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# NAVAL POSTGRADUATE SCHOOL

**MONTEREY, CALIFORNIA**

# THESIS

**ENLISTMENT DECISIONS OF THE MILLENNIAL GENERATION: AN ANALYSIS OF MICRO-LEVEL DATA**

by

Kevin M. Halfacre

September 2007

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| Thesis Advisor: | Stephen Mehay |
| Co-Advisor: | Elda Pema |

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# ENLISTMENT DECISIONS OF THE MILLENNIAL GENERATION: AN ANALYSIS OF MICRO-LEVEL DATA

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Submitted in partial fulfillment of the
requirements for the degree of

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This thesis examines enlistment decisions of youth in the Millennial Generation based on individual-level data. Current recruiting policies are based upon studies that were conducted in the 1980s and 1990s. To update the factors that influence individual enlistment decisions of youth in the Millennial Generation, a nationwide representative survey of youth born between 1980 and 1984—the 1997 National Longitudinal Survey of Youth—was analyzed. The data set was used to compare enlistment decisions of previous generations and to update the potential background characteristics that affect the post-high school decisions of American youth. In addition to using demographic data similar to previous studies, four additional predictors of enlistment were examined: high school type; participation in high school vocational, academic, and JROTC programs; educational classification; and legal issues. Results show that there are some differences in the factors that affect enlistment decisions across generations based upon demographic data, type of high school programs, and legal background.

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# I. INTRODUCTION

## A. BACKGROUND

With a downsizing of the military and the high numbers of youth that are eligible for military service, one would think that recruiting today's youth would be easy. However, the job of the recruiter is considered one of the toughest jobs in the military, possibly second to actual combat. The successful recruiter is the one who continuously meets his or her goal. The continuing success of the all-volunteer military is strongly based upon the achievement of recruiting goals. Recruiting might then be classified as "ground-zero" for the military.

Each year nearly 200,000 youth enlist in the military. These numbers classify the armed forces as a major employer of youth. Numerous studies have been conducted since the beginning of the All-Volunteer Force in 1973 to determine the military attitudes of youth and to identify predictors of youth enlistment behaviors. These studies have been able to predict youth enlistment at aggregate levels and analyze intentions at the individual level. Many policy decisions and allocations of recruiting resources have been made based upon these studies. However, aggregate data and enlistment intentions fail to fully address the question of who ultimately enlists. As Hosek states, "aggregate and intentions studies both possess limitations that may affect the interpretation and applicability of their results" (Hosek and Peterson, 1985). On the other hand, micro-level data on the actual enlistment decisions of individuals may yield results that can be effectively applied to the design and analysis of enlistment incentives.

Based on the numerous previous studies the individual enlistment decision already has been exhaustively researched and modeled. However, over the years generational characteristics tend to change. Explaining these generational changes will have to take into account several different factors. Education, for example, greatly influences people's attitudes, values, and preferences. The generations born after World War II are much better educated than older Americans. This means that middle-aged and younger generations will think and behave differently from the way their parents did at

the same age. Diversity also plays an important role in the younger generations. Younger generations have become accustomed to interaction with a wide variety of cultures and races (New Strategist Editors, 2005). Consequently, updating individual factors that currently influence the 'Millennial Generation' is crucial for developing an effective modern recruiting strategy—or targets for incentives.

## B. MILLENNIAL GENERATION

Before defining the Millennial Generation, it is important to understand how a generation is defined. Neil Howe and Bill Strauss, generational historians, define a generation as "[a group who] is shaped by events or circumstances according to which phase of life its members occupy at the time" (Howe and Strauss, 2007). Andrew Wilcox quotes Don Tapscott saying, "the baby boomers were shaped by pivotal events such as the war in Vietnam, Woodstock, the moon landing—all of which were brought to youth by the new glowing device in the living room" (Wilcox, 2001). Generations are a result of the unique influences in their life.

### 1. Introduction of the Millennial Generation

The Millennial Generation—America's current (2007) teens and youngest adults—is the most mysterious of the five generations of living Americans (Millennial Generation, Generation X, Baby-Boom Generation, Swing Generation, and World War II Generation). The Millennial Generation consists of those youth born between 1977 and 1994. They are characterized as the "babies on board" from the early Reagan years, the "Have you hugged your child today?" from the Clinton era, and the teens from Columbine (Howe and Strauss, 2000). In 2004, the Millennial Generation numbered 73 million and accounted for 26 percent of the total population—close to the Baby Boom's 28 percent share (New Strategist Editors, 2004).

The Millennial Generation is the next generation after Generation X, also known as the Baby-Bust Generation, whose members were born in the years 1965 to 1976. The oldest of the Millennials were born in 1977, and the total number of births has reached 3.3 million. This spurt followed a 12-year lull in births during the Generation X time

period. By 1980, annual births had reached 3.6 million, and by 1990, they reached 4 million. In total, 68 million babies were born between 1977 and 1994 (New Strategist Editors, 2004)

The time frame in which Millennials are growing up is very different from that of their parents. Racial and ethnic diversity is higher among Millennials than among older generations. The inter-connection with other countries is becoming more transparent, as travel, migration, and the Internet connect members of the generation across the globe. Millennials also face a more difficult world, one in which terrorism is a real threat and economic anxiety is difficult as their parents cope with a fragile economy, rising health care costs, and uncertain retirement prospects (New Strategist Editors, 2005).

## 2. General Characteristics

Who are these Millennials? According to an article written by Claire Raines, "They're the hottest commodity on the job market since Rosie the Riveter. They're sociable, optimistic, talented, well-educated, collaborative, open-minded, influential, and achievement-oriented. They've always felt sought after, needed, [and] indispensable" (Raines, 2002). These are the Gen-Xers on steroids. The Millennials are unlike any other previous youth generation. Howe and Strauss describe them as "more numerous, more affluent, better educated, and more ethnically diverse" (Howe and Strauss, 2000). They also state that they "will prove false the assumption that each generation of young adults is more alienated and risk prone than the one before" (Howe and Strauss, 2007).

### *a. Gender*

Over the years gender differences have changed significantly and especially compared to that of the Millennials. In an interview with Andrew Wilcox, Bill Strauss states that these kids "have been raised in a culture that has made a lot of difference to making sure society is gender neutral" (Wilcox, 2001). Roles of the parents are becoming blurred. More fathers are staying home while the mothers go to work. The parental and home duties are becoming more evenly split. The "Leave it to Beaver" model is more folklore than actuality. The New Strategist Publications say that

Millennial girls and women will further the gains made by elder women. Females are moving more into male dominated arenas, such as politics and sports. And young women are more numerous in colleges than males (New Strategist Editors, 2005).

### *b. Work Ethic*

The Millennials even have differing and distinct traits in their work ethic than previous generations. According to Raines, the characteristics that describe the Millennials are: confident, hopeful, goal- and achievement-oriented, civic-minded, and inclusive. They are confident because they are raised by parents who believe in the importance of self-esteem. They characteristically consider themselves to be ready to leap tall buildings. The Millennials are hopeful because they believe in the future and their role in it. They are optimistic, yet practical and goal-oriented. Many of the Millennials arrive at their first day of work with their personal goals written on paper. They were taught to think in terms of the greater good, which drives the desire to be civic-minded. And Millennials are used to being organized in teams—making sure no one is left behind. They expect to be inclusive in that they earn a living in a workplace that is fair to all, where diversity is the norm—and they will use their collective power if someone is treated unfair (Raines, 2002).

### *c. Education*

The Millennial Generation places more importance on education than previous generations. Howe and Strauss report that in the early 1980s American education was considered to be "a nation at risk." The Gen-X children were considered to be stupid in many subjects. And in the late 1980s the nation's leaders set out to make America's youth number one in the world in math and science (Howe and Strauss, 2000).

The growth of private and parochial schools increased during the 1990s—after seeing a decline in the 1980s. The charter school movement also has impacted the Millennials, since the use of public funds can be obtained to run these magnet schools. Even with the growth of non-public schools, the traditional public school remains the standard for most Millennial school children. The passing of the *No Child Left Behind*

*Act of 2001* has caused public schools to be more accountable for their actions. Public schools are becoming the focus of many parental groups to uphold educational standards—which are being defined mainly by standardized tests to meet the *No Child Left Behind Act* guidelines (Howe and Strauss, 2000).

## C. PURPOSE OF THIS STUDY

The purpose of this thesis is to identify the individual characteristics that affect the decision to enlist and to evaluate any factors that may have changed from previous decades. By using two previous studies of individual decisions—one from the 1980s and one from the 1990s—with the results in this thesis on the Millennial Generation, we can compare generational differences in enlistment behavior. In addition, this thesis will attempt to identify new demographic and educational characteristics that influence the decision to enlist that were omitted from previous research.

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# II. COMPARISON OF PREVIOUS STUDIES

## A. INTRODUCTION

The purpose of this chapter is to compare previous research studies on individual enlistment decisions. This will help set the framework for the updated models presented in this thesis. A summary of previous empirical findings is also presented in an attempt to identify any changes of factors that predict enlistment for the Millennial Generation.

## B. THE 1985 HOSEK AND PETERSON STUDY

Hosek and Peterson (1985) builds upon previous studies of enlistment decisions using micro-data by having a large population of new enlistees with which to perform detailed analyses. Such small numbers in previous studies did not allow for stratification of the data to examine whether enlistment behavior differs among subpopulations of youth.

To accomplish this, Hosek and Peterson (1985) build a model to explain enlistment decisions as a function of the expected value of the utility of enlistment relative to other alternatives. Hosek and Peterson's model conditions the enlistment decision upon the individual's eligibility, as determined by their Armed Forces Qualification Test (AFQT) score.

Hosek and Peterson (1985) distinguish between two market segments—high school seniors and graduates. Their work shows that there is a difference in the characteristics and enlistment determinants of these two groups. Hosek and Peterson further stratify each of these two groups into several subgroups. The first subgroup is determined by respondents' educational expectations (high or low), whereas the second is based on ability (as proxied by the respondents' AFQT score). The predictor variables that they use are based on both supply and demand factors. They use data on males from the *1979 National Longitudinal Survey of Labor Force Behavior, Youth Survey* (NLS) combined with the *1979 DoD Survey of Personnel Entering Military Service* (AFEES).

Because the AFEES-NLS is a choice-based sample composed of two stratified random samples, they use the weighted, exogenous sampling maximum likelihood (WESML) method. Table 1 shows the results for the graduate group from Hosek and Peterson's specification and Table 2 shows the results for the senior group. The variables and results are explained below.

Table 1. Hosek and Peterson Enlistment Model Results for Graduates (t-statistics).

| | | Expect More Education | | AFQT Group | |
|---|---|---|---|---|---|
| **Variable** | **All** | **Yes** | **No** | **Upper** | **Lower** |
| Black | .467 | .510 | .148 | .906 | -.027 |
| | (2.19) | (1.93) | (.36) | (2.23) | (-.10) |
| Hispanic | -.214 | -.342 | .348 | -.477 | -.363 |
| | (-.70) | (-.91) | (.77) | (-1.07) | (-.80) |
| AFQT CAT IV (score 10-30) | -.190 | .209 | -1.145 | n.a. | -2.789 |
| | (-.57) | (.44) | (-2.25) | | (-2.48) |
| Share of Seniors and recent grads | -24.543 | -18.436 | -32.886 | -34.449 | -9.341 |
| | (-5.42) | (-2.92) | (-4.64) | (-5.16) | (-1.36) |
| Recruiter Density | -.257 | -.287 | -.845 | 2.425 | -6.440 |
| | (-.20) | (-.17) | (-.32) | (1.39) | (-2.79) |
| GED | .787 | -.103 | 2.275 | .674 | 1.302 |
| | (2.55) | (-.23) | (5.31) | (1.47) | (2.65) |
| Age 17 when Senior | .024 | -.219 | .323 | -.309 | .358 |
| | (.16) | (-1.05) | (1.35) | (-1.35) | (1.43) |
| Age 19+ when senior | -.098 | -.542 | .597 | -.331 | -.252 |
| | (-.42) | (-1.68) | (1.55) | (-.82) | (-.73) |
| AFQT score | .0025 | .0147 | -.0196 | .0084 | -.0672 |
| | (.52) | (2.26) | (-2.49) | (1.04) | (-2.34) |
| Live at home | .042 | .108 | .212 | .283 | -.139 |
| | (.19) | (.36) | (.58) | (.87) | (-.38) |
| Family income | .0020 | .0034 | -.0035 | .0065 | -.0069 |
| | (.28) | (.34) | (-.27) | (.62) | (-.50) |
| Number of siblings | .102 | .083 | .193 | .055 | .149 |
| | (2.95) | (1.58) | (4.29) | (1.01) | (3.67) |
| Expect more education | .465 | n.a. | n.a. | 1.004 | .014 |
| | (3.45) | | | (4.77) | (.06) |
| Mother's education | .034 | -.015 | .134 | -.073 | .094 |
| | (1.22) | (-.41) | (3.20) | (-1.58) | (2.34) |
| Some postsecondary education | -.641 | -.560 | -.684 | -1.010 | -.245 |
| | (-2.49) | (-1.89) | (-1.58) | (-3.10) | (-.66) |
| Ln months since school | -.395 | -.344 | -.705 | -.422 | -.373 |
| | (-5.23) | (-3.50) | (-5.349) | (-3.73) | (-2.97) |
| Ln hourly wage | -1.026 | -.618 | -1.102 | -1.028 | -1.368 |
| | (-4.49) | (-1.87) | (-3.91) | (-2.82) | (-4.06) |
| Weekly hours, employed | -0.12 | -.008 | -.017 | -.006 | -.016 |
| | (-1.33) | (-.69) | (-1.58) | (-.45) | (-1.06) |

| | | | | | |
|---|---|---|---|---|---|
| Ln months on job, employed | -.236 | -.233 | -.173 | -.293 | -.175 |
| | (-3.76) | (-2.88) | (-1.73) | (-3.16) | (-1.67) |
| Not currently employed | -3.072 | -2.730 | -1.737 | -3.692 | -3.437 |
| | (-3.93) | (-2.78) | (-1.59) | (-3.28) | (-2.85) |
| Weekly hours, not currenly employed | .052 | .055 | .033 | .083 | .048 |
| | (3.33) | (2.59) | (1.49) | (3.96) | (2.02) |
| Months not employed | .252 | .221 | .215 | .159 | .396 |
| | (4.35) | (2.78) | (2.48) | (1.75) | (5.60) |
| Not employed last 12 months | -.824 | -.599 | - | .832 | -.834 |
| | (-1.47) | (-.79) | | (-1.00) | (-1.01) |
| Constant | 3.057 | 1.928 | 4.827 | 3.794 | 6.458 |
| | (3.28) | (1.48) | (3.70) | (2.59) | (3.55) |
| Notes: T-statistics in parenthesis;<br>Sample: all males | | | | | |

Source: Hosek and Peterson 1985

Table 2. Hosek and Peterson Enlistment Model Results for Seniors (t-statistics).

