0000	***
Unemployed over six months	-1.1603	0.3361	-3.45	0.0006	***
Out of labor force	1.0685	0.2545	4.20	0.0000	***
Live with spouse/partner	-0.0801	0.1892	-0.42	0.6721	
Kids live with	0.3962	0.2443	1.62	0.1053	
Hispanic	0.8669	0.2603	3.33	0.0009	***
Black, non-Hispanic	1.4552	0.3617	4.02	0.0001	***
Any siblings	-0.3896	0.2385	-1.63	0.1028	
Mom non-HSDG	0.7438	0.2610	2.85	0.0045	**
Mom some college	-0.4923	0.2443	-2.02	0.0442	*
Mom four or more years of college	-0.8726	0.2747	-3.18	0.0015	**
R-squared	0.316				
Observations	800				

NOTE: Dependent variable is the response on a 0–10 scale to the Survey 1 question “How likely is it that you would actively consider serving in the Army in the next few years?” before the respondent had been informed about Army jobs, training, pay, and benefits. Reference person is male, is not currently a student, does not intend to get more education, is working and not looking for another job, lives alone, is white non-Hispanic, has no siblings, and has a mother who is a HSDG. Significance codes: *** = 0.001, ** = 0.01, * = 0.05, + = 0.1.

TABLE B.2
“After” Regression

	Estimate	Standard Error	t value	Pr(> t)	Significance
Intercept	1.1310	0.9688	1.17	0.2434	
Age	0.1298	0.0304	4.26	0.0000	***
Female	-1.2455	0.1922	-6.48	0.0000	***
Predicted AFQT score	0.0320	0.0134	2.39	0.0172	*
Currently a student	0.6414	0.3463	1.85	0.0644	+
College student	-0.2742	0.2910	-0.94	0.3464	
Intend to get more education	0.5797	0.1972	2.94	0.0034	**
Working and looking	0.1994	0.2303	0.87	0.3868	
Unemployed	0.5826	0.2159	2.70	0.0071	**
Unemployed over six months	-0.8860	0.3294	-2.69	0.0073	**
Out of labor force	0.2289	0.2495	0.92	0.3592	
Live with spouse/partner	-0.1212	0.1855	-0.65	0.5138	
Kids live with	0.5060	0.2395	2.11	0.0349	*
Hispanic	1.0124	0.2552	3.97	0.0001	***
Black, non-Hispanic	1.5520	0.3546	4.38	0.0000	***
Any siblings	-0.1857	0.2338	-0.79	0.4273	
Mom non-HSDG	0.6430	0.2559	2.51	0.0122	*
Mom some college	-0.3409	0.2395	-1.42	0.1549	
Mom four or more years of college	-0.7758	0.2693	-2.88	0.0041	**
Adjusted R-squared	0.202				
Observations	800				

NOTE: Dependent variable is the response on a 0–10 scale to the Survey 1 question “How likely is it that you would actively consider serving in the Army in the next few years?” after the respondent had been informed about Army jobs, training, pay, and benefits. Reference person is male, is not currently a student, does not intend to get more education, is working and not looking for another job, lives alone, is white non-Hispanic, has no siblings, and has a mother who is a HSDG. Significance codes: *** = 0.001, ** = 0.01, * = 0.05, + = 0.1.

TABLE B.3
“Change” Regression

	Estimate	Standard Error	t value	Pr(> t)	Significance
Intercept	1.8025	0.8678	2.08	0.0381	*
Age	-0.0166	0.0273	-0.61	0.5433	
Female	0.3815	0.1721	2.22	0.0269	*
Predicted AFQT score	-0.0079	0.0120	-0.66	0.5089	
Currently a student	-0.8875	0.3102	-2.86	0.0043	**
College student	0.6097	0.2606	2.34	0.0196	*
Intend to get more education	0.3039	0.1767	1.72	0.0858	
Working and looking	-0.1885	0.2062	-0.91	0.3611	
Unemployed	-0.6562	0.1934	-3.39	0.0007	***
Unemployed over six months	0.2744	0.2951	0.93	0.3528	
Out of labor force	-0.8397	0.2235	-3.76	0.0002	***
Live with spouse/partner	-0.0411	0.1661	-0.25	0.8049	
Kids live with	0.1098	0.2145	0.51	0.6089	
Hispanic	0.1455	0.2285	0.64	0.5245	
Black, non-Hispanic	0.0968	0.3176	0.31	0.7607	
Any siblings	0.2039	0.2094	0.97	0.3307	
Mom non-HSDG	-0.1008	0.2292	-0.44	0.6601	
Mom some college	0.1514	0.2145	0.71	0.4804	
Mom four or more years of college	0.0968	0.2412	0.40	0.6884	
Adjusted R-squared	0.063				
Observations	800				

NOTE: Dependent variable is the difference in the responses on a 0–10 scale to the Survey 1 question “How likely is it that you would actively consider serving in the Army in the next few years?” after versus before the respondent had been informed about Army jobs, training, pay, and benefits. Reference person is male, is not currently a student, does not intend to get more education, is working and not looking for another job, lives alone, is white non-Hispanic, has no siblings, and has a mother who is a HSDG. Significance codes: *** = 0.001, ** = 0.01, * = 0.05, + = 0.1.

Analysis of Survey 1 Best-Worst Data with a Logit Choice Probability Model

This appendix describes the method of analyzing the Survey 1 data on respondent choices among a set of individual enlistment incentives and presents the estimation results in Table C.1.

Respondents in Survey 1 were shown a series of triplets from a set of 19 enlistment options, such as bonus amount, choice of job type, choice of location area, and others, as listed in Table A.2. For each triplet, the respondent indicated the most preferred option and the least preferred option. Thus, each triplet provided two pieces of information about the respondent's preferences over enlistment options. In all, the respondent saw 19 triplets, one triplet at a time, in an experimental design where each of 19 options appeared in approximately three different triplets, with the other two options in a triplet selected at random. Eight different versions of the 19 triplets were created to achieve greater randomization for the experiment, and a version was drawn at random for each respondent. As discussed in Appendix A, in creating the triplets, we imposed rules to ensure that the triplets contained meaningful choices. Across all versions and options, the average number of appearances was 2.94. Because every option appeared in approximately three triplets and the respondent selected both the most and least preferred option in each triplet, the respondent provided six preference indications about each of the 19 options.¹ By selecting the most preferred and the least preferred option in each triplet, the respondent made 38 ($= 19 \times 2$) decisions. The resulting data are referred to as best-worst data or MaxDiff data.

We used random utility theory to model the choice of options, and we first considered the option chosen as most preferred, then the option chosen as least preferred. Following McFadden (1974), the probability that respondent n most prefers option i is

$$\begin{aligned} P_{ni} &= \text{Prob}(V_{ni} + \varepsilon_{ni} > V_{nj} + \varepsilon_{nj} \quad \forall j \neq i) \\ &= \text{Prob}(\varepsilon_{nj} < \varepsilon_{ni} + V_{ni} - V_{nj} \quad \forall j \neq i) \end{aligned}$$

where $V_{ni} + \varepsilon_{ni}$ represents the utility obtained by the respondent, V_{ni} is the portion of utility represented by observed variables, and ε_{ni} is the remaining, unobserved portion, and similarly for $V_{nj} + \varepsilon_{nj}$. Note that the notation V_{nj} allows the observed value of an option to depend on observed attributes of the individual (as described later in this chapter), but if the option is entered only by itself, it can be written V_j . Each unobserved portion is assumed to be a random and independently, identically distributed Type I extreme value. This specification leads to a closed-form expression, as Train (2009) proves:

$$P_{ni} = \frac{e^{V_{ni}}}{\sum_j e^{V_{nj}}}$$

¹ Consider a triplet with three options, a, b, and c. Suppose a is most preferred—that is, a is preferred to b, and a is preferred to c. By asking which option is least preferred, we also learn whether b is preferred to c or vice versa.

Next, the probability that the respondent least prefers option k is

$$\begin{aligned} P_{ni} &= \text{Prob}(V_{nk} + \varepsilon_{nk} < V_{nj} + \varepsilon_{nj} \quad \forall j \neq i) \\ &= \text{Prob}(\varepsilon_{nj} > \varepsilon_{nk} + V_{nk} - V_{nj} \quad \forall j \neq i) \end{aligned}$$

Multiply both sides of the inequality by -1 to obtain

$$P_{ni} = \text{Prob}(-\varepsilon_{nj} < -\varepsilon_{nk} + (-V_{nk}) - (-V_{nj}) \quad \forall j \neq i)$$

Because this expression has the same form as above, Train's proof applies, and the probability that the respondent least prefers option i can be written as

$$P_{ni} = \frac{e^{-V_{ni}}}{\sum_j e^{-V_{nj}}}$$

An implication is that data on the least preferred option can be analyzed in the same way as data on the most preferred option provided that the variables representing the observed portion of utility are multiplied by -1 .²

For insight into how the best and worst choices from each triplet can be used to compose a likelihood function, suppose that each utility depends only on the option itself (i.e., drop attributes of the respondent) and express the value of option i as $\beta_i D_i$, where D_i is an indicator variable and β_i is its relative value. The probability that, say, option 1 is chosen best among options 1, 2, and 3 and when options 4,...,19 are not offered is

$$P_{n1} = \frac{e^{\beta_1 D_1}}{e^{\beta_1 D_1} + e^{\beta_2 D_2} + e^{\beta_3 D_3} + 16}$$

The term 16 results from the option indicators being zero for options 4,...,19 and the fact that $e^0 = 1$, and the term is included for proper scaling.³ Similar expressions can be written for all 38 choices made from the 19 triplets seen by each respondent, and, because the respondents are independent, the probabilities can be multiplied together to form a likelihood. The likelihood is maximized with respect to the coefficients $\beta_1, \beta_2, \dots, \beta_{19}$, with one of the coefficients being set to zero for identification (Train, 2009). The estimated coefficients are termed *relative values* and are used in predicting the probability that an option will be chosen as most preferred.

When the model includes explanatory variables, such as respondent demographics, the utility value might be written in a linear form, such as

$$\beta_k D_k + \sum_m \beta_{km} x_m$$

where each x_m has a coefficient specific to each alternative. With 19 enlistment options, this results in a proliferation of coefficients. We instead did a series of two-way comparisons to see whether the predicted values differed between various cuts of the data—e.g., male or female, younger or older, do or do not intend to get more education, and so forth. Regressions were run on each two-way cut of the data—e.g., a regression for

² Marley and Louviere (2005) provide a rigorous discussion of best-worst models and offer a different derivation of the result above.

³ Suppose the options were nearly equally likely to be chosen and the denominator included only the three options in the triplet. The probability of an option being chosen would then be about one-third. But when all options are considered and, again, the options are nearly equally likely to be chosen, the probability of an option being chosen would be about 1/19.

men and a regression for women. Predictions based on these models are discussed in the report, and the regression estimates are available on request.

We also ran an alternative specification of the main model to compute McFadden's R-squared for the enlistment options. It is defined as

$$R^2_{McFadden} = 1 - \frac{\log L_c}{\log L_{null}}$$

where, in our context, L_c is the maximum likelihood value from a model with intercepts and indicators for the enlistment options, and L_{null} is the maximum likelihood value from a model with intercepts only. For the models to be identified, the intercept for one of the enlistment options is set to zero and the coefficient on one of the enlistment option indicator variables is set to zero; the coefficients set to zero need not be for the same enlistment option.

