TEACHING ALTRUISM: ESSAYS EXAMINING THE IMPACT OF EDUCATION ON VOLUNTEERISM AMONG YOUNG ADULTS

BY

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DISSERTATION

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ABSTRACT

This dissertation is composed of three chapters that each examine the impact of education on the volunteerism of young adults. Below are the individual abstracts for each chapter.

Chapter 1: All Work and No Pay

Throughout the 1990s and into the early 2000s, there has been a steady increase in the overall volunteering rate among youth. Much of this change is led by an increase in volunteerism among students who apply to selective colleges, as these students account for more than 70 percent of the total volunteers in 2004. This trend is accompanied by an overall increase in the competitiveness among selective schools during the same time period. To explore the role of college selectivity in influencing volunteerism, this research uses a difference-in-differences approach that specifically controls for both ELS cohort fixed-effects and group fixed-effects for students who apply to selective colleges. The results indicate that the volunteering rate for this group of students is increasing by 5 to 8 percentage-points more than all other students. In particular, participation in school service organizations, religious organizations, and neighborhood social action groups is increasing significantly. These estimates are robust to the inclusion of control variables that measure changes in cognitive ability, work preferences, and altruistic attitudes, and the results imply that the changes to the college admission environment provides the most plausible explanation for much of the trend.

Chapter 2: Teaching Altruism

Over the past ten years, the use of mandatory community service requirements in high school has become increasingly popular. To assess its impact, this study uses data from the ELS: 2002 survey to examine the effects of mandatory community service on civic behavior both

during high school and two years after high school. Using a probit regression framework, this study finds that mandatory service does increase the probability of volunteering during high school; however, the students that are exposed to such a requirement are less likely to report that helping in the community is very important.   After high school, this policy has a modest positive effect on the probability of volunteering, but no measurable impact on the probability of voting. To address the potential selection bias in these estimates, this study draws a comparison group of students from the earlier NELS: 88 cohort who are attending schools with similar characteristics as the schools with mandatory service programs in the later ELS cohort but have not adopted such a policy. The results from incorporating this new comparison group into a difference-in-differences framework are consistent with the cross-section regression results using only the ELS sample.

Chapter 3: Do Four-Year Colleges Produce Better Citizens?

While many studies have identified a positive correlation between attending a four-year school and civic behavior rates, the exact size and scope of this relationship is largely unknown. This research merges data from the National Education Longitudinal Study of 1988 (NELS) with the Integrated Postsecondary Data System (IPEDS) and the Common Core of Data (CCD) to develop a new instrumental variable approach for assessing the extent of this relationship. The results from a bivariate probit model show that attending a four-year school anytime during early adulthood appears to have a very strong impact on voting behaviors. In addition, if a student enrolls full-time in a four-year school immediately after high school they increase their probability of volunteering by nearly 8 percentage points. This effect is both immediate and persistent, as quick enrollment after high school has a positive impact on volunteering both two and eight years after high school.

For my wife, who blazed the trail.

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TABLE OF CONTENTS

INTRODUCTION

Education plays an important role in maintaining the health and well-being of a democracy. The cognitive development and critical thinking skills gained in the classroom are the essential tools of the citizen to evaluate political leaders and to analyze information for collective policy decisions. These skills can also be applied to help identify and solve the most pressing problems of society. However, an educational system does not strengthen a democracy simply through the transfer of knowledge—it also has the potential to promote civic engagement. Many studies in the past have documented a positive correlation between the level of education and adult civic behavior; however, the extent to which education has a direct impact on civic actions is largely unknown. This effect is often referred to as a social benefit of education or a positive externality within the context of economics and the existence of these externalities provides a key justification for the public support of education at all levels. Therefore, understanding the exact size and scope of social benefits such as education's impact on civic behavior has become an important topic within economics. Recent works by Thomas Dee (2004) as well as Kevin Milligan, Enrico Moretti, and Philip Oreopoulos (2004), have begun to address this question directly with careful empirical techniques. This dissertation contributes to this burgeoning field of research by assessing the precise impact of secondary and postsecondary education on the future civic behavior of individuals.

To address this broad theme more explicitly, this dissertation contains three chapters that address three specific research questions. Chapter 1, entitled "All Work and No Pay," provides an analysis of the current trends in volunteerism among high school students in the United States using two longitudinal datasets from the National Center of Education Statistics: the National

Education Longitudinal Study of 1988 (NELS) and the Educational Longitudinal Study of 2002 (ELS).   Between the class of 1992, represented in the NELS, and the class of 2004, represented in the ELS, there has been a steady increase in volunteerism among high school students. This first chapter identifies the specific factors that contribute to this increase by paying particular attention to the role that competition for college admission might play in influencing the decision to volunteer.   Students applying to selective colleges account for more than 70 percent of the total volunteers in 2004 which is an increase of 10 percentage-points compared to the class of 1992. In addition, this trend is accompanied by an overall increase in the competitiveness among selective schools during the same time period. To address the issues of an endogenous variable with respect to the college application decision, this research uses a difference-in-differences approach that specifically controls for both ELS cohort fixed-effects and group fixed-effects for students who apply to selective colleges. In addition, the analysis in this chapter takes advantage of the variable-rich NELS and ELS datasets by incorporating a number of control variables including controls for individual cognitive ability, work preferences, and altruistic attitudes.

Chapter 2, entitled "Teaching Altruism," examines the use of mandatory community service programs in high schools and its effect on adult civic behavior. This is a policy that involves a school-wide requirement for students to complete a certain number of community service hours in order to graduate. Although mandated service in high schools across the country have been gaining considerable support over the past decade, the full ramifications on future civic behavior remain largely unknown since this is such a relatively new policy trend. The main contribution of this chapter is to provide one of the first national assessments of this policy by utilizing the latest round of the ELS to examine the policy's impact on civic behavior occurring after high school. This dataset is contemporary enough to capture the current trend in mandatory

service programs, and it contains information about civic behavior both during high school and two years after high school.

Because a mandatory service program is enacted at the school-level, there is the potential for selection bias in the estimation of policy effects since students and their parents have a considerable influence over the type of school that the student attends. This research addresses the issue in three ways using data from both the NELS and the ELS. First, the estimation approach in this chapter controls for as much of the observable differences between students exposed to a mandatory service requirement and those who are not. Second, this research focuses on the contrast between schools with mandatory service programs and those with high levels of participation but no school-wide mandate. Students at these two types of schools are very similar in observable characteristics compared to students from other types of schools with lower levels of community service programs. In addition, by focusing on this distinction it is helpful in determining if there are any additional effects from a mandatory policy even when volunteering is already heavily encouraged within a school. Finally, in a particularly novel approach, this analysis generates a comparison group of students from the earlier NELS sample. This comparison group is comprised of students who have a high probability of being exposed to a service requirement in high school based on the observable characteristics of the school that they attend, but very little chance to actually enroll into a school with such a policy because they are a part of an earlier cohort of students. In other words, this comparison group is comprised of students who are most likely to have been exposed to a mandatory service requirement if they had been part of the class of 2004. This technique approximates how the students who are actually exposed to the mandatory service requirement might have behaved in the absence of the policy.

Finally, Chapter 3, entitled "Do Four-Year Colleges Produce Better Citizens?," is an examination of how postsecondary school shapes civic behavior. Attending a four-year school is highly correlated with many measures of civic engagement such as voting and volunteering, so this chapter focuses on determining if this correlation represents a causal impact specific to four-year institutions using an instrumental variable approach in a bivariate probit model. Since the choice of postsecondary school type is potentially endogenous with civic behavior outcomes, this research merges data from the NELS with the Integrated Postsecondary Data System (IPEDS) and the Common Core of Data (CCD) to develop a new instrumental variable approach to assess the extent of this relationship. The instrumental variable is based on the institutional characteristics of nearby postsecondary institutions, using the fraction of students enrolled in a public four-year school within a 100-mile radius to predict attendance and enrollment in a four-year school. The rationale is based on the substitutability of nearby public four-year schools with other types of postsecondary opportunities. If other postsecondary opportunities can be substituted, the decision to attend a four-year school could be based, in part, to the relative number of slots at a public four-year school in the surrounding area. If that number is high, it may be easier to gain admission to a nearby public four-year school and thus influence the exposure rates. Because the analysis in Chapter 3 uses longitudinal data from the NELS, it is possible to measure the effect of four-year school attendance on civic behavior occurring eight years after the end of high school. The extent to which social benefits occur at the postsecondary level is an important policy question, especially in the debate about the role of government in subsidizing postsecondary education.

Overall, this dissertation is designed to make two broad contributions to the literature in economics. In the field of the economics of education, this dissertation provides a more precise

understanding of the size and scope of the social returns to education in the form of increased civic engagement. Using established quantitative methods such as instrumental variables and difference-in-differences equations, this research assesses the impact of secondary and postsecondary school experiences on the probability of engaging in adult civic behavior such as voting and volunteering. Therefore this research contributes to a more complete measurement of education's impact on society beyond just productivity and returns to an individual's wage. Secondly, for the field of labor economics, this research provides new insight into the incentives that prompt individuals to work without pay as a community volunteer. The contribution of unpaid labor to the non-profit profit sector and to the entire economy as a whole is significant, and this research measures the impact of education on the level of volunteerism specific to young adults.

CHAPTER 1

ALL WORK AND NO PAY

PART I: INTRODUCTION

Throughout the 1990s and into the early 2000s, there has been a steady increase in the overall volunteering rate among youth in the United States. Studies using the Monitoring the Future survey which are data collected by the University of Michigan's Survey Research Center identified a growing trend in volunteerism among 12th graders. Between the years of 1991 and 2001, the data show an 8 percentage-point increase in the proportion of 12th graders who report ever volunteering and a 9 percentage-point increase in the proportion of regular volunteers (Lopez & Marcelo, 2007; Youth Services Bureau 2003). A similarly sized trend also exists among 12th graders in the National Education Longitudinal Study of 1988 (NELS) and the Education Longitudinal Study of 2002 (ELS). These datasets are from the U.S. Department of Education and are designed to make comparisons between two nationally representative samples of 12th graders from the class of 1992 and the class of 2004. Like the results generated with the Monitoring the Future survey, results from these datasets indicate a 10 percentage-point increase in the proportion of students who ever volunteered in high school. This represents a 20% change in the volunteering rate among high school students.[1] Given this trend, this research provides a more precise understanding of the specific factors that prompt such a significant increase in volunteering among youth during this time period.

This research takes advantage of the NELS and ELS datasets which are uniquely positioned to capture the current trend in volunteering. Both of these datasets are variable-rich and are specifically designed to make comparisons of 12th grade cohorts over time. In addition

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[1] Based on authors own calculations using the NELS and ELS data.

to containing information about volunteering activities and attitudes towards service during high school, these datasets also contain a number of variables representing measures of household demographics, school-level characteristics, cognitive ability, the level of extracurricular involvement, and the college application decision. Because of these features in the data, it is possible to see how a change in the volunteering rates between 1992 and 2004 varies among different sub-groups of high school students. In particular, the sub-group of students who apply to selective colleges has experienced a considerable increase in volunteering during this time period. Growth in volunteer rates among this group in over 13 percentage-points and the share of volunteers who also apply to selective colleges has grown to over 70 percent of the volunteers in the ELS sample. The share of volunteers who also applied to selective college was only 60 percent for the NELS cohort ten years earlier. During this same time period, the college admission environment is also changing. The percentage of students applying to selective colleges has increased between the NELS and ELS samples while the overall enrollment rates for these schools are lower than the population growth of high school students in the United States. The aggregate results imply that the competition for selective colleges is increasing during this time period and this change could be a catalyst for the trend in volunteerism.

To evaluate this explanation, this research uses a difference-in-differences approach that specifically controls for both ELS cohort fixed effects and group fixed effects for students who apply to selective colleges. The results indicate that the volunteering rate for students who apply to selective colleges is increasing by 5 to 8 percentage-points more than all other students— including students who apply to non-selective postsecondary schools. Students who apply to selective colleges are more likely to volunteer for all types of organizations, but involvement in school service organizations, religious organizations, and neighborhood groups experienced

2

particularly large increases for this group of students. All of these estimates are robust to the inclusion of additional control variables that measure changes in cognitive ability, work preferences, and altruistic attitudes which bolsters an argument that changes in the college admission environment is the most plausible explanation for this trend.

Volunteering and College Selectivity

College selectivity can have a role in influencing the decision to volunteer when the act of volunteering is modeled as a human capital investment decision. This theoretical framework is often referred to as an investment model or a job skills model, and it has been incorporated into a number of papers on volunteering done by economists throughout the 1980s and 1990s (Govekar & Govekar, 2002).[2] In an investment model, the primary motivation for volunteering comes from the potential for private benefits that affect future labor market outcomes. Typically these benefits including gaining work experience or important contacts in the labor market. In the context of college selectivity, volunteering has the potential of setting an applicant apart and increasing the probability of gaining access to a particular school or program which may lead to gains in income or job satisfaction later in life. An underlying assumption in this context is that volunteering can influence college admission decisions and that changes to the returns to volunteering over time will affect volunteering behavior. An investment model implies that individuals with fewer opportunities for gaining traditional paid work experience will have a stronger tendency to volunteer; hence, this explanation is particularly applicable for the volunteering decision among young adults. Using survey data from the National Survey of Giving, Volunteering, and Participation in Canada, Jones (2000) shows that a large percentage youth aged 15-25 cited job related reasons for their volunteering such as improving job

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[2] These include work by Vaillancourt & Payette (1986), Menchick & Weisbrod (1987), and Schiff (1990).

opportunities or developing skills and experience—this is especially true among full time students in this age range.

Work experience is certainly not the only relevant incentive for youth to be engaged in volunteering. Most theoretical work in economics has incorporated many types of incentives. Early work by Menchick and Weisbrod (1987) use both an investment model and a consumption model where the act of volunteering is thought of as a normal utility-bearing good. Thus the decision to volunteer could be influenced both by the extrinsic incentive from the benefits towards the labor market and the intrinsic preferences of the individual. Taking this further, Benabou and Tirole (2006) develop a model that takes into account the potential for competing influences between intrinsic and extrinsic motivations for volunteering. They highlight the fact that external rewards and punishments around a volunteering action have the potential to crowd out more intrinsic motivations and ultimately cause a decrease in volunteering behavior. Beyond private gains to volunteering, volunteering can also be a response to a societal need for charitable labor (Schiff, 1990). In this case, volunteering is more of an act of altruism where individuals are only concerned with the well-being of others without the thought of personal benefit. All these studies suggest that a careful empirical estimation of volunteering needs to account for personal tastes and societal needs for volunteering in addition to the external benefits to the individual.

Regardless of the theoretical context, traditional economic theory might suggest that volunteers are comprised of individuals with smaller opportunity costs for such activity. This would explain why youth would be more likely to engage in volunteering since they would have to give up less in terms of wages compared to older, more experienced individuals. However, work by Freeman (1997), argues that these traditional explanations do not fully explain the

volunteering actions measure in data. He concludes that in addition to the economic costs, social pressure is a significant incentive for volunteers. He describes volunteer work as a conscience activity, an action that would not be taken unless somebody asks. This result is confirmed in a later empirical paper by Yoruk (2008), who uses a propensity score matching technique to show that the probability of volunteering is significantly impacted when an individual receives a personal solicitation. Therefore, when estimating the factors that contribute to volunteering, social connections may play an important role as well. For high school students, the level of involvement in extra-curricular activities in general may have a direct impact on the probability of being a volunteer and controls should be included in a regression framework estimating the probability of engaging in volunteering behavior.

The main contribution of this research is to use an empirical estimation approach that incorporates many aspects of the previous theoretical work to assess the role of college selectivity on the recent increase in volunteering among high school students. The rest of the paper is organized as follows: Part II provides additional detail about the datasets used in this analysis as well as an outline of the current trends in volunteerism among high school students. To put these trends into context, Part II also includes trends in other activities such as participation in traditional paid work, extra-curricular activities, and the decision to apply to college. Part III contains the main regression results from an expanded difference-in-differences framework. This section considers a number of potential explanations for the increasing in volunteering and provides additional robustness checks to bolster the main result. Part IV concludes.

PART II: DATA

The data for this research come from two separate surveys of high school students in the United States, the National Education Longitudinal Study of 1988 (NELS) and the Educational Longitudinal Study of 2002 (ELS). The earlier NELS survey contains a nationally representative sample of 12th graders from the class of 1992 while the later ELS survey contains a similar sample of 12th graders from the class of 2004. Both of these datasets come from National Center for Education Statistics and are specifically designed to compare of high school students across time as many of the questions are identical or nearly identical between the two surveys. The sample design scheme is also very similar although different high schools are used in each survey. Although the NELS and ELS are both longitudinal studies, they contained weights to construct a representative sample of 12th graders for use in a repeated cross-section design scheme. (Curtin, Ingels, Wu, & Heuer 2002; Ingels, Pratt, Rogers, Siegel, & Stutts 2005)

The focus of this is study is on volunteerism, so samples in both datasets are limited to students with complete information about their volunteering behavior during high school.[3] The information on volunteering behavior comes from data collected during the 12th grade follow-up of both surveys. During this follow-up, students were asked whether they had volunteered at anytime between 10th and 12th grade. If so, the students were then asked about whether they participated in a specific type of volunteering including volunteering for a school service organization which are community service groups housed within high schools[4], a church or religious organization, and social action groups which are local neighborhood organizations centered on a specific social issue. Both surveys also gathered information about the intensity of volunteering during the 12th grade year. Students were asked how often they engaged in

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[3] The restricted sample size from the NELS is 13,430, and from the ELS, it is 10,800.
[4] One example of this type of organization is Key Club, a student organization housed within a high school that is specifically centered on doing acts of community service.

community service activities over the course of a week and about the relative importance of helping out in the community (Curtin, et al. 2002; Ingels, et al. 2005).

Trends in Volunteerism

The first half of Table 1.1 shows comparisons of the mean participation rates of volunteering in general and volunteering by type for both the NELS and ELS cohorts. The key result from this table is that members of the class of 2004 (the ELS cohort) are 10 percentage-points more likely to volunteer between 10th and 12th grade compared to their counterparts in the class of 1992 (the NELS cohort). This change is significant both statistically and in terms of magnitude, representing a 22% change in volunteer rates over this time period. Looking at volunteering by type, the mean participation rate in school service organizations has the most dramatic increase across the two samples. This type of volunteering includes activities such as student service clubs that are housed within high schools. Participation in this type of service increased nearly four-fold from 5% of students among the class of 1992 to nearly 20% of students among the class of 2004. There are also large changes in the mean volunteering rates for religious organizations and social action groups. The other types of volunteering, including volunteering for a youth organization, a political organization, a hospital, an educational organization, or an environmental organization experience smaller increases in participation. When aggregated into one category of "Other Types" the results indicate a total increase of 7.2 percentage-points.

Not only did overall participation in volunteering among high school students increase during this time period, volunteering intensity and attitudes towards community service also changed. The second half of Table 1.1 shows volunteering intensity and attitudes towards service reported during the last year of high school for both cohorts. These results are generated

7

from a series of questions about how often a student engages in various types of activities including community service. ELS cohort members are more likely to report that they volunteer on a regular basis during the 12th grade compared to their earlier counterparts in the NELS. The percentage of students reporting that they volunteered rarely or never during the 12th grade dropped nearly 13 percentage-points which represents an overall change of approximately 20%. Attitudes towards service also appear to change over this time period as well. Students in the ELS cohort are 6.5 percentage-points more likely to report that helping in the community is very important.

Trends in Related Activities

To put the volunteering trends from Table 1.1 into context, Table 1.2a shows the mean participation rates in extracurricular activities for the same two samples of students. Unlike the positive trend in volunteering, mean participation rates in sports and music have remained constant within this same time period while participation in academic clubs has dropped by 4 percentage-points. Table 1.2a also reports the participation intensity in extracurricular activities. For this measure, students are asked how often they regularly participate in any type of extracurricular activity during a typical week of school. Students in the ELS cohort are 1.5 percentage-points less likely to report that they do not participate in extracurricular activities and about 1.5 percentage-points more likely to spend 10 or more hours on such activities. While these changes show a positive increase in the overall intensity of participation, the changes are relatively small compared to the changes in volunteering rates. This result implies that the size of the increase in volunteering rates found in Table 1.1 represents a significant change in behavior among high school students during this time period.

Table 1.2b shows the participation trends in traditional paid-work activities across the two samples to add additional context to the changes in voluntary labor shown in Table 1.1. A high proportion of students in both cohorts, well over 80%, report that they have worked for pay outside of the home sometime between 10th and 12th grade. This proportion has changed very little between the ELS and NELS samples. What has changed is the work intensity of students during the school year. In both surveys, students are asked to report the number of hours that they work for pay outside of the home on a typical week during the school year. Students in the ELS sample are 7.5 percentage-points less likely to report that they do not work at all during the school year and 5.6 percentage-points more likely to work 25 or more hours. There appears to be a positive trend in both the intensity of paid work and the intensity of volunteering which suggests that there is little trade-off between these two activities when looking at the means of participation.

Table 1.2c and 1.2d show the participation trends for time spent on homework outside of school and time spent on leisure activities like TV or video games. On average the ELS cohort are less likely to report spending a large amount of time doing homework outside of school (16 or more hours). This may be illustrating the opportunity cost of the increased time spent on volunteering for students; however, the size of the differences across the cohorts is not very large. In terms of leisure activities, the increase the in volunteering trend does not appear to have an affect on the time spent watching TV or playing video games. For the latter, ELS cohort members are much more likely to spend 1 to 5 hours on video games during weekdays compared to their earlier counterparts in the NELS.

College Application Behavior

This research pays particular attention to the role of the college admission environment in explaining the increase in volunteerism among high school students. To consider this explanation, Table 1.3 summarizes the college application trends for both the ELS and NELS cohorts. In both surveys, students are asked in the spring of their 12th grade year to name the top two postsecondary institutions that they have applied to and are likely to attend.[5] Using this measure to gauge the overall postsecondary application rate within these samples, the first row of Table 1.3 shows that the percentage of students who reported any type of postsecondary application is up nearly 5 percentage-points. It is important to note that this does not imply that colleges are becoming any more or any less competitive during this time period because the datasets do not contain information about admission rates at the postsecondary school level.[6] However, because the question asks only about postsecondary institutions that students are likely to attend, this might rule out the simple explanation of a change in application costs. This is because a decrease in application costs should have little effect on the probability of applying to a school that a student is most likely to attend. Instead, it should only affect the decision to apply to a school that a student is *less* likely to attend.

To further categorize this change, the postsecondary institutions that students report apply to in the ELS and NELS can be linked to the Carnegie Classification of Institutions of Higher Education.[7] This classification categorizes the selectivity of four-year postsecondary institutions into three broad categories which the ELS survey refers to as inclusive, moderately selective, and

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[5] For both the NELS and ELS surveys the question for students read: "Print below the names and locations of the two schools to which you have applied that you are most likely to attend" (Curtain et. al., 2002; Ingels, et. al., 2005).
[6] Even datasets like the Integrated Postsecondary Education Data System (IPEDS) do not have information about admission rates until early 2003.
[7] Contained in this data is the Undergraduate Profile Classification which is a time specific snapshot of postsecondary schools based on data from the Integrated Postsecondary Education Data System and the College Board collected in 2003 and 2004.

very selective schools.[8] These categories are based on the average ACT or SAT test score for first-time, first-year students for each institution. The ACT-equivalent cut off score that defines each category is 18 or less, 18-21, and 21 or higher for the three levels of selectivity respectively. Schools that are moderately selective and very selective institutions are made up of the upper 3 quartiles of the average test score distribution (Carnegie Foundation for the Advancement of Teaching, 2010). When this trend is broken out by type of institution based on selectivity, much of this increase appears to be from the changes in the application rate to schools that are moderately selective. The application rate to moderately selective schools increases by over four percentage-points, representing a change in the application rate of a little less than 20%. There is also an increase in the application rate to non-selective schools by two percentage-points while there is no measurable increase or decrease in the application rate for very selective schools.

The data within the NELS and ELS surveys only contain information about application rates and not the admissions environment. Since there could be any number of potential explanations for a shift in the application rate, this research uses aggregate data from the U.S. Census and the Integrated Postsecondary Education Data System (IPEDS) to draw an inference about how the level of competition is changing for each category of school. These datasets contain information on the changes in the high school age population in the United States as well as the overall enrollment rates for each college type between 1991 and 2004. Data from the Resident Population Estimates show an increase in young adults aged 14-17 from 13.5 million to 16.8 million between 1991 and 2004. This represents a population increase of over 20% (U.S. Census Bureau, 2000 & 2009). During this same time period, the enrollment for very selective schools increases by only 8 percentage-points while in non-selective school, the enrollment

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[8] These categories titles are consistent with the ones used in the ELS dataset, but the actual titles in the Carnegie Classification are inclusive, selective, and more selective respectively.

increases by nearly 17 percentage-points. Moderately selective schools experience a growth of 13 percentage-points.[9] This result indicates that the enrollment levels for non-selective schools are keeping up with the population change of high school students in the United States, while the enrollment levels for very selective and moderately selective schools are not. In addition, since application rates are up—especially for moderately selective schools—this implies that these schools are becoming increasingly competitive at the aggregate level over this time period. In other words, a greater proportion of an increasing population is applying to moderately selective schools, yet the enrollments rates are not increasing at the same rate.

To further explore the potential relationship between the changing admission environment and volunteering, Table 1.4 shows a two-by-two table of mean volunteering rates conditional on both college application type and ELS/NELS cohort membership. The first row of this table shows the mean volunteering rates in high school for students who applied to a moderately selective or very selective four-year school across the two datasets. The second row reports the mean volunteering rates for all other students including non-applicants. For both cohorts, students who applied to a more selective four-year school are significantly more likely to report that they participate in volunteering activities during high school. In the ELS cohort [1], students in this category are nearly 37 percentage-points more likely to volunteer compared to all other students, and in the NELS cohort [2], these students are 28 percentage-points more likely to report volunteering.

Table 1.4 also includes an initial difference-in-differences estimate which shows how the rate of volunteering changes over time conditional on the college application decision. The estimate is the result of the following regression:

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[9] These calculations are based on postsecondary schools in the IPEDS with complete information about general enrollment levels in the 1992 and 2004 surveys.

$$(1) \ Y_i \ = \alpha \ Select + \ \beta \ (Select \ \text{x} \ ELS) + \gamma \ ELS \ + \ \varepsilon_i$$

Y_i indicates if a student has ever volunteered between 10th and 12th grade. *Select* is a binary variable indicating if a student has applied to a moderately or very selective school and *ELS* is a binary variable indicating membership in the ELS cohort. The main coefficient of interest is the difference-in-differences estimator which is represented by β and is reported in the lower right corner of Table 1.4. This coefficient is an estimate of the rate of change in volunteering over time for students who apply to more selective schools relative to the overall change in volunteering. Unlike the simple difference in means reported in the earlier tables, the difference-in-differences estimator shows the variation in volunteering for a specific group of students over time after controlling for both group fixed effects from students who apply to more selective schools (α) and ELS cohort fixed effects (γ).