| | | Expect More Education | | AFQT Group | |
|---|---|---|---|---|---|
| **Variable** | **All** | **Yes** | **No** | **Upper** | **Lower** |
| Age 17 when senior | -.361 | -.400 | -.237 | -.451 | -.322 |
| | (-2.30) | (-1.81) | (-.84) | (-2.02) | (-1.28) |
| Age 19 when senior | .602 | .097 | .815 | - | .093 |
| | (2.36) | (.23) | (2.08) | | (.28) |
| AFQT score | -.0107 | -.0044 | -.0203 | -.0105 | .0054 |
| | (-2.00) | (-.59) | (-2.06) | (1.20) | (.26) |
| Live at home | .208 | .175 | -.687 | -.052 | .580 |
| | (.62) | (.42) | (-1.29) | (-.09) | (1.22) |
| Family income (in thousands) | -.028 | -.086 | -.013 | -.032 | -.050 |
| | (-3.50) | (-3.22) | (-.92) | (-3.08) | (-3.26) |
| Number of siblings | .104 | .184 | .055 | .310 | -.025 |
| | (2.74) | (3.44) | (1.02) | (5.47) | (-.50) |
| Expect more education | -.598 | n.a. | n.a. | -.079 | -1.075 |
| | (-3.58) | | | (-.28) | (-4.21) |
| Mother's education | .109 | .007 | .303 | .065 | .179 |
| | (3.34) | (.16) | (4.58) | (1.37) | (3.67) |
| Ln hourly wage | -2.416 | -.667 | -3.416 | -3.402 | -2.804 |
| | (-4.29) | (-.76) | (-3.62) | (-3.71) | (-3.13) |
| Weekly hours, employed | .017 | .104 | -.003 | .013 | .047 |
| | (1.15) | (6.19) | (-.17) | (.83) | (3.19) |
| Ln months on job, employed | -.156 | -.321 | -.153 | -.200 | .014 |
| | (-1.84) | (-2.42) | (-1.16) | (-1.40) | (.11) |
| Not currently employed | -1.208 | -.429 | -2.045 | -1.410 | -1.743 |
| | (-2.14) | (-.64) | (-2.12) | (-1.84) | (-1.66) |
| Weekly hours,<br>not currenly employed | -.006 | .022 | -.054 | .006 | -.010 |
| | (-.59) | (1.69) | (-2.48) | (.44) | (-.70) |
| Months not employed | .234 | .133 | .671 | .171 | .571 |
| | (4.25) | (1.80) | (5.16) | (2.17) | (4.81) |

| | | | | | |
|---|---|---|---|---|---|
| Not employed last 12 months | -2.276 | .630 | -2.816 | -3.521 | -1.632 |
| | (-3.10) | (.56) | (-2.46) | (-2.97) | (-1.53) |
| Black | .465 | -.075 | 1.097 | .149 | .649 |
| | (2.18) | (-.24) | (3.06) | (.36) | (2.23) |
| Hispanic | .431 | -.389 | 1.73 | -.280 | .842 |
| | (1.69) | (-.99) | (4.26) | (-.61) | (2.38) |
| AFQT cat IV (10-30) | -1.078 | -.912 | -2.202 | n.a. | -.668 |
| | (-3.04) | (-1.73) | (-3.64) | | (-1.41) |
| Share of seniors and recent grads | -4.772 | .204 | -1.791 | -11.080 | -4.822 |
| | (-.99) | (.03) | (-.22) | (-1.49) | (-.60) |
| Recruiter density | .592 | -2.228 | 1.831 | 1.639 | .056 |
| | (.48) | (-1.10) | (.74) | (.84) | (.030) |
| Constant | -.211 | -2.371 | -.968 | 1.662 | -1.350 |
| | (-.18) | (-1.45) | (-.51) | (.94) | (-.74) |
| Sample Size | 1784 | 881 | 801 | 810 | 834 |
| | | | | | |

Source: Hosek and Peterson 1985

### 1. Supply Determinants

Supply side determinants that factor into one's utility are based upon the individual's direct expenses of attending college and his or her learning proficiency. The specific variables that Hosek and Peterson use as predictors of supply side determinants are: age when a senior, AFQT score, live at home, family income, number of siblings, expect more education, mother's education, hourly wage, weekly hours, months since school, months on current job, months not employed, and race/ethnicity.

*Age When a Senior.* Hosek and Peterson hypothesize that the enlistment probability for seniors will rise with the age of a senior because older seniors may have been held back when in elementary school, indicating lower ability. Table 1 shows that they did not find any significant effect of enlistment probabilities of graduates who were 17 versus 18 when they were seniors, or 18 versus 19 or older.

*AFQT Score.* Table 1 shows that the enlistment probability of those in the 31-100 range (Category I-IIIB) is weak and insignificant for graduates. The insignificant *AFQT score* effect for all graduates arises because of the competing and opposite effects between the educational expectations subgroups. Table 2 shows that the effect is strong and significant for all seniors. Also, the *AFQT score* is statistically significant and negative for those who do not expect more education.

*Lives at Home.* The hypothesis of seniors living at home is that youth will be in a better position to finance education and, therefore, will be less likely to enlist. For graduates, the effect will be very small. Empirically, living at home is not a strong predictor of enlistment decisions.

*Family Income.* The effect of *family income* for seniors reduces the enlistment probability as income rises. Among the seniors group, the negative effect is stronger for those who expect more education, and there is a stronger effect between the lower AFQT groups than the upper. The relationship between *family income* and graduates is statistically insignificant.

*Number of Siblings*. As the number of brothers and sisters increases, the family has less money available to them to pay for further education. The results confirm their hypothesis. They find a positive relationship between *number of siblings* and enlistment probabilities for both seniors and graduates.

*Expect More Education*. Those in the senior group who expect more education have significantly lower enlistment probabilities than those who do not expect more education. This was a confirmation of their hypothesis.

*Mother's Education*. There was no specific hypothesis originally stated by Hosek and Peterson on the effect of *mother's education*. But they do find that within the seniors' group, the effect of *mother's education* depends upon the education expectations of the youth. Overall, *mother's education* exhibits a positive effect for the propensity of enlistment for seniors, but if the senior expects more education, then *mother's education* has no effect. If the youth does not expect more education, then *mother's education* greatly increases enlistment propensity. However, when the graduates are split into an upper-AFQT and lower-AFQT group, *mother's education* has a negative effect among the upper-AFQT graduates and a positive effect among lower-AFQT graduates.

*Hourly Wage*. Hosek and Peterson's access to individual data allows them to control for individuals' current, or most recent, wage rate. However, it should be noted that this variable may not reflect the individual's future wage potential. Overall, the results show greater wage responsiveness for seniors than for graduates. However, there

are differences within the two groups when they are subdivided by educational expectations. Seniors who do not expect more education have a larger, more negative, wage elasticity than seniors who expect more. This means that seniors headed for further education not only have a low probability of enlistment but also are unresponsive to the wage rate at their civilian job. Seniors not headed to further education are very responsive to changes in wage rates.

*Weekly Hours.* The effect of weekly hours of work on the probability of enlistment is negative and significant for graduates. Hosek and Peterson attribute this to the fact that individuals working longer hours typically have higher weekly and annual earnings and, compared to graduates working shorter hours, will tend to have a higher utility for working in the civilian sector relative to the alternatives of enlistment or further schooling. Interestingly, the effect of hours on the enlistment propensity of seniors appears positive. This suggests that longer employment hours during the senior year may serve as a signal indicating a tendency to postpone postsecondary schooling.

*Months since School*. Hosek and Peterson find that the relationship between *months since school* and graduates' probabilities of enlistment is negative. They also find that those who do not expect more education have a larger, more negative, probability than those that do expect more education.

*Months on Current Job*. The results show that the number of months on the current job has a negative effect on probability of enlistment. This effect is also stronger for graduates than for seniors.[1] This effect shows a greater responsiveness in both the graduates and seniors for those that expect more education and those in the upper-AFQT group.

*Months not Employed*. Unemployed graduates are more likely to enlist than employed graduates. However, unemployed seniors are less likely to enlist than employed seniors. Hosek and Peterson's original hypothesis is that the effect on seniors is ambiguous because the months not employed would not concern them. They find that

[1] Hosek and Peterson note that months on current job is expressed in natural logarithm form in the regression analysis. The reported negative effect of an additional month on the job on the probability of enlisting is strongest for those with shorter job tenure.

unemployed seniors are less likely to enlist than employed seniors. When they group the seniors by education expectations they found that those who expect more education are less affected by the number of months not employed. The graduates do not respond the same way. The education expectations do not affect the enlistment probability. However, when graduates are grouped by AFQT score, those in the lower groups are more likely to enlist.

*Race/Ethnicity.* Hosek and Peterson find that relative to white non-Hispanics, black and Hispanic seniors have higher enlistment probabilities, even after controlling for their socioeconomic background and employment status. They suggest that this overall effect is because labor market opportunities are worse for minority seniors who have no future education plans and have lower AFQT scores. For graduates, the results for Hispanics are small and statistically insignificant. However, black graduates are more likely to enlist than their white counterparts.

### 2. Demand Determinants

Items on the demand side of the enlistment model are mainly measured at the state and national level. This is because a number of the factors that contribute to the demand side cannot be measured at the individual level. Many different enlistment policy decisions vary at the national level, such as recruiter density and distribution, the types and amount of enlistment bonuses, and other recruiting incentives. Hosek and Peterson look specifically at two demand side determinants: *Recruiter Density* and *Share of Seniors and Recent High School graduates in the Local Market*.

*Recruiter Density.* Hosek and Peterson state that the Services allocate recruiters largely on the basis of youth population, so the ratio of recruiters to youth populations are similar across all recruiting areas, which they define as the Military Entrance Processing Station (MEPS) areas. They find no effect of *recruiter density* in either the seniors or graduates group. However, they find an exception within the upper- and lower-AFQT graduates. An increase in recruiter density increases the enlistment probability in the upper-AFQT group and decreases it in the lower group. Hosek and Peterson attribute the poor performance of the *recruiter density* variable to that of inadequate data.

*Share of Seniors and Recent High School Graduates in the Local Market.* They first define this variable as the number of high school seniors and recent (within one year) graduates in a local recruiting market, relative to the number of young men age 15-24 residing in that market. The data show that the market share variable has a negative effect for both seniors and graduates; however, it is only statistically significant for graduates. In regards to the different AFQT groups, only the upper-AFQT seniors have a nearly statistically significant result. Hosek and Peterson state that upper-AFQT youths are more costly to recruit and therefore, the recruiter will tend to recruit more lower-AFQT youths. Consistent with their hypothesis, a relative abundance of seniors in a market allows the recruiter to recruit more seniors and fewer graduates. This increase is not because the recruiter increases the probability of any given senior, but because the recruiter is able to reach more seniors.

## C. THE 2000 KILBURN AND KLERMAN STUDY

Kilburn and Klerman's model is similar in nature to that of Hosek and Peterson (1985), but with some innovations in the specification. Some of those innovations are the addition and omission of variables based upon changes that may have occurred between 1980 and 1992. Kilburn and Klerman use data from the Second Follow-Up of the National Education Longitudinal Study of 1988 (NELS) to investigate the relationship between individual characteristics and enlistment probabilities. The NELS follows a representative sample of individuals who were eighth graders in 1988, obtaining information on high school, work, family formation, postsecondary education, and background characteristics. The NELS interviewed respondents in the Base Year (1988), a First Follow-UP (1990), a Second Follow-UP (1992), and a Third Follow-Up (1994). In most of the follow-ups the samples were "freshened," a process that adds students to compensate those who are no longer in the sample.

First, Kilburn and Klerman look at what changes may have occurred in the recruiting environment since the early 1980s. The discussion groups the factors according to whether they influence recruit supply or demand. In attempting to replicate Hosek and Peterson (1985), Kilburn and Klerman add or omit variables as necessary

depending upon the changes in the recruiting environment. Second, due to the increase in postsecondary educational enrollment since the 1980s, Kilburn and Klerman update the bivariate model by adding "additional schooling" as an option for youth. And finally, Kilburn and Klerman (2000) estimate a trivariate model by defining the decisions set as including three options—enlistment, civilian labor force participation, and school enrollment. Table 3 lists the NELS coefficients for the replication of Hosek and Peterson (column 2) for graduates along with the Kilburn and Klerman 2000 updated bivariate specification for graduates (column 3). The variable definition and results are discussed more fully below.

Table 3. Kilburn and Klerman Bivariate Specifications.

| (1) Variable | (2) NELS Data (Replicate H&P) | (3) Updated Bivariate Model (NLES Data) |
|---|---|---|
| Black | 0.2200 | 0.1981 |
| Hispanic | 0.2396 | 0.3334 |
| Age 16 when senior | -0.9093 | -0.2033 |
| Age 17 when senior | 0.0493 | -0.0616 |
| Age 19+ when senior | -0.4089 | -0.4251 |
| AFQT score (31-99) | 0.0117 | - |
| AFQT CAT I indicator | - | 1.7400*** |
| AFQT CAT II indicator | - | 0.9110** |
| AFQT CAT IIIb indicator | - | 0.6044 |
| AFQT CAT IV indicator | 0.2919 | 0.0224 |
| AFQT CAT V indicator | | -1.5263** |
| AFQT score missing | 0.7478 | 0.6472 |
| GED | -0.1084 | 0.1559 |
| Mother's years of schooling | 0.0280 | -0.0039 |
| Mother worked | 0.1877 | 0.2228 |
| Family income (in $ thousands) | -0.0154* | 0.0004 |
| Family income < $5,200 | -1.5747*** | -0.7002** |
| Family income missing | -1.0555*** | -0.4854 |
| Number of siblings | 0.0938 | 0.0622 |
| Missing number of siblings | 0.0266 | -0.0981 |
| Lives at home | -1.7779*** | - |
| Ln Hourly wage | -0.0469 | - |
| Hourly wage missing | 4.2439*** | - |
| Weekly hours currently employed | 0.0722*** | - |
| Ln Months employed | -0.0722*** | - |
| Not currently employed | 3.1304*** | - |
| Weekly hours not currently employed | 0.0632*** | - |
| Missing weekly hrs not currently employed | 4.2066*** | - |
| Months not employed | -0.3601*** | - |
| Months not employed in last 12 months | 4.9063*** | - |

| | | |
|---|---|---|
| Unemployment rate in county | 0.0860 | 0.0674 |
| Share of seniors and recent graduates | -1.6950 | - |
| Percent of population that is black | 1.2234 | 2.5226** |
| Percent of population that is Hispanic | -6.6640 | 4.4664 |
| Percent of labor force that is female | 0.0060 | 0.0805 |
| Per-capita personal income | 0.7650 | -0.3977 |
| % change in per-capita personal income | -2.5864 | -2.9325 |
| Unemp rate x not currently employed | -0.0605 | - |
| Unemp rate x not employed last 12 months | 0.2078 | - |
| Unemp rate x mos not employed | -0.0101 | - |
| Recruiter Density | -3.7306*** | 1.3160 |
| Missing state | 0.9887 | 3.6780 |
| Expects more education | 0.5190 | 0.2037 |
| Missing expects more education | -0.9339* | -0.0450 |
| Plans to get married in next 5 years | 0.1696 | 0.0577 |
| Plans never to marry | 0.3685 | 0.2824 |
| Ever been married | 0.5247* | 0.8453*** |
| Has children | -0.9775*** | -0.4715 |
| Missing marital information | -0.1382 | -0.0354 |
| Ln Months since school | 0.0507 | - |
| Some post-HS school | -0.4289 | - |
| Parent in the military | - | 1.6914*** |
| Missing parent in the military | - | -0.4812 |
| English not first language | - | -0.2646 |
| Missing English language info | - | 0.2859 |
| Uses marijuana | - | -0.5474 |
| Missing marijuana use | - | -0.6700** |
| R or friend has been arrested | - | 0.1151* |
| Missing arrest info | - | -0.7740 |
| Average in-state tuition | - | 0.0001 |
| Constant | -7.8287 | -7.3424 |

Notes:
A "—" indicates that the variable was not included in the model.
Significance levels: *** 0.01 level, ** 0.05 level, * 0.10 level
Sample: all males

Source: Derived from Kilburn and Klerman 2000

### 1. Replication of Hosek and Peterson

Kilburn and Klerman first attempt to estimate a model that replicates that of Hosek and Peterson (1985) as closely as the NELS data set will allow. Due to the structure of the NELS questions, some of the variables differ slightly in their definition and measurement.