In the intercept-only model, the estimated intercepts show the probability of an option appearing in the questions asked of the respondents. Because, as mentioned, the version of 19 triplets shown to the respondent was drawn at random from the eight versions of the triplets, and because the versions differed slightly in the number of times each enlistment option appeared, there were small differences in the number of times an option appeared among the respondent population. We mentioned earlier that our experimental design had eight versions of 19 triplets of enlistment options, with the property that each option appeared approximately three times. If the number of appearances had been precisely the same for each enlistment option, each intercept would have been no greater or less than the probability for the omitted intercept (the one set to zero). Therefore, the estimated value of the intercept would have been zero because it implicitly equals the difference between the own coefficient and the coefficient on the omitted intercept. The estimated intercepts are close to zero. They range from -0.01 to 0.16 , and ten are significant at 10 percent or better. This reveals some difference in the number of times an enlistment option was shown to the respondents.

Because of the random nature of the experimental design and the random assignment of versions to respondents, we expected little change in the coefficients on the enlistment indicator variables in the model including intercepts, and this proved to be the case. The indicator-variable coefficients changed by only 0.0025 on average. For this reason, we prefer to report in Table C.1 the specification without intercepts. However, the specification with intercepts enabled computation of McFadden's R-squared. Its value was 0.64 , which implies that the enlistment option indicator variables have considerable predictive power.

TABLE C.1
Relative Value of Enlistment Incentives

	Estimate	Standard Error	z value	Pr(> z)	Significance
\$5,000 bonus, 3+ years	-0.5457	0.0435	-12.54	0.0000	***
\$15,000 bonus, 3+ years	-0.0691	0.0427	-1.62	0.1058	
\$30,000 bonus, 3+ years	0.5546	0.0435	12.75	0.0000	***
\$10,000 bonus, 4+ years	0.0362	0.0429	0.84	0.3992	
\$20,000 bonus, 4+ years	0.3756	0.0428	8.77	0.0000	***
\$40,000 bonus, 4+ years	0.7794	0.0434	17.95	0.0000	***
Choice of job, 3+ years ^a	0	--	--	--	
Choice of job, 3+ years, \$15,000 bonus	0.4539	0.0442	10.28	0.0000	***
Choice of job location, 3+ years	0.0064	0.0430	0.15	0.8810	
Choice of job location, 3+ years, \$15,000 bonus	0.3817	0.0434	8.80	0.0000	***
Choice of job and location, 3+ years	0.0965	0.0435	2.22	0.0265	*
\$65,000 LRP, 3+ years	0.2631	0.0431	6.11	0.0000	***
\$35,000 LRP, 3+ years	0.0233	0.0427	0.55	0.5855	
\$65,000 LRP, 3+ years, \$15,000 bonus	0.4925	0.0428	11.50	0.0000	***
\$35,000 LRP, 3+ years, \$15,000 bonus	0.4092	0.0427	9.59	0.0000	***
\$10,000 HIGRAD, 3+ years	-0.1261	0.0428	-2.95	0.0032	**
\$10,000 HIGRAD, 3+ years, \$15,000 bonus	0.2560	0.0434	5.90	0.0000	***
PaYS, 3+ years	0.2356	0.0435	5.41	0.0000	***
PaYS, 3+ years, \$15,000 bonus	0.5553	0.0427	13.00	0.0000	***
Observations	30,400				

NOTE: Estimates are from a logit choice probability model. Each respondent was shown 19 triplets composed randomly from a set of 19 enlistment incentives (Table A.2) such that each incentive appeared in three different triplets. The 19 triplets shown to a respondent were selected at random from eight alternative sets of 19 triplets. For each triplet, the respondent chose the most preferred incentive and the least preferred incentive. Significance codes: *** = 0.001, ** = 0.01, * = 0.05, + = 0.1.

^a The coefficient on choice of job, 3+ years was set to zero for the purpose of identifying the model.

Predicting Respondent AFQT Score

The AFQT score was predicted by means of an auxiliary analysis using the 1997 NLSY. A purpose of the 1997 NLSY was to renorm the AFQT on a current generation of American young adults, updating it from the previous norming done with the 1979 NLSY. The Armed Service Vocational Aptitude Battery was administered to survey participants, and the AFQT score was predicted from it and included in the survey. Our research approach was to estimate an AFQT regression using NLSY variables that have counterparts to those in our surveys, then use our survey variables to predict the AFQT score for our survey respondents.

Table D.1 reports the AFQT regression. Its variables are like those in the AFQT regression in Hansen, Heckman, and Mullen (2004) but adapted to variables in our surveys. The regression explains 31 percent of the variance in AFQT score. Side calculation shows that 67 percent of low-quality observations (AFQT score < 50) were correctly predicted to be low quality, and 73 percent of high-quality observations were correctly predicted to be high quality.

The NLSY is longitudinal, but Surveys 1 and 2 are cross-sectional. NLSY respondents were ages 12–17 when first interviewed in 1997 and have been interviewed 19 times since then, most recently in 2019–2020. At that time, the NLSY respondents were ages 34–39. By comparison, the respondents in our surveys were ages 18–27. Furthermore, one of the explanatory variables in the AFQT regression is parent income. Our survey respondents were asked to provide their best estimate of their parents' income when they were age 18. In contrast, all NLSY participants were initially less than 18 years old and needed to age before parent income at age 18 could be observed. In addition, other factors changed after age 18, such as marital status and education. To allow for such changes and thereby make the NLSY data compatible with our survey data, we sampled participants in NLSY waves to achieve the age distribution in Survey 1 shown in Table A.1. Because the NLSY is longitudinal, participants appear repeatedly in waves of the survey, and we were careful to avoid resampling the same participant.

Our use of the NLSY-based AFQT regression differed between Survey 1 and Survey 2. For Survey 1, we predicted the AFQT score of respondents after the survey had been administered. The predicted score allowed us to analyze ex post whether the relative value of enlistment options differed between low- and high-quality respondents (high-quality respondents have a predicted AFQT score of 50 or higher). For Survey 2, the AFQT score was predicted in real time from questions at the beginning of the survey, which enabled us to assign the enlistment options offered later in the survey by whether the respondent was high quality or not. We also used predicted quality when analyzing the survey data—e.g., running separate regressions for high- versus low-quality respondents.

TABLE D.1
AFQT Regression

	Estimate	Standard Error	t value	Pr(> t)	Significance
Intercept	49.9886	2.0745	24.10	0.0000	***
Female	0.9800	0.9243	1.06	0.2891	
Hispanic	-10.2882	1.3218	-7.78	0.0000	***
Black, non-Hispanic	-19.9113	1.3052	-15.26	0.0000	***
Asian/Pacific Islander, non-Hispanic	-4.5992	4.0693	-1.13	0.2585	
Other, non-Hispanic	-4.0894	3.2409	-1.26	0.2071	
Birth quarter April–June	-2.7126	1.2655	-2.14	0.0322	*
Birth quarter July–September	0.1263	1.2293	0.10	0.9182	
Birth quarter October–December	-0.3095	1.2451	-0.25	0.8037	
Enrolled in school	13.0574	1.0048	13.00	0.0000	***
Associate degree	4.4122	1.6231	2.72	0.0066	**
Siblings	-1.2029	0.3953	-3.04	0.0024	**
Household income \$26,000–\$40,000	-1.2511	1.7412	-0.72	0.4725	
Household income \$41,000–\$60,000	4.7551	1.5943	2.98	0.0029	**
Household income \$61,000–\$75,000	3.7776	1.7568	2.15	0.0316	*
Household income \$76,000–\$95,000	5.6964	1.7612	3.23	0.0012	**
Household income \$96,000–\$125,000	4.6458	1.7902	2.60	0.0095	**
Household income > \$125,000	7.7482	1.8874	4.11	0.0000	***
Dad’s education less than grade 12	-4.4588	1.3307	-3.35	0.0008	***
Dad’s education more than grade 12	4.0143	1.0712	3.75	0.0002	***
Mom’s education less than grade 12	-5.9355	1.4370	-4.13	0.0000	***
Mom’s education more than grade 12	4.7764	1.0341	4.62	0.0000	***
Region: South	-0.4168	0.9865	-0.42	0.6726	
Urban (population > 100,000)	-0.8490	1.1025	-0.77	0.4413	
Rural (population < 10,000)	-3.6185	1.2208	-2.96	0.0031	**
Formerly married, has kids	-7.0828	3.9218	-1.81	0.0710	+
Married/cohabiting, has kids	-1.8543	1.2610	-1.47	0.1415	
Single, has kids	-3.4351	1.2881	-2.67	0.0077	**
Formerly married, no kids	-8.8050	4.2668	-2.06	0.0392	*
Married/cohabiting, no kids	-1.6404	1.4720	-1.11	0.2652	

Table D.1—Continued

	Estimate	Standard Error	t value	Pr(> t)	Significance
Adjusted R-squared	0.308				
Residual standard error	22.88				
Observations	2,734				

NOTE: OLS regression. Dependent variable is the AFQT score. Reference person is male, is white non-Hispanic, has a birth quarter of January–March, is not enrolled in school, is a high school diploma graduate, has no siblings, had a household income at age 18 of \$25,000 or less, had a father with 12 years of education, had a mother with 12 years of education, is from a non-South region, lives in a town with a population of 10,000–99,999, was never married, and has no kids. The sample consists of participants drawn from various waves of the 1997 NLSY such that the age distribution of the sample followed the age distribution of Survey 1 respondents shown in Table A.1. Significance codes: *** = 0.001, ** = 0.01, * = 0.05, + = 0.1.

Average and Maximum Enlistment Bonuses by Job

Data on enlistment bonuses came from Army personnel records—RA Analyst data—for FY 2001–FY 2019. Relevant information in the record includes a soldier’s AFQT score, length of initial enlistment term, MOS (“job”), and bonus awarded, if any. We used the data to infer the bonus offered in each quarter by job, term length, and quality, where *high quality* is defined as an AFQT score of 50 or greater and a high school diploma and *low quality* is a score less than 50 and/or no high school diploma. It was necessary to infer the bonus from personnel data because there is no distinct database of bonuses offered by job, term length, and quality.

The Army groups jobs into six job types. These are ground forces, signal and intelligence, mechanics and engineering, aviation and aerial defense, support and logistics, and science and medicine. For each job type, Survey 2 showed respondents a list of jobs accounting for at least 90 percent of the first-term positions in that job type. There was a total of 45 such jobs, and the analysis of bonus data focused on those jobs.

For each of the 45 jobs listed in these groups on goarmy.com, we computed the average and maximum bonus and the number of soldiers receiving the bonus in each quarter of each year, by quality and term length, where term length was either three years or four or more years, though most of the latter are four years. Thus, the average and maximum bonuses were computed by quarter for LQ3 (low quality, three-year term), LQ4+ (low quality, four-or-more-year term), HQ3 (high quality, three-year term), and HQ4+ (high quality, four-or-more-year term). These were *direct* estimates of the average and maximum bonuses.