The difference-in-differences estimator in Table 1.4 is positive and significant and this result indicates that not only are students who apply to more selective schools more likely to volunteer, the rate of growth in volunteering rates for this group of students has also increased over time. For students who apply to selective colleges, the rate of volunteering is increasing 8 percentage-points more than all other students. This estimate provides initial evidence of a link between changes in the college admission environment and changes to the volunteering rate of youth. However, this simple difference-in-differences estimate alone is not compelling enough to draw a causal link between college application decisions and the decision to volunteer. This is because there are other potential explanations that could be occurring over time. From the earlier theoretical discussion, these could include changes to personal preference to volunteering,

13

changes to the level of social interactions, and changes to societal needs for volunteers. To test

this causal claim further, the research expands upon the initial difference-in-differences model to

include additional control variables to account for other potential explanations in the variation in

volunteering rates and incorporates additional robustness checks to confirm that the change in

the college admissions environment is the most likely explanation for this increase in

volunteering.

PART III: MAIN REGRESSION RESULTS

To test the robustness of this initial difference-in-differences estimate, this research uses

the following expanded linear probability model.

$$(2)\ Y_i = \alpha\ \text{SELECT}_i + \beta\ (\text{SELECT}_i \times ELS) + \gamma\ ELS_i + \delta_1 X_i + \delta_2\ (X_i \times ELS) + \varepsilon_i$$

Here, Y_i is a binary variable indicating if an individual student participated in one of five

different measures of participation in volunteering activities. The dependent variables include

binary variables that indicate if an individual has ever volunteered between 10th and 12th grade, if

an individual is a regular volunteer during the 12th grade, and whether a student volunteers for

three specific types of volunteering including ever volunteered for a school service organization,

a church organization, or a social action group. SELECT_i is a vector of binary variables

indicating if a student has ever applied to one of three types of postsecondary schools including

very selective four-year schools, moderately selective four-year schools, or inclusive schools.[10]

The omitted group in each regression is non-applicants. As in the previous tables, the data for

the college application decision come from the 12th grade follow-up in which students are asked

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[10] Inclusive also includes applicants to 2-year schools.

to name the top two postsecondary institutions that they have applied to and are likely to attend. X_i is a vector of additional control variables including controls for individual, household, and school level characteristics. They include obvious individual level control variables for gender, race, socio-economic status, and high school type. Also included are control variable that account for regional differences in the demand for volunteers including binary variables for urbanicity and geographical region.

The strength of this regression specification is that every explanatory variable is allowed to vary with the ELS cohort. This specification provides a measure of the change in volunteering rates across different observable groups and controls for the fixed effect component of each group. Table 1.5 reports the coefficient results from a regression predicting the probability of ever being a volunteer between 10th and 12th grade. These results are from a single regression with the first column containing the estimated coefficients on each of the control variables and the second column containing the coefficients on each of the interaction terms. The results in the first column of Table 1.5 can be interpreted as an estimation of the initial coefficients that applies to the NELS cohort only, and the results in the second column provide an estimate of how much this coefficient has changed between the ELS and NELS cohorts. For example, females in the NELS cohort are nearly 10 percentage-points more likely to volunteer when compared to the omitted group of males in the NELS cohort (column 1). The estimates from an interaction term show that female members of the ELS cohort are more likely to volunteer by an *additional* 4 percentage-points compared to females of the NELS cohort. In other words, holding being female constant, the coefficient on the interaction term provides an estimate of how much in impact of being female changes if an individual is a member of the ELS cohort. The total effect of being female on the probability of volunteering within the ELS cohort can be obtained by

adding the two coefficients from column 1 and column 2 together for a total of nearly 14 percentage-points. Looking at the other control variables, with the exception of being Hispanic, there is no measurable change in the rate of volunteering between the NELS and ELS cohorts across different regions, high school types, or household socio-economic status.

Turning to the effect of college application decisions, the results in Table 1.5 show that, even with additional control variables, there still remains a positive and significant change in the rate of volunteering over time among students who applied to moderately selective or very selective schools. The results from column 2 show that students in the ELS cohort are 5 percentage-points more likely to volunteer compared to their counterparts in the NELS cohort holding constant the decision to apply to a very selective four-year school. The volunteering rate increases by over 8 percentage-points during this time period for students applying to moderately selective schools. Both of these results are statistically significant and are similarly sized in magnitude when compared to the initial difference-in-differences estimate from Table 1.4. In contrast, there appears to be no change in the volunteering rates between the NELS and ELS cohorts among students who applied to an inclusive four-year school or to a two-year school as the coefficient on the interaction term is very small and not statistically significantly different from zero.[11] Overall, the results from Table 1.5 provide strong evidence that students bound for very selective or moderately selective four-year schools are volunteering at a much higher rate than in previous years. The next set of tables provide additional robustness checks to show that much of this change in the volunteering rates can be attributed to changes in the college admission environment during this time period.

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[11] To make this explicit, Table 1.6 includes Wald tests to show that the interaction term for applicants of non-selective schools is statistically difference from the interaction term for applicants of moderate selective and very selective schools.

Alternative Explanations: Changes in Cognitive Ability

Just because there are changes over time in the volunteering rates of students that apply

to selective schools does not necessarily imply that this is a result of a change in college

selectivity or admission standards. It is possible that there are other changes occurring during

this time period that might also impact volunteering and only affect the group of students that are

applying to these types of schools. For example, if higher cognitive ability makes it easier to

participate in volunteering activities and the pool of applicants to selective post-secondary

schools is increasing in the level of cognitive ability over time, then it might be a story of

changes in ability and not changes to college admission standards that could explain the change

in volunteering rates.   To rule out this explanation, column 2 of Table 1.6 provides estimates

from a regression predicting the probability of volunteering during high school that includes

specific controls for cognitive ability levels. The controls are binary variables indicating

standardized test score quartiles for both math and reading tests administered to survey

participants in both the NELS and ELS surveys. Interaction terms between test scores and the

ELS indicator variable are also included in the regression

For a comparison, Column 1 in Table 1.6 provides the estimates from the original

specification laid out in Table 1.5. When test scores are included in the regression, the estimated

coefficient on the interaction terms for students who applied to moderately selective and very

selective schools remains statistically unchanged. The presence of these control variables does

not soak up the variation in volunteering rates for these college applicants across the NELS and

ELS cohort. In contrast, there is a change in the coefficients of the non-interaction terms that

indicate different types of college applicants. The impact of applying to a very selective school

on volunteering drops by 10 percentage-points from 33 percentage-points to 23 with the

inclusion of the test score variables. Similarly, there is 4.5 percentage point drop for students applying to moderately selective schools. These results are evidence that part of the estimated impact of the college application decision on volunteering is biased upward without controls for cognitive ability; however, this representation of cognitive ability does little to explain the increase in volunteering rates over time among applicants to selective schools.

Alternative Explanations: Changes in Preferences

If a consumption model for volunteering is applied then another potential alternative explanation could stem from a change in individual preferences towards work outside of the classroom that is specific to college bound students over this time period. For example, if students in the ELS cohort who apply to selective schools are deriving greater happiness from extracurricular activities than their previous cohort in the NELS, they may be choosing to volunteer more often because of this change in preference. To proxy for changes in work ethic and changes in preferences towards extracurricular activities, column 3 of Table 1.6 includes control variables that account for the time spent doing paid work and extracurricular activities during the school year. These controls include categorical dummy variables indicating how many hours per week a student works during the school year and how many hours are spent on all types of extracurricular activities. Each regression also includes interaction terms between these outside work intensity dummy variables and the ELS indicator variable.

With the inclusion of these control variables, the coefficient on the college application interaction term remains constant. Students in the later ELS sample that apply to very selective colleges are still approximately 5 percentage-points more likely to volunteer, and similarly, students who apply to moderately selective schools are still nearly 8 percentage-points more likely to volunteer. However, like the results from column 2 in this table, the inclusion of these

18

control variables does have an effect on the size of the non-interacted terms measuring the college application decisions. The estimated coefficient for these terms decreases by 5 to 6.5 percentage points. These regression results seem to suggest that while work ethic or preferences towards extracurricular activities are correlated with both the college application decision and volunteering behavior, the inclusion of these proxies does very little to explain the change in volunteering rates over time for college bound students.

One final alternative explanation is the possibility that students who apply to selective colleges have become more altruistic over time. In the final column of Table 1.6, the regression includes a control variable for a student's self-reported attitude towards community service. In both the ELS and NELS surveys students are asked to rate the importance of helping out in the community choosing from the follow choices: "very important", "somewhat important", or "not important at all." The regression specification in column 4 includes dummy variables for each of the categorical responses with the "not important at all" responders left as the omitted comparison group. Like the previous specifications, each regression also includes an interaction term between the dummy variables for the attitude categories and the ELS cohort indicator variable. The results in column 4 are statistically unchanged from column 3 suggesting including proxies for altruistic attitudes provides little information about the variation between college application decisions and volunteering behavior. In the final specification of Table 1.6 the positive impact of being a college-bound student on volunteering persists; however, the coefficient on the ELS cohort term is still positive and significant. This suggests that even with extensive control variables in a regression there is still a significant portion of the variation in volunteering that remains unexplained between the two cohorts.

Effect on Volunteering Types: School Service Organizations

Table 1.7 uses the same regression specification in the last column of Table 1.6 to consider the changes in participation rates for college bound student for other types of volunteering outcomes. The first column of Table 1.7 uses a dependent variable that indicates participation in a school service organization which is a student organization housed within a high school that is mainly focused on participating in community service projects. This type of volunteering had the largest increase in participation between the NELS and ELS cohorts, and volunteering for this type of organization increased by a dramatic amount for college bound students. Students who apply to very selective schools in the ELS cohort are 19 percentage points more likely to volunteer for a school service organization compared to their counterparts in the earlier NELS cohort. There is also a similar, though smaller, shift among students who apply to moderately selective schools in the ELS cohort at 11 percentage points. Unlike Table 1.6, there is a clear statistical difference between students applying to very selective schools and students applying to moderately selective schools in terms of their rate of participation in school service organizations. This may be due to the resources available at the high school to support such organizations. Students who apply to very selective colleges also attend schools with more resources, on average, which may increase the availability of these activities. From Table 1.6 it is clear that volunteering for all college-bound students is increasing overall, but students bound for very selective colleges appear to choose school service organizations in much higher numbers. Another notable change is that the coefficient on the ELS cohort term is not significantly different from zero suggesting that college application type as well as other control variables in the regression have explained most of the variation between the two cohorts. If the college admission environment is driving the trends in volunteering, it appears that volunteering

20

for a school service organization is a popular choice for the college bound student, especially for applicants of very selective schools.

Because there is a marked increase of participation in school service organizations, another alternative explanation could come from the increase use of mandatory community service policies in high school. This is a policy where high schools require community service as an additional requirement for graduation and there has been a significant increase in the use of mandatory service across the United States over the past ten years (Education Commission of the States, 2009; Spring, Grimm, & Diez, 2008; RMC Research Corporation, 2008). Within the ELS sample specifically, many of the schools that have adopted such a policy are private (Dunick, 2010). Therefore, the increase in volunteering for college bound students could simply be a result of a new community service mandate at the high school level that disproportionately affects students bound for selective colleges. However, the regression in Table 1.7 specifically includes a control variable for school type that is made up of a binary variable for attending a Catholic school and a binary variable for attending any another type of private school. Since these interaction terms are never statistically different from zero, the impact of mandatory service programs, mainly adopted by private schools, does not appear to explain much of the increase in volunteer among college bound students. Also, volunteering with other types of service organizations outside of students organizations housed within a high school has also increased during this time period. This implies that the explanation that only high schools are providing the volunteering opportunities does not fully explain the trend in volunteerism among high school students.

Other Outcomes: Religious Organizations, Social Action Groups, & Intensity

The second and third column of Table 1.7 contains the estimates from predicting the probability of volunteering for a church or religious organization and a social action group respectively. The estimates follow a very similar pattern and are similar in magnitude to the results in Table 1.6. The main result indicates that students that are applying to very selective or moderately selective schools are volunteering for these types of activities at a significant higher rate over time. Also, the coefficient for the ELS cohort variable is no longer significant, suggesting that much of the variation has been explained with the included regressors. There are also similar results in column 4, where the dependent variable indicates that a student volunteers during the 12th grade on a regular basis (more than rarely). Each of the regression specifications in Table 1.7 includes controls for cognitive ability, preferences for work and extracurricular activities, and altruistic attitudes.

Part IV: Conclusion

Over the past decade, the volunteering rate among high school students in the United States has increased steadily. With data from the National Education Longitudinal Study of 1988 (NELS) and the Educational Longitudinal Study of 2002 (ELS), this research estimates that students in the class of 2004 are 10 percentage points more likely to volunteer than the students in the class of 1992. This trend is significant both statistically and in terms of magnitude because it represents a 20% change in the overall volunteering rate of high school students. Much of this change is led by an increase in volunteerism among students who apply to selective colleges, as these students account for more than 70 percent of the total volunteers in 2004. The share of volunteers who also applied to selective college was only 60 percent for the NELS cohort ten years earlier. In addition, this trend is accompanied by a change in the college admission

environment. Application rates are increasing, especially for moderately selective postsecondary schools, while enrollment rates for moderately selective and very selective schools are not keeping up with the increase in the high school aged population of the United States. This translates into increasing competitiveness within higher education, and a strong explanation for the current trend in volunteerism.

To explore the role of college selectivity in influencing volunteerism, this research uses a difference-in-differences approach that specifically controls for both ELS cohort fixed effects and group fixed effects for students who apply to selective colleges. The results indicate that the volunteering rate for this group of students is increasing by 5 to 8 percentage-points more than all other students. Overall, volunteering among high school students is increasing, but students bound for selective colleges are increasing at a rate that is 50% to 80% more than non-applicants. These estimates are robust to the inclusion of control variables that measure changes in cognitive ability, work preferences, and altruistic attitudes.   Looking at particular types of volunteering, participation in school service organizations, religious organizations, and neighborhood social action groups is increasing significantly for students who apply to selective institutions. For example, students applying to very selective colleges have increased their participation in school service organizations by 19 percentage-points between 1992 and 2004. This is a dramatic change since the mean participation level for this type of activity was only five percent for the class of 1992   This clearly indicates that high schools are assisting college-bound students in their quest for volunteering experiences which appears to be mainly driven by the incentive created through increased competitiveness in college admissions.   As future rounds of the ELS survey are released, it will be important to see how this incentive will affect volunteering beyond the college years.

Table 1.1: Volunteering Rates and Attitudes Towards Service among High School Students in the ELS and the NELS Samples

	ELS Sample [1]	NELS Sample [2]	Difference [1] - [2]
Volunteering Rates			
Ever Volunteered (10th-12th Gr.)	0.540	0.440	0.100***
			[0.011]
Volunteering Types			
School Service Organization	0.197	0.053	0.144***
			[0.007]
Church or Religious Organization	0.289	0.213	0.076***
			[0.008]
Social Action Group	0.151	0.099	0.052***
			[0.006]
All Other Types	0.343	0.271	0.072***
			[0.010]
Volunteering Intensity in 12th Grade			
Rarely or Never	0.595	0.721	-0.126***
			[0.010]
Less than Once a Week	0.246	0.168	0.078***
			[0.007]
Once or Twice a Week	0.134	0.087	0.047***
			[0.006]
Almost Everyday	0.024	0.024	0.001
			[0.004]
12th Grade Attitudes Towards Service			
Helping in the Community is Very Important	0.385	0.320	0.065***
			[0.008]
Helping in the Community is Somewhat Important	0.549	0.608	-0.059***
			[0.008]
Helping in the Community is Not Important at All	0.066	0.072	-0.011
			[0.009]
Sample Size	10550	13100	

* significant at 10%; ** significant at 5%; *** significant at 1%

Standard errors are in brackets and are adjusted for clustering at the school-level. The sample is limited to students in the 12th grade cohort with complete information about their volunteering activities in high school and their post-secondary application decision. The estimates are weighted using a cross-sectional weight designed to create a nationally representative sample of the 12th graders for each dataset.

Table 1.2a: Mean Participation Rates in Extracurricular Activities among High School Students in the ELS and the NELS Samples

	ELS Sample	NELS Sample	Difference [1] - [2]
Extacurricular Activities			
Participated in Sports (10-12th Gr.)	0.397	0.394	0.003
			[0.009]
Sample Size	10490	12930	
Participated in Band or Chorus (10-12th Gr.)	0.206	0.204	0.002
			[0.008]
Sample Size	10480	12990	
Paricipated in Academic Clubs (10th-12th Gr.)	0.213	0.255	-0.042***
			[0.008]
Sample Size	10450	12970	
Hours Per Week on Extracurricular Activities			
Does Not Participate in Extracurricular Activities	0.311	0.296	0.015*
			[0.009]
Less Than 1 Hour Per Week	0.107	0.130	-0.022***
			[0.006]
1 -9 Hours Per Week	0.314	0.333	-0.019**
			[0.008]
10-19 Hours Per Week	0.211	0.197	0.014*
			[0.007]
20 or More Hourse Per Week	0.057	0.044	0.013***
			[0.005]
Sample Size	10520	13060	

* significant at 10%; ** significant at 5%; *** significant at 1%

Standard errors are in brackets and are adjusted for clustering at the school-level. The sample is limited to students in the 12th grade cohort with complete information about their volunteering activities in high school and their post-secondary application decision. The estimates are weighted using a cross-sectional weight designed to create a nationally representative sample of the 12th graders for each dataset.

Table 1.2b: Mean Work Participation Rates among High School Students in the ELS and the NELS Samples

	ELS Sample	NELS Sample	Difference [1] - [2]
Work Experience			
Ever Worked Outside the Home (10-12th Gr.)	0.861	0.870	-0.009
			[0.006]
Sample Size	10500	13030	
Hours Worked Per Week During the School Year			
Did Not Work During the School Year	0.236	0.310	-0.075***
			[0.009]
1-10 Hours Per Week	0.183	0.171	0.012
			[0.008]
11-24 Hours Per Week	0.405	0.399	0.006
			[0.010]
25 or More Hours Per Week	0.177	0.120	0.056***
			[0.006]
Sample Size	10490	12400	

* significant at 10%; ** significant at 5%; *** significant at 1%

Standard errors are in brackets and are adjusted for clustering at the school-level. The sample is limited to students in the 12th grade cohort with complete information about their volunteering activities in high school and their post-secondary application decision. The estimates are weighted using a cross-sectional weight designed to create a nationally representative sample of the 12th graders for each dataset.

Table 1.2c: Mean Participation Rates for Time Spent on Homework among High School Students in the ELS and the NELS Samples

	ELS Sample	NELS Sample	Difference [1] - [2]
Hours Spent on Homework Outside of school			
None	0.032	0.043	-0.011***
			[0.004]
Less Than 1 Hour Per Week	0.104	0.100	0.004
			[0.006]
1-3 Hours Per Week	0.294	0.242	0.053***
			[0.008]
4-6 Hours Per Week	0.250	0.230	0.020**
			[0.008]
7-9 Hours Per Week	0.125	0.123	0.002
			[0.006]
10-12 Hours Per Week	0.086	0.081	0.005
			[0.005]
13-15 Hours Per Week	0.056	0.058	-0.001
			[0.004]
16-20 Hours Per Week	0.03	0.046	-0.016***
			[0.004]
More than 20 Hours Per Week	0.020	0.052	-0.033***
			[0.004]
Sample Size	10550	12750	

* significant at 10%; ** significant at 5%; *** significant at 1%

Standard errors are in brackets and are adjusted for clustering at the school-level. The sample is limited to students in the 12th grade cohort with complete information about their volunteering activities in high school and their post-secondary application decision. The estimates are weighted using a cross-sectional weight designed to create a nationally representative sample of the 12th graders for each dataset.

Table 1.2d: Mean Participation Rates for Time Spent on Leisure Activities among High School Students in the ELS and the NELS Samples

	ELS Sample	NELS Sample	Difference [1] - [2]
Hours Spent Wathing TV During Weekdays			
None	0.047	0.041	0.006
	[0.003]	[0.002]	[0.004]
Less Than 1 Hour Per Week	0.177	0.175	0.002
	[0.005]	[0.005]	[0.007]
1-2 Hours Per Week	0.238	0.259	-0.021***
	[0.005]	[0.006]	[0.008]
2-3 Hours Per Week	0.254	0.246	0.008
	[0.005]	[0.005]	[0.007]
3-5 Hours Per Week	0.184	0.186	-0.002
	[0.005]	[0.006]	[0.008]
More than 5 Hours Per Week	0.086	0.079	0.007
	[0.004]	[0.004]	[0.005]
Hours Spent Playing Video Games During Weekdays			
None	0.502	0.626	-0.124***
	[0.006]	[0.006]	[0.009]
Less Than 1 Hour Per Week	0.239	0.234	0.005
	[0.005]	[0.006]	[0.008]
1-2 Hours Per Week	0.112	0.069	0.043***
	[0.004]	[0.003]	[0.005]
2-3 Hours Per Week	0.081	0.035	0.046***
	[0.003]	[0.003]	[0.005]
3-5 Hours Per Week	0.038	0.012	0.026***
	[0.002]	[0.001]	[0.003]
More than 5 Hours Per Week	0.018	0.006	0.012***
	[0.002]	[0.001]	[0.002]
Sample Size	10550	12750	

* significant at 10%; ** significant at 5%; *** significant at 1%

Standard errors are in brackets and are adjusted for clustering at the school-level. The sample is limited to students in the 12th grade cohort with complete information about their volunteering activities in high school and their post-secondary application decision. The estimates are weighted using a cross-sectional weight designed to create a nationally representative sample of the 12th graders for each dataset.

Table 1.3: College Applications Rates Across the ELS and the NELS Samples

	ELS Sample	NELS Sample	Difference [1] - [2]
College Applications			
Ever Applied to Postsecondary School	0.65	0.604	0.047***
			[0.011]
Highest Level of College Selectivity among Applications			
Very Selective Four-Year School	0.239	0.254	-0.014
			[0.011]
Moderately Selective Four-Year School	0.254	0.211	0.043***
			[0.009]
Inclusive Four-Year School or a Two-Year School	0.157	0.139	0.019**
			[0.007]
Sample Size	10550	13100	

* significant at 10%; ** significant at 5%; *** significant at 1%

Standard errors are in brackets and are adjusted for clustering at the school-level. The sample is limited to students in the 12th grade cohort with complete information about their volunteering activities in high school and their post-secondary application decision. The estimates are weighted using a cross-sectional weight designed to create a nationally representative sample of the 12th graders for each dataset.

Table 1.4: Mean Volunteering Rates Conditional on the College Application Decision and the NELS/ELS Sample

College Application Type	ELS Sample [1]	NELS Sample [2]	Difference [1] - [2]
Very or Moderately Selective School	0.727	0.593	0.134***
Sample Size	5730	6440	[0.012]
All Others (Including Non-applicants)	0.358	0.307	0.051***
Sample Size	4820	6660	[0.012]
Difference	0.369***	0.286***	0.083***
	[0.012]	[0.012]	[0.017]

* significant at 10%; ** significant at 5%; *** significant at 1%

Standard errors are in brackets and are adjusted for clustering at the school-level. The sample is limited to students in the 12th grade cohort with complete information about their volunteering activities in high school and their post-secondary application decision. The estimates are weighted using a cross-sectional weight designed to create a nationally representative sample of the 12th graders for each dataset.

Table 1.5: Linear Probability Model Predicting Volunteering Rates with ELS Interaction Terms

Depedent Variable: Ever Volunteered (10th-12th Grade)	Estimated Coef.	Interaction Term
College Application Type		
Ever Applied to a Very Selective Four-Year School	0.330***	0.052**
	[0.016]	[0.022]
Ever Applied to a Moderately Selective Four-Year School	0.193***	0.084***
	[0.017]	[0.022]
Ever Applied to a Post-Secondary School (Other)	0.086***	0.003
	[0.017]	[0.024]
Other Control Variables	Estimated	Interaction Term
Female	0.098***	0.041**
	[0.012]	[0.016]
White	0.062**	-0.036
	[0.025]	[0.033]
African-American	0.023	-0.056
	[0.033]	[0.042]
Hispanic	0.067**	-0.099**
	[0.031]	[0.040]
2nd SES Quartile	0.052***	-0.022
	[0.019]	[0.025]
3rd SES Quartile	0.076***	0.008
	[0.018]	[0.025]
4th SES Quartile	0.132***	0.026
	[0.019]	[0.026]
Attended a Catholic High School	0.150***	-0.012
	[0.031]	[0.036]
Attended a Private High School	0.036	0.049
	[0.040]	[0.048]
High School was Suburban	-0.018	-0.001
	[0.017]	[0.023]
High School was Urban	-0.015	0.037
	[0.018]	[0.027]
Geographical Region: Midwest	0.030*	-0.01
	[0.018]	[0.026]
Geographical Region: South	0.044**	0.004
	[0.018]	[0.023]
Geographical Region: West	0.096***	-0.026
	[0.020]	[0.030]
ELS Cohort Member	0.080*	-
	[0.043]	-

* significant at 10%; ** significant at 5%; *** significant at 1%

Standard errors in brackets and are adjusted for clustering at the school-level. Sample size is 23,650.