Kilburn and Klerman define the two groups, seniors and graduates, similar to that of Hosek and Peterson. In the model of seniors, the variables that are significant tend to be those that tie relatively close to postsecondary education alternatives. These variables

include AFQT score, mother's years of schooling, family income, and number of siblings. In the model for graduates, the significant variables tend to be those associated with work alternatives, such as weekly hours employed, employment status, and length of employment. Kilburn and Klerman find that in both the senior and graduate model there are many fewer significant variables than found in the Hosek and Peterson study. Although there are some statistically significant individual characteristics that raise the probability of enlistment, the overall predictive power of the model is relatively low.

#### *a. Seniors*

According to Kilburn and Klerman, there are some notable differences between their results and those in the Hosek and Peterson study for the seniors group. With respect to demographic variables, the effect of race and age appear to change over time. Hosek and Peterson find that African Americans are more likely to enlist, whereas Kilburn and Klerman find this variable has a negative effect, but the coefficient is not statistically different from zero. In addition, Hosek and Peterson find higher enlistment probabilities for older seniors, while Kilburn and Klerman find no significant effect for this variable. With respect to labor market variables, Kilburn and Klerman find no effect of the individual's hourly wage rate, in contrast to Hosek and Peterson who find a large negative effect. Kilburn and Klerman state that this may be due to the fact that they use per-capita income at the state level, whereas Hosek and Peterson use county-level income data. Finally, Hosek and Peterson find that individuals who are not employed are initially less likely to enlist, but after two months of being unemployed, the probability of enlistment increases. Kilburn and Klerman find the opposite effect for this variable—those who are not employed are initially more likely to enlist and less likely to enlist the longer the unemployment lasts.

Regarding family characteristics, Kilburn and Klerman find that higher mother's education lowers enlistment probability, where Hosek and Peterson find this variable has a positive influence. Additionally, Kilburn and Klerman find that enlistment probability is inversely related to family income where Hosek and Peterson find this variable to be statistically insignificant. Next, Kilburn and Klerman estimate different

values for marital expectations variables. For the variable "Plans never to marry," Kilburn and Klerman did not find a significant result, whereas Hosek and Peterson found a large positive coefficient. And for the variable "Plans to get married in next 5 years," Kilburn and Klerman estimate a magnitude approximately one-third that of Hosek and Peterson.

#### *b. Graduates*

For the graduate sample, many coefficients are significantly different between the two studies. Most of these coefficients are related to labor force alternatives. One of the significantly different effects is that of recruiter density. Hosek and Peterson estimate the enlistment effect to be positive, where as Kilburn and Klerman find that result to be negative and large. They state that several factors may contribute to this disparity. First, the aggregate level that they are using is different than Hosek and Peterson. Kilburn and Klerman only have state-level data for the NELS respondents, while Hosek and Peterson use county-level data. Second, Kilburn and Klerman state that recruiter density is at the discretion of the Department of Defense and thus may vary with the enlistment probability and characteristics of the state or county. For example, if in some area enlistment probabilities are low, more recruiters may be assigned to obtain a given number of recruits. This may result in the finding that more recruiters are associated with fewer enlistments rather than more.

### 2. Updated Bivariate Specification

In their updated bivariate specification (presented in Table 3, column 3) Kilburn and Klerman add some new variables to better capture the factors that influence enlistments in the environment of the 1990s. These factors may not have been important predictors at the time of Hosek and Peterson's study. These new variables are: average in-state tuition at a four-year institution; whether a youth was from an immigrant household or not—a proxy that English is not the individual's first language; whether an individual has a parent serving in the military; and whether the individual meets the

military's moral standards—based on whether the individual ever reported using marijuana and whether the youth or one of his friends had ever been arrested.

The new specifications omit some variables from the Hosek and Peterson models, in part due to endogeneity concerns. As an example, Kilburn and Klerman claim that the variable 'live at home' present in the Hosek and Peterson specification, may be correlated to the decision to enlist, work, or enroll in school. Some other variables are omitted because their meaning for the populations is unclear. For example, Kilburn and Klerman claim that it is inappropriate to include labor market variables in the enlistment models for graduates, since the employment status for those who are graduates is ambiguous. In addition, Kilburn and Klerman do not include the variables that indicate time since postsecondary education and whether the respondent has some postsecondary education since the sample only includes individuals who are seniors in 1992 and interviews them all at a point about two years after graduation.

Again, the analysis is stratified into two separate groups—seniors and graduates. Similar to the replication of Hosek and Peterson's model, Kilburn and Klerman only find a few variables that are significant. One of the findings is that Blacks in the seniors' group have lower enlistment propensities, contrary to the findings in Hosek and Peterson and counter to conventional wisdom that Blacks are overrepresented in the enlisted force. Another contrast to earlier estimates is that Kilburn and Klerman find a positive effect for "whether the mother worked." They also find that those who "expect more education" have a lower probability of enlistment. In terms of the variables added to the Hosek and Peterson specification, Kilburn and Klerman find that only two variables significantly affect enlistment. The first is the use of AFQT categories instead of a continuous variable for AFQT percentile. Kilburn and Klerman find that those in the AFQT CAT I group have a substantially lower probability of enlistment. The second finding is that those who do not have English as the first language have lower rates of enlistment.

Within the graduates group, Kilburn and Klerman find only a few variables that are significant. The data show that in contrast to the senior group, graduates in the upper AFQT categories are more likely to enlist. Kilburn and Klerman also find that having a parent in the military raises the probability of enlistment. They also find that those who

did not respond to the question about marijuana use are less likely to join the military. The authors suggest that the sensitive nature of the question may drive this result, since likely users may fail to report drug use. The models also predict a higher probability of enlistment for those who have been arrested, or those who have a friend that has been arrested. The authors find this to be surprising, especially since the arrested variable was intended to be a proxy for meeting the moral standards of enlistment. However, they do not give a reason for what may cause the higher enlistment probability of those who have been arrested, or have a friend who has been arrested.

### 3. Trivariate Specification

Kilburn and Klerman use a multinomial model to jointly analyze the mutually exclusive choices of either pursuing further education, or working, or joining the military. For this, the authors restrict attention to the 1994 follow-up of the NELS, which includes information on student outcomes two years after their normal high school graduation date. This allows the authors to observe career choices after some time has elapsed since graduation from high school. More specifically, the mutually exclusive choices are defined as: (1) the individual has enlisted in the military; (2) enrolled in college full-time; or (3) those not in either of the two previous categories are placed in the working/other category. They acknowledge that the results from the trivariate model cannot be compared directly with previous studies because the model is estimated on a slightly different sample and includes both seniors and graduates. However, Kilburn and Klerman claim that separating nonenlistment into a college and work/other alternative reveals why certain variables might be related to the probability of enlisting by affecting college or work/other alternatives differently. For example, previous estimates found that family income lowered the probability of enlistment. This may be true because higher family income raises the likelihood of attending college for seniors and lowers the likelihood of working for graduates. Additionally, Kilburn and Klerman state that another advantage of using the trivariate model is that some explanatory variables may raise the likelihood of enlisting relative to college but lower the likelihood of enlisting relative to working/other. If that is the case, then the effect of that variable in the bivariate model is

likely to be estimated close to zero. Using the trivariate approach will allow the examination of the effect of enlistment relative to the two other alternatives. Table 4 shows the results from the Kilburn and Klerman trivariate specification.

Table 4. Kilburn and Klerman Trivariate Specification.

| (1) | (2) | (3) | (4) |
|---|---|---|---|
| Variable | Enlist | Attend College | Work/ Other |
| Black | 0.0116 | -0.0653** | 0.0537 |
| Hispanic | 0.0055 | -0.0398 | 0.0343 |
| Age 16 when senior | 0.0042 | -0.0079 | 0.0037 |
| Age 17 when senior | 0.0031 | 0.0054 | -0.0085 |
| Age 19+ when senior | -0.0104 | -0.0137 | 0.0241 |
| AFQT CAT I indicator | 0.0225 | 0.2391 | -0.2617* |
| AFQT CAT II indicator | 0.0164 | 0.0454 | -0.0618* |
| AFQT CAT IIIb indicator | 0.0296 | -0.0870*** | 0.0574* |
| AFQT CAT IV indicator | 0.0037 | -0.2095** | 0.2059* |
| AFQT CAT V indicator | -0.0044 | -0.2667 | 0.2711** |
| AFQT score missing | 0.0326 | -0.1301*** | 0.0975 |
| GED | 0.0232 | -0.2372*** | 0.2141 |
| Mother's ed: less than high school | 0.0219 | -0.1109*** | 0.0890 |
| Mother's ed: some college | -0.0007 | 0.0780 | -0.0773 |
| Mother's ed: college degree | -0.0069 | 0.1876*** | -0.1807 |
| Mother's ed: postcollegiate | -0.0266 | 0.2098*** | -0.1833 |
| Missing mother's education | 0.0375 | -0.0783*** | 0.0408*** |
| Mother worked | 0.0138 | 0.0534 | -0.0672** |
| Family income (in $ thousands) | -0.0005 | 0.0046*** | -0.0041 |
| Family income < $5,200 | -0.0267 | 0.0247* | 0.0021* |
| Family income missing | -0.0293 | 0.1056*** | -0.0763* |
| Number of siblings | 0.0086 | -0.0336*** | 0.0250** |
| Missing number of siblings | 0.0024 | -0.0933 | 0.0909 |
| Unemployment rate in county | 0.0087 | -0.0275*** | 0.0189 |
| Percent of population that is black | 0.0868 | 0.1302* | -0.2171*** |
| Percent of population that is Hispanic | -0.1707 | 1.5238 | -1.3531 |
| Percent of labor force that is female | 0.0018 | -0.0009 | -0.0010 |
| Per-capita personal income | -0.0881 | 0.1235*** | -0.0353** |
| % change in per-capita personal income | -0.0967 | -1.2809 | 1.3776 |
| Recruiter Density | 0.1310 | -0.3982*** | 0.2671*** |
| Missing state | 0.0556 | -0.2427 | 0.1871 |
| Expects more education | -0.0606 | 0.5326*** | -0.4720 |
| Missing expects more education | -0.0847 | 0.4075*** | -0.3228 |
| Plans to get married in next 5 years | 0.0310 | -0.1924*** | 0.1614 |
| Plans never to marry | 0.0322 | -0.1480*** | 0.1158 |
| Ever been married | 0.0825 | -0.3919*** | 0.3094*** |
| Has children | 0.0029 | -0.2336*** | 0.2307*** |
| Missing marital information | -0.0122 | -0.0154 | 0.0276 |
| Parent in the military | 0.0995 | -0.2271*** | 0.1276*** |
| Missing parent in the military | 0.0117 | -0.0901* | 0.0784 |
| English not first language | -0.0435 | 0.2019*** | -0.1584 |

| | | | |
|---|---|---|---|
| Missing English language info | -0.0329 | 0.0329*** | 0.1861 |
| Uses marijuana | -0.0077 | -0.1135 | 0.1211** |
| Missing marijuana use | 0.0154 | -0.1260 | 0.1414** |
| R or friend has been arrested | 0.0145 | -0.1178* | 0.1033 |
| Missing arrest info | -0.0133 | -0.2918 | 0.3051 |
| Average in-state tuition | 0.0000[a] | 0.0000[a] | 0.0000[a] |
| Constant | -0.1722 | -0.1823 | 0.3545 |
| Significance: *** 0.01 level, ** 0.05 level, * 0.10 level.<br>[a]The estimates of these coefficients are less than 0.00005<br>Sample: All students included in the 1992 (2nd) NELS follow-up. | | | |

Source: Kilburn and Klerman 2000 Table 5.10

In the multinomial specification Kilburn and Klerman find that Blacks are more likely to enlist, primarily because they are less likely than Whites to attend college. Also, the variables related to mother's education, family income, and number of siblings affects enlistment probabilities mainly by influencing the probability of attending college. Expectations regarding further education affect enlistment since educational expectations influence attending college. Kilburn and Klerman report that expectations on family formation also influence enlistment mainly by reducing the probability of attending college. Also, having a mother who worked increases the probability of enlistment, largely because it makes work less likely for the individual. Another finding that they report is that not having English as a second language lowers enlistment probability primarily by substantially raising the likelihood of attending college. In addition, marijuana use raises the likelihood of working, whereas an arrest reduces the chances of attending college. Higher in-state tuition costs affect the enlistment decision by raising the probability of working.

Kilburn and Klerman state that the signs of the estimated changes in the probability of being in the two groups, attending college and work/other, are often opposite. They conclude that this is due to the fact that many of the variables affect a relatively small change in the probability of enlisting, which means that the probability for enlistment is relatively close to zero, therefore causing the other two choices to offset each other.

# III. 1997 NATIONAL LONGITUDINAL SURVEY OF YOUTH DATA

## A. INTRODUCTION

This chapter describes the data set—the 1997 National Longitudinal Survey of Youth (NLSY97)—used to study the post-high school decisions of the Millennial Generation. It also provides tables which describe important characteristics of individuals in the data set.

## B. NLSY97 DATA

The NLSY97 is designed to be representative of U.S. residents in 1997 that were born between the years 1980 through 1984. Not represented by the survey are U.S. immigrants who were born from 1980 to 1984 and moved to the United States after 1997. During the initial interview period, interviewers visited randomly selected households to identify all youths that were eligible. All household residents ages 12 to 16 as of December 31, 1996, were considered eligible. The sample included those who usually resided in a household in the sample area even if they were away at school or college, as well as those in a hospital, correctional facility, or other type of institution.

To draw the sample of 8,984 respondents, interviewers screened 75,291 households to maximize the statistical efficiency of samples through several stages of sample selection—counties, enumeration districts, blocks, and sample listing units. Households were asked about all eligible aged youth. Two samples were drawn—a cross-sectional representative of the U.S. population and a supplemental sample of Black and Hispanic youth. The cross-sectional sample consists of 6,748 individuals and the supplemental sample is comprised of 2,236 Hispanic and Black youth, which brought the total to 8,984 respondents.

The NLSY has conducted the survey annually starting in 1997. The data used for this thesis is from the first eight rounds of the survey, which cover the years 1997 through 2004. Table 5 provides a definition of the variables this study uses.