In addition, four differences were computed by quarter: HQ4+ minus HQ3, HQ3 minus LQ3, HQ4+ minus LQ4+, and LQ4+ minus LQ3. The differences were constrained (1) to be based on cases in which more than five recruits in the respective groups received a bonus in the quarter and (2) to be nonnegative. That is, we expected the bonus for, say, LQ4+ to be greater than or equal to the bonus for LQ3, and so forth for each of the differences. We then computed the weighted average of these quantities, with weights equal to the number of soldiers, given quality, and term length, receiving the bonus in a quarter relative to the total number of such soldiers across all quarters, FY 2001–FY 2019. These computations were used to obtain *indirect* estimates of the average and maximum bonuses.

As illustrated in Table E.1 for the average bonus of job 11X, we averaged the direct and indirect estimates to obtain a final estimate. The process of averaging was expected to decrease measurement error associated with each individual direct average.

Table E.2 presents the final estimates of the average bonus by Army job for quality and term length, where the averages are based on the process just described. Table E.3 has the final estimates of the maximum bonus. Army jobs are designated by MOS codes, and Table E.4 relates the codes to the job titles, sorted by job type. Even though the bonus estimates were constructed to have nonnegative differences in each quarter, averaging across quarters led to a few instances of reversal as a result of remaining measurement error or weighted averaging. These instances are shown in red. Weights depend on the relative number of accessions by term and quality, and these numbers can be randomly large or small. For an example of reversal, job code 12N has a slightly higher average bonus for LQ3 than for HQ3, as seen in Table E.2.

TABLE E.1
Direct, Indirect, and Final Estimates for Job 11X Average Bonus

Category	Direct Estimate (dollars)	Difference	Indirect Estimate (dollars)	Category
LQ3	11,203	LQ4+ minus LQ3	17,845	LQ4+
		HQ3 minus LQ3	14,479	HQ3
		HQ4+ minus LQ4+	20,443	HQ4+
		HQ4+ minus HQ3	19,081	HQ4+
HQ3	11,702	HQ4+ minus HQ3	16,305	HQ4+
		HQ3 minus LQ3	8,427	LQ3
		HQ4+ minus LQ4+	13,707	LQ4+
		LQ4+ minus LQ3	15,069	LQ4+
LQ4+	20,831	LQ4+ minus LQ3	14,189	LQ3
		HQ4+ minus LQ4+	23,429	HQ4+
		HQ3 minus LQ3	14,189	HQ3
		HQ4+ minus HQ3	18,826	HQ3
HQ4+	15,855	HQ4+ minus HQ3	11,252	HQ3
		HQ4+ minus LQ4+	13,257	LQ4+
		HQ3 minus LQ3	7,977	LQ3
		LQ4+ minus LQ3	6,615	LQ3
	Final Estimate			
LQ3	10,279	= Average [11,203 + 8,427 + 14,189 + Average (7,977 + 6,615)]		
HQ3	13,485	= Average [11,702 + 1,4479 + Average (14,189 + 18,826) + 11,252]		
LQ4+	16,580	= Average [20,831 + 17,845 + Average (13,707 + 15,069) + 13,257]		
HQ4+	18,838	= Average [15,855 + Average (20,443 + 19,081) + 16,305 + 23,429]		

NOTE: Direct estimate is a weighted average of the quarterly average for FY 2001–FY 2019 with weights based on the relative number of soldiers receiving the bonus. Indirect estimate is the nonnegative difference between the quarterly averages. Final estimate is an average of the direct and indirect estimates. Data are from Army personnel files.

TABLE E.2
Average Enlistment Bonus (in dollars) by Army Job, FY 2001–
FY 2019

MOS	LQ3	HQ3	LQ4+	HQ4+
11X	10,279	13,485	16,580	18,838
12B	6,446	9,444	9,422	12,606
12N	11,663	13,487	5,965	9,270
13B	12,644	16,542	20,050	23,800
13D	13,789	18,992	21,497	27,719
13F	13,806	18,027	21,821	26,222
13M	10,560	12,958	17,798	20,905
14E	13,652	19,993	25,446	31,217
14G	13,370	18,306	21,019	25,956
14T	13,027	18,619	19,577	27,162
15T	8,342	8,783	11,125	13,326
18X	0	15,121	13,915	19,439
19D	8,879	11,319	13,837	15,595
19K	7,638	10,530	12,841	15,645
25D	8,516	8,853	11,587	13,075
25N	11,662	13,933	10,756	12,828
25Q	9,084	15,308	17,852	22,792
25S	0	24,124	26,963	32,301
25U	10,183	17,625	14,088	23,183
31K	9,694	11,143	12,030	14,496
35F	6,759	6,001	8,288	11,227
35G	10,048	12,578	11,287	16,182
35M	7,651	9,501	11,864	14,046
35N	16,862	14,870	14,677	19,861
35P	0	0	34,542	21,562
35Q	9,247	11,699	14,129	16,374
35W	11,583	0	21,773	27,325
42A	11,504	12,247	12,954	15,869
68C	11,683	14,479	13,112	16,477
68D	6,693	9,175	10,396	13,897
68K	0	0	0	12,906
68W	0	0	7,412	13,113
68X	5,537	6,183	9,559	9,942

Table E.2—Continued

MOS	LQ3	HQ3	LQ4+	HQ4+
68Z	4,704	7,142	11,184	12,388
74D	8,252	11,412	13,142	14,985
88M	14,384	20,138	21,592	27,858
89B	8,668	9,631	10,919	14,826
89D	13,916	25,070	22,983	30,491
91B	8,842	12,761	15,524	18,145
92A	8,990	9,855	9,412	11,459
92F	13,541	19,726	21,935	30,141
92G	11,879	16,083	16,760	24,553
92R	11,208	15,388	15,022	21,415
92Y	7,277	9,781	9,394	12,818
94E	6,755	17,803	14,080	22,274

NOTE: The process of computing the average bonus is described in the text. Zero in a cell indicates that no bonus was paid. The jobs listed are a subset of all Army jobs and comprise at least 90 percent of the first-term positions in each of the Army's six job types.

TABLE E.3

Maximum Enlistment Bonus (in dollars) by Army Job, FY 2001–FY 2019

MOS	LQ3	HQ3	LQ4+	HQ4+
11X	20,526	24,550	30,544	36,309
12B	13,423	18,877	17,770	30,594
12N	13,915	13,541	19,094	37,759
13B	22,352	25,618	31,836	37,707
13D	23,179	26,818	36,713	40,310
13F	22,477	25,882	37,050	39,562
13M	16,322	18,741	26,222	30,798
14E	22,801	23,957	36,966	40,685
14G	21,154	24,626	31,997	37,011
14T	21,071	23,918	34,453	39,447
15T	9,705	10,000	15,651	19,578
18X	0	16,471	24,654	31,157
19D	16,932	19,706	23,206	30,302
19K	13,939	17,737	21,988	30,845
25D	11,244	12,676	16,870	20,043
25N	14,594	22,489	16,915	28,850

Table E.3—Continued

MOS	LQ3	HQ3	LQ4+	HQ4+
25Q	19,472	24,210	31,459	37,917
25S	0	29,272	37,198	41,547
25U	23,027	26,636	30,782	38,055
31K	14,417	18,189	23,059	34,781
35F	11,310	14,524	11,198	28,520
35G	15,700	20,098	20,224	29,560
35M	12,094	18,418	17,123	28,634
35N	19,186	19,088	22,929	32,368
35P	0	0	41,702	41,826
35Q	14,175	22,250	24,725	37,339
35W	13,737	0	29,261	39,089
42A	15,630	16,796	21,976	27,211
68C	17,178	28,214	21,745	38,317
68D	11,320	11,767	19,389	24,943
68K	0	0	0	24,860
68W	0	0	22,684	26,950
68X	9,240	10,727	15,368	22,712
68Z	12,102	13,279	16,218	26,488
74D	15,574	18,927	23,094	28,666
88M	26,160	29,103	36,501	40,996
89B	10,404	13,725	19,443	26,525
89D	29,320	29,512	37,415	45,143
91B	18,264	22,482	25,661	36,336
92A	12,663	14,623	19,842	28,691
92F	22,347	25,306	36,273	39,506
92G	19,880	23,760	29,608	37,579
92R	18,551	22,507	28,564	35,452
92Y	14,712	19,521	19,602	30,553
94E	7,833	22,387	31,228	35,723

NOTE: The process of computing the average bonus is described in the text. Zero in a cell indicates that no bonus was paid. The jobs listed are a subset of all Army jobs and comprise at least 90 percent of the first-term positions in each of the Army's six job types. Cells with red text are instances of exception to a monotonic increase in bonus value moving from LQ3 to LQ4+ to HQ3 to HQ4+.

TABLE E.4

Army Job Codes, Job Titles, and Percentage of Jobs by Job Type

MOS	Job Title	Percentage
Ground forces		
11X	infantryman	59%
19D	cavalry scout	10%
13B	cannon crew member	9%
19K	M1 armor crewman	7%
18X	special forces candidate	5%
Signal and intelligence		
25U	signal support systems specialist	17%
35F	intelligence analyst	12%
25Q	multichannel transmission systems operator-maintainer	11%
25N	nodal network systems operator-maintainer	7%
25D	cyber network defender	6%
35M	human intelligence collector	6%
25B	information technology specialist	5%
25S	satellite communication systems operator-maintainer	5%
35Q	cryptologic cyberspace intelligence collector/analyst	5%
35W	human intelligence collector recruit	4%
35N	signals intelligence analyst	4%
35G	geospatial intelligence imagery analyst	3%
94E	radio and communications security repairer	3%
Mechanics and engineering		
91B	wheeled vehicle mechanic	35%
12B	combat engineer	25%
91D	tactical power generation specialist	5%
91F	small arms/artillery repairer	4%
91S	stryker systems maintainer	3%
91H	track vehicle repairer	3%
91M	Bradley fighting vehicle system maintainer	3%
12W	carpentry and masonry specialist	2%
94F	computer/detection systems repairer	2%
91J	quartermaster and chemical equipment repairer	2%
12C	bridge crewmember	2%
91A	M1 Abrams tank system maintainer	2%
91E	allied trade specialist	2%

Table E.4—Continued

MOS	Job Title	Percentage
Aviation and aerial defense		
15T	UH-60 helicopter repairer	13%
14T	Patriot launching station enhanced operator/maintainer	13%
15R	AH-64 helicopter repairer	9%
14E	Patriot fire control enhanced operator/maintainer	8%
15U	CH-47 helicopter repairer	7%
14G	air defense battle management system operator	6%
15W	unmanned aircraft systems operator	6%
15Y	AH-64 armament/electrical/avionic systems repairer	4%
15Q	air traffic control operator	4%
14P	air and missile defense crewmember	4%
15F	aircraft electrician	3%
15G	aircraft structural repairer	3%
15B	aircraft powerplant repairer	2%
15E	unmanned aircraft systems repairer	2%
15D	aircraft powertrain repairer	2%
15N	avionic mechanic	2%
Support and logistics		
88M	motor transport operator	14%
31K	military working dog handler	11%
92G	culinary specialist	10%
92Y	unit supply specialist	10%
92A	automated logistical specialist	10%
92F	petroleum supply specialist	10%
42A	human resources specialist	9%
74D	chemical, biological, radiological, and nuclear specialist	6%
31B	military police	3%
89B	ammunition specialist	3%
92R	parachute rigger	3%
91C	utilities equipment repairer	2%

Table E.4—Continued

MOS	Job Title	Percentage
Science and medicine		
68C	practical nursing specialist	50%
68W	combat medic specialist	17%
68D	operating room specialist	7%
68E	dental specialist	5%
92W	water treatment specialist	5%
68M	nutrition care specialist	4%
68K	medical laboratory specialist	3%

Constructing Equal-Value Enlistment Options

The EOO concept is intended to allow recruiting prospects to select from a choice set of enlistment options. This appendix describes the choice sets that were initially constructed and used in the first soft launch of Survey 2, which gathered data from 100 respondents. Analysis of the soft-launch data indicated that the stand-alone bonuses were too frequently chosen over the non-bonus options. In response, we revised the choice sets by increasing the supplemental bonuses. The revised choice sets, shown in Tables 4.1–4.4, were then used in the survey.