Table 1.6: Linear Probability Model with ELS Interaction Terms and Additional Control Variables for Test Scores, Participation in Work & Extracurricular Activities, and Altruistic Attitudes

Depedent Variable: Ever Volunteered (10th-12th Grade)	Estimated Coef. [1]	Estimated Coef. [2]	Estimated Coef. [3]	Estimated Coef. [4]
Very Selective School x ELS Cohort (β_1)	0.052**	0.053**	0.049**	0.054**
	[0.022]	[0.022]	[0.022]	[0.021]
Moderately Selective School x ELS Cohort (β_2)	0.084***	0.080***	0.077***	0.078***
	[0.022]	[0.022]	[0.022]	[0.021]
Non-Selective Postsecondary School x ELS Cohort (β_3)	0.003	0.002	0.001	0.003
	[0.024]	[0.023]	[0.023]	[0.023]
ELS Cohort	0.080*	0.080*	0.095**	0.101**
	[0.043]	[0.043]	[0.041]	[0.049]
Ever Applied to a Very Selective Four-Year School	0.330***	0.235***	0.170***	0.156***
	[0.016]	[0.017]	[0.017]	[0.017]
Ever Applied to a Moderately Selective Four-Year School	0.193***	0.148***	0.093***	0.085***
	[0.017]	[0.018]	[0.018]	[0.017]
Ever Applied to a Non-Selective Postsecondary School	0.086***	0.080***	0.056***	0.047***
	[0.017]	[0.017]	[0.017]	[0.017]
Other Control Variables				
Standardized Test Quartiles in Math and Reading	No	Yes	Yes	Yes
Controls for Participation in Work and Extracurricular Activities	No	No	Yes	Yes
Controls for Attitudes Towards Community Service	No	No	No	Yes
F-Test Statistic for Coefficient Equivalence				
$H_0: \beta_1 = \beta_2$	1.83	1.33	1.48	1.10
$H_0: \beta_1 = \beta_3$	3.21*	3.63*	3.37*	3.78*
$H_0: \beta_2 = \beta_3$	8.70***	8.17***	8.15***	8.16***
R^2	0.13	0.15	0.18	0.20

* significant at 10%; ** significant at 5%; *** significant at 1%

Standard errors in brackets and are adjusted for clustering at the school-level. Sample size is 23,650.

Table 1.7: Linear Probability Model Predicting the Probability of Other Types of Volunteering With Additional Control Variables

Dependent Variable	Volunteering Types			Intensity
	School Org. [1]	Religious Org. [2]	Social Action [3]	More than Rarely [4]
Very Selective School x ELS Cohort (β_1)	0.191***	0.038*	0.040**	0.029
	[0.016]	[0.021]	[0.017]	[0.023]
Moderately Selective School x ELS Cohort (β_2)	0.116***	0.061***	0.050***	0.057***
	[0.016]	[0.018]	[0.014]	[0.022]
Non-Selective Postsecondary School x ELS Cohort (β_3)	0.033***	0.003	0.01	-0.013
	[0.012]	[0.019]	[0.016]	[0.022]
ELS Cohort	0.036	-0.004	0.024	0.039
	[0.031]	[0.035]	[0.029]	[0.043]
Ever Applied to a Very Selective Four-Year School	0.038***	0.078***	0.050***	0.144***
	[0.009]	[0.016]	[0.012]	[0.018]
Ever Applied to a Moderately Selective Four-Year School	0.020*	0.044***	0.015*	0.059***
	[0.011]	[0.013]	[0.009]	[0.018]
Ever Applied to a Non-Selective Postsecondary School	-0.001	0.032**	0.008	0.038**
	[0.005]	[0.013]	[0.012]	[0.016]
Other Control Variables				
Standardized Test Quartiles in Math and Reading	Yes	Yes	Yes	Yes
Controls for Participation in Work and Extracurricular Activities	Yes	Yes	Yes	Yes
Controls for Attitudes Towards Community Service	Yes	Yes	Yes	Yes
F-Test Statistic for Coefficient Equivalence				
$H_0: \beta_1 = \beta_2$	15.00***	1.08	0.32	1.23
$H_0: \beta_1 = \beta_3$	75.88***	2.07	1.83	2.69
$H_0: \beta_2 = \beta_3$	21.28***	6.41**	4.29**	7.64***
R^2	0.04	0.09	0.07	0.14

* significant at 10%; ** significant at 5%; *** significant at 1%
Standard errors in brackets and are adjusted for clustering at the school-level. Sample size is 23,650.

CHAPTER 2
TEACHING ALTRUISM

PART I: INTRODUCTION

During the 2008 presidential campaign, Barack Obama included in his agenda for

education a nationwide policy to require high school students to complete 50 hours of

community service prior to graduation (The Office of the President Elect, 2008). This proposed

policy is an expansion of an already emerging trend within high schools to formally incorporate

community service into graduation requirements and to expand school-sponsored service

programs (Education Commission of the States, 2009; Spring, Grimm, & Diez, 2008). Much of

this movement started at the school and district level, particularly at private schools, with a main

impetus for the policy being the promotion of civic engagement. Over the past decade, this trend

has received widespread support from policy makers and has been applied in a growing number

of public schools across the country. Maryland was the first state to adopt such a policy in 1992

by requiring 75 hours of community service to receive a high school diploma. The District of

Columbia followed shortly after with a requirement of 100 hours of service (Quenqua, 2008).

Eight other states now permit individual school districts to allow students to count community

service as credit toward their high school graduation (RMC Research Corporation**,** 2008).[12]

Implementing mandatory service policies is not without significant costs for state

governments and local school districts, so having a clear understanding of the impact of service

requirements on students' civic behavior is important. For example, a recent report by the

Legislative Analyst Office for the state of California estimated that the initial cost to state

government to establish a community service requirement for high school students would by

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[12] These states are Arkansas, Connecticut, Delaware, Iowa, Minnesota, Oklahoma, Rhode Island, and Wisconsin.

around $400,000, and the total annual costs across all of the local school districts to implement this policy would be around $7 million (Legislative Analyst Office, 2002). Many of these costs go to finding appropriate service opportunities for students and to hiring individuals to facilitate student compliance with the requirement. Beyond these administrative costs, mandatory requirements create an opportunity cost for school administrators, teachers, and students. Inevitably, other activities of educational value must be forgone in the effort to administer and complete these mandatory service requirements.

Although mandated service is gaining considerable support, the full ramifications on future civic behavior remain largely unknown since this is such a relatively new policy trend. The main contribution of this research is to provide one of the first assessments of this policy by utilizing the latest round of the Educational Longitudinal Study of 2002 (ELS). This dataset is contemporary enough to capture the current trend in mandatory service programs, and it contains information about civic behavior both during high school and two years after high school. There is also school-level data, reported directly by school administrators, which are used to identify if a school has a mandatory community service program. School administrators are not asked directly if community service is a requirement for graduation, but they are asked about student participation in school-sponsored community service. For this research, high schools are identified as having a mandatory community service requirement if the school administrator reports having 100% participation in a school-sponsored community service program.

Typically, mandatory service requirements are enacted at the school-level, which makes estimating the effect of such a policy challenging. This is because exposure to the requirement is not randomly distributed since students and their parents have a considerable influence over the type of school that the student attends. Hence, there is the potential for selection bias when

35

estimating a policy effect and this research addresses the issue in three ways. First, the estimation approach takes advantage of the variable-rich nature of the ELS dataset in a probit regression framework to control for as much of the observable differences across the treatment and control groups as possible. Second, this research focuses on the contrast between schools with mandatory service programs and those with high levels of participation but no school-wide mandate. Students at these two types of schools are very similar in observable characteristics compared to students from other types of schools with lower levels of community service programs. In addition, by focusing on this distinction it is helpful in determining if there are any additional effects from a mandatory policy even when volunteering is already heavily encouraged within a school. Finally, this analysis takes advantage of an earlier dataset, the National Education Longitudinal Study of 1988 (NELS), which contains a sample of students from the high school class of 1992. Using a difference-in-differences approach, this research draws a sample of students from the NELS who have a high probability of being exposed to a service requirement in high school based on the observable characteristics of the school that they attend, but very little chance to actually enroll into a school with such a policy because they are a part of an earlier cohort of students. In other words, this comparison group would be the students most likely to have been exposed to a mandatory service requirement if they had been part of the class of 2004.

The results of the analysis indicate that the effect of mandatory community service on civic behavior and attitudes during high school is mixed, while the effect on behavior after high school is positive but modest in size. The policy clearly has a positive impact on the probability of volunteering during high school as students who are exposed to the requirement are 12 percentage-points more likely to volunteer between 10th and 12th grade. However, the impact on

36

civic attitudes appears to be negative, as these same students are less likely to report that helping in the community is very important by the end of high school. Beyond high school behavior, the estimated impact on the probability of volunteering in the two years following high school is 6 percentage-points higher, representing a 15 % increase in the overall probability. This result is robust to additional control variables and is consistent with the results from the difference-in-differences framework that incorporates the earlier NELS data. Although the effect on volunteering after high school is positive, there does not appear to be any spillover effect on other forms of civic behavior, as there is no measurable impact from the policy on the probability of voting.

The organization of the rest of the paper is as follows: Part II further describes the nature of a mandatory community service program in high school and summarizes some of the current analysis of this policy. Part III formally introduces the ELS dataset used for this analysis as well as the identification strategy and general trends in the civic behavior rates of students across different types of school-sponsored community service programs. Part IV presents the main results from the probit model that estimate the effect of mandatory service on high school and post-high school civic behavior. Part V compares the results from Part IV to a difference-in-difference analysis that utilizes data from an earlier NELS survey. Part VI concludes.

PART II: COMMUNITY SERVICE REQUIREMENTS IN HIGH SCHOOL

To illustrate the growing use of community service requirements in high schools across the United States, Figure 2.1 shows the growth in participation in school-sponsored community service programs between a representative sample of the class of 1992 from NELS dataset and a representative sample of the class of 2004 from the ELS dataset. What is clear from Figure 2.1 is that the percentage of students exposed to a school with no school-sponsored community

service program or low levels of participation in such a program has decreased, while the percentage of students exposed to a service program with high levels of participation has increased. The largest increase over this time period is among the percentage of students exposed to a school with virtually complete school-wide participation in a service program (75% to 100 % participation). For the class of 2004, nearly 10% of the students surveyed reported being in a school that had full participation in school-sponsored service, up from only 3% of students in the class of 1992. The results clearly indicate that a growing number of high schools in the United States have achieved a high level of student participation in school-sponsored community service. This result implies that schools must be making community service a requirement at some level in order to achieve such a high level of school-wide participation.

The volunteering experiences created through school-sponsored community service programs vary widely. These programs may be voluntary, where the students may choose to earn credit or a special distinction on their high school diploma for completing a certain number of service hours. Or, as increasingly is the case, these service programs could be mandatory, where students are required to meet a certain number of community service hours in order to graduate. The service projects that students engage in may include activities that take place within the school or occur outside of school grounds and may vary (e.g. cleaning local parks, helping the elderly, tutoring younger children, or distributing food). These projects may also involve working with outside non-profit organizations coordinated through the local high school. School-sponsored community service often lacks explicit learning objectives, so the main goal of many of these programs is simply to encourage students to engage with the community through volunteering. In this way, school-sponsored community service differs significantly from

service learning initiatives, because the community service experience is not necessarily integrated into the curriculum (Spring et al., 2008).

Beyond the potential effect on future civic behavior, the volunteering opportunities created through school-sponsored community service may also provide other benefits for participants. These types of experiences are similar to work-based academic programs or unpaid internships, because the community service may provide valuable work experience for youth with a limited employment history. Research has shown that volunteering experiences can enhance a student's ability to enter post-secondary school or to find future employment, therefore improving the student's ability to earn income (Hackl, Halla, & Pruckner, 2007; Day & Devlin 1998; Menchik & Weisbrod, 1987). In addition, community service in the form of service learning has been linked to other benefits such as enhanced personal and academic development as well as improved social skills (Corporation for National and Community Service, 2007). This research seeks to add to the understanding of these programs by determining how well school-sponsored service programs foster the future civic engagement of students, particularly when these service programs become mandatory.

Relevant Research on Mandatory Service

Because the expansion of the use of mandatory service requirements is so recent, research on this policy has been limited. Much of the research in this area has focused on the impact of course-specific service requirements or community service and service learning initiatives (Skinner & Chapman 1999; Niemi, Hepburn, & Chapman, 2000; Kielsmeier, Scales, Roehlkepartain, & Neal, 2004; Spring et al., 2005; Hart, Donnelly, Youniss, & Atkins, 2007). These are community service projects that are specifically integrated into a particulate course, often with pre-determined curricular objectives. Most of these studies conclude that this type of

39

community service within schools has a positive effect on civic behavior. However, the quality and intensity of the volunteering experience may be different when it is part of a specific class instead of a school-wide requirement and, therefore, may have different effects. In addition, many of these studies do not directly address the issue of selection bias in their estimates. Since students often have the opportunity to select classes within a school, it is possible that a course with a community service requirement attracts students with an unobserved proclivity for service. Because these studies do not specifically address the issue of endogeniety in their estimation, the results from their regressions may overstate the actual effect of the experience.

The best examples of research that measures school-wide community service requirements while being mindful of the issue of selection comes from a pair of studies by Metz and Youniss (2003 & 2005). Their research takes advantage of a major educational policy change in Ontario, Canada that eliminated the 13th year of high school and added a service requirement for graduation. This policy created a double cohort of individuals graduating at the same time, one group in their 13th year of high school and another group in their 12th year, who were subject to a community service requirement. The potential bias from selection in this study was minimized, because exposure to the new service requirement depended mostly on the time a student first entered school. Metz and Younnis conclude that the requirement appeared to have both an immediate positive impact on volunteerism and a positive impact on the intention to volunteer later in life. However, due to data limitations, these studies could only measure the immediate impact of the new service requirement on civic behavior and self-reported projections of future civic engagement. To look at the impact on civic engagement later in life, Henderson, Brown, Pancer, & Ellis-Hale (2007) created a dataset from a sample of college freshman at a Canadian university who were subject to this same policy change. One year after the exposure to

a service requirement, they found that the initial positive impact uncovered by Metz and Younnis appears to fade. Students in their sample were not significantly more engaged in civic activities compared to their counterparts who were not subject to the requirement. This study did not conclude that there is a negative impact from this policy, only that there was no longer a measurable positive impact.

Despite the results of these studies, there is lingering concerns about the overall effectiveness of a mandatory service requirement. Critics have argued that policies requiring community service might actually weaken the overall quality of the service experience for students, thus reducing its impact (Quenqua, 2008). For example, if many high school students and parents are intent on minimizing the burden of a service requirement in the face of other obligations, they might complete the necessary hours of service without a concerted effort to make a measurable impact on the local community. If students are not engaged in the service project and are simply going through the motions to fulfill a requirement, the experience most likely will not have a lasting impact on the students' civic behavior. In addition, if a mandatory requirement increases the number of student volunteers who are not fully engaged in a community service project, local non-profit organizations may be flooded with less productive and more resentful volunteers. This may disrupt the productivity of these organizations and further erode the quality of local service experiences. Finally, mandatory service requirements may have a lasting negative impact on the probability of a student later engaging in civic activities. A qualitative study by Warburton and Smith (2003) found that students subject to a service requirement against their will develop resentment towards such activities, which resulted in reduced in future civic engagement. Because the costs of mandatory service programs are not trivial, understanding if the effects are positive for civic engagement is important.

The contribution of this research can be placed within an emerging literature in economics focused on measuring the exact size and scope of the additional social benefits to education. A lot of recent work has been particularly focused on understanding the effect of education on civic participation and its impact within a democratic society (Acemoglu, Johnson, Robinson, & Yard, 2005; Dee, 2003 & 2004; Huang, Maassen van den Brink, & Groot, 2009; Milligan, Moretti, & Oreopoulos, 2004). The recent expansion of community service in high schools provides an opportunity to gauge a specific policy mechanism within secondary education and to measure its particular influence on later civic involvement. Beyond establishing a general link between education and future civic outcomes, this research seeks to evaluate the effectiveness of a specific mechanism, namely, mandatory service requirements.

PART III: DATA OVERVIEW

The Educational Longitudinal Study of 2002 (ELS) is contemporary enough to capture the recent use of school-wide service requirements in high schools across the United States. The ELS is a large-scale, nationally representative study of high school students administered by the National Center for Education Statistics. Starting in 2002 with a sample of over 16,000 10th graders, this study was specifically designed to document high school students' transition into early adulthood with follow-up surveys occurring every two years until 2006.[13] Questionnaires were also administered to parents, school administrators, and teachers during the base-year (2002) and first follow-up (2004) of the survey (Ingels et al., 2007). This variable-rich dataset has both school-level information about the level of participation in school-sponsored community service programs and individual-level data on civic behavior both during high school and two years after graduation. The main outcomes of interest for this research are the

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[13] Follow-up surveys will continue to be administered in 2010 or 2012 to document post-secondary school attainment and labor market outcomes.

volunteering and civic attitudes reported at the end of high school in 2004 and the volunteering

and voting habits reported in the second follow-up in 2006, two years after high school.

To evaluate the effect of school-wide service requirements on civic behavior and attitudes

in high school, this research uses a sub-sample from the ELS limited to students who are in the

12th grade cohort in 2004 with complete information about their volunteering behavior and civic

attitudes at the end of high school.[14] In the subsequent tables, this sub-sample is referred to as

the "high school sample." Students who dropped out of high school between 10th and 12th grade

are removed, because even if they attended a high school with a service requirement, it is unclear

how much exposure they had to that requirement. A slightly different sub-sample is used

evaluate the impact of community service requirements on civic behavior occurring two years

after high school. The second sub-sample also includes only students in the 12th grade cohort in

2004, but is further limited to students with complete information about their voting and

volunteering behavior two years after high school.[15] The sub-sample is referred to as the "post-

high school sample" in the subsequent tables and analysis.

The treatment variable that identifies if a student is exposed to a mandatory community

service requirement in high school comes from the school administrators' survey taken during

the base-year of the ELS in 2002. In the survey, administrators were asked about the level of

student participation in school-sponsored community service.[16] From the responses to this

question, schools are divided into five categories based on their reported levels. Schools are

considered to have a "mandatory" service program if the school administrators report 100%

participation in school-sponsored community service. Schools with participation rates between

25-99% are considered to have a "high participation" program and schools with rates between 0-

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[14] The sample size is just under 13,000 students for the high school sample.

[15] The post-high school sample contains approximately 11,600 students.

[16] Unfortunately, the ELS does not ask school administrators if community service is a requirement for graduation.

24% are considered to have a "low participation" program.   The last two categories include

schools that reported no school-sponsored community service program and schools with missing

information. These categories are selected based on the pattern of distribution across the sample.

The cut-off for the "high" and "low" participation program is set at 25%, because that is the

mean level of participation among schools that have a program.[17]   Figure 2.2 shows a histogram

of the number of students exposed to different levels of participation in school-sponsored service

in those schools with a community service program. Because school administrators are asked to

report an exact percentage of participation, there appears to be a lot of clustering at every 5 to

10% level. There is a significant mass of students at the 100% level, and the total sample

exposed to the treatment is around 1200 students or 10% of the sample considered in this

analysis. Figure 2.2 illustrates that there were very few students attending schools with 80-99%

participation. This possibly suggests that administrators report 100% participation when their

school is at or near full participation school-wide thus implying that there is a mandatory service

requirement present.

Summary Statistics

This analysis considers six outcome variables, three measures of volunteering and civic

attitudes during high school, and three measures of voting and volunteer behavior occurring two

years after high school. Table 2.1 reports the mean civic participation rates conditional on being

exposed to the different types of school-sponsored community service programs as defined in the

previous section (columns 1-5). The first three rows use the post-high school sample and show

the conditional mean rates of volunteering two years after high school, the voting rates in the

2004 Presidential election, and the voting rates in any state or local election within two years of

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[17] This definition of "high" and "low" participation program also divides the sample in each category into a near
equal number allowing the possibility for other statistical comparisons.

high school. From column 6, the students exposed to a "mandatory" service program in high school are 12 percentage points more likely to report volunteering after high school and nearly 9 percentage points more likely to report voting compared to students who attended a school with no community service program.

The differences in the initial summary statistics are less stark, however, when students from the "mandatory" service school are compared to students from a school with a "high level" of participation. In column 7, these students are more likely to report being a volunteer, but there is no measurable difference in the voting rates. The group of students in the "high level" program may be more appropriate as a comparison group to measure the specific effect of making community service compulsory in high school. This is because this group of students most similar to the group of students in the "mandatory" service schools based on observable characteristics in the data.

In a similar fashion, the last three rows of Table 2.1 show the mean volunteering rates during high school and measures of civic attitudes reported during 12th grade.[18] To measure attitudes, students were asked to rate the importance of helping out in the community and the importance of solving inequality. Students exposed to "mandatory" service are 21.5 percentage points more likely to report ever volunteering during high school when compared to students who attended a high school with no service program (column 6). However, these students are no more likely to report that helping out in the community or solving inequality is very important. This table shows that while "mandatory" service is very highly correlated with volunteering in high school, it is not positively correlated with attitudes towards service or solving inequality. Similar outcomes result when these students are compared to "high participation" program students (column 7). Students subject to the "mandatory" service requirement are 4.3 percentage

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[18] This section of the table uses the high school sample to include the largest sample size possible.

points less likely to report that helping in the community is very important compared to students in schools with "high-level" programs. This result suggests that the students in the "mandatory" service school are subject to a requirement that is effective, yet the decision to be at such a school is exogenous to students' tastes towards service.

It is difficult to draw strong conclusions from these summary statistics, especially because of the potential for bias from selection, discussed earlier. Table 2.2 shows a set of background characteristics for students conditional on exposure to different types of school-sponsored community service. The results in Column 1 show that over three quarters of the students exposed to a "mandatory" service requirement are from private schools and over half attend a Catholic school. In addition, students faced with a service requirement are also more likely to be from an urban neighborhood and to be in the highest socio-economic status quartile, compared to students exposed to programs with less than mandatory service requirements (columns 2-5). Since so much of this practice occurs at private schools, it is clear from this table that students are not randomly assigned to schools with a service requirement. Therefore, to address this issue, this research will employ three approaches. These include using extensive control variables in a probit regression, looking at prior preferences towards service across service program types, examining the specific comparison in outcomes between students enrolled in schools with "mandatory" service and those enrolled in schools with "high participation" only, and finally, using a difference-in-differences approach by constructing a sample of students who have a high probability of being exposed to a mandatory service requirement but cannot choose a school with such a policy since they are part of the earlier NELS cohort.

PART IV: MAIN RESULTS

This research uses a single equation probit model to measure the effects of mandatory service in high school.[19] The dependent variable is a binary variable indicating participation in a civic activity such as voting or volunteering. The main variable of interest in the model is a binary variable signifying an individual's exposure to a school with a "mandatory" community service program. This is defined as attending a school with a 100% participation in its school-sponsored service program.[20] The regression also includes three other mutually exclusive binary variables indicating a "high participation" program (25-99% participation), a "low participation" program (0-24% participation)[21], and an indicator for missing program information.[22] The omitted group in the regression is composed of students who attend a school where the school administrator reported that the school did not have a community service program; this group serves as the comparison group in this estimation framework. Each regression also includes a set of other binary control variables that help explain the probability of future civic behavior.

Table 2.3 reports the estimated marginal effects from service programs on volunteering and civic attitudes during high school. Each column is a separate regression with a different dependent variable indicating if a respondent has ever volunteered between 10th and 12th grade, has reported that helping in the community is very important during the 12th grade, or has reported that solving inequality is very important during the 12th grade. Each regression includes control variables for gender, race, family composition, parental education, household income,

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[19] The regression results are similar using a linear probability model.

[20] Appendix A and B contain an alternative specification where "mandatory" service is defined as a school having 75-100% participation in school-sponsored service. The final probit results from this specification are similar to those in Tables 2.3 and 2.4.

[21] A very small number of schools report having a community service program yet having 0% of students participate. They are included in the low participation category.

[22] The coefficient on the binary variable indicating a missing program is never statistically significant for each and every specification of this probit model as well, and all subsequent results are robust to dropping respondents with missing program information.

parent's religious affiliation, standardized test scores in math and reading, controls for participation in extra-curricular activities and work experience during high school. There are also school-level control variables indicating school type (public, private, or Catholic), location (urban, suburban, or rural), and census division. To maximize the number of observations in the regression, the sample for each regression in this table is limited to the high school sub-sample that includes the class of 2004 cohort with complete information about their volunteering and civic attitudes in high school.

Attending a school with a "mandatory" service program makes a student 11 percentage points more likely to volunteer in high school. This is a sizable impact, representing an 18% increase in the probability of volunteering overall. These results show that this policy has a substantial impact on volunteering behavior in high school. This estimate is also statistically larger than the effect from other types of school-sponsored community service programs. In the last row of this table are the test statistics and p-scores for a Wald test for coefficient equivalence between "mandatory" and "high participation" programs. This result suggests that mandatory service requirements are more effective at exposing students to a volunteering experience, even when compared to students that attend schools where service is strongly encourage but not mandated. Estimates in the first column also include the marginal effects for other control variables in the regression. Scoring well in standardized test in math and reading and having highly educated parents are both highly correlated with volunteering in high school.

While "mandatory" programs are effective at getting students to volunteer in high school, they do not have a positive influence on civic or altruistic attitudes. The second and third columns of Table 2.3 show the estimated marginal effect of different types of school-sponsored service on attitudes reported during the student's last year of high school. Students that attend a

school with a "mandatory" program are nearly 6 percentage points *less* likely to report that helping in the community is very important. From the last row of this table, this result is statistically different from students who attend a school with "high participation" in a service program. The result indicates that while "mandatory" programs can effectively mandate service, they do not necessarily increase the value and importance of the action for students. In addition, the estimated effect from "mandatory service" on the probability of reporting that solving inequality is very important is not statistically different from zero. This suggests that there is no measurable impact from the requirement on altruistic attitudes. In contrast, attending school with a "high participation" program appears to have a positive and significant effect on students' sense of importance for solving inequality. This results indicates that community service programs can have a positive effect on altruistic attitudes, but those programs with a mandate do not, on average.

Table 2.4 presents the estimated marginal effects from this single equation probit model on three civic outcomes occurring after high school. Like Table 2.3, each column shows the results for three separate regressions for three different dependent variables. The outcomes include ever volunteering after high school, ever voting in a state or local election within two years of high school, or ever voting in the 2004 Presidential election. The sample for each regression is the post-high school sample, drawing individuals from the class of 2004 with complete information about their post-high school civic behavior. In addition to the control variables used in Table 2.3, each regression also includes post-high school control variables for the number of children the respondent has two years after high school and the post-secondary school enrollment decision.

Attending a school with a "mandatory" service program increases the probability of volunteering within two years after high school by nearly seven percentage points. This represents a 15% increase in the probability of volunteering, since the estimated probability of volunteering for the entire sample in around 44%. This estimate is slightly smaller when compared to the results from Table 2.1, which shows a 12 percent difference. However, the effect remains positive and significant even with extensive controls variables. Since the comparison group are students exposed to schools with no community service program, this estimated effect is approximating the impact of a state-wide mandate for service since many schools would be forced to go from no service program to a mandatory program under such a policy.

Examining other comparison groups, no other non-mandatory service program has a statistically significant impact on the probability volunteering two years after high school relative to schools with no program at all. The last row of Table 2.4 reports the test statistic and p-score for a Wald test for coefficient equivalence to measure the difference between a "mandatory" service program and a "high participation" program. Although the impact from a "mandatory" program is significant and the impact of a "high participation" program is not, the difference between the two types of programs is not statistically different at the 10% level of significance. This suggests the effects on future volunteering from a mandatory program are no different from the effects from a program that simply encourages service without a school-wide mandate.