Table 5. Variable Definitions.

| **Variable Name** | **Definition** |
|---|---|
| Demographic Variables | |
| Female | =1 if female; =0 otherwise |
| Black | =1 if Black; =0 otherwise |
| Hispanic | =1 if Hispanic; =0 otherwise (can be of any race). |
| Ability and Schooling (measured prior to enlistment if individual did enlist) | |
| AFQT Cat I | =1 if AFQT CAT I (93-99); =0 otherwise |
| AFQT Cat II | =1 if AFQT CAT II (65-92); =0 otherwise |
| AFQT Cat IIIa | =1 if AFQT CAT IIIa (50-64); =0 otherwise |
| AFQT Cat IIIb | =1 if AFQT CAT IIIb (31-49); =0 otherwise |
| AFQT Cat IV | =1 if AFQT CAT IV (10-30); =0 otherwise |
| AFQT Cat V | =1 if AFQT CAT V (0-9); =0 otherwise |
| AFQT Missing | =1 if missing AFQT scores; =0 otherwise |
| Dropout | =1 if dropout ; =0 otherwise |
| GED | =1 if GED ; =0 otherwise |
| High School Diploma | =1 if HS diploma; =0 otherwise |
| Some College | =1 if Some College; =0 otherwise |
| Associate Degree | =1 if Associate's Degree; =0 otherwise |
| Bachelor Degree | =1 if Bachelor Degree or higher; =0 otherwise |
| Family Background | |
| Parents' Education Less than High School | =1 if parents' highest education level (either parent, whichever is higher) is less than high school diploma; =0 otherwise |
| Parent's Education High School Diploma | =1 if parents' highest education level is a high school diploma; =0 otherwise |
| Parent's Education Some College | =1 if parent's highest education level is some college; =0 otherwise |
| Parent's Education College | =1 if parent's highest education level is a bachelor degree; =0 otherwise |
| Parent's Education Post College | =1 if parent's highest education level is beyond a bachelor degree; =0 otherwise |
| Parent's Education Missing | =1 if parent's highest education level is missing for both parents; =0 otherwise |
| Avg Household Income 25$^{th}$ percentile | =1 if household income (1997-2004) is ≤ to $22,000; =0 otherwise |
| Avg Household Income 50$^{th}$ percentile | =1 if household income (1997-2004) is between $22,001 & $40,000; =0 otherwise |
| Avg Household Income 75$^{th}$ percentile | =1 if household income (1997-2004) is between $40,001 & $68,000; =0 otherwise |
| Avg Household Income 100$^{th}$ percentile | =1 if household income (1997-2004) is ≥ $68,001; =0 otherwise |

| | |
|---|---|
| Avg Household Income Missing | =1 if household income (1997-2004) is missing; =0 otherwise |
| English as Second Language | =1 if English is not the respondent's first language; =0 otherwise |
| English as Second Language missing | =1 if English is not the respondent's first language is missing; =0 otherwise |
| Marijuana | =1 if ever used marijuana; =0 otherwise |
| Hard Drugs | =1 if ever used hard drugs (cocaine, heroine, crack); =0 otherwise |
| Arrested | =1 if ever was arrested; =0 otherwise |
| Census Region: Northeast | =1 if lives in northeast in 1997; =0 otherwise |
| Census Region: North Central | =1 if lives in north central in 1997; =0 otherwise |
| Census Region: South | =1 if lives in south in 1997; =0 otherwise |
| Census Region: West | =1 if lives in west in 1997; =0 otherwise |
| Rural | =1 if residence is rural in 2004; =0 otherwise |
| Urban | =1 if residence is urban in 2004; =0 otherwise |
| Both Biological Parents | =1 if parent figure for all years were both biological parents; =0 otherwise |
| Biological Parent and Step-Parent | =1 if parent figure for all years were a biological parent(mother or father) and a step-parent; =0 otherwise |
| Biological Mother Only | =1 if parent figure for all years was biological mother only; =0 otherwise |
| Biological Father Only | =1 if parent figure for all years was biological father only; =0 otherwise |
| Other Parent Figure | =1 if parent figure for all years was something else (grandparent, aunt, foster parent, etc); =0 otherwise |
| Multi-parent Figure | =1 if lived in a multi-parent type household over all survey years; =0 otherwise |
| High School Characteristics | |
| Public School | =1 if attended public school only over all years; =0 otherwise |
| Private High School | =1 if attended private school only (both religious and non-religious) over all years; =0 otherwise |
| Other High School | =1 if attended a school other than a public or private school over all years; =0 otherwise |
| Multiple School Types | =1 if attended multiple type schools (private, public or other) over all years; =0 otherwise |
| Job Shadowing | =1 if participated in a job shadowing STW program; =0 otherwise |
| Mentoring | =1 if participated in a mentoring STW program; =0 otherwise |
| Cooperative Education | =1 if participated in a cooperative education STW program; =0 otherwise |
| Tech Prep | =1 if participated in a tech prep STW program; =0 otherwise |
| Internship | =1 if participated in an internship STW program; =0 otherwise |
| Other School-To-Work program | =1 if participated in any other STW program not mentioned; =0 otherwise |
| STW Missing | =1 if STW program information is missing; =0 otherwise |

| | |
|---|---|
| JROTC | =1 if participated in a JROTC program; =0 otherwise |
| Academic Specialist | =1 if Academic Specialist; =0 otherwise |
| Vocational Specialist | =1 if Vocational Specialist; =0 otherwise |
| Both Acad/Voc Specialist | =1 if both an Academic and Vocational Specialist; =0 otherwise |
| Academic Specialty Missing | =1 if academic classification is missing |

## C. DESCRIPTIVE STATISTICS FOR INDEPENDENT VARIABLES

### 1. Demographic Characteristics

The current study uses the NLSY97 sample through round 8, which contains 8,984 respondents. Table 6 provides a breakout of the descriptive statistics for the demographic variables in the data set. The data is broken down into two groups: the entire sample of 8,984 respondents (columns 2-3); a sub-sample of 325 respondents who enlisted (columns 4-5). To better compare each category, the proportion of each group with the given demographic characteristic is also shown in the table. Demographic categories depicted in the table are gender and race.

Table 6. Sample Demographic Characteristics.

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| **Category** | **Variable** | **Entire Sample** | **Proportion of Sample** | **Respondents that Enlisted** | **Proportion of Enlistees** |
| **Sample Size** | n | 8,984 | | 325 | |
| **Gender** | Male | 4,599 | 0.512 | 255 | 0.785 |
| | Female | 4,385 | 0.488 | 70 | 0.215 |
| | | | | | |
| **Race/Ethnicity** | | | | | |
| | Black | 2,335 | 0.260 | 83 | 0.255 |
| | Hispanic | 1,901 | 0.212 | 72 | 0.222 |
| | Non-Black/ Non-Hispanic | 4,748 | 0.528 | 170 | 0.523 |

Source: Derived from the NLSY97

In the NLSY97 sample, 21.5 percent of the 325 individuals who enlisted are female. This is compared to the entire sample of 8,984 of which 48.81 percent are female. The proportion of respondents within the racial categories that enlist are similar to that of the overall sample proportion. The proportion of blacks that enlist is 0.255, and

is similar to the percentage of blacks in the sample of 0.260. The proportion of Hispanics that enlist is 0.222, compared to the overall sample proportion of 0.212.

### 2. Family Characteristics

Table 7 provides information on family characteristics, to include parental education level, family structure (e.g. both natural parents in home), and family income. While students with missing values are dropped from calculations, due to the high number of non-responses to questions about family characteristics, this study will include a discrete variable for the missing variables.

Table 7. Sample Family Characteristics.

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| **Category** | **Variable** | **Entire Sample** | **Proportion of Sample** | **Respondents that Enlisted** | **Proportion of Enlistees** |
| **Sample Size** | N | 8,984 | | 325 | |
| **Parent's Education** | Less than GED | 922 | 0.103 | 26 | 0.08 |
| | GED | 324 | 0.036 | 7 | 0.022 |
| | HS Diploma | 3,337 | 0.371 | 131 | 0.403 |
| | Associate's Degree | 847 | 0.094 | 46 | 0.142 |
| | Bachelor Degree | 1,274 | 0.142 | 45 | 0.138 |
| | Post-Bachelor Degree | 798 | 0.089 | 27 | 0.083 |
| | Missing | 1,482 | 0.165 | 43 | 0.132 |
| | | | | | |
| **Family Structure** | Both Biological Parents | 2,169 | 0.241 | 57 | 0.175 |
| | One Biological and one step-parent | 285 | 0.032 | 11 | 0.034 |
| | Biological Mother only | 791 | 0.088 | 19 | 0.058 |
| | Biological Father only | 45 | 0.005 | 0 | 0 |
| | Multi-type parent household | 5,409 | 0.602 | 228 | 0.702 |
| | Other parental figure | 285 | 0.032 | 10 | 0.031 |

| | | | | | |
|---|---|---|---|---|---|
| **Average Household Income** | First Quartile (<$22,000) | 2,113 | 0.235 | 55 | 0.169 |
| | Second Quartile ($22,001-$40,000) | 2162 | 0.241 | 89 | 0.274 |
| | Third Quartile ($40,001-$68,000) | 2274 | 0.253 | 108 | 0.332 |
| | Fourth Quartile (>$68,000) | 2186 | 0.243 | 70 | 0.215 |
| | Missing | 228 | 0.025 | 3 | 0.009 |
| | | | | | |
| **English as Second Language** | ESL | 473 | 0.053 | 18 | 0.055 |
| | ESL Missing | 2080 | 0.231 | 59 | 0.182 |

Source: Derived from the NLSY97

A comparison of parent's education between the two samples—the overall NLSY97 sample and the sub-sample of the respondents that enlist—shows that the two are rather similar. Most of the parents within the overall NLSY97 sample have a high school diploma as their highest education level; this is similar to the parents of those that enlist. Additionally, most of the respondents come from a household whose parental status has changed over the course of the survey, whether it is from a household with both biological parents to a biological and a step-parent, or to only one biological parent, or vice-versa. This "multi-parent household" variable is comparatively large due to the survey conducted over eight years. This demographic is seen in both the main sample and within those that enlist. In regards to average household income, the main NLSY97 sample is fairly evenly distributed; however, most of the respondents that enlist come from the two middle quartiles where the average household income is between $22,001 and $68,000. In the English as a second language category, the proportion of those that enlist is similar to the entire sample proportion.

### 3. Regional Variables

Table 8 shows the composition of the sample based upon type of area (rural or urban) and region of the country (north central, northeast, west, and south). Additionally, there are missing categories created due to the number of respondents with missing data.

Table 8. Regional Characteristics.

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| **Category** | **Variable** | **Entire Sample** | **Proportion of Sample** | **Respondents that Enlisted** | **Proportion of Enlistees** |
| **Sample Size** | N | 8,984 | | 325 | |
| | | | | | |
| **Area** | Rural | 1,255 | 0.140 | 46 | 0.152 |
| | Urban | 5,909 | 0.658 | 184 | 0.566 |
| | Missing | 1,820 | 0.202 | 95 | 0.292 |
| | | | | | |
| **Region** | North Central | 2,050 | 0.228 | 74 | 0.228 |
| | Northeast | 1,585 | 0.176 | 51 | 0.157 |
| | West | 1,990 | 0.222 | 63 | 0.194 |
| | South | 3,359 | 0.374 | 137 | 0.421 |

Source: Derived from the NLSY97

For the regional characteristics variables, specifically the area variable—rural or urban—the respondents that enlisted are similar to that of the entire sample. Similarly, in the region variables, most of the respondents in the main sample and those that enlist are from the South. However, the proportion of those that enlist from the West are slightly lower than the main sample proportions.

### 4. AFQT Category Variables

Table 9 shows the distribution of the sample based upon the individual's AFQT category. The AFQT was only administered to a select number of individuals; therefore, there AFQT category is missing for a large number of respondents.

Table 9. AFQT Categories.

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| **Category** | **Variable** | **Entire Sample** | **Proportion of Sample** | **Respondents that Enlisted** | **Proportion of Enlistees** |
| **Sample Size** | n | 8,984 | | 325 | |
| | | | | | |
| **AFQT** | CAT I | 406 | 0.045 | 10 | 0.031 |
| | CAT II | 1,637 | 0.182 | 80 | 0.246 |
| | CAT IIIa | 894 | 0.099 | 50 | 0.154 |
| | CAT IIIb | 1,269 | 0.141 | 61 | 0.188 |
| | CAT IV | 1,690 | 0.188 | 49 | 0.151 |
| | CAT V | 845 | 0.094 | 8 | 0.025 |
| | Missing | 1,891 | 0.210 | 51 | 0.157 |

Source: Derived from NLSY97

Within the AFQT categories, most of those that enlist are from the CAT II category. However, the largest proportion of the NLSY97 sample is in the CAT IV category. It should be noted that there are those who enlist who are in the CAT V category even though they are ineligible. The scores derived from the NLSY97 administration of the ASVAB are not the scores that respondents use to qualify for service. Although the AFQT score provided in the NLSY97 is similar to the test administered by Department of Defense (DoD), it is not authorized by them.[2]

### 5. School Characteristic Variables

Table 10 shows the variable distribution according to school characteristics. These include the high school type (public, private, or other), individual's educational level, and educational classification (academic specialist, vocational specialist).[3]

[2] See the NLSY97 user's guide for detailed explanation of the AFQT calculation.

[3] See Appendix for educational classification definition.

Table 10. School Characteristics Variables.

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| **Category** | **Variable** | **Entire Sample** | **Proportion of Sample** | **Respondents that Enlisted** | **Proportion of Enlistees** |
| **Sample Size** | n | 8,984 | | 325 | |
| **School Classification** | Public | 7,231 | 0.805 | 272 | 0.837 |
| | Private | 367 | 0.041 | 6 | 0.018 |
| | Other | 111 | 0.012 | 2 | 0.006 |
| | Multiple Types | 1,256 | 0.140 | 44 | 0.135 |
| | | | | | |
| **Education Level** | Dropout | 1,244 | 0.138 | 6 | 0.018 |
| | GED | 516 | 0.057 | 18 | 0.055 |
| | HS Diploma | 3,974 | 0.442 | 215 | 0.661 |
| | Some College | 1,916 | 0.213 | 69 | 0.212 |
| | Associate's Degree | 322 | 0.036 | 2 | 0.006 |
| | Bachelor's Degree or Higher | 632 | 0.070 | 5 | 0.015 |
| | Missing | 380 | 0.042 | 10 | 0.031 |
| | | | | | |
| **Education Classification** | Academic Specialist | 1,268 | 0.141 | 36 | 0.111 |
| | Vocational Specialist | 1,472 | 0.164 | 83 | 0.255 |
| | Both Academic/Vocational Specialist | 476 | 0.053 | 23 | 0.071 |
| | Neither Academic/Vocational Specialist | 2,599 | 0.289 | 93 | 0.286 |
| | Education Classification Missing | 3,169 | 0.353 | 90 | 0.277 |

Source: Derived from NLSY97

The proportion of the respondents that enlist based on what type of school they attended (public, private, other) is similar to the proportion of the entire sample. Additionally, the education level distribution of those that enlist and the main sample is similar. Most of those that enlist have a high school diploma as their highest level of education prior to enlistment. However, within the education classification variables, most of the respondents that are classified with some academic specialty are less likely to enlist than those classified as vocational specialists, or with no specialty.

### 6. Legal Issues—Drug Use and Arrests

Table 11 describes the legal backgrounds of respondents in the NLSY97 data set. This study focuses on legal issues that include marijuana use, use of hard drugs, and arrests. Since this information is self-reported, and therefore missing for a large portion of the sample, a discrete missing variable is also included.

Table 11. Legal Issues Variables.

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| **Category** | **Variable** | **Entire Sample** | **Proportion of Sample** | **Respondents that Enlisted** | **Proportion of Enlistees** |
| **Sample Size** | n | 8,984 | | 325 | |
| | | | | | |
| **Legal Issue** | Marijuana Use | 4,921 | 0.548 | 191 | 0.588 |
| | Hard Drug Use | 1,849 | 0.206 | 54 | 0.166 |
| | Arrested | 2,466 | 0.274 | 103 | 0.317 |

Source: Derived from NLSY97

For the legal issues variables the distribution is similar between the survey sample and enlistees. Marijuana use is within the 50 percent range for the main NLSY97 sample and for those that enlist. There are also similar numbers for those that have been arrested. Both the NLSY97 sample and those that enlist are in the high twenties and low thirties respectively. However, for those that reported hard drug use, there is a slight disparity. The proportion of respondents reporting hard drug use within the enlisted sub-sample is lower than the proportion in the main NLSY97 sample. This may be a result of the military's zero tolerance policy.

### 7. School Program Participation—Vocational Programs and JROTC

School program participation variables are defined as School-To-Work (STW) programs and Junior Reserve Officer Training Corps. Table 12 lists and defines the STW categories. Table 13 shows the distribution of the school program variables within the NLSY97 data set.