An *enlistment option* is defined here as a stand-alone enlistment bonus or either one or a pair of non-bonus incentives that might come with a supplemental bonus. The supplemental bonus is of lesser value than the bonus by itself but, by adding to the overall value of the non-bonus incentive, is roughly on par with the bonus incentive. This helps to ensure that every option in a choice set is potentially attractive to a prospective recruit.

We constructed choice sets for each of the six job types the Army features on its website, goarmy.com, for low- and high-AFQT score prospects. These job types are mechanics and engineering, science and medicine, signal and intelligence, support and logistics, ground forces, and aviation and aerial defense. Furthermore, because the non-bonus incentives had to be on par with the bonus while the bonus could (and did) vary over time, choice sets were constructed for three bonus conditions:

- no incentives
- average bonus and comparable non-bonus incentives
- maximum bonus and comparable non-bonus incentives.

Bonuses at the average level can be associated with the historical average of recruiting conditions across years, while bonuses at the maximum level reflect the maximum bonuses received over this period.

In creating the initial choice sets, we utilized the relative value of incentives as estimated from Survey 1 data along with the bonus estimates by job (Appendix E).

Average and Maximum Bonuses by Job Type

Tables F.1 and F.2 contain estimates of the average and maximum bonuses for the six Army job types, by recruit quality and term length. These bonuses are weighted averages of the average and maximum bonuses for the jobs in Tables E.2 and E.3 where the weights equal the relative number of accessions for the jobs in Table E.4 by job type.

TABLE F.1
Average and Maximum Bonus (in dollars) by Army Job Type

Job Type	Average Bonus			
	LQ3	HQ3	LQ4+	HQ4+
Ground forces	9,975	14,078	16,774	19,672
Signal and intelligence	9,392	12,919	14,247	18,259
Mechanics and engineering	8,228	11,595	12,296	15,196
Aviation and aerial defense	11,673	15,625	18,183	23,240
Support and logistics	10,901	14,087	14,896	19,505
Science and medicine	2,693	3,329	8,190	11,890
	Maximum Bonus			
	LQ3	HQ3	LQ4+	HQ4+
Ground forces	19,129	23,438	29,618	35,595
Signal and intelligence	15,184	21,690	23,694	34,632
Mechanics and engineering	16,025	20,248	22,063	34,334
Aviation and aerial defense	17,709	19,494	28,414	32,816
Support and logistics	17,936	21,090	26,700	34,002
Science and medicine	5,218	5,926	17,254	25,255

SOURCE: Weighted averages for average and maximum bonuses by job in Tables E.2 and E.3.

Relative Value of Enlistment Incentives

Table F.2 is derived from Table C.1 in which the coefficients show the relative value of enlistment incentives. We used the coefficients to predict the probability that an incentive is chosen as best. In Table F.2, the column labeled “Relative Impact” is the predicted probability of an incentive being chosen best relative to the predicted probability of the incentive “\$15,000 bonus, 3+ years” being chosen best. The table is sorted in ascending order of the relative impact.

The relative impact values largely seem credible in that more-generous options have higher values, though some values were suspect. For example, the impact of a \$10,000 bonus for a term of four or more years was 1.04, which is a bit greater than the impact of a larger bonus, \$15,000, for a term of three or more years. The impact of PaYS, a program guaranteeing a job interview with a major corporation or public agency when leaving the Army, was 1.27, which seemed high to us. Thus, allowing for some latitude in applying the relative impacts, we concluded that

- \$35,000 LRP, choice of job location, and PaYS had approximately equal values in terms of the probability of being chosen best and were roughly on par with a \$10,000 to \$15,000 bonus.
- Adding a \$15,000 bonus to an incentive always increased its relative impact as seen in the lower rows of the table, but the increase was not additive—e.g., the impact of choice of job location plus \$15,000, 1.46, was less than the sum of choice of job location (1.01) and choice of \$15,000 bonus (0.93).
- The impact of larger bonuses, while positive, was less than the increase in the nominal amount of the bonus—e.g., the impact of a \$40,000 bonus, 2.18, was less than twice the impact of a \$20,000 bonus, 1.46.

TABLE F.2
Relative Impact of Enlistment Incentives

Incentive	Relative Impact
\$5,000 bonus, 3+ years	0.58
\$10,000 HIGRAD, 3+ years	0.88
\$15,000 bonus, 3+ years	0.93
Choice of job, 3+ years	1.00
Choice of job location, 3+ years	1.01
\$35,000 LRP, 3+ years	1.02
\$10,000 bonus, 4+ years	1.04
Choice of job and location, 3+ years	1.10
PaYS, 3+ years	1.27
\$10,000 HIGRAD, 3+ years, \$15,000 bonus	1.29
\$65,000 LRP, 3+ years	1.30
\$20,000 bonus, 4+ years	1.46
Choice of job location, 3+ years, \$15,000 bonus	1.46
\$35,000 LRP, 3+ years, \$15,000 bonus	1.51
Choice of job, 3+ years, \$15,000 bonus	1.57
\$65,000 LRP, 3+ years, \$15,000 bonus	1.64
\$30,000 bonus, 3+ years	1.74
PaYS, 3+ years, \$15,000 bonus	1.74
\$40,000 bonus, 4+ years	2.18

We used these insights to construct enlistment option sets by job type, quality level (low AFQT, high AFQT), and bonus condition (average condition, max condition). These are presented in Chapter 4.

Expected Sample Sizes by Job Type

When designing Survey 2, an important objective was to have enough observations on a job type to support statistical analysis. A respondent would find it tedious and cognitively burdensome to be asked a series of questions about all six Army job types, so we considered a strategy of asking about two, or alternatively three, job types drawn at random, plus another job type based on the respondent's own ranking of the job types. Given the ranking, the respondent would then see the top-ranked job that he or she had not already been asked about. That is, if the random draws had not included the top-ranked job, it would be shown to the respondent; if the random draws had included the top-ranked job, the respondent would be shown the next highest ranked job that had not yet been asked about.

This strategy mixes random draws with a draw based on the respondent's preferences (job ranking). The random draws are from a uniform distribution: Each job type had the same probability of being drawn. A respondent's preferences are unknown beforehand, however, so we needed to consider a hypothetical distribution of top-job preferences for the respondent population. If, for example, most respondents highly preferred the same three of the six job types, then allowing respondents to freely choose the job types they wanted to be asked about would risk having too few observations on the other three job types. Counterbalancing this concern, when recruiting prospects speak with recruiters, they may be told about many different jobs and the incentives that come with them, and the prospect can choose the most appealing one—in other words, the prospect has latitude to choose among the jobs available at the time. Therefore, we wanted to ensure that the respondent's most highly ranked job type would be included in the job types the respondent was asked about. Our survey strategy serves both perspectives: Assigning job types at random to the respondent guarantees that all job types will have some minimum number of observations to support analysis, and assigning a job type based on the respondent's ranking of job types guarantees that the respondent's preferences will be served in a way similar to the actual recruiting process.

Table G.1 illustrates a sample size calculation for two and three job types drawn at random.

The upper panel of the table is for random draws. The rows compute the probability that a particular job is drawn on the first draw, and if not on the first then drawn on the second draw, and if not on the first and second then drawn on the third. This calculation gives the probability that a particular job is drawn in the number of draws, two or three. For two draws the probability is $1/3$, and for three draws the probability is $1/2$. The survey was planned to have 800 respondents, so each job type was expected to be seen by 267 $[= (1/3) \times 800]$ or 400 $[= (1/2) \times 800]$ respondents. In other words, for 800 respondents and, say, three job types drawn at random without replacement, the expected number of observations for a given job type is 400. This is true for each of the job types, so this produces a sample of 400 observations for analysis for each job type.

Because one of the jobs is a person's top-ranked job, we next show that in expectation 267 respondents would see their top-ranked job type under two random draws, and 400 would see their top-ranked job type under three random draws. Let $(p_1, p_2, p_3, p_4, p_5, p_6)$ be an arbitrary job preference distribution for the respondent population, where $\sum p_i = 1$. The expected number of respondents who would see their top-ranked job under random draws is the sum over respondents of the probability that a particular job is

drawn multiplied by the probability that it is the respondent's top-ranked job. For instance, for two draws $800 \sum 1/3 p_i = 267 \sum p_i = 267$. An identical calculation can be done for the second-ranked job type, third-ranked job type, etc., using the respondent preference distribution for those job types. That is, any job type, no matter its ranking to the respondent, will have an expected value of 267 respondents who would see their top-ranked job type under two random draws and 400 respondents under three random draws.

The middle panel of the table relates to the number of additional observations resulting from assigning the top-ranked job type given that the respondent has not yet seen it in the random draws. The expected number of respondents depends on the respondents' job preference distribution. As mentioned, this is not known beforehand, and the distribution in the table is hypothetical, with probabilities chosen to range over high and low values for a given job type. Under two random draws and with 800 respondents, an expected 267 will have seen their top-ranked job and 533 respondents will not have seen their top-ranked job. Now, suppose, for example, that job type 2 is the top-ranked job for 15 percent of respondents. The survey will therefore assign them job type 2, which adds $80 (= 533 \times 0.15)$ more respondents seeing job type 2. Under three random draws, 400 respondents will not have seen their top-ranked job but will now be assigned it, adding $60 (= 400 \times 0.15)$ more respondents.

The lower panel adds the expected number of respondents from the upper and middle panels to obtain the total expected number of respondents by job type. Allowing for the fuzziness of the hypothetical job preference distribution, the total number ranges from about 300 to 400 respondents with two random draws and about 400 to 500 with three random draws.

TABLE G.1
Expected Sample Size Calculation

		Two Draws	Three Draws
Round 1: Random Draws			
Prob(job X=x in 1st draw)	1/6	1/6	1/6
Prob(job X=x in 2nd draw and not in 1st)	5/6 * 1/5	1/6	1/6
Prob(job X=x in 3rd draw and not in 1st and 2nd)	5/6 * 4/5 * 1/4		1/6
Prob(job X=x drawn)		1/3	1/2
Expected respondents seeing job X=x, x = 1,...,6		267	400
One of the jobs is a respondent's top job, so in expectation 267, or 400, of 800 saw their top job			
Round 2: Assignment of Top Job Based on Respondent Ranking			
Expected respondents not seeing top job in round 1		533	400
Person can choose top job (Pr = 1)			
Fraction of respondents with top job =1	0.30	160	120
Fraction of respondents with top job =2	0.25	133	100
Fraction of respondents with top job =3	0.15	80	60
Fraction of respondents with top job =4	0.15	80	60
Fraction of respondents with top job =5	0.10	53	40
Fraction of respondents with top job =6	0.05	27	20
Total Expected Observations			
Expected respondents for job 1		427	520
Expected respondents for job 2		400	500
Expected respondents for job 3		347	460
Expected respondents for job 4		347	460
Expected respondents for job 5		320	440
Expected respondents for job 6		293	420

Survey 2 Questions and Responses

Below we first show the survey instrument, then show the respondents' responses to the questions. The survey instrument contains both the questions asked of the respondents and the instructions provided to the programmers who coded the survey for its online use. The questions to respondents appear in black, and the instructions to programmers are in blue after each question and in bold red, which is used for instructions related to structural linkages between different parts of the survey, including information on which respondents were asked which questions and which sections of the survey were repeated for alternative recruiting conditions and job types.