The second and third columns of Table 2.4 contain the estimated marginal effects on the probability of voting. Unlike the results from the first column of this table, attending a school with a "mandatory" service program has no measurable effect on the probability of voting. The initial positive correlation uncovered in Table 2.1 becomes small and non-significant when

50

control variables are used in the probit regression framework. There is also no measurable effect

for the other types of service programs. The results indicate that there is no evidence that a

program that encourages volunteering during high school has a spillover effect on other types of

civic engagement, like voting in the very near term.

For each regression, the estimated marginal effects from a select group of control

variables are also reported. Not surprisingly, college enrollment is a very strong predictor of all

three types of civic behavior. The size of this correlation is also considerably larger than the

estimated marginal impact of attending a school with a "mandatory" service program. Attending

an out-of-state post-secondary school is also positively correlated with volunteering but

negatively correlated with both voting outcomes. This may be an indication of the additional

barriers to voting when moving out-of-state that include registering to vote at a new location or

going through the steps to vote using an absentee ballot. Scoring in the highest quartile in a

standardize math test is positively correlated with volunteering but has no measurable

relationship with the probability of voting. Having children is negatively correlated with all

three types of civic behavior outcomes. This research does not make any causal inferences on

the effects of these specific control variables, but the results are consistent with intuitive

expectations.

Varying the Definition of Mandatory

Thus far in the analysis the "mandatory" service variable have been purposely limited to

schools that had reported 100% participation in school-sponsored service programs. To test the

robustness of this treatment definition, the regression results reported in Appendix A and B use

an expanded definition of a mandatory program to include schools that reported participation

between 75-100% of the high school student body. The results remain very similar even when

the treatment group is expanded. Students who attend a high school with full or near-full school-wide participation in school-sponsored community service are more likely to volunteer both during high school and two-years after high school when compared to students that attend a school with no service program. There is also a measurable difference for high school volunteering between students in the expanded "mandatory" service category (75-100%) and students in schools with a level of participation between 25 and 75%. The negative effect on civic attitudes, especially on the importance of working in the community, is not statistically significant with this new identification. However, like the results in Table 2.4, there is still no measurable impact on the probability of voting two years after high school.

PART V: DIFFERENCE-IN-DIFFERENCES APPROACH

As mentioned earlier in this research, mandatory service is potentially endogenous with respect to civic behavior outcomes. Thus far this issue has been addressed with control variables to account for observable differences across students exposed to difference school service programs. However, even with extensive control variables there could remain unobserved individual heterogeneity between students exposed to the requirement and those who are not and unobserved school-level heterogeneity between the schools with and without a requirement. This is an important concern, especially for the estimates that show a positive effect from mandated service on the probability of volunteering two years after high school. Regression results would be biased if the decision to attend a school with a mandatory service requirement was correlated with some unobserved characteristic that also affected civic behavior but was unaccounted for by the control variables. For example, if students with a proclivity towards service disproportionately enroll in a school with mandatory service, then the effect of the requirement on volunteering may be overstated. The regression results would also be biased if

52

there are unobserved characteristics at the school level that also affect a student's future civic behavior. For example, if the schools that have requirements are also more likely to have a school environment that fosters civic engagement in other ways that are unaccounted for in the regression framework, then the specific effect of mandatory service may be overstated.

Selecting the Comparison Group

To correct for as much of the potential bias that remains from unobserved heterogeneity at the individual and school level, this research utilizes the data from an earlier dataset, the National Longitudinal Study of 1988 (NELS). This dataset contains a representative sample from the high school class of 1992 and is specifically designed to make comparisons with the later ELS sample as it contains both school- and student-level data with the same or very similar questions in each survey.[23] It would be ideal if these two datasets surveyed students from the exact same high schools across time because it would then be possible to address the issue of selection bias through the use of controls for school-level fixed effects. However, the ELS and NELS each contain a completely different set of high schools in the sample. So to simulate a panel of schools were none previously exists, this research draws a sample of students from the earlier NELS who have a high probability of being exposed to a service requirement in high school based on the observable characteristics of the high school they attend. These students have very little chance to actually enroll into a school with such a policy because they are a part of an earlier cohort of students. In other words, this research uses the earlier NELS sample to create a comparison group made up of students who would have most likely been exposed to a mandatory service requirement if they had been part of the later ELS sample.

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[23] These two longitudinal surveys occur during the same point in the U.S. political cycle, strengthening the voting behavior comparisons across the two samples.

To select a comparison group, this research uses a simple probit model to estimate the probability that a school will adopt a service requirement based on the characteristics of schools in the ELS sample only. The regression includes control variables for school-level characteristics such as teacher salaries, the number of full-time teachers in the school, geographical location, school type, and percentages of students in college-prep courses. The estimated coefficients from the regression are then applied to the earlier NELS sample to predict a probability that a school will adopt a service requirement.[24] To choose schools in the NELS with a high probability of adopting a mandatory policy in the future, a cut-off point is chosen which renders the same proportion of schools that actually have the policy in the later ELS sample. Since ten percent of schools in the ELS have a mandatory program, then the top ten percent of schools in the NELS sample in terms of predicted probability make up the comparison group.[25]

To gauge the effectiveness of this constructed comparison group, Table 2.5 shows the mean proportion of characteristics such as high school type, urbanicity, and socio-economic status quartile of students. Column [1] shows the summary for the ELS group actually exposed to the mandate (referred to as the actual treatment group) and column [2] shows the summary for the constructed comparison group taken from the NELS sample with a high probability of being exposed to such a mandate. This table reports results of the mean proportion within each group attending private school and Catholic school, attending suburban and rural schools, and the mean proportion in each of the socio-economic quartiles. The actual treatment group in column [1] has a high proportion of students attending Catholic and other private schools and a small proportion from rural school districts. This group is also more heavily represented by students

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[24] The results of this regression can be found in Appendix C. They include two sets of regressions for both the high school sample and the post-high school sample; however, both samples yield similar coefficients.
[25] The cut-off for the predicted probability for each high school to define this group is 23%.

from the highest socio-economic quartile. The characteristics from the constructed sample shown in column [2], mimic the actual treatment group. This comparison group also has a high proportion of students from private schools, no students from rural districts, and is heavily represented by students in the highest socio-economic quartile. Column [3] contains students from the ELS cohort with a high probability of exposure defined in the same way as those in column [2];[26] however, these students are not actually exposed to the treatment. Once again, the observable characteristics are similar suggesting that the groups in both the ELS and NELS created from this process are appropriate comparison groups.

Volunteering Trends for the Constructed Comparison Groups

To evaluate the trends among these groups, Table 2.6 shows the mean volunteering rate in the two years following high school conditional on both cohort membership and whether or not a student attended a school with a high probability of exposure to mandatory service. The first row of this table shows that within the later ELS cohort, students attending a school with a high probability of exposure are 10 percentage-points more likely to volunteer. However, this simple difference alone does not reveal much since in this specification this group now consists of both individuals who are actually exposed to mandatory service and those who are not. There is a similarly sized difference within the NELS cohort as students with a high probability of exposure are 8.7 percentage-points more likely to volunteer in the two years following high school. This second result reveals that even in the absence of an actual mandatory service policy, there is a positive correlation between attending a school that is likely to adopt a mandatory policy and volunteering after high school. To address the issue of volunteering differences across school type this research controls for school type fixed-effects in a more

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[26] The cut-off for the predicted probability for each high school to define this group is 23%.

formal difference-in-differences regression framework to see if there is any remaining effect

from the mandatory policy itself.

Difference-in-Differences Regression

To further test this result, this research combines the NELS and ELS samples and applies

the following difference-in-differences regression using a linear probability model:

(1) $Y_i = \alpha \, HIGH_i + \beta \, ELS_i + \gamma \, (HIGH_i \times ELS_i) + \delta \, TREATED_i + \mu X_i + \varepsilon_i$

The dependent variable is Y_i which is a binary variable indicating participation in civic behavior

two years after high school. $HIGH_i$ is a binary variable indicating if an individual is attending a

school with a high probability of having a mandatory service program. In a regression

framework, the coefficient α is an estimation of the fixed-effect from this type of high school.

The variable ELS_i is a binary variable that indicates membership in the ELS cohort and controls

for cohort fixed-effects. The interaction term is the traditional difference-in-differences

estimator and controls for changes in the trend specific to schools that are likely to adopt

mandatory service. The key variable of interest, however, is $TREATED_i$ which is a binary

variable indicating if a student is actually exposed to a mandatory service policy. If there is any

remaining effect from the policy itself, it would be captured by the estimated coefficient δ. X_i is

a set of additional control variables such as race, gender, and socio-economic status quartile.

These control variables are the same ones used in the earlier regressions of Table 2.4.

For reference, column [1] in Table 2.7 provides the results from a simple difference-in-

differences estimation in its traditional form. This specification includes only the first three

terms of equation (1) which include binary variables that indicate whether a student attends a

school with a high probability of having mandatory service, a binary variable for cohort membership, and the interaction of those two terms. The coefficient on the interaction term corresponds directly to the third row of Table 2.6 which shows the difference in differences for volunteering across school type and cohort. Also like Table 2.6, the results from this regression specification indicate that there is a positive correlation between attending a school with a high probability of adopting mandatory service and future volunteering. There is also a positive correlation between volunteering and being a member of the later ELS cohort.[27] The coefficient on the interaction term is positive but not statistically significant suggesting that the time trend specific to volunteering for students who attend schools with a high probability of adopting mandatory service is not different from the general time trend.

To test if the actual policy has an impact, the other regression specifications in Table 2.7 include the binary variable indicating actual treatment (TREATED$_i$). In column [2], the regression includes only the first four terms of equation (1) for a baseline. The results indicate that students exposed to the actual policy of mandatory service are 7.4 percentage-points more likely to volunteer in the two years after high school. This estimated effect is positive and statistically significant and is similarly sized as the previous estimations from Table 2.4. The specification in Column [3] includes the same set of control variables from the specification in Table 2.4. The estimated impact of the policy remains positive be becomes non-significant. However, the size of the estimate is statistically similar to the baseline and previous results from Table 2.4. The results for Table 2.7 indicate that even in the face of school type and cohort fixed-effects there remains a modest positive effect from mandatory service on the probability of volunteering after high school.

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[27] Dunick (2010) explores this trend further looking at what factors contribute to the overall increase in volunteering overtime for high school students.

As a further robustness check, the regression specification in Table 2.8 replaces the binary variable $HIGH_i$ with the actual predicted probability estimated from an earlier probit regression. Instead of categorizing students into two groups, this specification measures how the probability of being a volunteer varies directly with the predicted probability of being exposed to mandatory service. Like Table 2.7, the first column in Table 2.8 shows the simple difference-in-differences specification and the estimated outcomes show a similar result. Once again there is positive correlation with being a volunteer when a students attends a high school with a higher the probability a having mandatory service. The effect of the actual policy measured in columns [2] & [3] of Table 2.8 also provide similar results as Table 2.7. When the binary treatment variable is included in the regression there is a positive and significant effect. This effect becomes non-significant with the inclusion of additional control variables, but the size of the estimate is still well within a reasonable statistical range of the original estimates of Table 2.4.

PART VI: CONCLUSION

The results of the analysis indicate that the effect of mandatory community service on civic behavior and attitudes during high school is mixed, while the effect on behavior after high school is positive but modest in size. The policy clearly has a positive impact on the probability of volunteering during high school as students who are exposed to the requirement are 12 percentage-points more likely to volunteer between 10th and 12th grade. However, the impact on civic attitudes appears to be negative, as these same students are less likely to report that helping in the community is very important by the end of high school. Beyond high school behavior, the estimated impact on the probability of volunteering in the two years following high school is 6 percentage-points higher, representing a modest 15 % increase in the overall probability. This result is robust to additional control variables and is consistent with the results from a difference-

in-differences framework that incorporates the earlier NELS data. Although the effect on volunteering after high school is positive, there does not appear to be strong evidence of a spill over effect onto other forms of civic engagement as most estimates show no measurable impact from the policy on the probability of voting. In addition, there appears to be no measurable differences in outcomes between students who attend schools where service is mandated school-wide and students who attend schools without a school-wide mandate but a high level of participation in service.

If encouraging students to be life-long volunteers is the main aim of this policy, then the short-term effects are very modest at best. An estimated impact of 6 percentage-points uncovered in this research is small compared to the 20 percentage-point correlation between volunteering and attending postsecondary school which is also present in each of the regressions of this paper. However even with modest effects, strong policy recommendations from this study are difficult to make since the data only captures behavior in the two years following high school. The ELS survey will continue to follow students into early adulthood which will be helpful to see if the modest effect uncovered in this research will persist well beyond the high school years.

FIGURES AND TABLES FOR CHAPTER 2

Figure 2.1: Percentage of Students Enrolled in High Schools with Various Levels of Participation in School-Sponsored Community Service Programs

Participation in School-Sponsored Service Programs
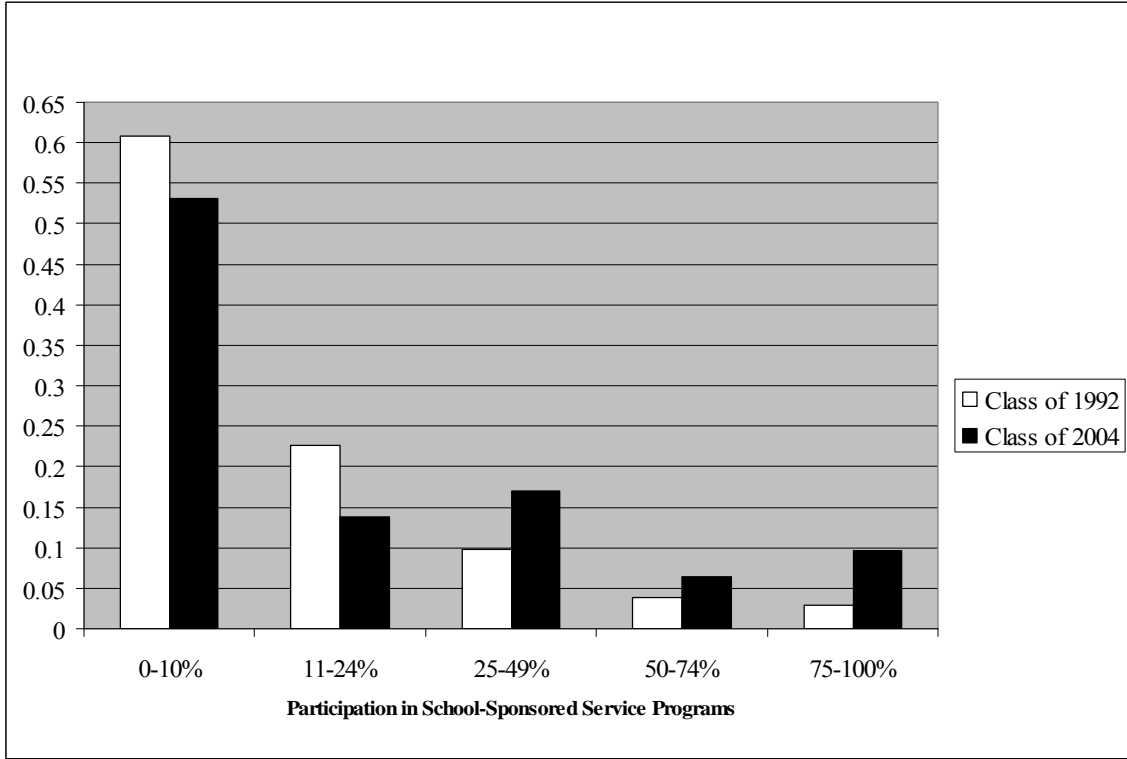
Figure 2.2: Number of Students Enrolled in High Schools with Various Levels of Participation in School-Sponsored Community Service Programs (Class of 2004 ELS Sample Only)

Participation in School-Sponsored Service
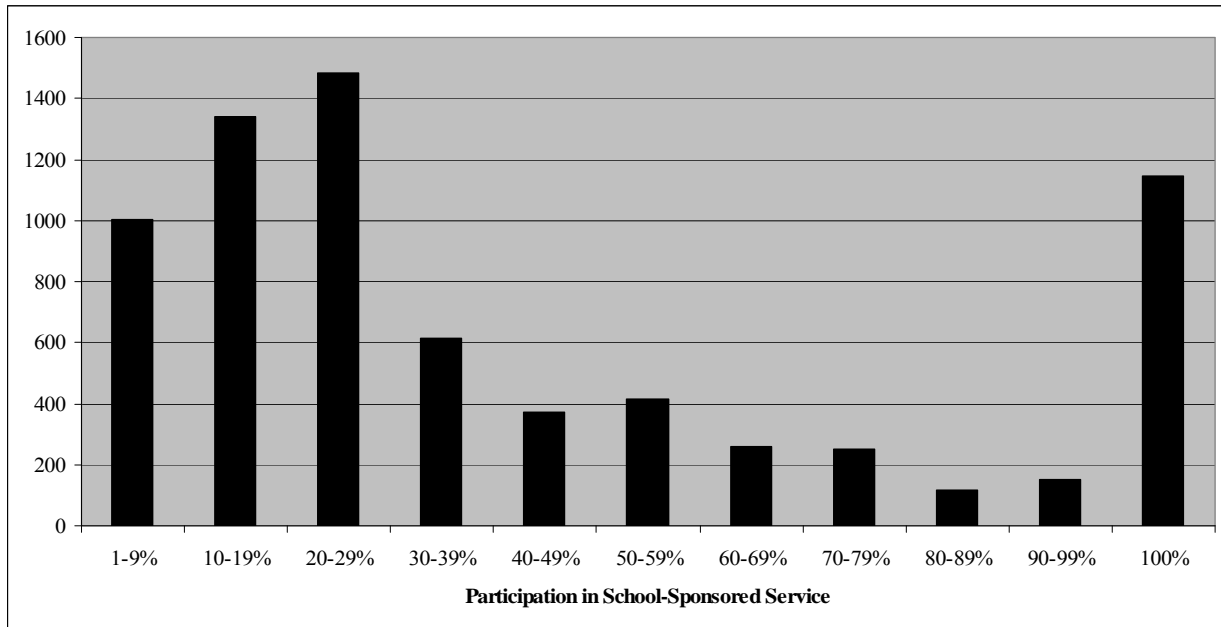
Table 2.1: Mean Civic Behavior Rates Conditional on Exposure to Different Levels of Participation in School-Sponsored Service Programs

	Level of Participation in School-Sponsored Community Service					Mean Differences	
	"Mandatory" 100%	"High Level" 25-99%	"Low Level" 0-24%	No Service Program	Missing Program	[1] - [4]	[1] - [2]
	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Civic Behavior Rates Reported Two Years After High School (Post-High School Sample)							
Ever Volunteered	0.544	0.478	0.421	0.423	0.410	0.121***	0.066**
						[0.028]	[0.028]
Voted in a State or Local Election	0.586	0.552	0.497	0.500	0.500	0.086***	0.033
						[0.024]	[0.025]
Voted in the 2004 Presidental Election	0.616	0.583	0.523	0.524	0.518	0.092***	0.033
						[0.025]	[0.024]
Sample Size for Each Category	1,150	2,980	3,060	2,870	1,560	-	-
Civic Behavior and Civic Attitudes Reported During the 12th Grade (High School Sample)							
Ever Volunteered (10th-12th Grade)	0.801	0.658	0.579	0.586	0.606	0.215***	0.143***
						[0.026]	[0.028]
Helping Community is Very Important	0.389	0.418	0.400	0.423	0.443	-0.035	-0.03
						[0.025]	[0.026]
Solving Inequality is Very Important	0.174	0.217	0.176	0.184	0.227	-0.009	-0.043**
						[0.020]	[0.021]
Sample Size for Each Category	1,280	3,290	3,440	3,200	1,750	-	-

* significant at 10%; ** significant at 5%; *** significant at 1%

The post-high school sample includes 11,630 individuals and is limited to respondents who were in the 12th grade in 2004 and had complete information about their civic behavior outcomes two years after high school. Each estimated is weighted using the panel weight for the first through third follow-up of the survey.

The high school sample includes 12,970 individuals and is limited to respondents who were in the 12th grade in 2004 and had complete information about their civic behavior outcomes during high school. Each estimated is weighted using the panel weight for the first through second follow-up of the survey.

Standard errors are in brackets and adjusted for clustering at the school-level. Sample sizes are rounded to the nearest 10.

Table 2.2: Student Characteristics Conditional on Exposure to Different Levels of Participation Service Programs

	Level of Participation in School-Sponsored Community Service				
	"Mandatory" 100% [1]	"High Level" 25-99% [2]	"Low Level" 0-24% [3]	No Service Program [4]	Missing Program [5]
High School Type					
Public School	0.211	0.622	0.934	0.937	0.786
Private School (Catholic)	0.553	0.235	0.021	0.024	0.116
Private School (Other)	0.236	0.144	0.045	0.039	0.097
Urbanicity					
Urban	0.569	0.379	0.281	0.174	0.448
Suburban	0.387	0.434	0.544	0.561	0.411
Rural	0.045	0.186	0.175	0.265	0.141
SES Quartile					
Lowest Quartile	0.073	0.160	0.255	0.249	0.239
2nd Quartile	0.162	0.207	0.243	0.262	0.249
3rd Quartile	0.265	0.247	0.252	0.251	0.247
Highest Quartile	0.501	0.385	0.250	0.239	0.265
Sample Size	1,280	3,290	3,440	3,200	1,760

*significant at 10%; ** significant at 5%; *** significant at 1%

The total sample includes 12,970 individuals and is limited to repsondents who were in the 12th grade in 2004 and had complete information about their civic behavior outcomes during high school. Estimates are unweighted and the results are similar when using the post-high school sample of 11,630.

Table 2.3: Estimated Marginal Effects of School-Sponsored Service Programs on Civic Behavior and Attitudes During High School

Dependent Variables (Reported in 12th Grade)	Ever Volunteered (10th-12th Grade)	Helping Community Very Important	Solving Inequality Very Important
Level of Participation in School-Sponsored Community Service			
"Mandatory" Program (100% participation)	0.114***	-0.056***	-0.005
	[0.030]	[0.022]	[0.023]
"High Level" Program (25-99% participation)	0.018	-0.011	0.038***
	[0.019]	[0.015]	[0.014]
"Low Level" Program (0-24% participation)	0.005	-0.028*	-0.019
	[0.016]	[0.015]	[0.012]
Missing Program Information	0.006	-0.017	0.004
	[0.020]	[0.019]	[0.016]
Selected Control Variables			
Highest Quartile in Standardized Math Test	0.123***	-0.094***	-0.075***
	[0.021]	[0.021]	[0.015]
Highest Quartile in Standardized Reading Test	0.163***	-0.029	0.050***
	[0.021]	[0.022]	[0.017]
Highest Education Level of the Parent is a Bachelor's Degree	0.125***	0.038	-0.006
	[0.027]	[0.030]	[0.021]
Ever Worked Outside the Home During High School	-0.007	-0.024	-0.012
	[0.016]	[0.016]	[0.012]
Pr(outcome)	0.638	0.412	0.184
F-test (β "manditory" – β "high level" = 0)	8.46***	4.58**	3.40*
(P-Score)	(0.004)	(0.033)	(0.066)

* significant at 10%; ** significant at 5%; *** significant at 1%

Standard errors are in brackets and adjusted for clustering at the school-level. Each regression includes controls for gender, race, family composition, parental education, household income, parent's religious affiliation, binary variables for standardized test quartiles in math and reading, high school type, high school urbanicity, Census division, level of involvement in extra-curricular activities, and work experience during high school. Each regression is weighted using the panel weight for the base-year through first follow-up. The sample is limited to repsondents who were in the 12th grade in 2004 and had complete information about their civic behavior outcomes during high school (high school sample). The total sample size is 12,970.

Table 2.4: Estimated Marginal Effects of School-Sponsored Service on Civic Behavior Two Years After High School

Dependent Variables	Ever Volunteered After High School	Voted in a State or Local Election	Voted in the Presidential Election
Level of Participation in School-Sponsored Community Service			
"Mandatory" Program (100% participation)	0.068***	0.024	0.025
	[0.033]	[0.028]	[0.027]
"High Level" Program (25-99% participation)	0.022	0.017	0.021
	[0.016]	[0.019]	[0.019]
"Low Level" Program (0-24% participation)	0.012	0.010	0.014
	[0.017]	[0.017]	[0.018]
Missing Program Information	-0.019	0.007	0.007
	[0.019]	[0.024]	[0.025]
Selected Control Variables			
Highest Quartile in Standardized Math Test	0.044*	-0.015	0.002
	[0.026]	[0.024]	[0.024]
Enrolled into a Four-Year College Following High School	0.212***	0.130***	0.124***
	[0.022]	[0.021]	[0.021]
Enrolled in College Out of State	0.066***	-0.072***	-0.080***
	[0.020]	[0.018]	[0.019]
Has One or More Children	-0.086***	-0.055**	-0.040*
	[0.024]	[0.024]	[0.024]
Pr(outcome)	0.434	0.515	0.544
F-test (β "mandatory" – β "high level" = 0)	*2.19*	*0.07*	*0.03*
(P-Score)	(0.140)	(0.797)	(0.865)

* significant at 10%; ** significant at 5%; *** significant at 1%

Standard errors are in brackets and adjusted for clustering at the school-level. Each regression includes controls for gender, race, family composition, parental education, household income, parent's religious affiliation, binary variables for standardized test quartiles in math and reading, high school type, high school urbanicity, Census division, number of children, post-secondary enrollment decision, and out of state college enrollment. Each regression is weighted using the panel weight for the base-year through second follow-up. The sample is limited to respondents who were in the 12th grade in 2004 and had complete information about their civic behavior outcomes 2 years after high school (post-high school sample). The total sample size is 11,630.

Table 2.5: Mean Characteristics of Students Exposed to Mandatory Service Compared to Various Control Groups

Sub-groups	Actual Treatment Group	High Probability of Exposure	High Probability of Exposure
	ELS Only [1]	NELS Only [2]	ELS Only [3]
Attending a Private School (Catholic)	0.557 [0.015]	0.607 [0.017]	0.677 [0.012]
Attending a Private School (Other)	0.234 [0.013]	0.287 [0.016]	0.314 [0.012]
Attending a Suburban School	0.376 [0.014]	0.296 [0.016]	0.365 [0.013]
Attending a Rural High School	0.044 [0.006]	0.000 [0.000]	0.024 [0.004]
2nd Quartile (SES)	0.162 [0.011]	0.158 [0.013]	0.174 [0.010]
3rd Quartile (SES)	0.266 [0.013]	0.199 [0.014]	0.255 [0.012]
Highest Quartile (SES)	0.505 [0.015]	0.483 [0.018]	0.507 [0.013]
Sample Size	1150	780	1430

* significant at 10%; ** significant at 5%; *** significant at 1%

Standard errors are in brackets and are adjusted for cluster at the school-level.