Table 12. Definitions of School-To-Work Programs.

| Program | Definition |
|---|---|
| **Job Shadowing** | A student follows an employee for one or more days to learn about an occupation or industry |
| **Mentoring** | A student is paired with an employee who assesses his or her performance over a period of time, during which the employee helps the student master certain skills and knowledge. |
| **Cooperative Education** | Students alternate or parallel their academic and vocational studies with a job in a related field |
| **School-Sponsored Enterprise** | The production of goods or services by students for sale or use by others. Enterprises typically involve students in the management of a project. |
| **Technical Preparation** | A planned program of study with a defined career focus that links secondary and post-secondary education |
| **Internship/Apprenticeship** | Students work for an employer for a short time to learn about an occupation or industry. |

Source: NLSY97 User's Guide

Table 13. School Program Participation Variables.

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| **Category** | **Variable** | **Entire Sample** | **Proportion of Sample** | **Respondents that Enlisted** | **Proportion of Enlistees** |
| **Sample Size** | n | 8,984 | | 325 | |
| | | | | | |
| **STW** | Job-Shadowing | 1,444 | 0.161 | 58 | 0.178 |
| | Mentoring | 577 | 0.064 | 19 | 0.058 |
| | Co-op Education | 949 | 0.106 | 54 | 0.166 |
| | School Enterprise | 540 | 0.060 | 20 | 0.062 |
| | Technical Prep | 856 | 0.095 | 43 | 0.132 |
| | Internship | 328 | 0.037 | 12 | 0.037 |
| | Other STW program | 228 | 0.025 | 6 | 0.018 |
| | | | | | |
| **JROTC** | JROTC | 121 | 0.013 | 12 | 0.037 |

Source: Derived from NLSY97

In the NLSY97 sample most of the respondents who participate in a STW program do so in the Job-Shadowing category. However, for the respondents who enlist, there is no dominant program. Three of the STW programs with the higher proportions are Job-Shadowing, Co-op Education, and Technical Preparation with the proportions being 0.178, 0.166, and 0.132, respectively. For the JROTC program, those who enlisted have a participation rate of 3.7 percent, whereas only 1.3 percent of the entire NLSY97 sample participates in the JROTC.

## D. DESCRIPTIVE STATISTICS FOR THE DEPENDENT VARIABLE

### 1. Bivariate Dependent Variable

There are many factors that may affect the decision to enlist in the military. For this study, the bivariate variable ENLIST is defined as equaling one for an individual who enlists in any branch of the military—regular component, reserve component, or National Guard—during any round of the survey. Determining whether a respondent has enlisted in the military is a key factor. A respondent is identified as being in the military based on the following conditions[4]:

- Answering yes to the Round 1 question (YCPS-2400) "Are you now in the active Armed Forces?"
- Answering the question in Rounds 2-8 (YEMP-58800.xx) "Which branch of the Armed Forces [are/were] you sworn in to?"

Table 14 shows the frequency and percentage of those that enlisted. Out of 8,984 possible respondents there are 335 that reported that they enlisted in the military. However, when determining enlistment over all eight rounds, there are ten individuals who are counted twice—either they exited the military and joined the same service, or they joined a different service. The reason is beyond the scope of this thesis; however, in determining ever enlisting, the individuals are only counted once—bringing the total to ever enlisting to 325 (3.61 percent of the total sample).

Table 14. Enlistment Variable.

| | (1) | (2) | (3) |
|---|---|---|---|
| **Category** | **Variable** | **Entire Sample** | **Proportion of sample** |
| **Sample Size** | n | 8,984 | |
| | | | |
| **Dependent Variable** | Enlist | 325 | 0.036 |

Source: Derived from NLSY97

[4] See Appendix B for issues concerning variable creation.

## 2. Multinomial Dependent Variable

For the multinomial logit model specification a variable CHOICE is created. It is based on data collected from round 8 of the survey conducted in 2004. The CHOICE variable is divided into three sub-components (military, school, work/other), similar to the Kilburn and Klerman (2000) definition. This sample has omitted those respondents classified as high school dropouts, since their outcome can be perfectly predicted within the CHOICE model—i.e., dropouts cannot enlist and some high school equivalency is required for college admittance. Therefore, the total sample size is 7,720 respondents. Table 15 shows the distribution of the NLSY97 sample for 2004.

Table 15. Multinomial Choice Variable Distribution.

| | (1) | (2) | (3) |
|---|---|---|---|
| **Category** | **Variable** | **Entire Sample** | **Proportion of sample** |
| **Sample Size** | n | 7,720 | |
| | | | |
| **Choice** | Military | 189 | 0.024 |
| | School | 2,181 | 0.283 |
| | Work/Other | 5,350 | 0.693 |

Source: Derived from NLSY97

In Round 8 of the NLSY97 data set administered in 2004, the choice variable shows that 2.4 percent of the sample is currently serving in the military, 28.3 percent is currently attending a school, and 69.3 percent of the sample is classified in the working/other category. An individual is considered to have enlisted if they are currently serving in the military. One is considered to be "attending school only" if they are currently enrolled in any type of school, even if they are also working part- or full-time. A respondent is considered to be in the "working or other" category if they are not in the military or not currently enrolled in school. This category includes those who are working as well as those who are unemployed or not in the labor force at all.

## E. CONCLUSION

Those who enlist appear very similar to the NLSY97 sample in most background characteristics. However, they also differ in certain respects. In particular, the proportion of females that enlist is quite lower than that of the main sample. Even with a change in roles for females and more opportunities for females within the military, the proportion is still quite small. Additionally, there are more that enlist from the two middle quartiles of average household income compared to the distribution within the main sample. The data also show that those who enlist are less likely to be from the west. Finally, those who attend JROTC are more likely to join the Armed Forces.

These results are not surprising. Prior studies have shown that those who enlist are likely to be non-black, non-Hispanic, males, from middle class families, with average education levels. Additionally, those who participate in the JROTC program have already shown a taste for the military and/or may be influenced to join by the program, so the higher enlistment proportion is to be expected. The remainder of this thesis will attempt to explain the individual effects of these variables while controlling for a number of factors.

# IV. METHODOLOGY

## A. INTRODUCTION

This chapter describes the models used to analyze the impact of demographic characteristics, school characteristics, school program participation, educational program participation, and legal background on enlistment rates and other post-high school decisions. The models are estimated via a binary PROBIT and a multinomial LOGIT based on the random utility framework. In each case, several specifications are estimated beginning with the least complex and adding more control variables with each new specification.

## B. THE RANDOM UTILITY FRAMEWORK

Earlier economic models of enlistment (Hosek and Peterson, 1985; Kilburn and Klerman, 2000) use variations of the random utility model. According to Kilburn and Klerman (2000), the basis for this model is that youth who are eligible for enlistment will choose between enlisting in the military and other activities such as attending college or employment. Individuals will choose to enlist in the military if that utility is greater than any other option, or

(1) $$U_{im} > U_{ij} \text{ for } j = 1,2\ldots J,$$

where U indicates utility, *i* represents the individual, *m* represents the military, and *j* represents nonmilitary options. This behavioral model is translated into a statistical model by expressing this likelihood as a probability. The probability that an individual chooses to enlist over some other activity, *j*, is

(2) $$\Pr(U_{im} > U_{ij}).$$

By letting the approximate utility of individual *I* of alternative *k* be a function of characteristics of an individual $X_i$ and a random error component $e_{ik}$ such that

(3) $$U_{ik} = f_k(X_i) + e_{ik}.$$

The $X_i$ includes characteristics that would be expected to alter the relative utility of the alternatives. The probability that each individual enlists increases as the coefficients of the individual characteristics is greater for enlistment than any other option. In terms of equation (3), the probability that an individual enlists is higher when $\beta_m > \beta_k$. This means that having a particular characteristic increases the probability that the individual will enlist.

## C. THE BIVARIATE PROBIT MODEL

The first models that are examined are based on the binary PROBIT model with the dependent variable *ENLSIT*. The PROBIT model begins with a base set of independent variables and additional models are examined by adding different control variables. And finally, a model which includes all control variables is examined.

The first model that is examined is the base model. It contains variables similar to the Kilburn and Klerman 2000 specification. It is defined as:

$$y_{enlist} = \beta_0 + \beta_1 female + \beta_2 race + \beta_3 AFQT + \beta_4 educ + \beta_5 peduc + \beta_6 ESL + \beta_7 hhinc + \beta_8 family + \beta_9 rural + \beta_{10} area + \varepsilon \quad (4)$$

In this model, *race* represents separate variables for black and Hispanic, *AFQT* is broken into separate variables for AFQT categories, *educ* is broken into separate variables for the respondents' education level, *peduc* is broken into separate variables for the respondents parent's highest level of education, *ESL* consists of separate variables for English as a second language and a discrete missing variable, *hhinc* consists of separate variables for categorical average household income, *family* consists of separate variables for family structure, and *area* consists of separate categorical variables for region of the country—north central, northeast, west, and south.

The second specification adds school variables to the baseline model. The model is specified as:

(5) $$y_{enlist} = \beta_0 + \beta_1 school\_type + \beta_2 academic\_program + \beta X + \varepsilon$$

In the above specification *school type* is defined as public, private, or other school; *academic program* is whether the respondents educational classification (academic specialist, vocational specialist, both, or neither); and *X* represents the base model characteristics.

The third specification adds the school programs in which the respondent may have participated to the base model. The model is specified as:

(6) $$y_{enlist} = \beta_0 + \beta_1 JROTC + \beta STW + \beta X + \varepsilon$$

Where the *STW* variable is a separate variable for each STW category—job shadowing, mentoring, cooperative education, school enterprise, technical preparation, internship, and a discrete missing variable. The *X* variable represents the base model characteristics.

The fourth specification is to add the legal issues to the base model. The model is specified as:

(7) $$y_{enlist} = \beta_0 + \beta legal + \beta X + \varepsilon$$

Where the *legal* variable is a separate variable for marijuana use, hard drug use, and if the respondent has ever been arrested, and the *X* variable represents the base model characteristics.

The final bivariate specification includes a comprehensive model containing all independent variables. This model is specified as:

(8) $$y_{enlist} = \beta_0 + \beta school\_type + \beta academic\_program + \beta STW + \beta JROTC + \beta X + \varepsilon$$

## D. THE MULTINOMIAL LOGIT MODEL

The next model that is examined is a multinomial LOGIT model with the dependent variable *CHOICE*. The multinomial LOGIT model is specified similar to the bivariate models above. The model is estimated with a base specification and additional categorical explanatory variables—school classification, school program, legal issues, etc.—are added one at a time. And finally, a model containing all explanatory variables is estimated.

The baseline multinomial model is similar to the Kilburn and Klerman 2000 trivariate specification. It is defined as:

$$(9)\quad y_{choice} = \beta_0 + \beta_1 female + \beta race + \beta AFQT + \beta peduc + \beta ESL + \beta hhinc + \beta family + \beta rural + \beta area + \varepsilon$$

Where *race* is a separate variable for black and Hispanic, *AFQT* are separate variables for AFQT categories, *peduc* consists of separate variables for the respondents' parents highest level of education, *ESL* consists of separate variables for English as a second language and a discrete missing variable, *hhinc* consists of separate categorical variables for average household income, *family* consists of separate variables for family structure, and *area* consists of separate categorical variables for region of the country—north central, northeast, west, and south

The second specification adds school variables to the model. The multinomial LOGIT model is specified as:

$$(10)\quad y_{choice} = \beta_0 + \beta school\_type + \beta academic\_program + \beta X + \varepsilon$$

Where *school type* is defined as public, private, or other school; *academic program* is whether the respondents educational classification (academic specialist, vocational specialist, both, or neither); *X* represents the base model characteristics.

The third specification of the multinomial LOGIT model adds the school programs the respondent may have participated in to the base model. The model is specified as:

$$y_{choice} = \beta_0 + \beta_1 JROTC + \beta STW + \beta X + \varepsilon \tag{11}$$

Where the *STW* variable is a separate variable for each STW category—job shadowing, mentoring, cooperative education, school enterprise, technical preparation, internship, and a discrete missing variable. The *X* variable represents the base model characteristics.

The fourth specification is to add the legal issues to the base model. The multinomial LOGIT model is specified as:

$$y_{choice} = \beta_0 + \beta legal + \beta X + \varepsilon \tag{12}$$

Where the *legal* variable is a separate variable for marijuana use, hard drug use, and if the respondent has ever been arrested. The *X* variable represents the base model characteristics.

The final multinomial specification is to include a comprehensive model containing all explanatory variables. This model is specified as:

$$y_{choice} = \beta_0 + \beta school\_type + \beta academic\_program + \beta STW + \beta JROTC + \beta X + \varepsilon \tag{13}$$

Within the multivariate LOGIT specifications, the base choice is the military only option. Each explanatory variable is examined for an effect relative to the decision to enter the military. Chapter V explains the results for both the binary PROBIT and multinomial LOGIT models.

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# V. RESULTS OF ANALYSIS OF NLSY97 DATA

## A. INTRODUCTION

This chapter reports the estimates from the NLSY97 specifications discussed in previous chapters. First, the baseline model is presented—the model similar to Kilburn and Klerman—followed by the updated bivariate specification of the enlistment model that incorporates additional decision factors that are available from the NLSY97 data set. These include being female, type of high school programs, legal issues, JROTC participation, and participation in STW programs. Second, this thesis discusses the updated multinomial specification of the enlistment model which allows a three-way choice by youth between enlistment, work, or additional education.

## B. NLSY97 BIVARIATE PROBIT MODEL RESULTS

The baseline and updated bivariate PROBIT model specifications contain variables from the NLSY97 that affect the enlistment decisions of youth. Columns 1 and 2 of Table 16 show the results of the enlistment model specification for males. The enlistment specification for the full sample (males and females) is shown in columns 3 and 4 of Table 16. In addition to the basic predictors, the updated specification includes variables for gender, family structure, legal issues, STW programs, type of high school attended, academic specialty, and JROTC participation. In Table 16 for each variable the PROBIT coefficient is presented first, the standard error of the coefficient is presented in parentheses, and the marginal effect is presented in brackets. The results are discussed more fully below.