Survey 2 Questions

Quotas

Total N	800
Q2=2, Female	160
Q2=1, Male	640
Hispanic (Q15=1)	144
Black or African American (Q15=2 + Q16=2)	96
White (Q15=2 + Q16=1)	480
Other (Q15=2 + Q16>2)	80
Q1: Age	
18–19	200
20–21	200
22–24	200
25–27	200

Introduction

Thank you very much for taking our survey. The survey begins with some background questions followed by questions related to jobs, compensation, and benefits in today's Army. As always, your responses are completely confidential. It will take about 20 minutes to complete the questionnaire.

(If Smartphone/Tablet):

Turn your device horizontally for the best view.

(Show this icon)



We are asking you these first questions for classification purposes.

1. How old are you? (Insert drop-down box with categories: Under 18, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, Over 30) (Terminate if under 18 or over 27)

2. What is your gender?

Male	1
Female	2

3. Are you currently a student?

Yes	1
No	2

4. (If Q3=1) What year are you in?

High School Junior	1
High School Senior	2
College/Vocational School: 1st year	3
College/Vocational School: 2nd year	4
College/Vocational School: 3rd year	5
College/Vocational School: 4th year or more	6 TERMINATE

5. (If Q3=2) What was the last level of education that you completed?

Less than high school or GED	1 TERMINATE
High school graduate with diploma	2
More than high school (college or vocational school) but <u>less than</u> two years of college	3
Associate's degree	4
More than two years of college but less than four years	5
Four or more years of college	6 TERMINATE

6. Do you intend to get further education?

Yes	1
No	2

7. Do you currently serve in the military or have you ever served in the military (Army, Navy, Air Force, Marine Corps, Coast Guard; either active duty or reserve)?

Yes	1 TERMINATE
No	2

8. How likely is it that you would actively consider serving in the Army in the next few years? (Insert 0–10 scale: 0=Extremely Unlikely; 10=Extremely Likely) **TERMINATE** if 0. (Bold labels)

9. What is your marital status?

Never Married	1
Married	2
Separated	3
Divorced	4
Widowed	5

(If Q9 NE 2)

10. Do you live with a spouse/partner? (If Q9=2 auto-code as Yes, “1”)

Yes	1
No	2

11. What state do you live in? (Add drop-down box)

(Programmers: create variable coding states into 9 census regions. Use the same definition as used in 2021 project for Echo Cove, ecr210030)

12. About how many people live in your city, town, or village? If you don’t know for sure, use your best guess.

Under 1,000	1
1,000 to 4,999	2
5,000 to 9,999	3
10,000 to 99,999	4
100,000 to 499,999	5
500,000 to 1,000,000	6
Over 1,000,000	7

13. Are you the parent of any children that live with you in your household?

Yes	1
No	2

14. How many brothers and sisters do you have? (Insert drop-down box with numbers 0–10)

15. Are you Spanish/Hispanic/Latino?

Yes	1
No	2

16. What is your race? (Mark one or more races to indicate what you consider yourself to be.)

Randomize

White	1
Black or African American	2
American Indian or Alaska Native	3
Asian	4
Native Hawaiian or Other Pacific Islander	5
Other	6

17. What month and year were you born in? (Insert drop-down boxes for month and year. Year range: 2005–1990)

(Programmers: add variable to flag if year born does not match age category in Q1)

18. Please provide your best estimate of your parent(s)' income when you were 18 years old.

\$25,000 or less	1
\$26,000–\$40,000	2
\$41,000–\$60,000	3
\$61,000–\$75,000	4
\$76,000–\$95,000	5
\$96,000–\$125,000	6
\$126,000 or more	7

19. What is your mother's level of education? If you are not sure, use your best guess.

Less than high school	1
Some high school	2
High school graduate	3
Some college/vocational school	4
4 or more years of college	5

20. What is your father's level of education? If you are not sure, use your best guess.

Less than high school	1
Some high school	2
High school graduate	3
Some college/vocational school	4
4 or more years of college	5

(Programmers: create variable: AFQT_RAW. The value will be based on an algorithm which we provide)

- **Create variable: AFQT**
- **If AFQT_RAW is LT 50 then AFQT=1 "Low"**
- **(If AFQT_RAW is GE 50 then AFQT=2 "High")**

(Programmers: create variable: BonusLevel)

- **BonusLevel has value: 1, 2, 3**
- **Assign one value to each respondent using Least Fill**

Next, please read the paragraph below. It gives some facts about the Army.

More than 485,000 men and women are on active duty in the Army. Army pay includes basic pay and allowances for housing and subsistence, and there are special pays for deployment and high skill, e.g., a foreign language. Basic pay and allowances together total more than pay earned by most workers (85 percent) of comparable age and education, and special pays add to that.

The Army has family support programs and provides health care, retirement benefits, 30 days of paid leave per year, and educational benefits. These include generous GI Bill benefits to fund education and living expenses after serving and that are transferable to spouses and children, as well as funding for continuing your education while serving. Initial training of two to three months is followed by training for your specific job. Job training is a few months to a year or more long depending on the job; the average is three to four months.

The Army offers a wide range of jobs and provides training for each. Each of the following six screens shows different types of jobs offered by the Army. Please read each screen carefully.

(Add a button to advance to next screen after each job type—show 1 job type per screen)
(Randomize)

Mechanics and Engineering Jobs: carpentry/masonry; interior electrician; plumber; diver; concrete/asphalt equipment operator; vehicle repairer; construction equipment repairer; chemical equipment repairer; power generation/distribution; ensuring equipment, materials and systems are available for missions; combat system maintainer; air defense system repairer; test measurement and diagnostic equipment maintenance

Science and Medicine Jobs: animal care; veterinary food inspection; dental; operating room; practical nursing; combat/special forces medic; medical laboratory; optical laboratory; pharmacy; physical therapy; nutrition care; preventive medicine; patient administration; petroleum laboratory; water treatment

Signal and Intelligence Jobs: computer/detection systems; cryptologic cyberspace analyst; signals intelligence analyst; geospatial intelligence imagery analyst; cyber operations; electronic warfare; information technology; microwave systems operator-maintainer; military intelligence systems maintainer/integrator; multichannel transmission systems operator-maintainer; radar repairer; radio and communications security repairer; radio operator-maintainer; satellite communication systems operator-maintainer; interpreter/translator; counterintelligence agent; psychological operations; public affairs communications

Support and Logistics Jobs: ammunition; ammunition stock control; automated logistics; cargo; chemical, biological, radiological, and nuclear; petroleum supply; parachute rigger; culinary; human resources; mortuary affairs; paralegal;

financial management; religious affairs; chaplain; firefighter; military police; military working dog handler; motor transport operator; watercraft operator; railway operations crewmember; transportation management coordinator; unit supply; utilities equipment repairer; visual information equipment operator-maintainer; multimedia illustrator; musician

Ground Forces Jobs: cannon crew; tank crewman; field artillery firefinder radar operator; indirect fire (e.g., artillery); infantryman; joint forces fire support; fire control; multiple launch rocket system crewmember; explosive ordnance disposal; cavalry scout; special forces; civil affairs

Aviation and Aerial Defense Jobs: Helicopter armament/electrical/avionic systems repairer; helicopter repairer (pneudraulics, powerplant, powertrain, structure); air traffic control equipment repairer; patriot missile fire control operator/maintainer; patriot launching station operator/maintainer; aviation operations; air traffic control operator; air and missile defense crewmember; air defense battle management system operator; air defense early warning system operator; unmanned aircraft systems operator; unmanned aircraft systems repairer.

Programmers:

- Create 3 variables: JobType1, JobType2, JobType3
- Select 3 of the following job types using Least Fill. Code values of selections in JobType1, JobType2, JobType3. Each JobType variable will be assigned a randomly selected job. No two JobType variables will have the same value.

Mechanics & Engineering	1
Science & Medicine	2
Signal & Intelligence	3
Support & Logistics	4
Ground Forces	5
Aviation & Aerial Defense	6

Programmers:

- Each respondent will now have three programmed variables:
 - AFQT: possible values: 1, 2 (based on algorithm)
 - BonusLevel: possible values: 1, 2, 3 (one value randomly assigned to each respondent)
 - JobType1, JobType2, JobType3: each will hold a value between 1 and 6 which is randomly assigned. No two will be the same for a given respondent.

Programmers:

- Use this table to insert the correct row of text in the following questions based on the jobs that were randomly assigned to variables JobType1, JobType2, and JobType3.

Job Table

Value	Job	Specific Jobs
1	Mechanics and Engineering	wheeled vehicle mechanic (35%) combat engineer (25%) tactical power generation specialist (5%) small arms/artillery repairer (4%) stryker systems maintainer (3%) track vehicle repairer (3%) Bradley fighting vehicle system maintainer (3%) carpentry and masonry specialist (2%) computer/detection systems repairer (2%) quartermaster and chemical equipment repairer (2%) bridge crewmember (2%) M1 Abrams tank system maintainer (2%) allied trade specialist (2%)
2	Science and Medicine	practical nursing specialist (50%) combat medic specialist (17%) operating room specialist (7%) dental specialist (5%) water treatment specialist (5%) nutrition care specialist (4%) medical laboratory specialist (3%)
3	Signal and Intelligence	signal support systems specialist (17%) intelligence analyst (12%) multichannel transmission systems operator-maintainer (11%) nodal network systems operator-maintainer (7%) cyber network defender (6%) human intelligence collector (6%) information technology specialist (5%) satellite communication systems operator-maintainer (5%) cryptologic cyberspace intelligence collector/analyst (5%) human intelligence collector recruit (4%) signals intelligence analyst (4%) geospatial intelligence imagery analyst (3%) radio and communications security repairer (3%)
4	Support and Logistics	motor transport operator (14%) military working dog handler (11%) culinary specialist (10%) unit supply specialist (10%) automated logistical specialist (10%) petroleum supply specialist (10%) human resources specialist (9%) chemical, biological, radiological, and nuclear specialist (6%) military police (3%) ammunition specialist (3%) parachute rigger (3%) utilities equipment repairer (2%)
5	Ground Forces	infantryman (59%) cavalry scout (10%) cannon crew member (9%) M1 armor crewman (7%) special forces candidate (5%)

Value	Job	Specific Jobs
6	Aviation and Aerial Defense	UH-60 helicopter repairer (13%) patriot launching station enhanced operator/maintainer (13%) AH-64 helicopter repairer (9%) patriot fire control enhanced operator/maintainer (8%) CH-47 helicopter repairer (7%) air defense battle management system operator (6%) unmanned aircraft systems operator (6%) AH-64 armament/electrical/avionic systems repairer (4%) air traffic control operator (4%) air and missile defense crewmember (4%) aircraft electrician (3%) aircraft structural repairer (3%) aircraft powerplant repairer (2%) unmanned aircraft systems repairer (2%) aircraft powertrain repairer (2%) avionic mechanic (2%)

As you have seen, the U.S. Army offers many different types of jobs and training. The jobs you can choose from if you join the active-duty Army depend on which jobs the Army needs to fill and your own job preferences when you apply to join. The enlistment incentives, if any, offered to you at that time will depend on the job and the length of the term of service you choose, as well as the number of persons the Army needs to recruit.