The sample is limited to respondents who were members of the 12th grade cohort in the ELS and NELS samples and had complete information about their civic behavior outcomes 2 years after high school.

The actual treatment group in column [1] consists of those students in the ELS sample who have been exposed to a "mandatory" service program. The sample in column [2] consists of students from the NELS sample who attend a school with a high predicted probability of having a mandatory service program based on a previous probit estimation. The cut-off point that defines a high probability is 23% which represents the top ten percent of schools in the NELS sample--the same proportion of schools who adopted the policy in the later ELS cohort. Column [3] contains the ELS cohort who attend a school with a high probability of exposure but are not part of the actual treatment group. From the sample in column [1], 860 individual attend a school with a predicted probability that is high enough to be classified in the high probability of exposure group in column [3] making the total sample size for this group 2,290.

Table 2.6: Mean Volunteering Rate Two Years After High School Conditional on Predicted Exposure to Mandatory Service Across the ELS and NELS Samples

	High Probability of Exposure	All Others	Difference
ELS Cohort	0.541	0.438	0.103***
	(2,290)	(9,340)	[0.014]
NELS Cohort	0.429	0.342	0.087***
	(780)	(7,210)	[0.032]
Difference	0.112***	0.096***	0.016
	[0.024]	[0.014]	[0.035]

Standard errors are in brackets are adjusted for cluster at the school-level. Sample sizes are in parenthesis.

The sample is limited to respondents who were members of the 12th grade cohort in the ELS and NELS samples and had complete information about their civic behavior outcomes 2 years after high school.

Students attending a school with a 23% or greater predicted probability of adopting a mandatory service program are considered to have a high probability of exposure. This cut-off probability deliniates the top ten percent of the high schools in the NELS sample. A proportion chosen because it is the same proportion of schools that adopted the policy in the later ELS cohort. All schools in both the NELS and ELS have been assigned a predicted probability from an earlier probit regression using school-level characteritics. Students actually exposed to a mandatory service program are included in the high probability of exposure category within the ELS cohort.

Table 2.7: Linear Probability Model Predicting Civic Behavior Two Years After High School Using the ELS and NELS Cohorts

Dependent Variable	Ever Volunteered After High School [1]	Ever Volunteered After High School [2]	Ever Volunteered After High School [3]
"Mandatory" Program (100% participation)	-	0.074**	0.053
	-	[0.032]	[0.033]
High Probability of Exposure x ELS Cohort Member	0.016	-0.010	-0.070*
	[0.035]	[0.037]	[0.040]
High Probability of Exposure to Mandatory Service	0.087***	0.087***	0.087
	[0.032]	[0.032]	[0.059]
ELS Cohort Member	0.097***	0.094***	0.068**
	[0.011]	[0.011]	[0.028]
Additional Control Variables Included	No	No	Yes

* significant at 10%; ** significant at 5%; *** significant at 1%

Students attending a school with a 23% or greater predicted probability of adopting a mandatory service program are considered to have a high probability of exposure. This cut-off probability deliniates the top ten percent of the high schools in the NELS sample. A proportion chosen because it is the same proportion of schools that adopted the policy in the later ELS cohort. All schools in both the NELS and ELS have been assigned a predicted probability from an earlier probit regression using school-level characteritics. Students actually exposed to a mandatory service program are included in the high probability of exposure category within the ELS cohort.

Standard errors are in brackets and adjusted for clustering at the school-level. The additional control variables ifor the specification in column [3] are for gender, race, family composition, parental education, household income, parent's religious affiilication, binary variables for standardized test quartiles high school urbanicity, Census division, level of involvement in extra-curricular activities, and work experience during high school. Each regression is weighted using the panel weight for the first through second follow-up for the NELS sample and the panel weight for the base-year through first follow-up for the ELS sample. Each sample is limited to respondents who are in the 12th grade cohort in 1992 and 2004 for the NELS and ELS samples. Sample size is 19,620 for each regresssion.

Table 2.8: Linear Probability Model Predicting Civic Behavior Two Years After High School Using the ELS and NELS Cohorts

Dependent Variable	Ever Volunteered After High School [1]	Ever Volunteered After High School [2]	Ever Volunteered After High School [3]
"Mandatory" Program (100% participation)	-	0.067**	0.047
		[0.032]	[0.033]
Predicted Probability of Exposure x ELS Cohort Member	0.095	0.041	-0.114
	[0.086]	[0.089]	[0.094]
Predicted Probability of Exposure to Mandatory Service	0.165**	0.165**	0.100
	[0.078]	[0.078]	[0.157]
ELS Cohort Member	0.093***	0.092***	0.068**
	[0.012]	[0.012]	[0.029]
Additional Control Variables Included	No	No	Yes

* significant at 10%; ** significant at 5%; *** significant at 1%

Standard errors are in brackets and adjusted for clustering at the school-level. The additional control variables ifor the specification in column [3] are for gender, race, family composition, parental education, household income, parent's religious afflication, binary variables for standardized test quartiles high school urbanicity, Census division, level of involvement in extra-curricular activities, and work experience during high school. Each regression is weighted using the panel weight for the first through second follow-up for the NELS sample and the panel weight for the base-year through first follow-up for the ELS sample. Each sample is limited to respondents who are in the 12th grade cohort in 1992 and 2004 for the NELS and ELS samples. Sample size is 19,620 for each regresssion.

CHAPTER 3

DO FOUR-YEAR COLLEGES PRODUCE BETTER CITIZENS?

PART I: INTRODUCTION

In the debate about the government's role in subsidizing higher education, the focus on individual wage returns can often overshadow the other positive social effects of post-secondary education.[28] This could be caused, in part, by the fact that the literature on the private wage returns to higher education is well developed yet little is known about the exact size and scope of the additional social returns to post-secondary education.[29] An understanding of the full and precise impact of higher education on both the individual and society as a whole is critical for policy makers to make informed decisions about who should bear the cost of higher education. Positive externalities such as greater civic participation, wage spillovers, and decreased crime rates have long been associated with increased educational levels within society, but the precise impact of specific types of education on these externalities is largely unknown. Careful estimates of the social benefits to education have only begun to emerge in the past few years.[30] This analysis adds to this growing body of research by using the National Education Longitudinal Study of 1988 (NELS: 88) to assess the impact of attending a four-year institution on civic behavior such as volunteering and voting both two and eight years after high school.

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[28] As evidence of the emphasis on the value of education to the individual, the U.S. has seen federal policies that have promoted the growth of student loans and decreased the reliance on federal grants throughout the 1990s (American Council on Education, 2004).

[29] The growth in the wage premium for a college education over the past twenty years has been significant and well documented (Goldin & Katz, 2007).

[30] For instance Acemoglu and Angrist (1999) and Moretti (2003) have looked at wage spillovers from education, while Moretti and Lochner (2004) have examined the educational effects on criminal activity. Estimates of the effects of education on civic behavior has been examined by Dee (2004), and Milligan, Moretti, and Oreopoulous (2004).

There has been little empirical research that comparatively measures the impact of both two- and four-year schools on future civic behavior. Earlier work from Pascarella, et. al. (1988 & 2005) has shown that certain experiences at four-year colleges such as living on campus, being involved in student organizations, and interacting with faculty had a positive impact on civic-mindedness nine years after the start of post-secondary school. Their data from the late 1970s, however, was limited to students who only attended four-year colleges, making it impossible to compare the results to similar students who attended two-year colleges. More recently, Persell and Wenglinsky (2004) examined the specific impact of attending a non-profit two-year college on civic behavior as compared to individuals attending for-profit two-year schools. Using the Beginning Post-secondary Study (BPS) and an Ordinary Least Squares regression framework, they found that students who attended two-year for-profit institutions participated less in civic activities then their counterparts in community colleges, even when controlling for prior civic participation. However, the findings shed no light on measuring the potential difference in impact between two- and four-year schools on civic behavior.

Filling this gap, Lopez and Brown (2006) have recently documented the differences in civic behavior between students that attended two- and four-year schools using the National Educational Longitudinal Study of 1988 (NELS: 88). Using a series of descriptive statistics, they found that students who attended a four-year school volunteered at a significantly higher rate compared to students who only attended a two-year school. The report also found differences in both the types of volunteering, as well as differences in voting practices. Lopez and Brown concluded that students who attended a four-year school participated in many civic activities in overall higher proportions. However, since the report was a collection of summary

statistics, they were unable to make any strong causal claims about the impact of attending a four-year school.

A key concern in any estimation of the impact of a four-year college education on civic behavior is the potential for selection bias due to the endogenous nature of post-secondary school choice. This type of bias is present if the unobserved characteristics that determine the choice to enroll in a four-year school also determine future civic behavior. For example, students with an unobserved preference for participating in community service may also be more likely to enroll in a four-year school. Without correcting for the influence of these unobserved preferences, the impact of a four-year school would be overstated. Since it is not possible to randomly distribute post-secondary school opportunities, estimating the impact of post-secondary education must rely on the use of pseudo-experimental techniques in an attempt to simulate exogenous variation in post-secondary school choice. This research directly addresses the issue of endogenous post-secondary school choice through the use of instrumental variables in a bivariate probit model. The contribution of this analysis is to expand upon the initial correlation uncovered by Lopez and Brown (2006) to more precisely assess the actual impact of four-year school attendance on civic behavior.

Seminal work by Card (1995, 1999) first introduced an instrumental variable that used the proximity to a four-year college, which was well suited for predicting post-secondary educational outcomes. Dee (2004) applied a similar estimation strategy to assess the impact of post-secondary school attendance on civic behavior. From the High School and Beyond (HS&B) dataset, a longitudinal study that followed a cohort of tenth graders from 1980 to 1992, Dee used an individual's proximity to a two-year college and the number of two-year colleges within the same county as instrumental variables to predict enrollment at a two- or four-year

college. Dee argued that the proximity to a two-year school is mostly independent from the

unobserved characteristics that might influence civic behavior yet measurements of proximity

help to predict post-secondary school enrollment. Incorporating the instrumental variables into a

bivariate probit model, Dee found significant positive effects of post-secondary school entrance

on voter participation. By his estimate, post-secondary school enrollment increased voter

participation by 21 to 30 percentage points. While his analysis took careful steps to correct for

bias from an endogenous education variable, he was unable to measure the effect on civic

behavior across different types of post-secondary education, lumping together the effects of

attending two- and four-year schools.

A strong instrumental variable approach remains one of the most effective ways to

address the potential selection bias driven by an endogenous variable such as the decision to

enroll into a four-year school.   Works from Card and Dee apply measures of proximity to

instrument for postsecondary enrollment in general; however, there have not been many

successful attempts to instrument for the specific decision to enroll into a four-year colleges

Therefore, the main contribution of this research is to introduce an instrumental variable that is a

variation on the proximity measures to predict enrollment into a four-year school. The

instrument is based on the institutional characteristics of nearby post-secondary institutions.

This research uses the fraction of students enrolled in a public four-year school within a 100-mile

radius as an instrument for attendance and enrollment in a four-year school. The rationale is

based on the substitutability of nearby public four-year schools with other types of postsecondary

opportunities. If other postsecondary opportunities can be substituted, the decision to attend a

four-year school could be based, in part, to the relative number of slots at a public four-year

school in the surrounding area. If that number is high, it may be easier to gain admission to a

nearby public four-year school and thus influence the exposure rates. The following analysis

incorporates this instrumental variable approach using a bivariate probit model that is similar to

one found in the work of Dee (2004).

While there is little empirical research on the effect of higher education on civic

behavior, the theoretical link between a post-secondary education and its effect on influencing

civic participation and shaping civic values has been explored in some detail.[31] Empirically,

increased higher education has been associated with greater civic participation. A causal

explanation could stem from increases in cognitive ability that would enhance and encourage

civic participation. In addition, with greater cognitive ability, people might find it less costly to

engage in civic activities. For example, greater cognitive ability may make it less time

consuming to understand and synthesize political issues prior to an important election. Still

another positive link may come from an educational curriculum that directly encourages civic

engagement or places greater emphasis on the benefit of civic engagement to society as a whole.

This is a potentially reasonable explanation considering that many post-secondary institutions

have a stated goal of encouraging greater civic engagement among their students.[32]

There is a potential for a negative relationship between post-secondary education and

some civic activities, especially volunteering. With high levels of education and the higher

wages that often follow, it becomes more costly in terms of forgone wages to take time away

from work to engage in community service. A study by Gibson (2001) provided evidence that

more education may actually decrease the probability of volunteering due to the opportunity cost

of increased wages. Dee (2004) found only small and non-significant effects of college entrance

on adult volunteering behavior, in contrast to the large and positive effects of college entrance on

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[31] See work such as Lacy (1978), Chickering (1969) , and Tinto (1975) cited in Pascarella and Terenzini (1988).
[32] An example of this includes the Wingspread Declaration on Renewing the Civic Mission of the American Research University (Boyte and Hollander, 1999).

voting. Since the full effect of different types of post-secondary educational experiences on civic behavior is not obvious, the key focus for this research is to identify the general nature of this relationship. This work is not able to pinpoint the exact mechanism within post-secondary education that might influence civic behavior, but rather it determines if exposure to a four-year school has a measurable impact of civic engagement in early adulthood.

The paper is organized into the following sections. Part II provides an overview of the data used in this project as well as summary statistics and precise definitions of the measures of civic behavior and the post-secondary educational outcomes used in this analysis. Part III provides results from a single-equation probit model of the effect of four-year college attendance on civic behavior with the extensive use of control variables. These estimates provide a context for the estimates presented in Part IV from a bivariate probit model with instrumental variables. Also in Part IV, I compare the new instrumental variable calculated with enrollment data to previously established instruments based on the proximity to two- and four-year colleges. Finally, Part V provides further discussion about the estimation of the civic returns to a four-year school and a conclusion with suggestions for future research.

PART II: OVERVIEW OF THE DATA

National Education Longitudinal Study of 1988 (NELS: 88)

Starting in 1988, the National Education Longitudinal Study of 1988 (NELS: 88) was a nationally representative large sample of over 24,000 eighth graders. Follow-up surveys occurred in 1990, 1992, 1994, and 2000 with over 11,000 individuals responding to a survey in all four of the subsequent follow-ups. In the base year through second follow-up, when most individuals were in high school, surveys were also administered to many of the respondents' schools, teachers, and parents (Ingels et al., 2002). With these additional surveys, the data is rich

in variables, and it includes significant information about civic behavior and civic attitudes both during high school and well into early adulthood. The main outcomes of interest for this study are civic behaviors reported in the third (1994) and fourth follow-up (2000) of the survey which represent behavior occurring two and eight years after high school for most of the respondents, respectively.

In total, this paper uses twelve different binary measures of civic behavior as reported in the last two follow-up surveys of the NELS: 88. Six measures of voting and volunteering come from the final follow-up survey occurring in 2000. These include three measures of voting behavior consisting of variables that indicate if an individual was registered to vote in 2000, had voted in any local or state election between 1998 and 2000, and if an individual had voted in the 1996 Presidential election. I also include three measures of volunteering behavior taken from a section of the survey on social integration. Individuals were asked if they had ever volunteered for a youth organization, a civic/community organization, or if they had ever been involved in a political organization (by more than just voting) within the past twelve months. A person was coded as "Ever Volunteered (1999-2000)" if they had answered "yes" to any one of the three volunteering questions. The two other binary variables for volunteering indicate participation in a youth organization and a community or civic organization between 1999 and 2000.[33] Another six binary measures of civic behavior come from the third follow-up of the NELS: 88 survey occurring in 1994. In a similar fashion, these include three measures of voting behavior consisting of variables that indicate if an individual was registered to vote in 1994, had voted in any local or state election between 1993 and 1994, and had voted in the 1992 Presidential election. Also included are three measures of volunteering taken from a series of questions on

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[33] Unfortunately, the final follow-up survey does not include questions about the quality or intensity of the volunteering and voting.

community service participation. These questions were slightly different and broader than the questions found in the final follow-up. Thus, the measure of volunteering includes a wider variety of volunteer activities beyond just participation in youth, civic, or political organizations which was the focus of the questions in the final follow-up. However, the third follow-up survey did include separate questions about volunteering for a youth organization and volunteering for a political club between 1993 and 1994 which have been incorporated into this study as binary variables.[34]

To assess the treatment effect of four-year school attendance on civic behavior, this analysis uses two separate binary variables that indicate two different types of exposure to a four-year school. The first measure is a variable indicating if an individual had ever attended a four-year school at any time after completing high school, and it is used to determine if any exposure to a four-year school has a causal impact on future civic behavior. This variable was derived within the NELS: 88 dataset with information taken from the third and fourth follow-up surveys. If an individual had ever reported attending a four-year school any time during the third or fourth follow-up survey, they were coded as having some exposure to a four-year school. The second measure of treatment is a variable indicating if an individual had enrolled full-time in a four-year school immediately following high school. With this measure it is possible to assess the impact of early exposure to a four-year school. This variable is taken from the third follow-up of the NELS: 88 dataset from a section where individuals reported their post-secondary school enrollment status month by month starting in the summer of 1992 when most individuals in the survey had completed high school. For this measure of exposure, individuals were coded as "1" if they had reported being enrolled full-time in a four-year school during the month of

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[34] The third follow-up does include some measures of community service intensity, including a question about the hours per week spent volunteering. These variables were not used in this analysis in an effort to maintain a consistent set of outcomes between the two follow-up surveys.

September in 1992, which represents the first September after high school for most individuals. All other enrollment outcomes reported for the month, including individuals who did not enroll in any school, were coded as "0".

General Trends in the NELS: 88

Figure 3.1 shows the general trend between exposure to different types of post-secondary school and civic behavior in the NELS: 88. This figure confirms the earlier work of Lopez and Brown (2006) by demonstrating the positive relationship between attending a four-year school and civic behavior outcomes eight years after high school. In an unrestricted weighted sample, 41.5% of individuals who had ever attended a four-year school reported that they had volunteered between 1999 and 2000, compared to 27% of individuals who only attended a two-year school. Of the individuals who had no exposure to post-secondary school, only 21% had reported ever volunteering in the final follow-up survey. The differences are nearly as large for voting behavior, as 48% of individuals who attended a four-year school reported that they had voted between 1998 and 2000 compared to 39% of individuals who only attended a two-year school.

There is a similar trend among enrollment decisions and civic behavior; the results in Figure 3.2a show that individuals who immediately enrolled into a four-year school volunteered at a much higher rate two years after high school. Specifically, 53% of individuals who were enrolled in a four-year school reported that they had volunteered compared to only 34% of individuals who started at a two-year school and 23% of individuals who did not enroll in any school. The difference in volunteering rates between enrolling in a two-year school and enrolling in a four-year school is nearly 20% which is slightly larger than the differences from Figure 3.1, suggesting that early exposure to a four-year school may have a stronger impact on

volunteering in the short-run. In contrast, there seems to be little difference in voter participation

rates between students that enrolled directly into a two-year school and those that went into a

four-year school after high school. From Figure 3.2a, the difference in proportions of individuals

who voted between 1993 and 1994 is very small; however, there is still a sizable difference

between those that went onto to post-secondary school after high school and those that did not.

Figure 3.2b shows the longer-run correlation of enrollment decisions and civic behavior

occurring eight years after high school. Once again, the results are very similar to Figure 3.1

suggesting a strong positive correlation between immediately enrolling in a four-year school and

participating in civic activities.

Evidence of Selection Bias

Although Figures 3.1, 3.2a, and 3.2b show obvious differences in civic behavior rates

across different educational outcomes, this is not necessarily a confirmation that attending or

enrolling in a four-year school has a causal impact on civic engagement.   In Figure 3.3, I take

advantage of the longitudinal nature of the NELS: 88 dataset to show that differences in civic

behavior and moral attitudes emerge *prior to* the start of any post-secondary school experience.

The proportion of individuals who reported that they had volunteered during high school is

dramatically higher for individuals who eventually attend a four-year school.   These individuals

also reported more often that they were frequently engaged in a religious activity and that they

felt that helping out in the community was very important.   Individuals who would eventually

attend a four-year school were also more likely to be in the top quartile of a standardized test in

history and civics and they were more likely to be a frequent volunteer in high school (these

results are not shown in Figure 3.3). This correlation between educational outcomes and prior

civic behavior emphasizes the potential for significant selection bias in an estimate of the effect

of four-year school attendance on adult civic behavior. It appears that individuals who are already prone to engage in civic behavior are also disproportionately selecting four-year schools. Without directly addressing this issue, any estimate the effects of four-year school attendance may be overstating the size of the actual causal impact.

When using a variable-rich dataset like the NELS: 88, one approach to correct for selection bias is try to control for as much of the unobserved heterogeneity as possible with the control variables available. Measures such as high school civic behavior, moral attitudes, and high school civic aptitudes are all potential proxies for the unobservable characteristics that are driving the upward bias and are readily available in the NELS: 88. In the next section, I present the results from this approach using a single equation probit model, that serve as a benchmark for the instrumental variable estimates presented in Section IV.

Restricted Sample

Since this analysis incorporates the use of instrumental variables, the sample is restricted to individuals for which an instrumental variable could be calculated. In the framework of this research, instruments such as proximity to post-secondary institutions could only be calculated for individuals who attended a public high school in 1992 which could be linked to the 1991-1992 Common Core of Data (CCD). The Common Core of Data, maintained by the U.S. Department of Education's National Center for Education Statistics, contains information on the locations of all of the public schools, public school districts, and state education agencies in the United States (1992). The Common Core of Data provides the necessary zip code information for calculating the instrumental variables used in this paper. To create a common sample over most of the rest of the analysis, individuals with missing high school identification codes or who

attended a private school which could not be linked to the CCD were dropped from the analysis, a total of 3,780 observations in all.[35]

While this represents a sizable reduction in sample size, it does not necessarily impede the ability to generalize the results. To illustrate this point, in Table 3.1a and Table 3.1b, I present a summary of all twelve measures of civic participation for both the restricted and unrestricted sample. The general trend is exactly the same, as individuals who have attended a four-year school engage in civic activities in significantly higher proportions than individuals who do not attend a four-year school (Table 3.1a). Similarly, the trend across enrollment patterns is the same for each sample when looking at civic behavior two years after high school (Table 3.1b). In addition, the size of the difference in proportion between four-year school attendees and non-attendees is very similar. In both samples, the difference is always statistically significant at the 1% level for all twelve measures of civic behavior. In the restricted sample the differences in proportion are sometime slightly smaller than the unrestricted sample but they are never larger. This provides evidence that the effect of attending a four-year school on civic behavior will certainly not be overstated in the restricted sample. For additional comparison, Appendix D provides a complete summary of all of the dependent and explanatory variables used in this analysis for both the restricted and the full sample of the NELS: 88. One key difference between these samples is that the restricted sample used in this analysis is completely made up of individuals who attended a public high school. Private school students make up 8 percent of the NELS sample; however, due to data limitations, they must be omitted since an instrumental variable could not be calculated for this group of students.

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[35] Additional observations were dropped from individuals with missing information regarding their educational outcomes and their civic behavior outcomes from the third and fourth follow-up survey.

PART III: INITIAL RESULTS

Table 3.2a shows the initial results from the single equation probit model estimating the effects of four-year college attendance on the probability of being a volunteer between 1999 and 2000. As expected, the first specification of this model shows that attending a four-year college is highly correlated with future civic behavior. The subsequent specifications shown in columns 2-4 of Table 3.2a show that this estimate is robust to the introduction of extensive individual-level and school-level controls. For example, in column 2, the regression includes twelve binary variables that indicate standardized test score quartiles in math, reading, and history which were taken during the second follow-up of the NELS: 88 when most individuals were seniors in high school. In column 3, school-level controls are added including binary variables for the region and the urbanicity of the respondent's high school.[36]   In column 4, the regression includes controls for prior civic behavior and moral attitudes which includes controls for prior volunteering experience and frequent religious activity in high school. Three of these additional control variables are positively associated with volunteering as an adult. For the final specification (column 5), I add controls from the final follow-up of the NELS: 88, which include binary variables for income, work status, number of children, and current level of religious activity in 2000.[37] In each specification of the model, the estimated marginal effect of attending a four-year school remains large, positive, and significant. In the last specification, the estimated impact of attending a four-year school increases the probability of volunteering by over 14 percentage points which represents a 44% change in the probability of volunteering. Table 3.2b presents the results of a similar set of probit models estimating the marginal effect of four-year

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[36] I have also run a specification with state-level fixed effects with similar results.
[37] The sample size for the last two specifications (columns 4 and 5) is smaller because I have dropped observations with missing variables for prior civic behavior and/or missing variables from the final follow-up of the NELS: 88. The findings in columns 1-3 do not differ any using the more restricted sample from columns 4 and 5.

school attendance on the probability of voting between 1998 and 2000. Once again, in the initial specification, the estimated marginal effect is positive and marginally significant at the 5% level. In contrast to the effect on volunteering, the estimated marginal effect of four-year college attendance does not remain significant when additional controls are added to the model. In the final specification, the estimated effect of four-year school attendance on voting shrinks by more than half and is not significant at any reasonable level.

The next set of tables makes use of a second measure of exposure to a four-year school using a binary variable that indicates if the respondent immediately enrolled full-time at a four-year college after high school to examine if earlier full-time exposure to a four-year school has an immediate impact on civic engagement. The dependent variables come from self-reported civic behavior from the third follow-up survey which occurred two years after high school for most of the respondents. This survey is taken when many of the individuals are still in college. Table 3.3a provides the estimated marginal effect of full-time enrollment at a four-year school on the probability of being a volunteer between 1993 and 1994 using the single equation probit model with similar specifications as the previous tables.[38] Similar to previous results on volunteering, the estimated marginal effect of enrollment is large, positive, and significant with every specification of this model. In a slight contrast, the results are different for Table 3.3b which shows the estimated marginal effects of enrollment on the probability of voting between 1993 and 1994. The estimate is positive and significant, but unlike previous estimates on voting, the estimate remains similar in size and also remains marginally significant at the 5% level in each specification of the model. In both Table 3.3a and 3.3b, the estimates of enrollment on

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[38] Since the dependent variable is an outcome occurring two-years after high school, the last specification of the probit model in each of these tables does not include individual level controls from the final follow-up of the NELS: 88.

civic behavior are robust to additional control variables, including controls for prior civic behavior.