Table 16. Probit Model Results for Baseline and Full Enlistment Model Specifications.

| | Males Only | | Males and Females | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| | Baseline | Full | Baseline | Full |
| Variable | Specification | Specification | Specification | Specification |
| Black | 0.018 | -0.018 | 0.120 | 0.089 |
| | (0.091) | (0.093) | (0.075) | (0.077) |
| | *[0.001]* | *[-0.001]* | *[0.006]* | *[0.004]* |
| Hispanic | 0.124 | 0.126 | 0.157 | 0.161 |
| | (0.094) | (0.096) | (0.079**) | (0.080**) |
| | *[0.010]* | *[0.010]* | *[0.008]* | *[0.008]* |
| AFQT Cat I | -0.367 | -0.292 | -0.314 | -0.260 |
| | (0.188*) | (0.193) | (0.160**) | (0.163) |
| | *[-0.020]* | *[-0.016]* | *[-0.011]* | *[-0.009]* |
| AFQT Cat II | -0.063 | -0.023 | -0.010 | 0.023 |
| | (0.105) | (0.107) | (0.085) | (0.086) |
| | *[-0.005]* | *[-0.002]* | *[-0.001]* | *[0.001]* |
| AFQT Cat IIIb | -0.168 | -0.178 | -0.115 | -0.122 |
| | (0.112) | (0.114) | (0.090) | (0.091) |
| | *[-0.011]* | *[-0.011]* | *[-0.005]* | *[-0.005]* |
| AFQT Cat IV | -0.368 | -0.389 | -0.374 | -0.387 |
| | (0.113***) | (0.116***) | (0.095***) | (0.096***) |
| | *[-0.023]* | *[-0.023]* | *[-0.014]* | *[-0.014]* |
| AFQT Cat V | -0.748 | -0.770 | -0.825 | -0.840 |
| | (0.178***) | (0.180***) | (0.163***) | (0.165***) |
| | *[-0.034]* | *[-0.033]* | *[-0.021]* | *[-0.020]* |
| AFQT Missing | -0.366 | -0.342 | -0.344 | -0.313 |
| | (0.230) | (0.232) | (0.199*) | (0.201) |
| | *[-0.023]* | *[-0.021]* | *[-0.014]* | *[-0.012]* |
| Dropout | -1.232 | -1.211 | -0.999 | -0.995 |
| | (0.196***) | (0.198***) | (0.158***) | (0.161***) |
| | *[-0.049]* | *[-0.047]* | *[-0.026]* | *[-0.024]* |
| GED | -0.383 | -0.376 | -0.269 | -0.266 |
| | (0.133***) | (0.139***) | (0.118**) | (0.123**) |
| | *[-0.021]* | *[-0.020]* | *[-0.010]* | *[-0.009]* |
| Some College | -0.283 | -0.284 | -0.223 | -0.231 |
| | (0.083***) | (0.084***) | (0.067***) | (0.068***) |
| | *[-0.018]* | *[-0.017]* | *[-0.009]* | *[-0.009]* |
| Associate's Degree | -1.122 | -1.133 | -0.903 | -0.928 |
| | (0.357***) | (0.355***) | (0.253***) | (0.257***) |
| | *[-0.035]* | *[-0.033]* | *[-0.019]* | *[-0.019]* |
| Bachelor Degree or higher | -0.780 | -0.783 | -0.792 | -0.789 |
| | (0.214***) | (0.224***) | (0.178***) | (0.185***) |
| | *[-0.032]* | *[-0.030]* | *[-0.020]* | *[-0.019]* |

| | | | | |
|---|---|---|---|---|
| Missing Education | -0.277 | -0.223 | -0.217 | -0.154 |
| | (0.201) | (0.217) | (0.165) | (0.185) |
| | *[-0.016]* | *[-0.013]* | *[-0.009]* | *[-0.006]* |
| Parent's ed: No Degree | 0.081 | 0.099 | -0.012 | 0.001 |
| | (0.131) | (0.132) | (0.111) | (0.112) |
| | *[0.006]* | *[0.008]* | *[-0.001]* | *[0.000]* |
| Parent's ed: GED | -0.137 | -0.152 | -0.267 | -0.283 |
| | (0.208) | (0.211) | (0.187) | (0.189) |
| | *[-0.009]* | *[-0.010]* | *[-0.010]* | *[-0.009]* |
| Parent's ed: Associate's | 0.128 | 0.142 | 0.126 | 0.140 |
| | (0.108) | (0.110) | (0.088) | (0.089) |
| | *[0.011]* | *[0.011]* | *[0.007]* | *[0.007]* |
| Parent's ed: Bachelor's | -0.128 | -0.097 | -0.108 | -0.082 |
| | (0.103) | (0.104) | (0.086) | (0.087) |
| | *[-0.009]* | *[-0.007]* | *[-0.005]* | *[-0.004]* |
| Parent's ed: Post Bachelor | -0.135 | -0.092 | -0.105 | -0.065 |
| | (0.126) | (0.128) | (0.106) | (0.108) |
| | *[-0.009]* | *[-0.006]* | *[-0.005]* | *[-0.003]* |
| Parent's ed: Missing | -0.173 | -0.141 | -0.114 | -0.077 |
| | (0.111) | (0.112) | (0.092) | (0.093) |
| | *[-0.012]* | *[-0.009]* | *[-0.005]* | *[-0.003]* |
| ESL | 0.149 | 0.141 | 0.143 | 0.140 |
| | (0.154) | (0.157) | (0.128) | (0.130) |
| | *[0.013]* | *[0.011]* | *[0.008]* | *[0.007]* |
| ESL Missing | 0.067 | 0.055 | 0.002 | -0.019 |
| | (0.211) | (0.214) | (0.183) | (0.185) |
| | *[0.005]* | *[0.004]* | *[0.000]* | *[-0.001]* |
| Rural | 0.058 | 0.043 | 0.055 | 0.050 |
| | (0.098) | (0.100) | (0.082) | (0.083) |
| | *[0.005]* | *[0.003]* | *[0.003]* | *[0.002]* |
| Area Missing | 0.423 | 0.430 | 0.327 | 0.330 |
| | (0.081) | (0.082***) | (0.070***) | (0.070***) |
| | *[0.039]* | *[0.039]* | *[0.019]* | *[0.019]* |
| Avg HH income: 0-25$^{th}$ percentile | -0.176 | -0.177 | -0.158 | -0.159 |
| | (0.105*) | (0.106*) | (0.086*) | (0.087*) |
| | *[-0.012]* | *[-0.012]* | *[-0.007]* | *[-0.007]* |
| Avg HH income: 26$^{th}$-50$^{th}$ percentile | -0.039 | -0.045 | -0.054 | -0.057 |
| | (0.087) | (0.088) | (0.073) | (0.074) |
| | *[-0.003]* | *[-0.003]* | *[-0.003]* | *[-0.003]* |
| Avg HH income: 76$^{th}$-100$^{th}$ percentile | -0.157 | -0.147 | -0.148 | -0.141 |
| | (0.091*) | (0.092) | (0.077*) | (0.077*) |
| | *[-0.011]* | *[-0.010]* | *[-0.007]* | *[-0.006]* |
| Avg HH income: missing | -0.861 | -0.776 | -0.499 | -0.443 |

| | | | | |
|---|---|---|---|---|
| | (0.389***) | (0.395**) | (0.247**) | (0.252*) |
| | *[-0.032]* | *[-0.029]* | *[-0.015]* | *[-0.013]* |
| Census Region: North Central | -0.102 | -0.115 | -0.110 | -0.119 |
| | (0.088) | (0.090) | (0.074) | (0.075) |
| | *[-0.007]* | *[-0.008]* | *[-0.005]* | *[-0.005]* |
| Census Region: Northeast | -0.119 | -0.121 | -0.122 | -0.114 |
| | (0.096) | (0.099) | (0.081) | (0.083) |
| | *[-0.008]* | *[-0.008]* | *[-0.005]* | *[-0.005]* |
| Census Region: West | -0.260 | -0.278 | -0.162 | -0.173 |
| | (0.097***) | (0.100***) | (0.079**) | (0.082**) |
| | *[-0.017]* | *[-0.017]* | *[-0.007]* | *[-0.007]* |
| Family Structure: Biological and Step-Parent | 0.302 | 0.269 | 0.155 | 0.122 |
| | (0.184) | (0.187) | (0.156) | (0.158) |
| | *[0.029]* | *[0.024]* | *[0.009]* | *[0.006]* |
| Family Structure: Biological Mom Only | 0.042 | 0.043 | -0.024 | -0.035 |
| | (0.152) | (0.154) | (0.124) | (0.125) |
| | *[0.003]* | *[0.003]* | *[-0.001]* | *[-0.002]* |
| Family Structure: Multi-Parent Type | 0.404 | 0.401 | 0.267 | 0.257 |
| | (0.085***) | (0.086***) | (0.070***) | (0.071***) |
| | *[0.029]* | *[0.028]* | *[0.012]* | *[0.011]* |
| Marijuana Use | 0.062 | 0.113 | 0.056 | 0.102 |
| | (0.071) | (0.074) | (0.058) | (0.061*) |
| | *[0.005]* | *[0.008]* | *[0.003]* | *[0.005]* |
| Arrested | -0.016 | 0.003 | 0.036 | 0.060 |
| | (0.074) | (0.075) | (0.065) | (0.066) |
| | *[-0.001]* | *[0.000]* | *[0.002]* | *[0.003]* |
| Female | N.A. | N.A. | -0.611 | -0.589 |
| | - | - | (0.060***) | (0.063***) |
| | - | - | *[-0.030]* | *[-0.028]* |
| Hard Drug Use | - | -0.228 | - | -0.206 |
| | - | (0.092**) | - | (0.077***) |
| | - | *[-0.015]* | - | *[-0.008]* |
| STW: Job Shadowing | - | 0.061 | - | 0.086 |
| | - | (0.092) | - | (0.073) |
| | - | *[0.005]* | - | *[0.004]* |
| STW: Mentoring | - | -0.060 | - | -0.010 |
| | - | (0.147) | - | (0.114) |
| | - | *[-0.004]* | - | *[-0.001]* |
| STW: Co-op Education | - | 0.193 | - | 0.198 |
| | - | (0.095**) | - | (0.079**) |
| | - | *[0.016]* | - | *[0.011]* |
| STW: School Enterprise | - | -0.001 | - | -0.002 |

| | | | | |
|---|---|---|---|---|
| | - | (0.143) | - | (0.113) |
| | - | *[0.000]* | - | *[-0.001]* |
| STW: Tech Prep | - | 0.053 | - | 0.026 |
| | - | (0.098) | - | (0.085) |
| | - | *[0.004]* | - | *[0.001]* |
| STW: Internship | - | 0.087 | - | -0.035 |
| | - | (0.174) | - | (0.147) |
| | - | *[0.007]* | - | *[-0.002]* |
| STW: Missing Info | - | -0.257 | - | -0.144 |
| | - | (0.473) | - | (0.337) |
| | - | *[-0.015]* | - | *[-0.006]* |
| Attended Private School Only | - | -0.299 | - | -0.325 |
| | - | (0.213) | - | (0.1838) |
| | - | *[-0.017]* | - | *[-0.011]* |
| Attended Multiple School Types | - | 0.066 | - | 0.029 |
| | - | (0.098) | - | (0.083) |
| | - | *[0.005]* | - | *[0.001]* |
| Attended Other School Only | - | -0.277 | - | -0.099 |
| | - | (0.442) | - | (0.310) |
| | - | *[-0.015]* | - | *[-0.004]* |
| Academic Specialist | - | -0.185 | - | -0.134 |
| | - | (0.128) | - | (0.099) |
| | - | *[-0.012]* | - | *[-0.006]* |
| Vocational Specialist | - | 0.005 | - | 0.007 |
| | - | (0.095) | - | (0.080) |
| | - | *[0.000]* | - | *[0.001]* |
| Both Academic and Vocational Specialist | - | -0.133 | - | -0.016 |
| | - | (0.156) | - | (0.122) |
| | - | *[-0.009]* | - | *[-0.001]* |
| Educational Specialty Missing | - | -0.082 | - | -0.089 |
| | - | (0.088) | - | (0.073) |
| | - | *[-0.006]* | - | *[-0.004]* |
| JROTC Participation | - | 0.494 | - | 0.555 |
| | - | (0.207**) | - | (0.170***) |
| | - | *[0.055]* | - | *[0.044]* |
| Constant | -1.325 | -1.352 | -1.307 | -1.342 |
| | (0.137***) | (0.161***) | (0.137***) | (0.136***) |
| Observations | 4599 | 4599 | 8938 | 8938 |
| Pseudo R-squared | 0.12 | 0.13 | 0.13 | 0.14 |

Notes: * significant at 10%; ** significant at 5%; *** significant at 1%;
Standard errors in parenthesis. *Marginal effects in brackets*. N.A. = not applicable

Source: Derived from the NLSY97

Several of the included variables appear to have an effect on the individual enlistment decision. First, the effect of gender on enlistment is negative and statistically significant. Studies show that there is a significant increase in the participation of women in the labor force. Additionally, the roles of women are changing in the military. Even with these changes, the NLSY97 data show that females are less likely to enlist than males. This may be a result of higher reservation wages for women, and military wages are gender-neutral. Additionally, the effect may be due to the different tastes of women for a military career. Therefore, with all else held constant, women are less likely to enlist.

Second, the NLSY97 data show that living in a multi-parent type household—the parent household type changes from either single parent, to both biological parents, or a biological and a step parent—has a positive effect on enlistment. This effect may just be a result of sheer size, since 70.2 percent of those that enlist come from this family structure.

The results show that legal issues affect enlistment decisions. In Kilburn and Klerman's specification, youth that had been arrested had a positive and statistically significant probability of enlistment. When the model is updated to include the use of hard drugs, the data show that being arrested no longer has a statistically significant affect on enlistment. The data show that the use of hard drugs has a negative and statistically significant effect on enlistment. This may be the effect of the military's policy on drug use, not necessarily the individual's decision to join. In addition, the waiver policy may affect those who are allowed to join. Those who have been arrested on hard drug charges may not be allowed to enlist vice those who have other types of arrests.

With regards to participation in School-to-Work programs, the only program that showed any effect on enlistment is the Cooperative Education program. This effect is shown to be positive and statistically significant. With the cooperative education program allowing students to parallel their educational and vocational studies with a job-related field, students are given the opportunity to increase their practical job skills in an area of their liking. However, students may find it difficult to locate a job in the civilian

market after completion of high school. With the difficulty in finding civilian employment, individuals that participated in the co-op education STW program may find the military to be a viable option for a job in the career field they previously studied—especially with the myriad number of jobs the military offers.

Another significant predictor from the updated specification is whether the respondent attended only a private school. Private school attendance shows a negative and statistically significant effect, which is in agreement with the hypothesis stated earlier. This effect may be due to the ability of the respondent's parents to fund their education. Parents that have the ability to fund secondary education will most likely also be able to support, if not fully fund, their children's post-secondary education. Additionally, the private school variable includes both religious and non-religious schools. Youth that attend parochial schools may not be prone to military service. However, religious preference affecting military service is beyond the scope of this thesis.

A final observation in the updated bivariate specification is the variable for JROTC participation, which has a positive and statistically significant effect. This result is in line with the previously stated hypothesis and may stem from the youth's taste for the military lifestyle. There are youth who seek the structure and discipline associated with the military. Additionally, the curricular and extracurricular activities that the JROTC program offers may attract high school youth. The JROTC program also offers financial incentives for those who enlist—this may be money for college through scholarships, or through enlisting at a higher pay grade when joining the military. Whatever the incentive may be, the data show that those who participate in a JROTC program have a higher probability of enlistment.

## C. NLSY97 MULTINOMIAL LOGIT MODEL RESULTS

The multinomial LOGIT model specification is estimated using data only from the 2004 (round eight) portion of the NLSY97. This allows the respondents to have enough time to make a post-high school decision, but not enough time to have already completed college and moved on to post-college employment. Recall, that an individual

is considered to have enlisted if they are currently serving in the military. One is considered to be "attending school only" if they are currently enrolled in any type of school, even if they are also working part- or full-time. A respondent is considered to be in the "working or other" category if they are not in the military or not currently enrolled in school. This category includes those who are working as well as those who are unemployed or not in the labor force at all. The marginal effects of a unit change in each regressor on the relative probability of making one choice versus the other are reported in Table 17, along with asterisks that indicate the significance level of the estimates. The estimated coefficients from the multinomial logit model are listed in Appendix B.