In the questions that follow, we will ask you about the chances you will join the active-duty Army in the next few years for jobs in several different job categories. We will show you specific jobs that make up 90 percent of the jobs in each category and the percentage of the jobs in the category that they represent—in other words, the likelihood the job will be available when you choose to join. You would select the job you prefer from those available. The job category will be paired with different possible lengths of enlistment and enlistment incentives if available for that job and enlistment length. Most recruits sign up for either three or four years, but a limited number of highly technical jobs that provide longer periods of initial training may require term lengths of five or six years. For this reason, we will ask you about joining for either three years or four or more years, though recognizing that four or more years usually means four years.

Sometimes, the Army may offer enlistment incentives to those who join. There can be one or more types of incentives.

- **Enlistment (Signing) Bonus**—A bonus for four or more years of service typically is larger than a bonus for three years. When offered, bonuses of up to \$10,000 are paid upon successful completion of initial entry training—basic training and job training. Recruits who enlist for cash bonuses totaling more than \$10,000 receive their initial payment of \$10,000 upon successful completion of initial entry training and the remaining bonus amount is paid in annual increments of up to \$10,000 a year until the bonus is paid in full.
- **Student Loan Repayment**—The amount that the Army will pay towards existing student loan debt you owe at the time you enlist. The student loan repayment amount for four or more years of service can be larger than the amount for three years. As true for enlistment bonuses, student loan repayment for debt up to \$10,000 is paid upon successful completion of initial entry training. Remaining student loan debt if any is paid in annual increments of up to \$10,000 a year until the student loan payment award is paid in full.¹
- **Job Interview**—A guaranteed job interview with a major company or public organization after leaving the Army.
- **Location**—Your choice of where you serve, an overseas area (e.g., Europe) or a region of the US.

¹ (This footnote did not appear in the survey.) Under current policy, the Army will repay one-third of the outstanding principal balance on qualifying student loans up to \$65,000, less the greater amount of taxes on the loans or \$1,500, following completion of each year of service for up to three years in total. Loans cannot be in default before or after entering active duty. Payments are made to the lender. The first payment is made after the completion of one year of service, including completion of all initial entry training. To maintain their eligibility, service members must remain qualified in their original MOS during their term of service. Service members who do not fulfill their obligated enlistment term lose their eligibility for LRP. To receive LRP, recruits must decline participation in the Montgomery GI Bill. For additional detail, see United States Army Human Resources Command, 2022.

Our incentive descriptions put LRP payouts on equal terms with enlistment bonus payouts, and, in some cases, our option choices offered different maximum LRP values and incentive combinations with LRP for longer enlistment terms and for high-AFQT respondents. The three-year payout LRP policy would further encourage recruits enlisting for four or more years to take LRP if the amount of their loan debt exceeded \$30,000 and they could receive a similar value of a stand-alone enlistment bonus. The reason is that they could get the payout in three years instead of four years. Conversely, the LRP policy would discourage those enlisting for three years to take it if their debt were \$20,000 or less and they could receive a stand-alone bonus of similar value over a period of two years.

Now we want to explain to you how to answer questions in those cases where enlistment incentives are offered. Please read the instructions on this screen and then click “Continue.”

In the table below, **each row is a different option** that includes **one or more** enlistment incentives. Incentives that are **not shaded** are **always included** as part of the listed option. **In addition:** when an option includes shaded incentives:

- You will be able to *choose the one incentive you prefer among orange-shaded incentives.*
- You will be able to *choose the two incentives you prefer among blue-shaded incentives.*

Please select one row based on the option you most prefer.

		Student Loan Repayment	Job Interview	Choice of Location	Signing Bonus	
☐	3	\$65,000				
☐	3	\$35,000	Yes	Yes	\$10,000	 Choose <u>One</u>
☐	3				\$20,000	
☐	4+	\$65,000			\$10,000	
☐	4+	\$35,000	Yes	Yes	\$12,500	 Choose <u>Two</u>
☐	4+	\$35,000	Yes	Yes	\$20,000	
☐	4+				\$30,000	

Job1

We are asking different people about different types of jobs that the Army offers. We are first going to ask you about **(Insert JobType1)**. The table below shows the jobs likely to be available and *the percentage of the jobs that they represent*—in other words, the likelihood the jobs will be available when you choose to join.

(Insert text from the row in the Job Table with the value that corresponds to value in JobType1)

No Incentives

As discussed earlier, the enlistment incentives, if any, offered at the time you join the Army will depend on the job, the length of the term of service you choose, as well as the number of persons the Army needs to recruit. First, we want to ask you about the chances that you will join the active-duty Army in the next few years if no enlistment incentives are offered to you.

(Randomize 21a AND 21b)

21a. What are the chances that you will join the active-duty Army in the next few years for an enlistment term of four (or more) years in one of these jobs in **(Insert: JobType1)** if no enlistment incentives are offered to you? Drag the arrow across the bar to show your response. [\(Insert 0%–100% slider bar\)](#)

21b. What are the chances that you will join the active-duty Army in the next few years for an enlistment term of three years in one of these jobs in **(Insert: JobType1)** if no enlistment incentives are offered to you? Drag the arrow across the bar to show your response. [\(Insert 0%–100% slider bar\)](#)

As discussed earlier, the enlistment incentives, if any, offered to you at the time you join the Army will depend on the job, the length of the term of service you choose, as well as the number of persons the Army needs to recruit. Now we are going to show you enlistment incentives available if you were offered jobs in **(Insert: JobType1)** under conditions in which the Army needs a larger number of recruits.

Average Incentives

22. Each row below is a different option including one or more incentives. Incentives that are **not shaded** are **always included** in that option. For incentives in **ORANGE** you will later choose the **one orange-shaded incentive you prefer and also will receive any bonus listed**. Please **select one row** based on the option you most prefer if you were offered jobs in **(Insert: JobType1)**.

Programmers:

- Insert question text from lookup table (Q22) based on assigned values for:
 - JobType1
 - AFQT
 - BonusLevel

(Insert from Lookup Table as specified)

22a. You selected an option that includes a choice of incentives. Which **one** would you choose?

Randomize

Student loan repayment	1
Guaranteed job interview	2
Choice of location	3

23. As a reminder, in the last question where the Army did not offer an incentive, you gave your chances of joining the Army in the next few years as (insert answer to 21b %) for three years and (insert answer to 21a %) for four or more years. What are the chances that you will join the active-duty Army in the next few years if you were offered jobs in (Insert: JobType1) given that you get the enlistment incentive option you chose? (Insert 0%–100% slider bar)

Max Incentives

Under certain conditions when the Army needs an even larger number of recruits, it will offer more generous incentives to join the Army. Now we want you to again consider being offered jobs in (Insert: JobType1) but with these more generous enlistment incentives.

24. Each row below is a different option including one or more incentives. Incentives that are **not shaded** are **always included** in that option. For incentives in **ORANGE** you will later choose the **one orange-shaded incentive you prefer and also will receive any bonus listed**. For incentives in **BLUE** you will later choose the **two blue-shaded incentives you prefer and also will receive any bonus listed**. Please **select one row** based on the option you most prefer.

Programmers:

- Insert question text from lookup table (Q24) based on assigned values for
 - JobType1
 - AFQT
 - BonusLevel

(Insert from Lookup Table as specified)

24a. You selected an option that includes a choice of incentives. Which **one** would you choose?

Randomize

Student loan repayment	1
Guaranteed job interview	2
Choice of location	3

(Insert from Lookup Table as specified)

24b. You selected an option that includes a choice of incentives. Which **two** would you choose?

Randomize

Student loan repayment	1
Guaranteed job interview	2
Choice of location	3

25. As a reminder, given the incentives offered in the last question you gave your chances of joining the Army in the next few years as (insert answer to Q23 %). What are the chances that you will join the active-duty Army in the next few years if you were offered jobs in (Insert: JobType1) given that you get the more generous enlistment incentives you just chose? (Insert 0%–100% slider bar)

Job2

Now we are going to ask you these questions again, but this time assume that the Army offered you jobs in (Insert JobType2). The table below shows the jobs likely to be available and the percentage of the jobs that they represent—in other words, the likelihood the job will be available when you choose to join.

(Insert text from a row in the Job Table with the value that corresponds to value in JobType2)

Programmers:

- Repeat questions from Job1 above, But use value for JobType2 in Q22 and Q24 lookup table
- Show Q21a and Q21b in the same order as in Job1

Job3

Now we are going to ask you these questions again, but this time assume that the Army offered you jobs in (Insert JobType3). The table below shows the jobs likely to be available and the percentage of the jobs that they represent—in other words, the likelihood the jobs will be available when you choose to join.

(Insert text from the row in the Job Table with the value that corresponds to value in JobType3)

Programmers:

- Repeat questions from Job1 above, But use value for JobType3 in Q22 and Q24 lookup table
- Show Q21a and Q21b in the same order as in Job1

Job Preferences

Here again are the types of jobs the Army offers. Please scroll down reading them to refresh your memory and then click “Continue” for the final few questions.

(Use the same order as in the table before JOB1)

1	Mechanics and Engineering wheeled vehicle mechanic, combat engineer, tactical power generation specialist, small arms/artillery repairer, stryker systems maintainer, track vehicle repairer, Bradley fighting vehicle system maintainer, carpentry and masonry specialist, computer/detection systems repairer, quartermaster and chemical equipment repairer, bridge crewmember, M1 Abrams tank system maintainer, allied trade specialist
2	Science and Medicine practical nursing specialist, combat medic specialist, operating room specialist, dental specialist, water treatment specialist, nutrition care specialist, medical laboratory specialist
3	Signal and Intelligence signal support systems specialist, intelligence analyst, multichannel transmission systems operator-maintainer, nodal network systems operator-maintainer, cyber network defender, human intelligence collector, information technology specialist, satellite communication systems operator-maintainer, cryptologic cyberspace intelligence collector/analyst, human intelligence collector recruit, signals intelligence analyst, geospatial intelligence imagery analyst, radio and communications security repairer
4	Support and Logistics motor transport operator, military working dog handler, culinary specialist, unit supply specialist, automated logistical specialist, petroleum supply specialist, human resources specialist, chemical, biological, radiological, and nuclear specialist, military police, ammunition specialist, parachute rigger, utilities equipment repairer
5	Ground Forces infantryman, cavalry scout, cannon crew member, M1 armor crewman, special forces candidate

- 6 Aviation and Aerial Defense
UH-60 helicopter repairer, patriot launching station enhanced operator/maintainer, AH-64 helicopter repairer, patriot fire control enhanced operator/maintainer, CH-47 helicopter repairer, air defense battle management system operator, unmanned aircraft systems operator, AH-64 armament/electrical/avionic systems repairer, air traffic control operator, air and missile defense crewmember, aircraft electrician, aircraft structural repairer, aircraft powerplant repairer, unmanned aircraft systems repairer, aircraft powertrain repairer, avionic mechanic

50. Please rank these jobs in order of your preference, with 1 being your most preferred and 6 being your least preferred. We recognize that you might not have strong preferences about some jobs over others but do your best to rank all the job types from 1 to 6. Click (or tap) each job type box in the order of your ranking; the rank number will appear to the left. If you change your mind, click (or tap) the box a second time.)