With this measure of enrollment status, it is also possible to assess if early exposure to a four-year school has a lasting effect on civic behavior later on into adulthood. Estimates from Table 3.4a show that starting full-time at a four-year college immediately after high school has a positive and significant estimated impact on the probability of volunteering eight years later. Like previous estimates on volunteering, this result is robust to both the introduction of individual- and school-level controls and the inclusion of controls for prior civic behavior and attitudes. Although the estimated marginal effect is slightly smaller than the effect of attending a four-year school (Table 3.3a), the estimated effect is still very large. From column 5, the estimated impact of immediately enrolling into a four-year school increases the probability of volunteering as an adult by 9 percentage points which represents a change of over 28 percent. In contrast to these results, the estimates in Table 3.4b show that the estimated impact of enrolling at a four-year school on the probability of voting eight years later is not robust to the introduction of additional controls. The estimate becomes smaller and immediately non-significant with each subsequent change in the model specification.

Although the evidence so far suggests that there is a causal impact of four-year college attendance on civic behavior, it is still difficult to draw strong conclusions from the initial results of the single equation probit model. One reason is that in this regression model, the decision to enroll at or attend a four-year college continues to be treated as an exogenous variable. The correction for selection bias relies solely on the power on the control variables to adequately proxy for the unobserved characteristics that determine both educational outcomes and civic behavior. However, even with extensive control variables, some selection bias may remain.

84

Lingering bias seems plausible, particularly since the inclusion of additional control variables did not have a sizable impact on lowering the estimated marginal effect of attending or enrolling at a four-year school—particularly for volunteering outcomes. Moreover, many of the control variables included in the previous regressions may be considered endogenous which would further complicate the estimate of four-year school attendance. Additionally, work by Reynolds (2008), has demonstrated that even if additional variables could adequately control for unobserved heterogeneity, the estimates of the treatment effect of two- and four-year colleges may still be incorrect within this type of regression framework, especially if the observable differences between the treatment and control groups are very large. To address this issue, the next section present results from a bivariate probit model with instrumental variables.

PART IV: THE BIVARIATE PROBIT MODEL

To address a potentially endogenous binary variable in a probit model, this analysis uses a maximum likelihood estimation that takes the form of a bivariate probit model.[39] [40] In a bivariate probit model, the decision to engage in a civic activity and the decision to attend a four-year school are represented using the following latent variable models.

$$(1)\ Y_i^* = E_i\beta + X_i\delta + \varepsilon_i$$

$$(2)\ E_i^* = Z_i\beta + X_i\delta + u_i$$

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[39] This model choice is more appropriate than an instrumental variable probit model since both the endogenous treatment variable and the dependent variable are both binary. Because of this, the results from a traditional Two-Staged Least Squares estimation using the same set of instrumental variables are large in magnitude and statistically imprecise making any interpretation difficult.
[40] To address the potential correlation in the error terms, the model allows for the unobserved characteristics that determine attendance at a four-year school and the decision to engage in a civic activity to be distributed in a bivariate normal distribution cumulative density function. Like the single equation probit, the predicted probabilities are bounded between zero and one (Wooldridge 2002).

In this case Y_i^*, is the unobserved perceived benefit of engaging in a civic activity such as volunteering or voting, and E_i^* is the unobserved perceived benefit of attending or immediately enrolling at a four-year school If the benefits are positive (i.e., $Y_i^* > 0$ and/or $E_i^* > 0$), then an individual will choose engage in the activity (i.e., volunteer and/or attend a four-year school); likewise, if the benefits are negative then the individual will choose to abstain. In equation (2), Z_i represents a vector of observed characteristics that determine attendance at a four-year school but are not part of the equation that determines civic behavior. This research employs two sets of instrumental variables for Z_i from previous literature and one new set of instrumental variables presented below.

Calculating the Instrumental Variable

To ensure the model is properly identified, this research introduces a new instrumental variable to predict attendance and enrollment at a four-year school.   The instrument measures the proportion of individuals enrolled at a public four-year school within a 100-mile radius of a respondent's high school. The variable is simply the fraction of the total enrollment for all public four-year schools over the total enrollment for all post-secondary schools within a 100-mile radius. This measurement is a predictor of four-year school enrollment if a local public four-year school is a substitute for a two-year school or other types of postsecondary schools. If there are a lot slots in the local public four-year school relative to other post-secondary opportunities, it may be easier for individuals to gain admission and attend a four-year school. To calculate this variable, I use data from the 1992 Integrated Postsecondary Education Data System (IPEDS) which was collected and maintained by the National Center for Education Statistics. The database contains information for all primary providers of postsecondary education in the United States and includes information on institutional characteristics as well as

86

enrollment data. The database represents a census of all post-secondary institutions in the United States, and for the IPEDS, a post-secondary institution is defined as any institution with a formal program that is created for individuals beyond the compulsory high school age. Data on enrollment levels comes from the updated final count of the Fall 1991 enrollment rate of all students at each institution. To calculate the total enrollment within a 100-mile radius, I first calculate the distance from each high school in the NELS: 88 that had zip code information available from the Common Core of Data to every institution in the IPEDS survey. Using a 100-mile radius cutoff, I then calculate the total enrollment for all of the institutions and the total enrollment for all of the public four-year schools in the surrounding area to create the instrumental variable.[41]

The idea for this instrument is motivated by growing evidence that close proximity to a four-year college has become less influential for enrollment decisions. Results from a nationwide survey of college freshman from the 1995 UCLA Freshman Survey of American College Freshman show that the median distance traveled by a student from home to any post-secondary institution has increased from under 50 miles during the late 1960s to 71 miles by the mid-1990s. In this time, students are also willing to travel a greater distance to attend a four-year school compared to the distance to attend a two-year school (Sax et al., 1995). This is not so surprising since many four-year schools provide campus housing, which makes it easier for students to consider schools that are farther away from their original home. However, the median distance traveled to a four-year school has been increasing over time, providing some evidence of the decreasing importance of proximity in the college enrollment decision. A similar

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[41] The use of public schools and the 100-mile radius cutoff proved to be the most powerful instrument to predict four-year school choice. The power of the instrument relies on the close substitutability of a nearby public four-year school with a local two-year school. The predictive power was smaller in magnitude with different and with private schools instead of public schools.

conclusion is reached by Kling (2001) in a study that replicates the instrumental variable

approach used by Card (1995), which incorporates a binary variable indicating if a four-year

school is within the same county of residence as the respondent. Kling found that while this

instrument was a strong predictor of educational outcomes for the original sample of youth

surveyed in the 1970s, the instrument had less predictive power for a subsequent sample of youth

surveyed in the 1980s.   As an explanation of this trend, Kling points to an analysis by Hoxby

(1997) which suggests that geographic proximity has become less important to students'

enrollment decisions as the overall market for higher education transitions from a highly

localized market to one that has become geographically integrated. Hoxby also argues that

changes such as deregulation in the airlines and telecommunication industry make it less costly

to attend a school that is farther away. With this evidence, this research argues that in order to

create an instrumental variable that is an effective predictor of post-secondary school choice it

must include the characteristics of schools contained in a wider radius of an individual's original

residence.

Measuring the Strength of the IV

For most applications, the strength of an instrumental variable strategy is determined by

the relative power of the instrumental variable to predict the endogenous variable while still

being independent of the error term that determines the dependent variable. This translates to

having an instrumental variable with strong predictive power over four-year school attendance

and enrollment while still being independent of the error term that determines civic behavior.[42]

To assess the first condition, Table 3.5 shows the estimated marginal effects of the fraction of

students enrolled in a public four-year school on both attending a four-year college and enrolling

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[42] This analysis of these conditions is presented because it is the widely accepted approach for assessing the strength
of an instrumental variable especially in the context of a two-staged-least-squares approach; however, instrumental
variables used in a bivariate probit model may not require such analysis.

in a four-year college immediately after high school. As a comparison, this table also includes other variables, including the sum total of all of the four-year institutions within a 100-mile radius and all of the two-year schools within a 30-mile radius. The results for the first set of instrumental variables show that the fraction of students enrolled in a public four-year school has a positive and significant effect on both attendance and enrollment at a four-year school. This relationship seems reasonable, showing that a higher proportion of students enrolled in a public four-year school in the surrounding area increases the probability of an individual to attend or enroll at a four-year school. The results are robust to the introduction of control variables for standardized test scores, region fixed effects, and school urbanicity controls. There is also a positive relationship between the number of institutions and the probability of attending and enrolling into a four-year school, although this is only precisely estimated for the enrollment decision.

To provide some context for these results, Table 3.5 also includes estimates for two other sets of instrumental variables that have been previously used in the literature. In the second set, I provide the results for instrumental variables that are very similar to ones used by David Card (1995) including the distance to the nearest four-year school and the number of four-year schools within a 15-mile radius.[43] The results show that proximity to a four-year college is not a good predictor of four-year college enrollment which confirms the conclusion of Kling's earlier study in 2001. In addition, the coefficient for the distance to a four-year school is positive when predicting attendance at a four-year school which is puzzling. The final set of instrumental variables in Table 3.5 closely approximate the instruments used by Dee (2004) which include the distance to the nearest two-year school and the number of two-year schools within a 15-mile

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[43] The NELS: 88 dataset does not have county-level information so I am unable to calculate an instrument that indicates the presence of a four-year school within the same county which is the exact instrument used by Card (1995) and Kling (2001).

radius. The estimated marginal effect of the distance to a two-year school on four-year school enrollment and attendance is positive and significant at the 5% level. This suggests that the farther an individual is away from a two-year school the higher the probability of enrolling or attending at a four-year school, which appears to be a reasonable relationship. However, complicating this interpretation, the other instrument measuring the number of two-year schools within 15-miles also appears to have a positive marginal effect on four-year college attendance. Since this effect is not statistically significant for either measure of four-year school exposure, the results illustrate the weak predictive power of this variable.

To further evaluate the effectiveness of the first set of instrumental variables, in Table 3.6, I show the correlation between the instruments and a wider range of educational outcomes. Besides a strong positive relationship with attending a four-year school, the measure of the fraction of enrollment at public four-year schools also has a negative relationship with ever attending a two-year school and completing an Associate's degree. The results indicate that much of the predictive power of this instrument is centered on post-secondary school outcomes with little statistical power to predict other outcomes such as high school completion. This provides further evidence of the relative strength of this measure as an instrumental variable which is especially evident since instruments such as the distance to the nearest four-year college has very little predictive power at all. The other instrument in this set (the total number of institutions), is not significantly correlated with ever attending a two- or four-year school. There is some correlation with attaining an Associate's degree and the instrument has marginally significant results for predicting a Bachelor's degree. Like the previous instrument, the total number of institutions cannot predict high school completion.

To evaluate the extent to which the instrumental variable is independent of the error term, this research looks at the correlation between the instrumental variable and observable characteristics that are related to the dependent variable. A persistent critique of using proximity as an instrument is that the communities surrounding two- or four-year colleges are fundamentally different on an observable level. For example, on average, communities that are closer to a four-year college tend to have higher educational levels and higher incomes. If communities with a higher level of Socio-Economic Status (SES) also encourage their children to both pursue higher education and engage in civic behavior, then proximity as an instrument violates the exclusion condition since it is correlated with the error term that determines the dependent variable. I argue that using an instrument that measures the fraction of enrollment in a public four-year school within a 100-mile radius is less susceptible to this type of critique. As evidence, Table 3.7 shows the weighted means of the six instrumental variables by SES quartile in 1992 as derived in the NELS: 88 dataset. The fraction of students enrolled at four-year schools is surprisingly similar across the SES quartiles. There is no significant difference in proportion between the highest and lowest quartile in the survey. In contrast to these results, three of the more established instrumental variables appear to have an inverse relationship to SES quartile measures. For example, the mean distance to the nearest four-year school is 3.5 miles closer for individuals in the highest SES quartile compared to individuals in the lowest SES quartile. Similarly, these individuals are also 2.7 miles closer to a two-year school. Clearly, these traditional instrumental variables are correlated with SES quartile measures within this dataset, while the proposed new instrument using the fraction of students enrolled in a four-year school is mainly independent of SES quartiles.

As additional evidence for the strength of this instrument, Table 3.8 presents results from Ordinary Least Squares regressions determining if there is any correlation with prior high school civic behavior, moral attitudes, and prior cognitive ability in civics. A separate regression is run for each set of the instrumental variables and each column represents a different dependent variable. The prior measures of civic behavior, attitudes, and ability represent the closest set of proxies for the unobserved variables that might determine both education and civic behavior. The estimated coefficients in this table show no statistically significant relationship between any of these measures and the fraction of students enrolled in public four-year schools, further confirming the soundness of this new instrumental variable. As a comparison, there is also not much significant correlation for the other instrumental variables. However, there is a marginally significant and positive relationship between the number of two- and four-year schools with history test scores and attitudes that value community service.

Main Results from the Bivariate Probit Model

The main results from the bivariate probit model measuring the effect of ever attending a four-year school are presented in Table 3.9. In this table, there are two specifications of the model: Model 1 uses only the fraction of enrollment at public four-year schools as the instrumental variable while Model 2 uses both the fraction of enrollment and the total number of institutions. The most striking result is that the estimated effect of attending a four-year school on volunteering in 2000 drops significantly with the use of instrumental variables. When compared to the results from the single equation probit model, two of the estimates on volunteering actually switch sign and all three are no longer statistically significant. While this result does not completely rule out the possibility for a positive causal relationship between four-year school attendance and volunteering, it does provide strong evidence that much of the initial

estimates are inflated due to selection bias. In stark contrast to these results, the estimated effect of four-year college attendance on two of the voting behavior measures has become larger, positive, and significant. The estimated marginal effect of attending a four-year college increases the probability of voting by approximately 14 percentage points. While these estimates are large, they are consistent with Dee's (2004) findings on the estimated impact of attending a post-secondary school on voting.

The results in Table 3.10a assess the immediate impact of enrolling full-time at a four-year school in September of 1992 on civic behavior occurring two years later. The key result in this table is that enrolling full-time at a four-year school continues to have a positive and significant estimated impact on being a volunteer between 1993 and 1994. The estimated marginal effect is nearly 8 percentage points which is similar in size to the initial estimate from the single-equation probit model. The results for volunteering for a youth and a political organization are not as robust to the inclusion of instrumental variables as both estimates become much smaller and statistically imprecise. The estimated impact of enrolling after high school on two of the voting measures has a similar result. For example, the estimated effect on voting in a state or local election between 1993 and 1994 was positive and marginally significant in the initial probit results, yet the estimate becomes negative and non-significant in the bivariate probit model. However, the impact of enrolling at a four-year college on being registered to vote in 1992 is similar in size to the initial probit estimate, but the result is also not significant. Finally, Table 3.10b provides estimates that examine whether full-time exposure to a four-year school immediately after high school has a persistent effect on volunteering later on in life. The results show that the impact on volunteering continues to be positive and significant. Being enrolled full-time at a four-year school increases the probability of being a volunteer eight years later by 9

percentage points. It also increases the probability of volunteering for a youth organization by 5 percentage points and a civic organization by 4.7 percentage points. However, there is little evidence for a persistent impact of full-time enrollment on any of the voting behaviors.

As expected, in the face of selection bias, many of the initially large and significant estimated marginal effects of four-year college attendance decreased in magnitude with the inclusion of instrumental variables. However, from the Table 3.9 there are two notable exceptions on voting behavior in which the effect of attending a four-year school actually increased in size compared to the initial probit estimates. Dee (2004) had a similar result, also showing that the estimated effect of post-secondary school attendance on voting increased with the inclusion of instrumental variables. He provided a few potential explanations for this outcome. One reason could be that the direction of the selection bias in voting is actually downward suggesting that individuals that have unobserved characteristics that deter them from voting also encourage four-year school attendance. This seems highly unlikely given that there is already an overall positive correlation between education and voting documented within this sample. A second explanation could be that attending a four-year school may have a very strong effect on voting behavior for the subset of individuals who were most affected by the instrument. In this case, individuals in areas with a high proportion of public four-year students may receive a greater impact on voting from their education. This could be an explanation if public four-year colleges have a greater impact on voting than private ones. A final explanation is that the instrumental variable does not adhere strictly to an exclusion restriction and there is still remaining bias from selection affecting the estimates. For this to be the case, the instrument would be correlated with unobservable characteristics that predict civic behavior. This final explanation also seems unlikely given the evidence presented in earlier tables, especially since

there is little correlation with prior civic behavior, attitudes, and prior civic aptitude. In addition, there is evidence that this use of this instrumental variable has corrected some of the selection bias as many of the estimates for other types of civic behavior seem to be considerably smaller and less significant.

Another potential estimation concern is the possibility of measurement error in the dependent variable. Lopez and Brown (2006) noted that the voter registration rates from the third and fourth follow-up survey within the NELS: 88 sample were much higher than the November Supplements to the Current Population Survey (CPS) in 1994 and 2000 across all educational groups. However, if this over-reporting is systematically correlated with education, it might bias the results and overstate the effect of attending a four-year school. It is conceivable that more educated individuals may feel compelled to report that they engaged in civic activities when if fact they have not. Although this research is not able to verify the accuracy of self-reported civic behavior within the NELS: 88, as similar study on the civic returns to education by Milligan, et al. (2004) using the CPS found little evidence that errors in self-reported voting rates were correlated with educational outcomes.

PART V: CONCLUSION

The main conclusion from this paper is that full-time enrollment and attendance at a four-year school does have a significant impact on civic behavior; however, estimates that do not carefully address the potential for selection bias overstate this effect. Attending a four-year school anytime during early adulthood initially had a very strongly correlation with volunteering and voting as seen in the initial regression estimates, but with the introduction of instrumental variables in a bivariate probit model, many of the estimates became small and non-significant. For example, attending a four-year school is significant and positively correlated with the

95

probability to volunteer eight years after high school in the single-equation probit model, but this estimate is small and non-significant with the inclusion of instrumental variables in the bivariate probit model. The only form of civic behavior that is a persistently affected by four-year college attendance is voting. Attending a four-year school increases the probability to vote by 13 to 14 percentage points representing a 25 percent increase. In contrast, the effect of enrolling full-time at a four-year school directly after high school does appear to be different than the effect of four-year college attendance in general. Students that go onto to a four-year college directly after high school experience both an immediate and lasting effect on volunteering behavior. The estimated marginal effect on the probability of volunteering as an adult is nearly 8 percentage points. The impact of early exposure to a four-year school appears to help establish a pattern of volunteering early on in the transition to adulthood that continues to persist six to eight years later. Additional research is needed to pinpoint the mechanisms within the four-year school experience that encourage this civic behavior effect and also help determine why this impact is larger for eighteen year olds starting full-time at a four-year school.

Fig. 3.1: Proportion Engaged in Civic Behavior as an Adult by Educational Outcomes
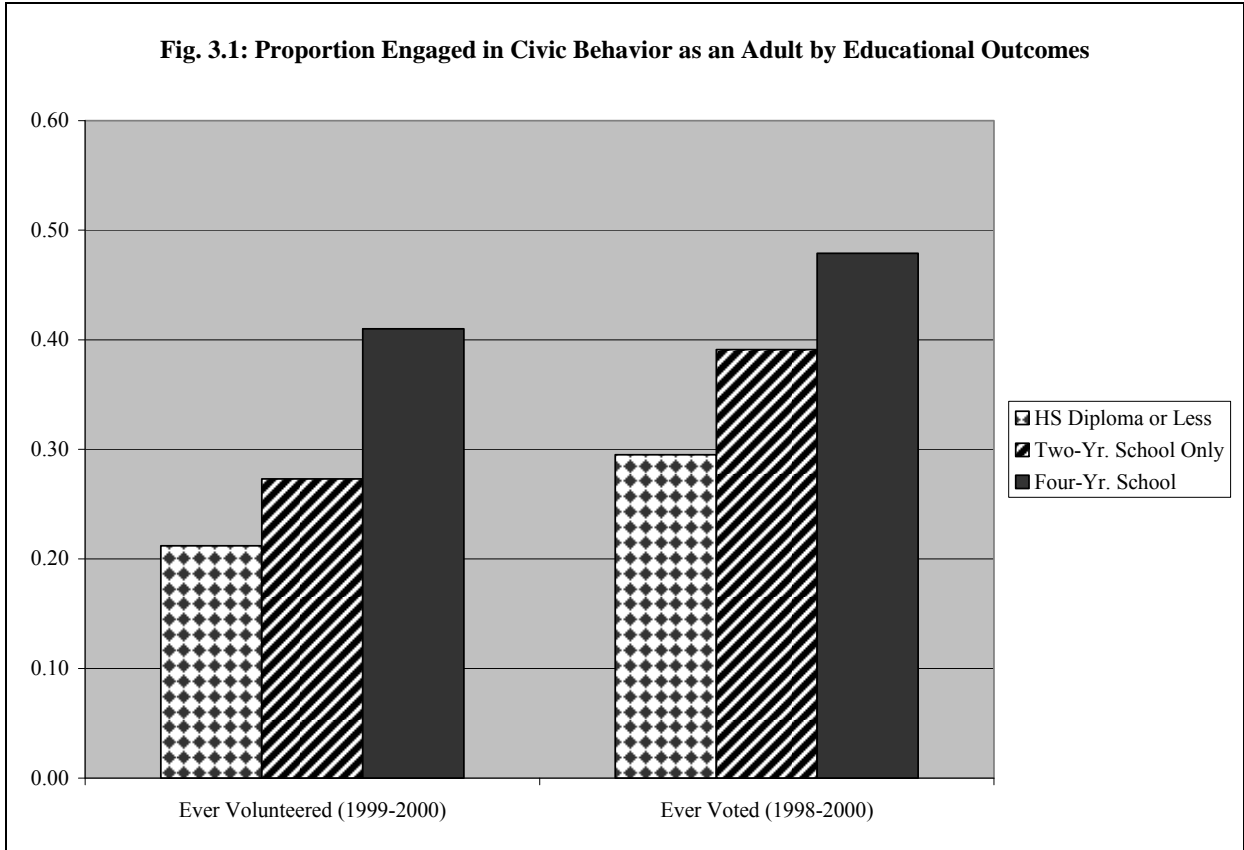
Fig. 3.2a: Proportion Engaged in Civic Behavior by Post-Secondary Enrollment Patterns
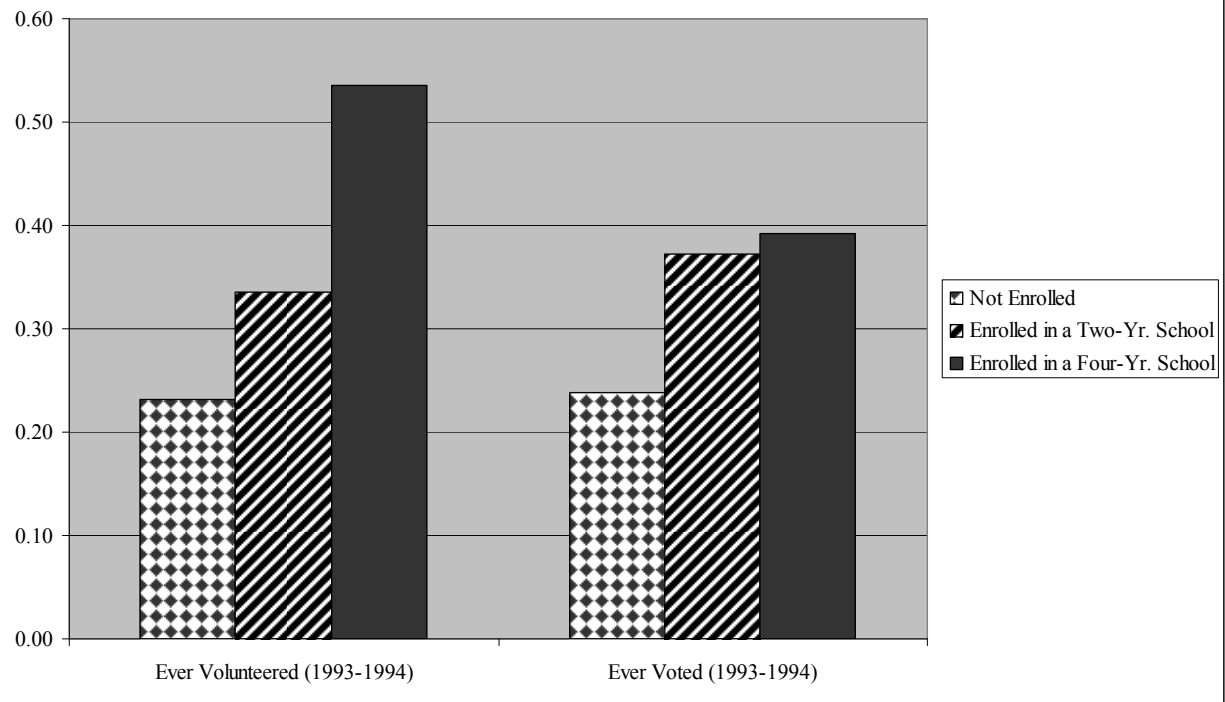
Fig. 3.2b: Proportion Engaged in Civic Behavior as an Adult by Post-Secondary Enrollment Patterns

Legend:
- Not Enrolled
- Enrolled in a Two-Yr. School
- Enrolled in a Four-Yr. School