Table 17. Change in Probability of Making Each Choice for One Unit Change in Each Regressor.

| Variable | Enlist | Attend School | Work/ Other |
|---|---|---|---|
| Female | -0.0269*** | 0.0260** | 0.009 |
| Black | 0.0022 | 0.0198 | -0.0220 |
| Hispanic | 0.0033 | 0.0303* | -0.0337** |
| AFQT CAT I | -0.0024 | 0.1127*** | -0.1103*** |
| AFQT CAT II | 0.0002 | 0.0652*** | -0.0653*** |
| AFQT CAT IIIb | -0.0049 | -0.0442*** | 0.0492*** |
| AFQT CAT IV | -0.0086*** | -0.0787*** | 0.0874*** |
| AFQT CAT V | -0.0162*** | -0.1747*** | 0.1908*** |
| AFQT Missing | -0.0095 | -0.0650** | 0.0745** |
| Parent's ed: None | -0.0027 | -0.0220 | 0.0248 |
| Parent's ed: GED | -0.0036 | -0.0868*** | 0.0904 |
| Parent's ed: Associate's | 0.0042 | 0.0736*** | -0.0778*** |
| Parent's ed: Bachelor's | -0.0008 | 0.1404*** | -0.1396*** |
| Parent's ed: Post Bachelor | -0.0063* | 0.2070*** | -0.2007*** |
| Parent's ed: Missing | -0.0039 | -0.0970*** | 0.1010*** |
| Avg HH Inc: 0-25$^{th}$ percentile | -0.0054* | 0.0297* | -0.0243 |
| Avg HH Inc: 51$^{st}$-75$^{th}$ percentile | 0.0044 | 0.0055 | -0.0098 |
| Avg HH Inc: 76$^{th}$-100$^{th}$ percentile | -0.0069** | 0.0233* | -0.0164 |
| English as second language (ESL) | 0.0038 | 0.0448 | -0.0486* |
| ESL missing | -0.0015 | 0.0326 | -0.0311 |
| Census region: Northeast | -0.0066** | 0.0040 | 0.0026 |
| Census region: North Central | -0.0053** | -0.0053 | 0.0106 |
| Census region: West | -0.0061** | 0.0273* | -0.0211 |
| Family structure: Biological and Step Parent | 0.0072 | 0.0261 | -0.0333 |
| Family structure: Biological Mom | -0.0059 | -0.0309 | 0.0368* |
| Family structure: Multiparent | 0.0080*** | -0.0907*** | 0.0827*** |
| Rural area | -0.0006 | -0.0088 | 0.0095 |
| Area missing | -0.0026 | -0.2376*** | 0.2402*** |
| Attended private school only | -0.0076 | 0.0244 | -0.0168 |
| Attended other type of school | -0.0052 | -0.0955** | 0.1007** |
| Attended multiple types of school | -0.0008 | 0.0092 | -0.0084 |

| | | | |
|---|---|---|---|
| Academic specialist | -0.0047 | 0.1353*** | -0.1306*** |
| Vocational specialist | -0.0008 | 0.0012 | -0.0004 |
| Both Acad/Voc specialist | -0.0068* | 0.1535*** | -0.1466*** |
| Specialty missing | -0.0037 | 0.0536*** | -0.0499*** |
| STW: Job shadowing | 0.0013 | 0.0570*** | -0.0583*** |
| STW: Mentoring | -0.0054 | 0.0449** | -0.0395* |
| STW: Co-op education | 0.0042 | 0.0423** | -0.0465*** |
| STW: School enterprise | 0.0038 | 0.0745*** | -0.0783*** |
| STW: Tech prep | -0.0005 | 0.0046 | -0.0041 |
| STW: Internship | -0.0008 | -0.0049 | 0.0058 |
| STW: Other STW program | 0.0001 | 0.0431 | -0.0432 |
| JROTC | 0.0506** | -0.0646* | 0.0140 |
| Marijuana use | 0.0039 | -0.0470*** | 0.0432*** |
| Hard drug use | -0.0089*** | -0.0288** | 0.0377*** |
| Arrested | -0.0039 | -0.0847*** | 0.0886*** |
| Observations | 7719 | 7719 | 7719 |

Significance: * at 10% level; ** at 5% level; *** at 1% level

Source: Derived from NLSY97

For estimation purposes, the omitted category is *Enlist*. Note that these estimates are not directly comparable with earlier estimates because this model is estimated on a slightly different sample (Round 8 respondents who are non-high school dropouts). The coefficients in Table 17 show the change in the relative probability of each outcome when the variable changes from zero to one. This specification is similar to that of the Kilburn and Klerman 2000 study. They state that, "Separating non-enlistment into the college and work/other alternatives better shows why a variable might be related to the probability of enlisting: by affecting college alternatives or work/other alternatives" (Kilburn and Klerman, 2000). For example, in the previous estimates being Hispanic increased the probability of enlistment. The multinomial results show that this is likely to be because being Hispanic significantly lowers the probability of being in the work/other category.[5] A curious result, however, is that Hispanics are more likely to enroll in school.

Also, many more variables have significant effects in the multinomial specification than in the bivariate specification. This is likely to be associated with the fact that a variable can have two opposing effects on the two nonenlistment choices,

[5] The work/other category includes both working and unemployed respondents. Hispanics may have the tendency to be hard working; therefore, the negative effect is from not being unemployed.

whereas when these choices are combined in the nonelistment category in the bivariate specification, the two effects could cancel each other. An example of a variable that has opposing effects on enlistment via the two other alternatives is AFQT. Respondents with higher AFQT scores are more likely to attend school but are less likely to make the work/other choice. On net this creates a small positive marginal effect of AFQT on enlistment. Another dual sign variable is the education classification category. Respondents who have an academic specialty—either full academic specialist or both vocational and academic specialist—are slightly less likely to enlist. This is because they are more likely to attend school and less likely to be in the work/other category. Similarly, marijuana use, hard drug use, and being arrested have small marginal effects on enlistment because respondents are less likely to be in school and more likely to be in the work/other category. Again, the work/other category contains both those who are employed and unemployed, so those with legal issues are not necessarily in the workforce.

Additionally, the data show that females are less likely to enlist because they are more likely to attend school. Also, the parent's education in general has an impact on what the respondent does. Respondents whose parents have college degrees—Associate's, Bachelor's, and graduate degrees—are less likely to enlist because they are more likely to attend school. Average household income also has an effect on enlistment. Respondents whose family's household income is higher—specifically in the $76^{th}$ to $100^{th}$ percentile—are less likely to enlist because they are more likely to go to school.

Another reason for conducting the three-choice model of enlistment is to identify the likelihood of what the individual will choose to do based on individual characteristics. Table 18 shows the likelihood of choosing enlistment over one of the other two choices for each predictor variable. Note that, for each variable, "more likely" or "less likely" is always compared to the reference category. For example, those with AFQT scores in the CAT IIIb category are less likely to enlist than work compared to those in the AFQT CAT IIIa category. The outcome "doesn't matter" is based on coefficients that are not statistically significant.

Table 18. Characteristics Significantly Affecting Probability of Choosing Enlistment Relative to School or Work/Other.

| Characteristic | Likelihood of Choosing Enlistment Over: School | Work |
|---|---|---|
| Female | Less likely | Less likely |
| AFQT CAT IIIb | Doesn't matter | Less likely |
| AFQT CAT IV | Doesn't matter | Less likely |
| AFQT CAT V | Doesn't matter | Less likely |
| Parent's ed: Bachelor's | Less likely | Doesn't matter |
| Parent's ed: Post Bachelor's | Less likely | Doesn't matter |
| Avg Household income: 0-25$^{th}$ percentile | Less likely | Doesn't matter |
| Avg Household income: 76$^{th}$-100$^{th}$ percentile | Less likely | Doesn't matter |
| Academic specialist | Less likely | Doesn't matter |
| Both Academic/Vocational specialist | Less likely | Doesn't matter |
| JROTC | More likely | More likely |
| Marijuana use | More likely | Doesn't matter |
| Hard drug use | Less likely | Less likely |
| Arrested | Doesn't matter | Less likely |

Note: "Doesn't matter" means that there is a more than 10 percent probability that the relationship is due to chance.

Source: Derived from the NLSY97

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# VI. DISCUSSION OF STATISTICAL RESULTS

## A. INTRODUCTION

The goal of this thesis was to explore the enlistment decisions of the Millennial Generation based on individual level data and to determine any changes that may have occurred in enlistment behavior since the 1980s or 1990s. The data set used is the 1997 National Longitudinal Survey of Youth, which is a representative survey of youth born between 1980 and 1984. It contains a wealth of information on youth demographics, high school programs and participation, and employment characteristics. This thesis used a binary PROBIT and a multinomial LOGIT model to determine the individual effects on enlistment.

## B. APPLICABILITY

This thesis is a follow-on study of individual-level effects on enlistment behavior. It attempts to extend previous research, which primarily was based on data from the 1980s and 1990s. In essence, this thesis is an attempt to discover patterns in enlistment behavior across time periods. The most comprehensive prior study focused upon individual enlistment decisions from the 1990s. Since the two previous studies were conducted with older data, this thesis attempted to replicate those studies in order to provide decision makers with updated data, which will allow the most accurate decisions possible regarding enlistment trends. Table 19 provides a comparison between the three studies in the relevant changed characteristics for the bivariate enlistment model. Table 20 compares the probability of choosing enlistment relative to school or work between Kilburn and Klerman and the NLSY97 data. The NLSY97 models in Table 19 and 20 are restricted to males only to provide a better comparison across decades and thus are not strictly comparable to prior results that include females in the samples.

Table 19. Comparing NLSY97, Kilburn and Klerman (K&K), and Hosek and Peterson (H&P) Coefficient Estimates—Bivariate Specifications of Enlistment Model for Males.

| Variable | NLSY97 Coefficient (Baseline) | K&K Coefficient (Graduates) | H&P Coefficient (Graduates) | NLSY97 Coefficient (Full Specification)[6] |
|---|---|---|---|---|
| Black | 0.018 | 0.198 | 0.467** | -0.018 |
| Hispanic | 0.124 | 0.333 | -0.214 | 0.126 |
| AFQT score (31-99) | - | - | 0.0025 | - |
| AFQT CAT I | -0.367* | 1.740*** | - | -0.292 |
| AFQT CAT II | -0.063 | 0.911** | - | -0.023 |
| AFQT CAT IIIb | -0.168 | 0.604 | - | -0.178 |
| AFQT CAT IV | -0.368*** | 0.022 | -0.190 | -0.389*** |
| AFQT CAT V | -0.748*** | -1.526** | - | -0.770*** |
| AFQT missing | -0.366 | 0.647 | - | -0.342 |
| HS Dropout | -1.232*** | - | - | -1.211*** |
| GED | -0.383** | 0.156 | 0.787 | -0.376*** |
| Some College | -0.283*** | - | - | -0.284*** |
| Associate Degree | -1.122*** | - | - | -1.133*** |
| Bachelor Degree or Higher | -0.780*** | - | - | -0.783*** |
| Education level missing | -0.277 | - | - | -0.223 |
| Some post-HS schooling | - | - | -0.641** | - |
| Mother's years of schooling | - | -0.004 | 0.034 | - |
| Parent's Education – Dropout[7] | 0.081 | - | - | 0.099 |
| Parent's Education – GED | -0.137 | - | - | -0.152 |
| Parent's Education – Associate Degree | 0.128 | - | - | 0.142 |
| Parent's Education – Bachelor Degree | -0.128 | - | - | -0.097 |
| Parent's Education – Post-Bachelor | -0.135 | - | - | -0.092 |
| Parent's Education – Missing | -0.173 | - | - | -0.141 |
| Family Income (in $thousands) | - | -0.001 | 0.0020 | - |
| Family Income <$5,200 | - | -0.700** | - | - |
| Avg HH income in 1st quartile (lowest) | -0.176* | - | - | -0.177* |
| Avg HH income in 2nd quartile | -0.039 | - | - | -0.045 |
| Avg HH income in 4th quartile | -0.157* | - | - | -0.147 |
| Family income missing | -0.861*** | -0.485 | - | -0.776** |
| English not first language | 0.149 | -0.265 | - | 0.141 |
| Missing English language info | 0.067 | 0.286 | - | 0.055 |
| Uses marijuana | 0.062 | -0.547 | - | 0.113 |
| Missing marijuana use | - | -0.670** | - | - |
| Has been arrested | -0.016 | 0.115* | - | 0.003 |
| Missing arrest info | - | -0.774 | - | - |
| Average in-state tuition | - | 0.000 | - | - |
| Constant | -1.325*** | -7.342 | 3.057*** | -1.352*** |

[6] Full results displayed in Appendix B.

[7] Parent's Education Level classified similar to Cook and Hutchinson (2006).

| | | | | |
|---|---|---|---|---|
| Observations | 4599 | 3798 | 2187 | 4599 |

Notes: A " – " indicates that the variable was not included in the model.
* significant at 10%; ** significant at 5%; ***significant at 1%.
Only those variables that were similar in all three studies are included.

Source: Derived from the NLSY97

Table 20. Comparing NLSY97 and Kilburn and Klerman (K&K) Probability of Choosing Enlistment Relative to School or Work (Males Only).

| | **NLSY97 likelihood of choosing enlistment over:** | | **K&K likelihood of choosing enlistment over:** | |
|---|---|---|---|---|
| **Characteristic** | **School** | **Work** | **School** | **Work** |
| Black | Doesn't matter | Doesn't matter | More likely | Doesn't matter |
| High AFQT score | Doesn't matter | Doesn't matter | Doesn't matter | More likely |
| Moderate to low AFQT score | Doesn't matter | Less likely | More likely | Less likely |
| Parent's Ed: None | Doesn't matter | Doesn't matter | More likely | Doesn't matter |
| Parent's Ed: College degree | Less likely | Doesn't matter | Less likely | Doesn't matter |
| Parent's Ed: Post-collegiate | Less likely | Doesn't matter | Less likely | Doesn't matter |
| Higher family income | Less likely | Less likely | Less likely | Doesn't matter |
| Very low family income | Less likely | Doesn't matter | Less likely | Less likely |
| ESL | Doesn't matter | Doesn't matter | Less likely | Doesn't matter |
| Arrested | Doesn't matter | Less likely | More likely | Doesn't matter |
| Marijuana use | More likely | Doesn't matter | Doesn't matter | Less likely |

Note: "Doesn't matter" means that there is more than a 10 percent probability that the relationship between the characteristic and the behavior is due to chance.

When comparing the coefficients of the previous studies in the bivariate model specification in Table 19, only a few variables reveal changes. In the Kilburn (2000) specification, the upper-AFQT categories have a positive affect on enlistment. However, most studies in the literature show that higher ability applicants are less likely to enlist (Asch, Kilburn, and Klerman, 1999). In addition, the data from the NLSY97 shows a negative coefficient of the AFQT CAT I category. Note that these are AFQT scores generated by the NLSY97 survey administrators, not necessarily the scores used by the military for enlistment purposes.

The data also show some differences within the education categories. Earlier studies found that a GED had a positive affect on enlistment, whereas the NLSY97 shows

it to be a statistically significant negative predictor of enlistment. However, there are similarities within the post-high school categories. Hosek and Peterson (1985) found a statistically significant negative effect on enlistment when an individual has a degree beyond high school. This relationship is confirmed in the NLSY97 data as well. Specifically, all post-secondary education attainment levels—some college, an Associates Degree, or a Bachelor Degree or higher—have a lower probability of enlistment, compared to a high school diploma only.

Additionally, family income data from the NLSY97 shows similar results with the Kilburn (2000) study. Low income families—those with income less than $5,200 and in the first quartile—are less likely to enlist in the military. This effect is negative and statistically significant. This may be due to the necessity of the youth having to work locally to assist the household financially. In addition, families with higher household incomes—in the fourth quartile—have a negative enlistment effect. This is similar to the negative coefficient—even though it is statistically insignificant—found in the Kilburn study. This effect may be the result of families having the ability to finance college for their children, therefore bypassing the enlistment decision.

A final observation in the bivariate model specification comparison is that of the effect of legal issues. Previously it was determined that marijuana use had a negative affect on enlistment. In the NLSY97 data, marijuana use has a positive coefficient.[8] This may be a result of an increase in the number of youth that have tried marijuana in high school (Arkes, 2007).