(Use the same order as in the table before JOB1)

Rank 1 to 6	
Mechanics and Engineering	1
Science and Medicine	2
Signal and Intelligence	3
Support and Logistics	4
Ground Forces	5
Aviation and Aerial Defense	6

(Programmers:

- Create variable, “JobType4” (Select highest ranking job in Q50 that has not been included in JobType1 or JobType2 or JobType3)
- Assign value for “JobType4” based on values in Job Table (can be any value between 1 and 6 that has not been assigned in JobType1, JobType2, or JobType3)

Now we are going to ask you these questions a final time, but this time assume that the Army offered you jobs in **(Insert JobType4)**. The table below shows the jobs likely to be available and *the percentage of the jobs that they represent*—in other words, the likelihood the jobs will be available when you choose to join.

(Insert text from the row from the Job Table with the value that corresponds to value in JobType4)

Programmers:

- Repeat questions from Job1 above, But use value for JobType4 in Q22 and Q24 lookup table
- Show Q21a and Q21b in the same order as in Job1

That completes our questionnaire. Thank you very much for your time.

Programmers: Create 16 variables

Job1_Q22: Contains response to Q22 asked as Job1 regardless of JobType or AFQT
Job1_Q24: Contains response to Q24 asked as Job1 regardless of JobType or AFQT
Job1_Q23: Contains response to Q23 asked as Job1 regardless of JobType or AFQT
Job1_Q25: Contains response to Q25 asked as Job1 regardless of JobType or AFQT

Job2_Q22: Contains response to Q22 asked as Job2 regardless of JobType or AFQT
Job2_Q24: Contains response to Q24 asked as Job2 regardless of JobType or AFQT
Job2_Q23: Contains response to Q23 asked as Job2 regardless of JobType or AFQT
Job2_Q25: Contains response to Q25 asked as Job2 regardless of JobType or AFQT

Job3_Q22: Contains response to Q22 asked as Job3 regardless of JobType or AFQT
Job3_Q24: Contains response to Q24 asked as Job3 regardless of JobType or AFQT
Job3_Q23: Contains response to Q23 asked as Job3 regardless of JobType or AFQT
Job3_Q25: Contains response to Q25 asked as Job3 regardless of JobType or AFQT

Job4_Q22: Contains response to Q22 asked as Job4 regardless of JobType or AFQT
Job4_Q24: Contains response to Q24 asked as Job4 regardless of JobType or AFQT
Job4_Q23: Contains response to Q23 asked as Job4 regardless of JobType or AFQT
Job4_Q25: Contains response to Q25 asked as Job4 regardless of JobType or AFQT

Survey 2 Results

TABLE H.1
Survey 2, Launch 3 Questions and Responses

No.	Question	Percentage or Mean
1	How old are you?	
	18	15%
	19	11%
	20	11%
	21	15%
	22	11%
	23	6%
	24	7%
	25	8%
	26	7%
	27	9%
2	What is your gender?	
	Male	54%
	Female	46%
3	Are you currently a student?	
	Yes	50%
	No	50%
4	If so, what year are you in?	
	High school junior	5%
	High school senior	19%
	College/vocational school: 1st year	31%
	College/vocational school: 2nd year	28%
	College/vocational school: 3rd year	16%

Table H.1—Continued

No.	Question	Percentage or Mean
5	If not, what was the last level of education that you completed?	
	High school graduate with diploma	60%
	More than high school but less than two years of college/vocational school	22%
	Associate's degree	12%
	More than two years of college but less than four years	6%
6	Do you intend to get further education?	
	Yes	79%
	No	21%
7	Do you currently serve in the military or have you ever served in the military (Army, Navy, Air Force, Marine Corps, Coast Guard; active or reserve)?	
	Yes	0%
	No	100%
8	How likely would you actively consider serving in the Army in the next few years? (0–10 scale: 0=Extremely Unlikely; 10=Extremely Likely)	4.74
9	What is your marital status?	
	Never Married	84%
	Married	12%
	Separated	2%
	Divorced	1%
	Widowed	0%
10	Do you live with a spouse/partner?	
	Yes	31%
	No	69%
11	What state do you live in? (summarized by region)	
	New England	3%
	Mid-Atlantic	13%
	East-North-Central	16%
	West-North-Central	5%
	South Atlantic	21%
	East-South-Central	8%
	West-South-Central	13%
	Mountain	7%
	Pacific	13%

Table H.1—Continued

No.	Question	Percentage or Mean
12	About how many people live in your city, town, or village?	
	Under 1,000	8%
	1,000 to 4,999	14%
	5,000 to 9,999	18%
	10,000 to 99,999	31%
	100,000 to 499,999	17%
	500,000 to 1,000,000	6%
	Over 1,000,000	6%
13	Are you the parent of any children that live with you in your household?	
	Yes	25%
	No	75%
14	How many brothers and sisters do you have?	2.66
15	Are you Spanish/Hispanic/Latino?	
	Yes	18%
	No	82%
16	What is your race? (Mark one or more to indicate what you consider yourself to be.)	
	White	71%
	Black or African American	15%
	American Indian or Alaska Native	5%
	Asian	7%
	Native Hawaiian or Other Pacific Islander	1%
	Other	10%
17	What month were you born in?	
	January	8%
	February	9%
	March	8%
	April	8%
	May	9%
	June	10%
	July	8%
	August	10%
	September	8%
	October	7%
	November	6%
	December	8%

Table H.1—Continued

No.	Question	Percentage or Mean
18	Please provide your best estimate of your parent(s)' income when you were 18 years old	
	\$25,000 or less	22%
	\$26,000–\$40,000	22%
	\$41,000–\$60,000	18%
	\$61,000–\$75,000	13%
	\$76,000–\$95,000	10%
	\$96,000–\$125,000	9%
	\$126,000 or more	6%
19	What is your mother's level of education?	
	Less than high school	5%
	Some high school	7%
	High school graduate	33%
	Some college/vocational school	30%
	4 or more years of college	25%
20	What is your father's level of education?	
	Less than high school	5%
	Some high school	11%
	High school graduate	35%
	Some college/vocational school	24%
	4 or more years of college	25%
	Predicted AFQT score	
	Less than 30	4%
	30–39	9%
	40–49	17%
	50–59	31%
	60–69	23%
	70–79	16%
	80 or more	0%

Logit Choice Regressions by Gender and AFQT

This appendix presents the results of our logit regressions of option choice for the men and women in the high AFQT and low AFQT respondent groups (shown in Tables I.1 and I.2).

TABLE I.1
Logit of Chosen Option by Gender: Average Bonus Level (Standard Errors)

	High AFQT				Low AFQT			
	Men	Significance	Women	Significance	Men	Significance	Women	Significance
\$35,000 LRP 3	0.438 (0.214)	*	0.623 (0.249)	*	0.440 (0.352)		-0.113 (0.377)	
Interview 3	-0.441 (0.231)	+	-0.470 (0.269)	+	-0.120 (0.370)		-0.204 (0.380)	
Location 3	0.314 (0.215)		0.348 (0.253)		0.199 (0.359)		-0.157 (0.379)	
Bonus 4+	-0.840 (0.162)	***	-0.951 (0.208)	***	-1.702 (0.302)	***	-1.456 (0.333)	***
\$35,000 LRP 4+	0.336 (0.133)	*	0.503 (0.154)	**	0.068 (0.226)		-0.041 (0.243)	
Interview 4+	-0.426 (0.152)	**	-0.761 (0.193)	***	-0.940 (0.281)	***	-0.655 (0.270)	*
Location 4+	0.126 (0.137)		0.193 (0.160)		-0.411 (0.247)	.	-0.181 (0.248)	
\$65,000 LRP 4+	0.748 (0.330)	*	0.463 (0.389)					
Bonus (000s)	0.046 (0.021)	*	0.017 (0.025)		0.131 (0.040)	**	0.057 (0.042)	

NOTE: Estimates for high AFQT omit job type 2, science and medicine. Estimates for low AFQT omit job types 1 and 2, mechanics and engineering and science and medicine. The variable name "\$35,000 LRP 3" denotes an indicator variable for a \$35,000 LRP with a three-year term of service, while "Bonus 4+" denotes an indicator variable for a stand-alone bonus with a term of four or more years. Other variable names have similar interpretations. Significance: *** = 0.001, ** = 0.01, * = 0.05, + = 0.10.

TABLE I.2

Logit of Chosen Option by Gender: Maximum Bonus Level (Standard Errors)

	High AFQT				Low AFQT			
	Men	Significance	Women	Significance	Men	Significance	Women	Significance
\$35,000 LRP 3	0.338 (0.190)	+	0.729 (0.201)	***	-0.227 (0.333)		0.595 (0.383)	
Interview 3	-0.539 (0.214)	*	-0.671 (0.246)	**	-0.527 (0.352)		0.227 (0.397)	
Location 3	0.170 (0.194)		0.401 (0.207)	+	-0.156 (0.330)		0.569 (0.384)	
\$65,000 LRP 3	0.319 (0.295)		0.735 (0.306)	*	1.188 (0.581)	*	0.852 (0.749)	
Bonus 4+	-0.768 (0.218)	***	-1.306 (0.247)	***	-0.725 (0.347)	*	-1.773 (0.475)	***
\$35,000 LRP 4+	-0.081 (0.121)		0.127 (0.129)		-0.505 (0.235)	*	-0.098 (0.240)	
Interview 4+	-1.186 (0.170)	***	-1.170 (0.189)	***	-1.676 (0.363)	***	-0.550 (0.274)	*
Location 4+	-0.249 (0.127)	*	-0.172 (0.138)		-0.737 (0.253)	**	-0.459 (0.266)	+
\$65,000 LRP 4+	0.086 (0.189)		0.077 (0.206)		0.417 (0.397)		0.799 (0.495)	
\$35,000 LRP and Interview 4+	-0.327 (0.150)	*	-0.300 (0.170)	+	-0.166 (0.324)		-0.099 (0.402)	
\$35,000 LRP and Location 4+	0.274 (0.132)	*	0.510 (0.145)	***	0.104 (0.312)		-0.004 (0.396)	
Interview and Location 4+	-0.263 (0.148)	+	-0.359 (0.173)	*	-0.166 (0.324)		0.339 (0.379)	
Bonus (000s)	0.026 (0.013)	*	0.035 (0.013)	**	0.044 (0.026)	+	0.065 (0.033)	*

NOTE: Estimates for high AFQT omit job type 2, science and medicine. Estimates for low AFQT omit job types 1 and 2, mechanics and engineering and science and medicine. Significance: *** = 0.001, ** = 0.01, * = 0.05, + = 0.10.