Ever Volunteered (1999-2000)   Ever Voted (1998-2000)
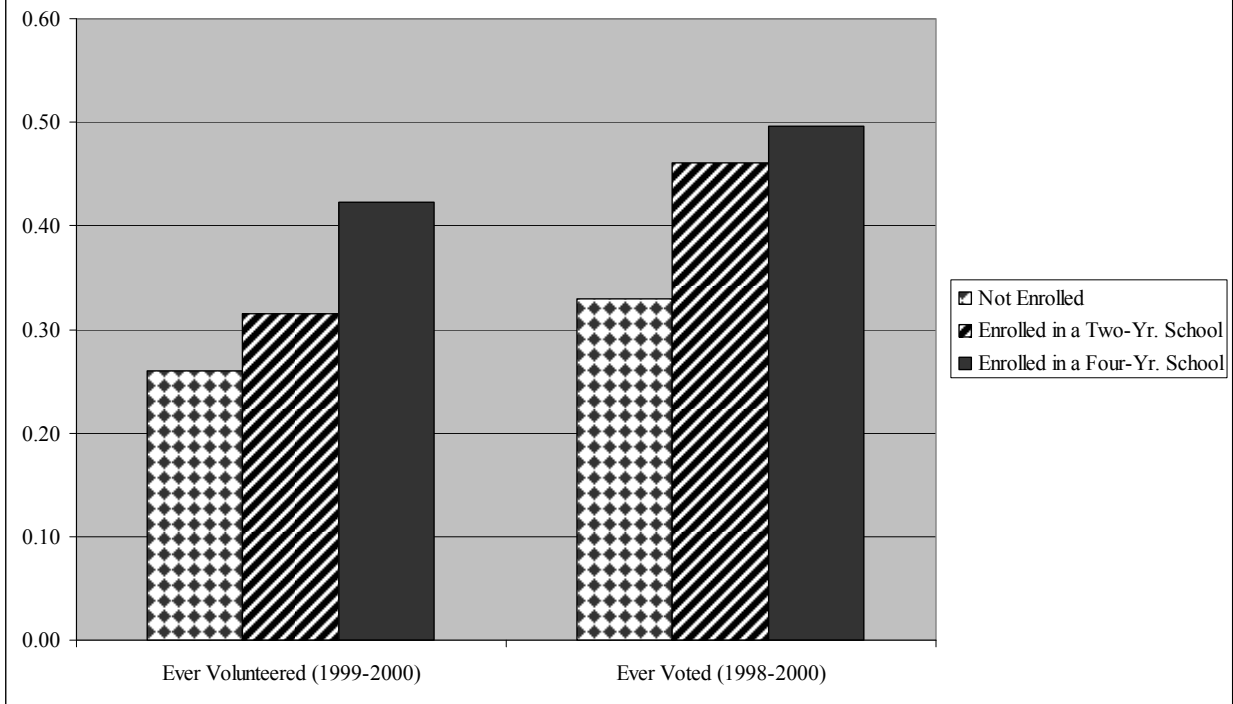
Fig. 3.3: Proportion Engaged in Civic Behavior in High School by Educational Outcomes
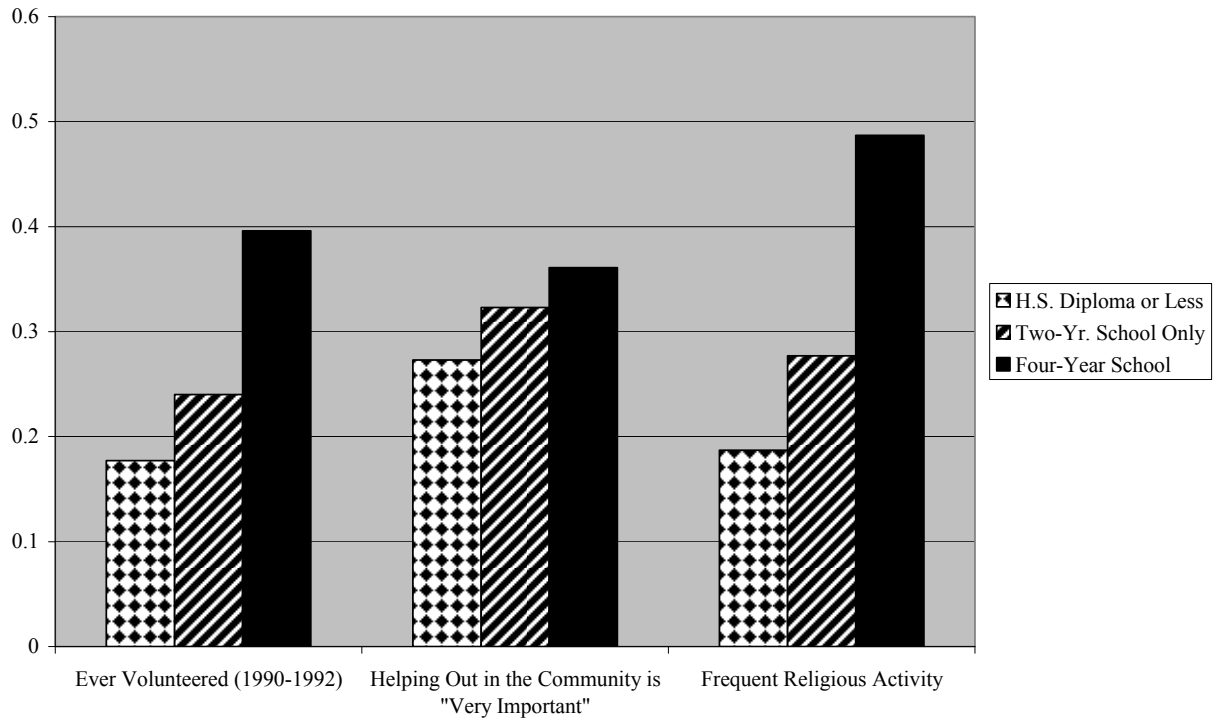
Table 3.1a
Difference in the Proportion Engaged in Civic Behavior By Attendance at a Four-Year School

Civic Behavior Eights After H.S.	Restricted Sample			Full Sample			
	Ever Attended a Four-Yr. School	No Exposure to a Four-Yr. School	Diff.	Ever Attended a Four-Yr. School	No Exposure to a Four-Yr. School	Diff.	Sample Size
Ever Volunteered (1999-2000)	0.415	0.249	0.166** [0.018]	0.41	0.238	0.172** [0.015]	11840
Volunteered for a Youth Org. (1999-2000)	0.251	0.159	0.091** [0.017]	0.244	0.149	0.095** [0.013]	11840
Volunteered for a Civic Org. (1999-2000)	0.278	0.151	0.128** [0.016]	0.271	0.143	0.128** [0.013]	11840
Registered to Vote in 2000	0.852	0.736	0.116** [0.017]	0.848	0.723	0.126** [0.014]	11750
Voted in the 1996 Presidental Election	0.665	0.489	0.177** [0.020]	0.663	0.449	0.214** [0.018]	11740
Voted in Any Election (1998-2000)	0.477	0.384	0.093** [0.020]	0.479	0.337	0.142** [0.017]	11820

* significant at 5%; ** significant at 1%

Standard errors (shown in brackets) are adjusted for clustering at the school level. Variables weighted using the panel weight for the second

through fourth follow-up of the NELS: 88. Sample size for the restricted sample is 7,820.

Table 3.1b
Difference in the Proportion Engaged in Civic Behavior By Enrollment Status at a Four-Year School Immediately after High School

Civic Behavior Two Years after H.S.	Restricted Sample			Full Sample			
	Enrolled Full-Time at a Four-Yr. School	Not Enrolled Full-Time	Diff.	Enrolled Full-Time at a Four-Yr. School	Not Enrolled Full-Time	Diff.	Sample Size
Ever Volunteer (1993-1994)	0.539	0.291	0.248** [0.018]	0.535	0.265	0.270** [0.015]	11910
Volunteered for a Youth Org (1993-1994)	0.154	0.078	0.077** [0.013]	0.144	0.07	0.074** [0.011]	11910
Volunteered for a Poli. Org. (1993-1994)	0.054	0.019	0.035** [0.007]	0.056	0.015	0.042** [0.006]	11910
Registered to Vote in 1994	0.807	0.686	0.120** [0.019]	0.796	0.642	0.153** [0.016]	11900
Voted in the 1992 Presidental Election	0.605	0.463	0.142** [0.020]	0.596	0.402	0.195** [0.017]	11920
Voted in Any Election (1993-1994)	0.412	0.328	0.084** [0.019]	0.394	0.277	0.117** [0.016]	11910

* significant at 5%; ** significant at 1%

Standard errors (shown in brackets) are adjusted for clustering at the school level. Variables weighted using the panel weight for the second

through fourth follow-up of the NELS: 88. Sample size for the restricted sample is 7,820.

102

Table 3.2a
Estimated Marginal Effects of Four-Year College Attendance on Adult Volunteering

Dependent Variable	Ever Volunteered (1999-2000)				
	1	2	3	4	5
Ever Attended a 4-Year School	0.154**	0.141**	0.143**	0.125**	0.143**
	[0.019]	[0.020]	[0.020]	[0.021]	[0.021]
Binary Control Variables					
Standaridized Test Quartiles	No	Yes	Yes	Yes	Yes
Regional Fixed Effects & School Urbanicity	No	No	Yes	Yes	Yes
Individual-Level Controls (Final Follow-up)	No	No	No	No	Yes
High School Civic Behavior & Attitudes					
Ever Volunteered in High School	-	-	-	0.083**	0.080**
	-	-	-	[0.020]	[0.019]
Volunteered Once a Week or More	-	-	-	0.158**	0.169**
	-	-	-	[0.033]	[0.034]
Frequent Religious Activity	-	-	-	0.061**	0.031
	-	-	-	[0.020]	[0.020]
Helping the Community "Very Important"	-	-	-	0.041*	0.031
	-	-	-	[0.020]	[0.019]
Solving Inequality "Very Important"	-	-	-	0.032	0.037
	-	-	-	[0.027]	[0.027]
Sample Size	7820	7820	7820	7230	7220

* significant at 5%; ** significant at 1%

Standard errors (shown in brackets) are adjusted for clustering at the school level. Variables weighted using
the panel weight for the second through fourth follow-up of the NELS: 88. Each probit model includes binary control
variables for gender (1), race(4), birth year(3), religious affiliation (5), parental education (6), family composition(7), and
family income(4). The individual level controls from the final follow-up include the number of dependent children(2),
level of religious activity(1), full-time work status(1), and annual income level(3). Individuals with missing variables
in the final follow-up and among the high school civic behavior variables were dropped in the last two columns.

Table 3.2b
Estimated Marginal Effects of Four-Year College Attendance on Voting

Dependent Variable	Voted in Any Election (1998-2000)				
	1	2	3	4	5
Ever Attended a 4-Year School	0.059**	0.044*	0.051*	0.034	0.028
	[0.021]	[0.021]	[0.021]	[0.022]	[0.023]
Binary Control Variables					
Standaridized Test Quartiles	No	Yes	Yes	Yes	Yes
Regional Fixed Effects & School Urbanicity	No	No	Yes	Yes	Yes
Individual-Level Controls (Final Follow-up)	No	No	No	No	Yes
High School Civic Behavior & Attitudes					
Ever Volunteered in High School	-	-	-	0.094**	0.091**
	-	-	-	[0.021]	[0.021]
Volunteered Once a Week or More	-	-	-	0.063	0.063
	-	-	-	[0.033]	[0.033]
Frequent Religious Activity	-	-	-	-0.004	-0.020
	-	-	-	[0.022]	[0.023]
Helping the Community "Very Important"	-	-	-	-0.006	-0.013
	-	-	-	[0.023]	[0.022]
Solving Inequality "Very Important"	-	-	-	0.048	0.051
	-	-	-	[0.029]	[0.028]
Sample Size	7820	7820	7820	7230	7220

 * significant at 5%; ** significant at 1%

Standard errors (shown in brackets) are adjusted for clustering at the school level. Variables weighted using
the panel weight for the second through fourth follow-up of the NELS: 88. Each probit model includes binary control
variables for gender (1), race(4), birth year(3), religious affiliation (5), parental education (6), family composition(7), and
 family income(4). The individual level controls from the final follow-up include the number of dependent children(2),
 level of religious activity(1), full-time work status(1), and annual income level(3). Individuals with missing variables
in the final follow-up and among the high school civic behavior variables were dropped in the last two columns.

Table 3.3a
Estimated Marginal Effects of Full-Time Enrollment in a Four-Year College After High School

Dependent Variable	Ever Volunteered (1993-1994)			
	1	2	3	4
Enrolled Full-Time in a Four-Year School After H.S.	0.191**	0.167**	0.169**	0.146**
	[0.018]	[0.020]	[0.020]	[0.021]
Binary Control Variables				
Standaridized Test Quartiles	No	Yes	Yes	Yes
Regional Fixed Effects & School Urbanicity	No	No	Yes	Yes
Individual-Level Controls (Final Follow-up)	No	No	No	No
High School Civic Behavior & Attitudes				
Ever Volunteered in High School	-	-	-	0.192**
	-	-	-	[0.020]
Volunteered Once a Week or More	-	-	-	0.149**
	-	-	-	[0.041]
Frequent Religious Activity	-	-	-	0.083**
	-	-	-	[0.022]
Helping the Community "Very Important"	-	-	-	0.088**
	-	-	-	[0.022]
Solving Inequality "Very Important"	-	-	-	0.041
	-	-	-	[0.026]
Sample Size	7820	7820	7820	7230

* significant at 5%; ** significant at 1%

Standard errors (shown in brackets) are adjusted for clustering at the school level. Variables weighted using
the panel weight for the second through fourth follow-up of the NELS: 88. Each probit model includes binary control
variables for gender (1), race(4), birth year(3), religious affiliation (5), parental education (6), family composition(7), and
family income(4). The individual level controls from the final follow-up include the number of dependent children(2),
level of religious activity(1), full-time work status(1), and annual income level(3). Individuals with missing variables
among the high school civic behavior variables were dropped in the last column.

Table 3.3b
Estimated Marginal Effects of Full-Time Enrollment in a Four-Year College After High School

Dependent Variable	Voted in Any Election (1993-1994)			
	1	2	3	4
Enrolled Full-Time in a Four-Year School After H.S.	0.049*	0.045*	0.046*	0.045*
	[0.020]	[0.021]	[0.021]	[0.021]
Binary Control Variables				
Standaridized Test Quartiles	No	Yes	Yes	Yes
Regional Fixed Effects & School Urbanicity	No	No	Yes	Yes
Individual-Level Controls (Final Follow-up)	No	No	No	No
High School Civic Behavior & Attitudes				
Ever Volunteered in High School	-	-	-	0.066**
	-	-	-	[0.020]
Volunteered Once a Week or More	-	-	-	0.033
	-	-	-	[0.027]
Frequent Religious Activity	-	-	-	0.022
	-	-	-	[0.022]
Helping the Community "Very Important"	-	-	-	-0.016
	-	-	-	[0.020]
Solving Inequality "Very Important"	-	-	-	0.040
	-	-	-	[0.040]
Sample Size	7820	7820	7820	7230

* significant at 5%; ** significant at 1%

Standard errors (shown in brackets) are adjusted for clustering at the school level. Variables weighted using the panel weight for the second through fourth follow-up of the NELS: 88. Each probit model includes binary control variables for gender (1), race(4), birth year(3), religious affiliation (5), parental education (6), family composition(7), and family income(4). The individual level controls from the final follow-up include the number of dependent children(2), level of religious activity(1), full-time work status(1), and annual income level(3). Individuals with missing variables among the high school civic behavior variables were dropped in the last column.

Table 3.4a
Estimated Marginal Effects of Full-Time Enrollment in a Four-Year College After High School

Dependent Variable	Ever Volunteered (1999-2000)				
	1	2	3	4	5
Enrolled Full-Time in a Four-Year School After H.S.	0.111**	0.091**	0.094**	0.080**	0.091**
	[0.018]	[0.020]	[0.020]	[0.021]	[0.021]
Binary Control Variables					
Standaridized Test Quartiles	No	Yes	Yes	Yes	Yes
Regional Fixed Effects & School Urbanicity	No	No	Yes	Yes	Yes
Individual-Level Controls (Final Follow-up)	No	No	No	No	Yes
High School Civic Behavior & Attitudes					
Ever Volunteered in High School	-	-	-	0.085**	0.081**
	-	-	-	[0.020]	[0.020]
Volunteered Once a Week or More	-	-	-	0.165**	0.175**
	-	-	-	[0.034]	[0.035]
Frequent Religious Activity	-	-	-	0.065**	0.037
	-	-	-	[0.019]	[0.020]
Helping the Community "Very Important"	-	-	-	0.038	0.028
	-	-	-	[0.020]	[0.020]
Solving Inequality "Very Important"	-	-	-	0.037	0.042
	-	-	-	[0.027]	[0.028]
Sample Size	7820	7820	7820	7230	7220

* significant at 5%; ** significant at 1%

Standard errors (shown in brackets) are adjusted for clustering at the school level. Variables weighted using
the panel weight for the second through fourth follow-up of the NELS: 88. Each probit model includes binary control
variables for gender (1), race(4), birth year(3), religious affiliation (5), parental education (6), family composition(7), and
family income(4). The individual level controls from the final follow-up include the number of dependent children(2),
level of religious activity(1), full-time work status(1), and annual income level(3). Individuals with missing variables
in the final follow-up and among the high school civic behavior variables were dropped in the last two columns.

Table 3.4b
Estimated Marginal Effects of Full-Time Enrollment in a Four-Year College After High School

Dependent Variable	Voted in a Local or State Election (1998-2000)				
	1	2	3	4	5
Enrolled Full-Time in a Four-Year School After H.S.	0.045*	0.030	0.036	0.023	0.016
	[0.019]	[0.020]	[0.020]	[0.021]	[0.022]
Binary Control Variables					
Standaridized Test Quartiles	No	Yes	Yes	Yes	Yes
Regional Fixed Effects & School Urbanicity	No	No	Yes	Yes	Yes
Individual-Level Controls (Final Follow-up)	No	No	No	No	Yes
High School Civic Behavior & Attitudes					
Ever Volunteered in High School	-	-	-	0.094	0.092
	-	-	-	[0.021]	[0.021]
Volunteered Once a Week or More	-	-	-	0.065	0.064
	-	-	-	[0.033]	[0.033]
Frequent Religious Activity	-	-	-	-0.002	-0.019
	-	-	-	[0.023]	[0.023]
Helping the Community "Very Important"	-	-	-	-0.0059	-0.013
	-	-	-	[0.023]	[0.022]
Solving Inequality "Very Important"	-	-	-	0.049	0.052
	-	-	-	[0.029]	[0.028]
Sample Size	7820	7820	7820	7230	7220

* significant at 5%; ** significant at 1%

Standard errors (shown in brackets) are adjusted for clustering at the school level. Variables weighted using
the panel weight for the second through fourth follow-up of the NELS: 88. Each probit model includes binary control
variables for gender (1), race(4), birth year(3), religious affiliation (5), parental education (6), family composition(7), and
family income(4). The individual level controls from the final follow-up include the number of dependent children(2),
level of religious activity(1), full-time work status(1), and annual income level(3). Individuals with missing variables
in the final follow-up and among the high school civic behavior variables were dropped in the last two columns.

Table 3.5
Marginal Effects of Instrumental Variables on Four-Year College Attendance and Enrollment

	Ever Attended a Four-Year School	Enrolled Full-Time in a Four-Year School After H.S.
Instrumental Variables Set #1		
Fraction of Enrollment in a Public Four-Year School	0.251**	0.173**
	[0.070]	[0.058]
Total Number of Institutions	0.006	0.010*
	[0.005]	[0.004]
Instrumental Variables Set #2		
Distance to a Four-Year School	0.0005	-0.0005
	[0.0006]	[0.0006]
Number of Four-Year Schools within 15 miles	0.0007	0.0006
	[0.0005]	[0.0004]
Instrumental Variables Set #3		
Distance to a Two-Year School	0.0014*	0.002*
	[0.0007]	[0.001]
Number of Two-Year Schools within 15 miles	0.001	0.001
	[0.001]	[0.001]
Prob. (Y=1)	0.601	0.306
Sample Size	7820	7820

* significant at 5%; ** significant at 1%

Standard errors (shown in brackets) are adjusted for clustering at the school level. Variables weighted using
the panel weight for the second through fourth follow-up of the NELS: 88. Each probit model includes binary control
variables for gender (1), race (4), birth year(3), religious affiliation (5), parental education (6), family composition(7), and
family income(4). Each probit also includes controls for standardized test scores (12), regional fixed effects(3), and high
school urbanicity(2).

Table 3.6
Estimated Marginal Effect of Instrumental Variables on Other Educational Outcomes in 2000

	H.S. Diploma	Two-Year School	Four-Year School	A.A.	B.A.
Instrumental Variables Set #1					
Fraction of Enrollment in Public Four-Year Schools	-0.005	-0.194**	0.251**	-0.076**	-0.050
	[0.015]	[0.058]	[0.070]	[0.027]	[0.055]
Total Number of Institutions	-0.001	-0.006	0.006	-0.005**	0.007*
	[0.001]	[0.003]	[0.005]	[0.002]	[0.003]
Instrumental Variables Set #2					
Distance to a Four-Year School	0.0001	-0.0002	0.0005	0.0001	0.0006
	[0.0001]	[0.0005]	[0.0006]	[0.0002]	[0.0005]
Number of Four-Year Schools within 15 miles	-0.0001	-0.0003	0.0007	-0.0004	0.0005
	[0.0001]	[0.0003]	[0.0005]	[0.0002]	[0.0004]
Instrumental Variables Set #3					
Distance to a Two-Year School	-0.0001	-0.002**	0.0014*	-0.0004	-0.00001
	[0.0001]	[0.001]	[0.0007]	[0.0003]	[0.00064]
Number of Two-Year Schools within 15 miles	-0.0001	-0.001	0.001	-0.0009**	0.001
	[0.0001]	[0.001]	[0.001]	[0.00033]	[0.001]
Sample Size	7820	7820	7820	7760	7760

* significant at 5%; ** significant at 1%

Standard errors (shown in brackets) are adjusted for clustering at the school level. Variables weighted using
the panel weight for the second through fourth follow-up of the NELS: 88. Each probit model includes binary control
variables for gender (1), race(4), birth year(3), religious affiliation (5), parental education (6), family composition(7), and
family income(4). Each probit also includes controls for standardized test scores (12), regional fixed effects(3), and
high school urbanicity(2).

Table 3.7
Weighted Means of Each Instrumental Variable by Socio-Economic Status Quartiles with a Restricted Sample

	SES Quartile Lowest	SES Quartile 2nd	SES Quartile 3rd	SES Quartile Highest	SES Quartile Missing	Difference High-Low
Instrumental Variables Set #1						
Fraction of Enrollment in Public Four-Year Schools	0.430	0.435	0.419	0.411	0.390	-0.019 [0.011]
Total Number of Institutions	31.53	28.92	26.95	33.35	33.82	1.83 [3.85]
Instrumental Variables Set #2						
Distance to a Four-Year School	12.96	13.00	10.91	9.43	10.74	-3.53** [0.91]
Number of Four-Year Schools within 15 miles	18.09	11.35	10.00	10.98	18.13	-7.11* [3.57]
Instrumental Variables Set #3						
Distance to a Two-Year School	10.73	10.58	9.05	7.99	8.50	-2.74** [0.80]
Number of Two-Year Schools within 15 miles	10.62	7.64	6.88	7.68	11.10	-2.93 [1.86]
Sample Size	1,510	1,770	1,870	1,740	940	3,250

* significant at 5%; ** significant at 1%
Standard errors (shown in brackets) are adjusted for clustering at the school level. Variables weighted using the panel weight for the second
through fourth follow-up of the NELS: 88.

Table 3.8
OLS Regressions of Instrumental Variables on Prior Civic Behavior, Aptitude, and Attitudes

	Activities in High School			History Score	Attitudes During High School	
	Ever Volunteered	Frequent Volunteer	Religious Activity		Solving Inequaltiy	Helping Community
Instrumental Variables Set #1						
Fraction of Enrollment in Public Four-Year Schools	-0.007	-0.013	0.108	5.696	0.002	-0.027
	[0.050]	[0.036]	[0.059]	[74.958]	[0.048]	[0.050]
Total Number of Institutions	-0.002	0.001	0.001	11.593*	0.006	0.007
	[0.004]	[0.003]	[0.004]	[5.398]	[0.003]	[0.004]
Instrumental Variables Set #2						
Distance to a Four-Year School	-0.0001	0.0005	0.0004	-0.799	0.001	0.0003
	[0.0004]	[0.0004]	[0.0005]	[0.708]	[0.0004]	[0.0005]
Number of Four-Year Schools within 15 miles	-0.0004	-0.00003	-0.0003	1.426*	0.001*	0.001*
	[0.0004]	[0.00033]	[0.0004]	[0.621]	[0.0004]	[0.0004]
Instrumental Variables Set #3						
Distance to a Two-Year School	0.0001	0.0005	0.0005	-1.200	0.001*	0.001*
	[0.0005]	[0.0005]	[0.0006]	[1.059]	[0.0006]	[0.0006]
Number of Two-Year Schools within 15 miles	-0.001	-0.0003	-0.0007	2.812*	0.002*	0.002*
	[0.001]	[0.0006]	[0.0008]	[1.172]	[0.001]	[0.001]
Sample Size	7700	7380	7400	6540	7760	7770

* significant at 5%; ** significant at 1%

Standard errors (shown in brackets) are adjusted for clustering at the school level. Variables weighted using the panel weight for the second through fourth follow-up of the NELS: 88. Each probit model includes binary control variables for gender (1), race(4), birth year(3), religious affiliation (5), parental education (6), family composition(7), and family income(4). Each probit also includes controls for standardized test scores (12), regional fixed effects(3), and high school urbanicity(2).

Table 3.9
Marginal Effects from the Probit and Biprobit Models on the Effect of Four-Year School Attendance on Civic Behavior

	Probit Estimates	Biprobit Estimates
Model 1		
Ever Volunteered (1999-2000)	0.143**	-0.010
	[0.021]	[0.065]
Volunteered for a Youth Org. (1999-2000)	0.093**	-0.055
	[0.017]	[0.065]
Volunteered for a Civic Org. (1999-2000)	0.096**	0.027
	[0.018]	[0.047]
Registered to Vote in 2000	0.079**	0.060
	[0.018]	[0.060]
Voted in the 1996 Presidental Election	0.079**	0.139*
	[0.023]	[0.071]
Voted in Any Election (1998-2000)	0.028	0.142**
	[0.023]	[0.048]
Model 2		
Ever Volunteered (1999-2000)	0.143**	-0.009
	[0.021]	[0.064]
Volunteered for a Youth Org. (1999-2000)	0.093**	-0.060
	[0.017]	[0.065]
Volunteered for a Civic Org. (1999-2000)	0.096**	0.019
	[0.018]	[0.047]
Registered to Vote in 2000	0.079**	0.052
	[0.018]	[0.058]
Voted in the 1996 Presidental Election	0.079**	0.135*
	[0.023]	[0.072]
Voted in Any Election (1998-2000)	0.028	0.133**
	[0.023]	[0.049]

 * significant at 5%; ** significant at 1%

Standard errors (shown in brackets) are adjusted for clustering at the school level. Variables weighted using
the panel weight for the second through fourth follow-up of the NELS: 88. Each probit model includes binary control
variables for gender (1), race(4), birth year(3), religious affiliation (5), parental education (6), family composition(7), and
family income(4). Each probit also includes controls for standardized test scores (12), regional fixed effects(3), and
high school urbanicity(2). Model 1 uses only one instrumental variable (enrollment), while Model 2 uses two.