Table 20 compares generational differences based on the multinomial enlistment specification by comparing relative probabilities of enlistment to attending school or work and reveals some interesting differences. Recall that the "school" category is defined as those pursuing post-high school education, even if they are working part- or full-time, and those in the "work/other" category are those that are not in school or the military. In general, the relationship between choosing enlistment over attending school has decreased. In the NLSY97 data, Blacks are less likely to choose enlistment over

[8] Even though the coefficients have changed signs between studies, it should be noted that both are statistically insignificant and, therefore, not different from zero.

attending school. Additionally, those with moderate to low AFQT scores are less likely to enlist, and respondents whose parents have no high school diploma are now less likely to enlist. However, respondents who use marijuana are more likely to choose enlistment over attending school.

Second, the factors that predict those who choose enlistment over work have decreased from the previous decade. Those with higher AFQT scores are now less likely to enlist than work. Additionally, respondents from higher income families are less likely to enlist. Also, respondents that have been arrested are less likely to enlist than work. However, in the NLSY97 data there is no discernment between those who enlist and those who work among marijuana users.

## C. LIMITATIONS

The NLSY97 data set contains a large representative sample of youth and has collected extensive information on respondents' labor market behavior and educational experiences. In addition, the data include characteristics of the respondents' families, community backgrounds, schooling, and other environmental factors that influenced youth. Although the data in the NLSY97 is extensive, there is no oversampling of those that enlist in the military. By comparison, in the Hosek and Peterson study the NLSY79 data was augmented by the Armed Forces Entrance Examination Stations (AFEES) data to create a choice-based sample. The relatively few enlistees in the NLSY97 data reduce the amount of variation and subsequently the power of statistical tests. In addition, in trying to replicate the two previous studies of individual decisions—Hosek and Peterson (1985) and Kilburn and Klerman (2000)—there are likely to be variables that are not defined exactly the same way across the three different data sets—NLSY79, NELS, and NLSY97.

While the NLSY97 data allow comparisons between the previous two studies on individual enlistment decisions, these comparisons have some limitations. First, Hosek and Peterson (1985) and Kilburn and Klerman (2000) were able to identify decisions based upon two groups—seniors and graduates. The NLSY97 data does not identify whether individuals enlisted while they were in high school. This may be a result of how

the question is asked: there is no question regarding a decision to join the Delayed Entry Program (DEP), which is what the respondent enters while they are still in high school. So this thesis only compares the graduate segment of the previous studies. Second, the public-use NLSY97 data set, which is used for this study, does not allow for the use of state and zip code level data due to confidentiality issues.[9] Third, the numbers of respondents that enlist in the NLSY97 data set are so small that it is difficult to determine variation in such a large enlistment model.

## D. CONCLUSION

Determining enlistment decisions based on individual data can be very useful. Decision makers within the recruiting community are able to accurately target specific individuals as opposed to targeting regions of the country with hopes of reaching the individual. Recruiting decisions at the aggregate level does have its place—it may be difficult to develop an advertising campaign for a certain area without knowing the regional characteristics.

Generally, the characteristics that were found in this thesis to be significant predictors of enlistment are similar to those identified in previous studies. However, it appears that some individual characteristics have changed. Hosek and Peterson found that Blacks were more likely to enlist, but Kilburn and Klerman found a decrease in their enlistment probability, and the NLSY97 data show that there has been a continuous decline into the 2000s of Black's enlistment probabilities. Historically, Black youths had characteristics that raised the probability of enlistment, but the blending of race and increased diversity within the Millennial Generation appears to be lowering those tendencies. Additionally, the NLSY97 data show that there is a distinct difference in enlistment probabilities within the AFQT categories. Patterns with the previous generations could not be consistently identified. Those in the upper and lower AFQT categories in the NLSY97 data set are generally less likely to enlist.

[9] There are two additional confidential data sets attached to the NLSY97. One, the Geocode data set, allows one to analyze state, county, and zip code level data. The second allows the analysis of school information. Both of these data sets were unable to be obtained for this thesis.

Kilburn and Klerman identified a strong link between college attendance and family income. This thesis confirms that pattern with household income, but also shows that parent's education level is inversely related to enlistment probability.

Additionally, there are some characteristics—school characteristics, JROTC, STW programs, legal issues, and school programs—that were omitted from previous studies that have been found to have an impact on individual enlistment decisions. Having participated in a JROTC program significantly increases the probability of enlistment. Additionally, those who used hard drugs have a lower probability of enlistment. The lower enlistment probability associated with hard drug use may be a result of the military's policy on drugs, not necessarily a result of the individual's propensity to enlist. A study of the military's waiver policy may be needed to specifically identify causality.

This thesis was designed to give an overview of the changes in individual enlistment characteristics between the Millennial Generation and those of previous decades. The design was to identify possible changes in effects—albeit positive or negative—of specific characteristics. It is not designed to argue for certain programs such as the JROTC program. The positive enlistment effects from the JROTC variable show that there may be a need to study enlistment effects specifically about the JROTC program and other youth programs of a similar nature. The results that are identified within this thesis should be able to help DoD leaders in the design of recruiting or incentive strategies.

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# APPENDIX A. CREATION OF VARIABLES

This appendix provides a detailed description of what was done to create the variables from the NLSY97 data set. This thesis uses data through round 8 of the NLSY97 survey. This includes the years 1997 through 2004. Variables that are self-explanatory are omitted from this discussion.

*Enlist*. The enlistment variable is defined as at any time did the respondent enlist in the Armed Forces. Two different variables from the NLSY97 data set were used. The first variable used was to identify anyone who enlisted in 1997. The variable [YCPS-2400] asks the question "Are you now in the active Armed Forces?" For the years 1998 through 2004, the variables [YEMP-58500.XX] are used. The question this variable asks is, "At [your employer] [are/were] you employed by government, by a private company, a non-profit organization or [are/were] you working without pay in a family business or farm or [are/were] you a member of the Armed Forces?" There are multiple questions throughout the survey that pertain to military employment and each one has a different value. The reason these variables were chosen is that it specifically identifies if the youth is or was a member of the Armed Forces. There is a distinction between working for the government and someone in the Armed Forces. This eliminates ambiguity between someone who is in the military, or someone who is a civilian working for the military. So if any of the variables, over all years, ever has someone reporting as a member of the Armed Forces (active, reserve or National Guard), then they are deemed to have enlisted.

*Black/Hispanic*. The black and Hispanic variable was created using the KEY!RACE_ETHNICITY variable. This variable is used upon recommendation from the NLSY97 user's guide. It is a combination variable that was created by the NLSY97 from two other variables—KEY!RACE and KEY!ETHNICITY. This variable indicates respondents' race and Hispanic or Latino ethnicity.

*AFQT Category*. The AFQT categories are created from the [ASVAB_MATH_VERBAL_SCORE_PCT] variable. The NLSY97 uses a weighted formula that is similar to the AFQT, but should be noted that it is work done by the

NLSY program staff and is neither generated, nor endorsed by the Department of Defense (DoD). The raw NLSY AFQT variable is first divided by 100, since the variable contains three implied decimal points and then categorized by the standard DOD AFQT categories.

*Individual's Education Level*. The individual's education level is defined as the highest degree attained. For those that enlist, it is the highest degree attained prior to enlisting. This is done to distinguish those that receive their degree while they are in the military, since there are many educational programs within the military and it is very likely for individuals to complete additional degrees while serving. This variable uses the variable [CV_HIGHEST_DEGREE_EVER] for each survey year to identify the education level. In addition, the previously created binary enlist variable is used. Therefore, the individual's education level takes on the highest value from the education variable over all years as long as the enlist variable is not one.

*Parent's Education Level*. The parent's education level is taken from the highest degree attained by either the youth's biological mother or father. Previous studies use only the mother's education level, but the father educational level may have an influence too. First, the father's highest educational level is determined from the variable [YCHR-1470]. Second, the mother's education level is determined from the variable [YCHR-1420]. Once these levels are determined, the greater of the two is used for the overall parent's educational level.

*English as Second Language.* The English as a second language variable is taken from the [ASVAB_ENG_SPEAK]. The question is limited only to those who took the ASVAB that was administered by the NLSY97 staff. Since there was a large number of those who did not take the ASVAB test, a missing variable is also created.

*Family Structure.* The family structure variable is taken from the NLSY97 staff created variable [CV_YTH_REL_HH_CURRENT]. It is the current relationship of the parent figure(s)/guardian in the household to the youth as of the survey date. The

variable is defined for each year and then created for all years. If the status changed between categories for all years, then the respondent is defined as having a multiple type parental figure.

*School Type.* The school type variable defines the type of school the respondent attended. It uses the variable [CV_SCHOOL_TYPE]. This variable is the most recent type of school attended as of the survey date. This thesis takes all rounds and determines the type of school attended. If the school type changes, then the respondent is classified as attending a multiple school type.

*Legal Issues*. The legal issue variables—marijuana use, hard drug use, or ever been arrested—uses all rounds of the survey and takes on a value of 1 if the respondent ever reported a yes for drug use or having been arrested.

*JROTC.* The JROTC variable is created using the training variable series of questions [YTRN-3600.xx]. The question asks what type of school or training program the respondent participated in. One of the options for response is "school based (K-12), includes ROTC." If the respondent selected this option at any time over all rounds of the survey, then he/she is defined as having participated in the JROTC program.

*Choice*. The CHOICE variable is a combination of multiple questions about the respondent's 2004 activities—military, school, or work/other. For the military only option the [YEMP-55607.XX] series of questions are used. The school option uses the [SCH_YEAR_TO_GRADE_2004] question. The work/other option use the [EMP_HOURS_2004.XX] series of questions. If the respondent answers yes to being in the military and in school or working then he/she is defined as military. Being in school also takes precedence over the working variable. The working variable takes the mean of the total hours worked a week over a 52 week period. For any value greater that zero, the respondent is deemed to have worked. However, since the CHOICE variable only has three options—military, school, work/other—those who are not classified as in the military or in school are placed in the work/other category. Respondents whose information is missing for all three categories are omitted.

*Educational Classification.* The education classification variable is recoded from the NLSY97 created variable [TRANS_SCH_PGM]. According to the NLSY97, the educational classifications "follow recommendations set forth in U.S. Department of Education. National Center for Education Statistics. 'Procedures Guide for Transcript Studies' Working Paper 1999-05, by Martha Naomi Alt and Denise Bradby, Project Officer, Denise Nelson. Washington, D.C.: 1999."

Academic Specialist – Student earned at least 12 credits in mathematics, science, English, and social studies (together), and less than 3 in any SLMP field.

Vocational Specialist – Student earned less than 12 credits in mathematics, science, English, and social studies (together), and at least 3 in any single SLMP field.

Both – Student earned at least 12 credits in mathematics, science, English, and social studies (together), and at least 3 in any single SLMP field.

Neither – Student earned credits insufficient to meet either the academic or vocational requirements as specified above.

# APPENDIX B SUPPLEMENTARY TABLE

Table 21. Multinomial Logit Estimates.

| Variable | Attend School/ Enlist | Work or Other/ Enlist |
|---|---|---|
| Female | 1.662 | 1.546 |
| | (0.197)*** | (0.193)*** |
| Black | -0.046 | -0.162 |
| | (0.217) | (0.209) |
| Hispanic | -0.067 | -0.243 |
| | (0.232) | (0.225) |
| AFQT CAT I | 0.582 | 0.010 |
| | (0.402) | (0.398) |
| AFQT CAT II | 0.261 | -0.098 |
| | (0.233) | (0.226) |
| AFQT CAT IIIb | 0.134 | 0.411 |
| | (0.258) | (0.247)* |
| AFQT CAT IV | 0.263 | 0.776 |
| | (0.268) | (0.257)*** |
| AFQT CAT V | 0.898 | 2.425 |
| | (0.638) | (0.617)*** |
| AFQT Missing | 0.410 | 0.826 |
| | (0.579) | (0.562) |
| Parent's ed: none | 0.081 | 0.216 |
| | (0.349) | (0.336) |
| Parent's ed: GED | -0.233 | 0.365 |
| | (0.511) | (0.480) |
| Parent's ed: Associate's | 0.052 | -0.348 |
| | (0.238) | (0.231) |
| Parent's ed: Bachelor's | 0.577 | -0.145 |
| | (0.230)** | (0.225) |
| Parent's ed: Post Bachelor's | 1.174 | 0.179 |
| | (0.335)*** | (0.332) |
| Parent's ed: missing | -0.245 | 0.400 |
| | (0.300) | (0.281) |
| Avg household income: 0-25$^{th}$ percentile | 0.510 | 0.349 |
| | (0.269)* | (0.260) |
| Avg household income: 26$^{th}$-50$^{th}$ percentile | -0.233 | -0.270 |
| | (0.195) | (0.186) |
| Avg household income 76$^{th}$-100$^{th}$ percentile | 0.584 | 0.460 |
| | (0.231)** | (0.226)** |
| ESL | -0.032 | -0.283 |
| | (0.386) | (0.373) |
| ESL missing | 0.236 | 0.054 |
| | (0.528) | (0.514) |
| Census Region: Northeast | 0.494 | 0.479 |
| | (0.247)** | (0.240)** |
| Census Region: North Central | 0.345 | 0.382 |
| | (0.214) | (0.207)* |
| Census Region: West | 0.551 | 0.404 |
| | (0.231)** | (0.224)* |
| Family Structure: Biological parent and step parent | -0.267 | -0.423 |
| | (0.469) | (0.458) |
| Family Structure: Biological mom only | 0.292 | 0.487 |
| | (0.417) | (0.410) |
| Family Structure: Multiparent household | -0.922 | -0.419 |

| | | |
|---|---|---|
| | (0.211)*** | (0.206)** |
| Rural | 0.000 | 0.053 |
| | (0.229) | (0.222) |
| Area missing | -1.458 | 0.477 |
| | (0.244)*** | (0.220)** |
| Attended private school | 0.731 | 0.604 |
| | (0.528) | (0.524) |
| Attended other type school | -0.163 | 0.518 |
| | (1.074) | (1.029) |
| Attended multiple types of schools | 0.091 | 0.039 |
| | (0.253) | (0.245) |
| Academic specialist | 0.840 | 0.147 |
| | (0.271)*** | (0.266) |
| Vocational specialist | 0.059 | 0.053 |
| | (0.222) | (0.211) |
| Both acad/voc specialist | 1.079 | 0.328 |
| | (0.370)*** | (0.365) |
| Educational specialty missing | 0.476 | 0.178 |
| | (0.214)** | (0.206) |
| STW: Job shadowing | 0.160 | -0.156 |
| | (0.215) | (0.210) |
| STW: Mentoring | 0.587 | 0.348 |
| | (0.378) | (0.373) |
| STW: Co-op ed | -0.062 | -0.301 |
| | (0.223) | (0.216) |
| STW: School enterprise | 0.078 | -0.324 |
| | (0.298) | (0.292) |
| STW: Technical prep | 0.053 | 0.027 |
| | (0.241) | (0.232) |
| STW: Internship | 0.032 | 0.062 |
| | (0.392) | (0.382) |
| STW: Other | 0.173 | -0.063 |
| | (0.490) | (0.477) |
| JROTC | -1.788 | -1.429 |
| | (0.414)*** | (0.356)*** |
| Marijuana use | -0.456 | -0.189 |
| | (0.172)*** | (0.166) |
| Hard Drug use | 0.542 | 0.726 |
| | (0.240)** | (0.233)*** |
| Arrested | -0.164 | 0.375 |
| | (0.197) | (0.187)** |
| Constant | 1.342 | 2.155 |
| | (0.370)*** | (0.358)*** |
| Observations | 7791 | |
| Pseudo R-square | 0.18 | |
| Notes: Significance: * at 10% level; ** at 5% level; *** at 1% level. Standard errors in parenthesis. | | |

Source: Derived from NLSY97

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