Logit Choice Regressions by Job Type and AFQT

In this appendix, we present the results of our logit regressions of option choice for the six job groups for the historical average and maximum bonus conditions for the high-AFQT and low-AFQT respondent groups (see Tables J.1–J.4). Between any two job types having similar menus (offering the same kind of enlistment options), the coefficients for a variable are generally within two standard errors of one another, indicating that they are not statistically different. This finding provided a basis for pooling the data across job types offering the same kind of enlistment options. Job type 2, science and medicine, offered fewer options than other job types, for instance, so its data were not pooled with other types.

TABLE J.1
Logit of Chosen Option by Job Type: Average Bonus Level, High AFQT Score (Standard Errors)

	1		2		3		4		5		6	
\$35,000 LRP 3	0.905	*			0.931	*	1.172	*	−0.085		0.340	
	(0.387)				(0.393)		(0.554)		(0.507)		(0.551)	
Interview 3	−0.283				−0.181		−0.067		−0.702		−0.386	
	(0.415)				(0.427)		(0.582)		(0.520)		(0.567)	
Location 3	0.378				1.010	**	0.867		−0.203		0.273	
	(0.396)				(0.392)		(0.558)		(0.509)		(0.552)	
Bonus 4+	−0.592	*	−1.198	+	−1.653	***	−0.694	*	−0.667	*	−1.171	*
	(0.236)		(0.630)		(0.320)		(0.346)		(0.322)		(0.456)	
\$35,000 LRP 4+	0.394		1.008	***	0.654	**	0.915	**	−0.092		0.394	+
	(0.295)		(0.209)		(0.199)		(0.324)		(0.299)		(0.221)	
Interview 4+	−0.285		−0.244		−0.302		0.017		−1.141	***	−0.944	**
	(0.317)		(0.236)		(0.235)		(0.351)		(0.347)		(0.290)	
Location 4+	0.306		0.608	**	0.392	+	0.598	+	−0.125		−0.182	
	(0.297)		(0.214)		(0.206)		(0.331)		(0.300)		(0.242)	
\$65,000 LRP 4+							1.290		−0.008		0.354	
							(0.800)		(0.731)		(0.797)	
Bonus (000s)	0.048		0.126	*	0.126	**	0.064		−0.008		0.027	
	(0.046)		(0.057)		(0.046)		(0.051)		(0.047)		(0.051)	

NOTE: Job types: 1 = mechanics and engineering, 2 = science and medicine, 3 = signal and intelligence, 4 = support and logistics, 5 = ground forces, 6 = aviation and aerial defense. Significance: *** = 0.001, ** = 0.01, * = 0.05, + = 0.10.

TABLE J.2

Logit of Chosen Option by Job Type: Average Bonus Level, Low AFQT Score (Standard Errors)

1			2			3			4			5			6					
\$35,000 LRP 3						−0.158			0.353			1.012			+ 0.073					
						(0.561)			(0.547)			(0.589)			(0.628)					
Interview 3						−0.312			−0.405			0.894			−0.185					
						(0.569)			(0.579)			(0.593)			(0.639)					
Location 3						−0.067			0.219			0.660			−0.128					
						(0.558)			(0.551)			(0.602)			(0.636)					
Bonus 4+			−1.588 ***			−0.237			−1.468 ***			−1.352 **			−2.355 ***			−1.799 ***		
			(0.408)			(0.317)			(0.434)			(0.421)			(0.578)			(0.531)		
\$35,000 LRP 4+			0.600 *						0.229			0.021			0.320			−0.395		
			(0.257)						(0.400)			(0.412)			(0.304)			(0.334)		
Interview 4+			0.002						−1.011 *			−0.639			−0.837 *			−0.541		
			(0.282)						(0.474)			(0.449)			(0.394)			(0.345)		
Location 4+			0.089						−0.150			−0.351			−0.191			−0.267		
			(0.278)						(0.415)			(0.430)			(0.334)			(0.326)		
\$65,000 LRP 4+			0.157 *			0.095			0.082			0.094			0.190 **			0.094		
			(0.064)			(0.058)			(0.064)			(0.064)			(0.067)			(0.073)		
Bonus (000s)									−0.158			0.353			1.012			+ 0.073		
									(0.561)			(0.547)			(0.589)			(0.628)		

NOTE: Job types: 1 = mechanics and engineering, 2 = science and medicine, 3 = signal and intelligence, 4 = support and logistics, 5 = ground forces, 6 = aviation and aerial defense. Significance: *** = 0.001, ** = 0.01, * = 0.05, + = 0.10.

TABLE J.3

Logit of Chosen Option by Job Type: Maximum Bonus Level, High AFQT Score (Standard Errors)

	1	2		3		4		5		6		
\$35,000 LRP 3	0.515			0.476		0.588		0.040		0.423		
	(0.436)			(0.727)		(0.484)		(0.461)		(0.521)		
Interview 3	-0.460			-0.451		-0.353		-0.744		-0.904		
	(0.470)			(0.749)		(0.522)		(0.488)		(0.573)		
Location 3	0.233			0.294		0.563		-0.234		0.403		
	(0.443)			(0.730)		(0.484)		(0.468)		(0.521)		
\$65,000 LRP 3	0.603			0.442		0.892		-0.440		0.573		
	(0.797)			(0.923)		(0.886)		(0.933)		(0.969)		
Bonus 4+	-0.925	-1.772	+	-1.066	+	-1.425	*	0.300		-1.506	*	
	(0.628)	(0.922)		(0.563)		(0.704)		(0.554)		(0.668)		
\$35,000 LRP 4+	-0.068	0.049		-0.138		-0.090		0.337		-0.018		
	(0.226)	(0.460)		(0.227)		(0.293)		(0.253)		(0.230)		
Interview 4+	-1.028	***	-1.703	***	-0.993	***	-1.437	***	-0.939	**	-1.425	***
	(0.292)		(0.510)		(0.283)		(0.378)		(0.352)		(0.340)	
Location 4+	-0.229		-0.302		-0.117		-0.110		0.042		-0.413	+
	(0.234)		(0.465)		(0.226)		(0.294)		(0.268)		(0.251)	
\$65,000 LRP 4+	0.010	0.255		-0.078		0.400		-0.124		-0.035		
	(0.450)	(0.226)		(0.548)		(0.489)		(0.552)		(0.532)		
\$35,000 LRP and interview 4+	-0.345	-0.436		-0.211		-0.232		-0.385		-0.426		
	(0.312)	(0.306)		(0.297)		(0.270)		(0.330)		(0.350)		
\$35,000 LRP and location 4+	0.144	0.460		0.361		0.727	**	0.382		0.287		
	(0.288)	(0.281)		(0.275)		(0.226)		(0.297)		(0.319)		
Interview and location 4+	-0.207	-0.318		-0.182		-0.345		0.021		-0.755	*	
	(0.304)	(0.302)		(0.296)		(0.278)		(0.309)		(0.371)		
Bonus (000s)	0.037	0.082	+	0.030		0.058		-0.029		0.035		
	(0.038)	(0.042)		(0.040)		(0.042)		(0.040)		(0.047)		

NOTE: Job types: 1 = mechanics and engineering, 2 = science and medicine, 3 = signal and intelligence, 4 = support and logistics, 5 = ground forces, 6 = aviation and aerial defense. Significance: *** = 0.001, ** = 0.01, * = 0.05, + = 0.10.

TABLE J.4

Logit of Chosen Option by Job Type: Maximum Bonus Level, Low AFQT Score (Standard Errors)

	1		2		3		4		5		6	
\$35,000 LRP 3	0.861				0.292		-0.256		0.923		0.941	
	(0.754)				(1.131)		(0.541)		(0.733)		(0.618)	
Interview 3	0.494				0.446		-0.518		1.192	+	0.353	
	(0.765)				(1.128)		(0.562)		(0.720)		(0.653)	
Location 3	0.436				0.234		0.124		1.303	+	0.941	
	(0.767)				(1.132)		(0.518)		(0.716)		(0.618)	
\$65,000 LRP 3									2.721	*	0.000	
									(1.292)		(0.000)	
Bonus 4+	-1.484	*	-0.581		-2.961	+	-1.353	*	-1.785	*	-2.165	**
	(0.599)		(0.970)		(1.796)		(0.660)		(0.760)		(0.821)	
\$35,000 LRP 4+	0.115		0.151		-0.256		-0.751	*	-0.013		-0.563	
	(0.318)		(0.424)		(0.263)		(0.324)		(0.315)		(0.362)	
Interview 4+	-0.578		-0.725		-0.679	*	-1.193	**	-0.929	*	-0.968	*
	(0.370)		(0.451)		(0.295)		(0.381)		(0.417)		(0.415)	
Location 4+	-0.273		-0.052		-1.059	**	-0.825	*	-0.524		-0.650	+
	(0.344)		(0.428)		(0.334)		(0.333)		(0.364)		(0.372)	
\$65,000 LRP 4+	1.483				1.748		0.695		1.590	+	1.827	*
	(1.083)				(1.888)		(0.756)		(0.857)		(0.912)	
\$35,000 LRP and interview 4+							0.224		0.581		0.353	
							(0.514)		(0.603)		(0.653)	
\$35,000 LRP and location 4+							-0.048		0.214		0.884	
							(0.528)		(0.631)		(0.621)	
Interview and location 4+							0.124		0.501		0.941	
							(0.518)		(0.608)		(0.618)	
Bonus (000s)	0.109		0.036		0.137		0.076		0.137	*	0.146	*
	(0.069)		(0.075)		(0.156)		(0.055)		(0.061)		(0.066)	

NOTE: Job types: 1 = mechanics and engineering, 2 = science and medicine, 3 = signal and intelligence, 4 = support and logistics, 5 = ground forces, 6 = aviation and aerial defense. Significance: *** = 0.001, ** = 0.01, * = 0.05, + = 0.10.

Abbreviations

AFQT	Armed Forces Qualification Test
DoD	U.S. Department of Defense
EOO	enlistment options optimizer
FY	fiscal year
GED	General Educational Development test
HSDG	high school diploma graduate
IIR	independence from irrelevant alternatives
LRP	Loan Repayment Program
MOS	Military Occupational Specialty
NLSY	National Longitudinal Survey of Youth
OLS	ordinary least squares
PaYS	Partnership for Your Success
RA	Regular Army
RCT	randomized controlled trial
USAREC	U.S. Army Recruiting Command

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The authors developed an Army Enlistment Options Optimizer approach that creates bundles of bonus and non-bonus enlistment incentives, often paired with smaller, supplemental bonuses. If implemented, potential recruits would choose the bundle they most value from those available according to job type, term length, recruit characteristics, and recruiting environment. This gives recruits greater agency in choosing their enlistment options, potentially increasing satisfaction and enlistments. At the same time, the recruit cohorts would have the characteristics desired by the Army and the Army would benefit from cost savings resulting from reduced bonus expenditures.

Through two surveys of young adults ages 18–27, the authors found that non-bonus incentives were as attractive as bonuses of \$10,000–\$15,000. Options that included non-bonus incentives and supplemental bonuses were chosen more often than larger stand-alone bonus options. Respondents choosing those options rated their likelihood of joining the Army in the next few years to be as high as or higher than respondents choosing stand-alone bonuses. The results also indicate that the student loan repayment option is very popular among today's young adults. It could be used to help penetrate the college market and could save recruiting resources when used in a controlled fashion as an element of the option menus. The results suggest that providing information in the recruiting marketing process on the many jobs that the Army offers and the pay and benefits of serving could increase consideration of joining the Army.

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