Table 3.10a
Biprobit Results on the Effect of Immediate Four-Year School Enrollment on Civic Behavior

Civic Behavior Two Years After High School	Probit Estimates	Biprobit Estimates
Model 1		
Ever Volunteer (1993-1994)	0.146**	0.078**
	[0.021]	[0.026]
Volunteered for a Youth Org. (1993-1994)	0.044**	0.003
	[0.012]	[0.014]
Volunteered for a Political Org. (1993-1994)	0.018**	-0.012
	[0.005]	[0.012]
Registered to Vote in 1994	0.067**	0.081
	[0.021]	[0.051]
Voted in the 1992 Presidental Election	0.019	-0.015
	[0.022]	[0.052]
Voted in Any Election (1993-1994)	0.045*	-0.020
	[0.021]	[0.030]
Model 2		
Ever Volunteer (1993-1994)	0.146**	0.070*
	[0.021]	[0.028]
Volunteered for a Youth Org. (1993-1994)	0.044**	-0.006
	[0.012]	[0.017]
Volunteered for a Political Org. (1993-1994)	0.018**	-0.012
	[0.005]	[0.011]
Registered to Vote in 1994	0.067**	0.023
	[0.021]	[0.059]
Voted in the 1992 Presidental Election	0.019	-0.0658
	[0.022]	[0.046]
Voted in Any Election (1993-1994)	0.045*	-0.025
	[0.021]	[0.029]

* significant at 5%; ** significant at 1%

Standard errors (shown in brackets) are adjusted for clustering at the school level. Variables weighted using the panel weight for the second through fourth follow-up of the NELS: 88. Each probit model includes binary control variables for gender (1), birth year(3), religious affiliation (5), parental education (6), family composition(7), and family income(4). Each probit also includes controls for standardized test scores (12), regional fixed effects(3), and high school urbanicity(2). Model 1 uses only one instrumental variable (enrollment), while Model 2 uses two.

Table 3.10b
Biprobit Results on the Effect of Immediate Four-Year School Enrollment on Civic Behavior

Civic Behavior Eight Years After High School	Probit Estimates	Biprobit Estimates
Model 1		
Ever Volunteered (1999-2000)	0.091**	0.091**
	[0.021]	[0.019]
Volunteered for a Youth Org. (1999-2000)	0.044*	0.051**
	[0.017]	[0.015]
Volunteered for a Civic Org. (1999-2000)	0.084**	0.047*
	[0.017]	[0.021]
Registered to Vote in 2000	0.024	0.035
	[0.015]	[0.061]
Voted in the 1996 Presidental Election	0.023	-0.030
	[0.023]	[0.044]
Voted in Any Election (1998-2000)	0.016	0.038
	[0.022]	[0.035]
Model 2		
Ever Volunteered (1999-2000)	0.091**	0.087**
	[0.021]	[0.020]
Volunteered for a Youth Org. (1999-2000)	0.044*	0.049**
	[0.017]	[0.016]
Volunteered for a Civic Org. (1999-2000)	0.084**	0.034
	[0.017]	[0.029]
Registered to Vote in 2000	0.024	0.023
	[0.015]	[0.044]
Voted in the 1996 Presidental Election	0.023	-0.033
	[0.023]	[0.039]
Voted in Any Election (1998-2000)	0.016	0.027
	[0.022]	[0.035]

 * significant at 5%; ** significant at 1%
Standard errors (shown in brackets) are adjusted for clustering at the school level. Variables weighted using
the panel weight for the second through fourth follow-up of the NELS: 88. Each probit model includes binary control
variables for gender (1), birth year(3), religious affiliation (5), parental education (6), family composition(7), and
family income(4). Each probit also includes controls for standardized test scores (12), regional fixed effects(3), and
high school urbanicity(2). Model 1 uses only one instrumental variable (enrollment), while Model 2 uses two.

Appendix A: Marginal Effects of School-Sponsored Service Programs on Civic Behavior and Attitudes During High School

Dependent Variables *(Reported in 12th Grade)*	Ever Volunteered (10th-12th Grade)	Helping Community Very Important	Solving Inequality Very Important
Level of Participation in School-Sponsored Community Service			
"Mandatory" Program (75-100% participation)	0.099***	-0.035	-0.013
	[0.028]	[0.022]	[0.019]
"High Level" Program (25-74% participation)	0.013	-0.013	0.044***
	[0.020]	[0.015]	[0.015]
"Low Level" Program (0-24% participation)	0.005	-0.028	-0.019
	[0.016]	[0.015]	[0.012]
Missing Program Information	0.006	-0.016	0.003
	[0.020]	[0.019]	[0.016]
Selected Control Variables			
Highest Quartile in Standardized Math Test	0.123***	-0.094***	-0.076***
	[0.021]	[0.021]	[0.015]
Highest Quartile in Standardized Reading Test	0.162***	-0.030	0.051***
	[0.021]	[0.022]	[0.017]
At Least One Parent Has a Bachelor's Degree	0.125***	0.038	-0.005
	[0.027]	[0.029]	[0.021]
Ever Worked Outside the Home During High School	-0.007	-0.024	-0.010
	[0.016]	[0.016]	[0.012]
Pr(outcome)	0.638	0.412	0.183
F-test (β "manditory" – β "high level" = 0)	*8.36*	*1.02*	*8.13*
(P-Score)	(0.004)	(0.313)	(0.005)

* significant at 10%; ** significant at 5%; *** significant at 1%

Standard errors are in brackets and adjusted for clustering at the school-level. Each regression includes controls for gender, race, family composition, parental education, household income, parent's religious affiliation, binary variables for standardized test quartiles in math and reading, high school type, high school urbanicity, Census division, level of involvement in extra-curricular activities, and work experience during high school. Each regression is weighted using the panel weight for the base-year through first follow-up. The sample is limited to repsondents who were in the 12th grade in 2004 and had complete information about their civic behavior outcomes during high school (high school sample). The total sample size is 12,970.

Appendix B: Marginal Effects of School-Sponsored Service Programs on Civic Behavior Two Years After High School

Dependent Variables	Ever Volunteered After High School	Voted in a State or Local Election	Voted in the Presidential Election
School-Sponsored Community Service Program Type			
"Mandatory" Program (75-100% participation)	0.061**	0.028	0.012
	[0.028]	[0.024]	[0.025]
"High Level" Program (25-74% participation)	0.023	0.019	0.019
	[0.018]	[0.019]	[0.020]
"Low Level" Program (0-24% participation)	0.021	0.014	0.013
	[0.016]	[0.016]	[0.017]
Missing Program Information	-0.019	0.007	0.008
	[0.019]	[0.023]	[0.025]
Selected Control Variables			
Highest Quartile in Standardized Math Test	0.063**	-0.011	0.003
	[0.026]	[0.025]	[0.024]
Enrolled into a Four-Year College Following High School	0.205***	0.119***	0.115
	[0.022]	[0.021]	[0.021]
Enrolled in College Out of State	0.068***	-0.072***	-0.082***
	[0.019]	[0.018]	[0.019]
Has One or More Children	-0.080***	-0.052**	-0.043*
	[0.024]	[0.024]	[0.024]
Pr(outcome)	0.440	0.522	0.549
F-test (β "manditory" – β "high level" = 0)	2.180	0.140	0.110
(P-Score)	(0.141)	(0.704)	(0.744)

* significant at 10%; ** significant at 5%; *** significant at 1%

Standard errors are in brackets and adjusted for clustering at the school-level. Each regression includes controls for gender, race, family composition, parental education, household income, parent's religious affiliation, binary variables for standardized test quartiles in math and reading, high school type, high school urbanicity, Census division, number of children, post-secondary enrollment decision, and out of state college enrollment. Each regression is weighted using the panel weight for the base-year through second follow-up. The sample is limited to respondents who were in the 12th grade in 2004 and had complete information about their civic behavior outcomes 2 years after high school (post-high school sample). The total sample size is 11,630.

Appendix C: Estimated Coefficients from a Probit Model Predicting the Probabilty of Exposure to a Mandatory Service Program

Dependent Variables	Ever Exposed to a "Mandatory" Program	Ever Exposed to a "Mandatory" Program
Selected Control Variables	Coeficient	Coeficient
Private School (Catholic)	1.403***	1.434***
	[0.069]	[0.065]
Private School (Other)	0.988***	1.002***
	[0.073]	[0.069]
Suburban School	-0.312***	-0.294***
	[0.046]	[0.043]
Rural School	-0.505***	-0.491***
	[0.081]	[0.076]
Highest Teacher Salary is above the Mean	-0.252***	-0.191***
	[0.060]	[0.057]
Lowest Teacher Salary is above the Mean	0.310***	0.298***
	[0.058]	[0.055]
# of Full Time Teachers is above the Mean	-0.525***	-0.538***
	[0.069]	[0.064]
% Receiving Free Lunch is above the Mean	-0.601***	-0.591***
	[0.066]	[0.062]
School Enrollment Level is above the Mean	0.284***	0.287***
	[0.074]	[0.069]
% Enrolled in College Prep. is above the Mean	0.095*	0.067
	[0.058]	[0.054]
Psuedo R-squared	0.3152	0.3144
Sample Size	10060	11220

* significant at 10%; ** significant at 5%; *** significant at 1%

Standard errors are in brackets and are adjusted for cluster at the school-level. Each probit regression also include dummy variables for census divisions and binary variables indicating missing information. Only observations with complete information about the type of school-sponsored service program.

Appendix D:

Below is the summary of all of the variables used in the estimation for both the restricted and unrestricted sample from the NELS: 88. The restricted sample is comprised of individuals with complete information about civic behavior outcomes and educational outcomes. In addition, all respondents in the restricted sample attended a high school that could be linked to the Common Core of Data. One key difference between these samples is that the restricted sample is completely made up of individuals who attended a public high school.

Entire Summary Statistics from the Restricted and Unrestricted Samples of the NELS: 88

	Restricted Sample		Unrestricted Sample	
	Weighted Mean	Sample Size	Weighted Mean	Sample Size
Civic Behavior Outcomes				
Ever Volunteered (1999-2000)	0.342	7820	0.323	11910
Volunteered for a Youth Org. (1999-2000)	0.211	7820	0.196	11910
Volunteered for a Civic Org. (1999-2000)	0.223	7820	0.207	11910
Registered to Vote in 2000	0.802	7820	0.785	11820
Voted in the 1996 Presidental Election	0.588	7820	0.554	11810
Voted in Any Election (1998-2000)	0.436	7820	0.407	11890
Ever Volunteer (1993-1994)	0.379	7820	0.348	12000
Volunteered for a Youth Org. (1993-1994)	0.105	7820	0.093	12000
Volunteered for a Poli. Org. (1993-1994)	0.032	7820	0.028	12000
Registered to Vote in 1994	0.729	7820	0.69	11990
Voted in the 1992 Presidental Election	0.513	7820	0.462	12010
Voted in Any Election (1993-1994)	0.357	7820	0.313	12000
Educational Outcomes				
Enrolled Full-Time in a Four-Year School After H.S.	0.353	7820	0.305	12040
Ever Attended a Four-Year School	0.563	7820	0.491	12060
High School Diploma	0.958	7820	0.824	12130
Bachelor's Degree	0.329	7760	0.287	12020
Associate's Degree	0.079	7760	0.066	12020
Controls for Prior Civic Behavior				
Ever Volunteered in High School (1990-1992)	0.37	7700	0.374	10590
Frequent Volunteer During High School	0.097	7380	0.109	9990
Solving Inequality "Very Important"	0.194	7760	0.205	10700
Helping in the Community "Very Important"	0.313	7770	0.333	10720
Frequent Religious Activity During High School	0.32	7400	0.315	10030
School-Level Controls				
Public High School	1.000	7820	0.869	12140
Private High School	0.000	7820	0.082	12140
High School Type Missing	0.000	7820	0.049	12140
Urban School	0.231	7820	0.29	12140
Suburban School	0.424	7820	0.401	11680
Rural School	0.345	7820	0.309	11680
Region: Northeast	0.193	7820	0.193	11680
Region: Midwest	0.261	7820	0.25	11680
Region: South	0.355	7820	0.362	11680
Region: West	0.19	7820	0.196	11680

Appendix D (cont.):

Individual-Level Controls				
Female	0.527	7820	0.524	12140
Hispanic	0.11	7820	0.119	12140
Black	0.126	7820	0.123	12140
White	0.721	7820	0.689	12140
Missing Race	0.005	7820	0.027	12140
Asian/Pacific Islander or Native American	0.037	7820	0.043	12140
Birthyear: 1975 or greater	0.008	7820	0.01	12140
Birthyear: 1974	0.634	7820	0.58	12140
Birthyear: 1973 or earlier	0.327	7820	0.36	12140
Birthyear: Missing	0.031	7820	0.051	12140
No Religion	0.086	7820	0.085	12140
Jewish	0.016	7820	0.02	12140
Catholic	0.212	7820	0.22	12140
Protestant	0.443	7820	0.399	12140
Religion Missing	0.091	7820	0.126	12140
Other Religion	0.051	7820	0.052	12140
Family Characteristics in High School				
Family Composition: Mother & Father	0.561	7820	0.507	12140
Family Composition: Mother & Other Male	0.099	7820	0.106	12140
Family Composition: Other Female & Father	0.019	7820	0.02	12140
Family Composition: Other Female and Male Family	0.011	7820	0.013	12140
Family Composition: Mother Only	0.134	7820	0.147	12140
Family Composition: Father Only	0.019	7820	0.025	12140
Family Composition: Independent Teen	0.011	7820	0.03	12140
Family Composition: Unknown	0.146	7820	0.152	12140
Parent 's Education: Did not Finish H.S.	0.079	7820	0.106	12140
Parent's Education: H.S. Graduate	0.179	7820	0.195	12140
Parent's Education: Some College	0.377	7820	0.361	12140
Parent's Education: College Graduate	0.149	7820	0.136	12140
Parent's Education: M.A. or Equivalent	0.081	7820	0.077	12140
Parent's Education: Ph.D., M.D., or Equivalent	0.033	7820	0.035	12140
Parent's Education: Unknown	0.102	7820	0.091	12140
Parental Income: Highest Quartile	0.098	7820	0.098	12140
Parental Income: 3rd Quartile	0.186	7820	0.165	12140
Parental Income: 2nd Quartile	0.12	7820	0.121	12140
Parental Income: Lowest Quartile	0.248	7820	0.278	12140
Parental Income: Unknown	0.173	7820	0.174	12140
Standardized Test Scores				
History Test Score: Lowest Quartile	0.171	7820	0.171	12140
History Test Score: 2nd Quartile	0.211	7820	0.176	12140
History Test Score: 3rd Quartile	0.223	7820	0.183	12140
History Test Score: Highest Quartile	0.231	7820	0.189	12140
History Test Score: Unknown	0.165	7820	0.281	12140
Reading Test Score: Lowest Quartile	0.187	7820	0.168	12140
Reading Test Score: 2nd Quartile	0.198	7820	0.179	12140
Reading Test Score: 3rd Quartile	0.233	7820	0.192	12140
Reading Test Score: Highest Quartile	0.224	7820	0.187	12140
Reading Test Score: Unknown	0.158	7820	0.274	12140
Math Test Score: Lowest Quartile	0.171	7820	0.17	12140
Math Test Score: 2nd Quartile	0.209	7820	0.185	12140
Math Test Score: 3rd Quartile	0.228	7820	0.178	12140
Math Test Score: Highest Quartile	0.236	7820	0.195	12140
Math Test Score: Unknown	0.156	7820	0.273	12140
Individual-Level Controls in 2000				
Yearly Income of Resondent in 2000	24.851	7360	24.159	11290
Worked Full-Time in 2000	0.793	7820	0.764	12140
Family Size in 2000	1.798	7820	1.917	11910

Variables weighted using f4f2pnwt, the panel weight for the second through fourth follow-up of the NELS: 88.

REFERENCES

Acemoglu, D., & Angrist, J. (1999). How large are the social returns to education? Evidence from compulsory schooling laws. *NBER Working Paper* #7444.

Acemoglu, D., Johnson, S., Robinson, J.A., & Yard, P. (2005). From education to democracy? *American Economic Review, 95*(2), 44-49.

American Council on Education. (2004, September). *Debt Burden: Repaying Student Debt* (Issue Brief). Washington, DC: Author.

Benabou, R., & Tirole, J. (2006). Incentives and prosocial behavior. *American Economic Review, 96*(5), 1652-1678.

Boyte, H., & Hollander, E. (1999). Wingspread Declaration on Renewing the Civic Mission of the American Research University. Proceedings of the Wingspread Conference. Racine, WI: University of Michigan Center for Community Service and Learning.

Bureau of Labor Statistics. (2002). *Volunteering in the United States* (USDL 02-686). Washington D.C.: U.S. Department of Labor. Available at http://www.bls.gov/cps.

California Legislative Analyst Office (2002, May 7). Community service requirements for high school pupils. *Fiscal Analysis Initiatives.* Retrieved on March 1, 2009, from http://www.lao.ca.gov/ballot/2002/020329_INT.htm.

Card, D. (1995). Using geographical variation in college proximity to estimate the returns to schooling. In L.N. Christofides et al. (Eds.), *Aspects of Labour Market Behavior: Essays in Honor of John Vanderkamp*. Toronto, ON: University of Toronto Press.

Card, D. (1999). The causal effect of education on earnings. In O. Ashenfelter & D. Card (Eds.), *Handbook of Labor Economics:* Vol. 3A. Amsterdam: Elsevier, 1999.

Carnegie Foundation for the Advancement of Teaching. (2010) *Carnegie Classifications Data File*. Internet: www.carnegiefoundation.org. Accessed: 24 February 2010.

Corporation for National and Community Service (2007). *The Impact of Service Learning: A Review of Current Research*. Washington DC: Author. Retrieved July 1, 2009 from http://www.nationalservice.gov/pdf/07_0224_issuebrief_servicelearning.pdf.

Curtin, T.R., Ingels, S.J., Wu, S., & Heuer, R.. (2002). *User's Manual: NELS:88 Base-Year to Fourth Follow-up: Student Component Data File* (NCES 2002-323). U.S. Department of Education, National Center for Education Statistics. Washington, DC: U.S. Government Printing Office.

Day, K. M., & Devlin, R. A. (1998). The payoff to work without pay: Volunteer work as an investment in human capital. *Canadian Journal of Economics, 31*(5), 1179.

Dee, T. S. (2003). The effects of catholic schooling on civic behavior. *International Tax and Public Finance,* 12(5), 605-625.

Dee, T. S. (2004). Are there civic returns to education? *Journal of Public Economics, 88,* 1697-1720.

Dunick, J. (2010). All Work and No Pay: The Impact of College Selectivity on Volunteerism among High School Students in the NELS and ELS Cohorts. Working paper.

Dunick, J. (2010). Teaching altruism: Do mandatory community service programs in high school promote civic engagement later in life? Working paper.

Education Commission of the States. (2009). *Recent State Policies/Activities Service Learning/Community Service*. Retrieved on July 1, 2009 from http://www.ecs.org.

Freeman, R. B. (1997). Working for nothing: The supply of volunteer labor. *Journal of Labor Economics, 15*(1), S140-166.

Gibson, J. (2001). Unobservable family effects and the apparent external benefit of education. *Economics of Education Review*, 20 (3), 225-233.

Goldin, C., & Katz, L. (2007). The race between education and technology: The evolution of U.S. wage differentials, 1890 to 2005. NBER Working Paper #12984.

Govekar, P. L., & Govekar, M. A. (2002). Using economic theory and research to better understand volunteer behavior. *Nonprofit Management and Leadership, 13*(1), 33-48.

Hackl, F., Halla, M., & Pruckner, G. J. (2007). Volunteering and income: The fallacy of the good samaritan? *Kyklos, 60*(1), 77-104.

Hart, D., Donnelly, T., Youniss, J., & Atkins, R. (2007). High school community service as a predictor of adult voting and volunteering. *American Educational Research Journal,* 44(1), 197-219.

Henderson, A., Brown, S.D., Pancer, S.M., & Ellis-Hale, K. (2007). Mandated community service in high school and subsequent civic engagement: The case of the "double cohort" in Ontario, Canada. *Journal of Adolescence and Youth,* 36(7), 849-860.

Hoxby, C. M. (1997). How the changing market structure of U.S. higher education explains college tuition. NBER Working Paper #6362.

Huang, J., Maassen van den Brink, H., & Groot, W. (2009). A meta-analysis of the effect of education on social capital. *Economics of Education Review, 28*(4), 454-464.

Ingels, S.J., Curtin, T.R., Kaufman, P., Alt, M.N., Chen, X., Owings, J. (2002). *Coming of Age in the 1990s: The Eighth-Grade Class of 1988 12 Years Later. Initial Results from the Fourth Follow-Up to the National Educational Longitudinal Study of 1988. Statistical Analysis Report.* (NCES 2002-321). U.S. Department of Education, National Center for Education Statistics. Washington, DC: U.S. Government Printing Office.

Ingels, S.J., Pratt, D.J., Rogers, J.E., Siegel, P.H., & Stutts, E.S.. (2005) *Education Longitudinal Study of 2002/2004: Base-Year to First Follow-up Data File Documentation* (NCES 2006-344). U.S. Department of Education, National Center for Education Statistics. Washington, DC: U.S. Government Printing Office.

Ingels, S. J., Pratt, D.J., Wilson, D., Burns, L. J., Currivan, D., Rogers, J. E., Hubbard-Bednasz, S. (2007). Education Longitudinal Study of 2002 (ELS:2002) Base-Year to Second Follow-up Public Use Data File Documentation. U.S. Department of Education, National Center for Education Statistics. Washington, DC: U.S. Government Printing Office.

Jones, F. (2000). Youth volunteering on the rise. *Perspectives on Labour and Income, 12* (1), 36-42.

Kielsmeier, J.C., Scales, P.C., Roehlkepartain, E.C., & Neal, M. (2004). Community service and service learning in public schools. *Reclaiming Children & Youth,* 13(3), 138-143.

Kling, J. R. (2001). Interpreting Instrumental Variables Estimates of the Returns to Schooling. *Journal of Business & Economics Statistics*, 19, 358-364.

Lopez, M. H., & Brown, B. (2006). Civic Engagement among 2-year and 4-year College Students: CIRCLE.

Lopez, M.H. & Marcelo, M.B. (2007). Volunteering among young people. Fact Sheet. *The Center for Information & Research on Civic Learning & Engagement (CIRCLE).*

Menchick, P.L. and Weisbrod, B.A. (1987). Volunteer labor supply. *Journal of Public Economics*, 32, 159-183.

Metz, E., & Younnis, J. (2003). A demonstration that school-based required service does not deter—but heightens—volunteerism. *Political Science and Politics,* 36(2), 281-286.

Metz, E., & Younnis, J. (2005). Longitudinal gains in civic development through school-based required service. *Political Psychology,* 26(3), 413-437.

Milligan, K., Moretti, E., & Oreopoulos, P. (2004). Does education improve citizenship? Evidence from the United States and the United Kingdom. *Journal of Public Economics,* 88, 1667-1669.

Moretti, E. (2003) Human Capital Externalities in Cities. NBER Working Paper #W9641.

Moretti, E. & Lochner L. (2004). The Effect of Education on Criminal Activity: Evidence from Prison Inmates, Arrests and Self-Reports" *American Economic Review* 94(1), 2004.

Niemi, R. G., Hepburn, M.A., & Chapman, C. (2000). Community service by high school students: A cure for civic ills? *Political Behavior,* 22(1), 45-69.

Pascarella, E. T., & et al. (1988). The Influence of College on Humanitarian/Civic Involvement Values. *Journal of Higher Education, 59*(4), 412.

Pascarella, E.T. & Terenzini P.T. (2005). *How College Affects Students.* San Francisco, CA: Jossey-Bass.

Persell, C. H., & Wenglinsky, H. (2004). For-profit post-secondary education and civic engagement. *Higher Education,* 47, 337-359.

Quenqua, D. (2008, November 26). Good deeds: The backlash. *New York Times*. Retrieved March 1, 2009, from http://www.nytimes.com.

Reynolds, L. (2008). Where to attend? Estimating the effects of beginning at a two-year college. Paper presented at the annual meeting of American Education Finance Association, Denver, CO.

RMC Research Corporation (2008). *State and School District Policy in K-12 Service-Learning.* Scotts Valley, CA: Learn and Serve America's National Service-Learning Clearinghouse. Retreived on July 1, 2009 from http://www.servicelearning.org.

Sax, L. J. et al. (1995). *The American Freshman: National Norms for Fall 1995*. Los Angeles, CA: Higher Education Research Institute UCLA.

Schiff, J. (1990). *Charitable Giving and Government Policy: An Economic Analysis.* New York: Greenwood Press.

Skinner, R. & Chapman, C. (1999). Service-learning and community service in K-12 public schools. U.S. Department of Education: National Center for Education Statistics.

Spring, K., Grimm, R., & Dietz, N. (2005). *Educating for Active Citizenship: Service-Learning, School-Based Service, and Youth Civic Engagement.* Washington DC: Corporation for National and Community Service, Office of Research and Policy Development. Retrieved July 1, 2009 from http://www.nationalservice.gov/pdf/06_0323_SL_briefing.pdf.

Spring, K., Grimm, R., & Dietz, N. (2008). *Community Service and Service-Learning in America's Schools*. Washington DC: Corporation for National and Community Service, Office of Research and Policy Development. Retrieved July 1, 2009 from http://www.nationalservice.gov/pdf/08_1112_lsa_prevalence.pdf .

U.S. Census Bureau (2000). *Resident Population Estimates of the United States by Age and Sex: April 1, 1990 to July 1, 1999.* Washington DC: Population Estimates Program.

U.S. Census Bureau (2009). *Resident Population Estimates of the United States by Age and Sex: April 1, 2000 to July 1, 2008.* Washington DC: Population Estimates Program.

U.S. Dept. of Education, National Center for Education Statistics (1992). Common Core of Data: Public School Universe Data, 1991-1992 [Computer file]. 2nd ICPSR version. Washington, DC: U.S. Dept. of Education, National Center for Education Statistics [producer]. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor], 1999.

The Office of the President Elect. (2008). *Agenda: Service.* Retrieved on July 1, 2009 from http://change.gov/agenda/service_agenda.

Vaillancourt, F. and Payette, M. (1986). The supply of volunteer work: The case of Canada. *Candian Journal of Economics,* 15, 45-56.

Warburton, J., & Smith, J. (2003). Out of the generosity of your heart: Are we creating active citizens through compulsory volunteer programmes for young people in Australia? *Social Policy & Administration,* 37(7)7, 772-786.

Wooldridge, J. M. (2002). *Econometric Analysis of Cross Section and Panel Data*. Cambridge, MA: MIT Press.

Yoruk, B. K. (2008). The power of asking in volunteering: Evidence from a matched sample. *Economics Letters,* 99(1), 79-84.

Youth Services Bureau (2003). *Celebrating America's Youth: The Facts are Positive*. U.S. Department of Health and Human Services. Washington D.C.: National Clearinghouse on Families and Youth.