ABSTRACT

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Volunteer activity is an important part of the lives of Americans. This dissertation uses economic analysis to study volunteering. The first essay examines the impact of mandated service on public school students in Maryland. Proponents of mandates note that individual volunteer activity is correlated over time, and therefore argue that mandates will create lifetime volunteers. Prior studies demonstrate that the observed characteristics of volunteers are different from nonvolunteers. Thus, it is possible that unobserved characteristics drive the correlation in service over time and the policy will not increase future service. Using restricted-access data from the Monitoring the Future project, I find mandates increased volunteering among eighth-grade students. However, by the twelfth grade, I find the law had at best no impact on volunteer activity, and in some specifications it reduced volunteering. In contrast to creating lifelong volunteers, my results suggest that the mandate changed the timing of volunteering, but did not alter overall volunteering among affected students.

The second essay examines the impact of survey nonresponse on inferences about volunteer behavior. Time use diaries are a key source of data on volunteering, though they typically have a high nonresponse rate. Since participation in surveys and volunteering are likely influenced by the same qualities, nonresponse bias may distort estimates of volunteering. A random subsample of individuals appears in both the Current Population Survey (CPS) September Volunteer Supplement and the American Time Use Survey (ATUS). As such, we can compare the reported volunteering (as found in the CPS) for ATUS respondents to that of nonrespondents in order to uncover the impact of unobservable differences. We find higher levels of volunteer activity among ATUS survey respondents than nonrespondents, differences that persist across narrowly-defined demographic groups. Using regression analysis, with annual hours spent volunteering as the dependent variable, we control for the observable characteristics available in the data and compare the results found using the full sample to the respondents-only sample. Although the signs on the coefficient estimates are generally consistent across the samples, the size of the estimates varies in magnitude, indicating that nonresponse bias continues to exist.

ESSAYS ON VOLUNTEERING

By

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Chapter 1: Introduction

In the United States, 28.8 percent of individuals report participating in volunteer activity in the last year. This corresponds to approximately 65.4 million adult Americans involved in formal volunteering, with the median number of hours invested annually equal to 50.[1] As far back as the 1800s, Alexis de Tocqueville noted

> "Americans of all ages, all stations of life, and all types of dispositions are forever forming associations… Americans combine to give fetes, found seminaries, build churches, distribute books, and send missionaries to the antipodes. Hospitals, prisons, and schools take shape in that way." (*Democracy in America,* 1835-1840)

In his early visit to America, de Tocqueville witnessed firsthand evidence of *social capital*, a term used across disciplines to capture the interconnectedness and trust level of a society. Robert Putnam sparked mainstream interest in social capital with his book, *Bowling Alone* (2000), in which he examines the evolution and devolution of social capital in America. He summarizes the nature of social capital as "connections among individuals—social networks and the norms of reciprocity and trustworthiness that arise from them" (p. 19).

An integral piece of social capital is civic engagement. Social scientists use the term *civic engagement* to describe an individual's level of interaction with and awareness of the world. Generally speaking, civic engagement includes two components which often overlap. One component includes participation in the political process, for example, voter turnout and civic and political knowledge. The other component centers on the connectedness of an individual with his community, for example, volunteer

[1] Estimates from Bureau of Labor Statistics (2005).

activity and membership in community groups.[2] While there have been economic studies of social capital and civic engagement,[3] there is a lack of substantial work on volunteering in particular. This dissertation applies economic analysis to the study of volunteering.

Volunteerism is "the performance of formal service to benefit others or one's community without receiving any external rewards."[4] Volunteer activity is defined in large part by the lack of monetary compensation. Even with the lack of pecuniary benefits, millions of Americans report volunteering. Opportunities abound for individuals intent on serving, through well-known organizations such as Habitat for Humanity, CityYear, and the Special Olympics, all of which depend on the volunteer work of ordinary citizens.

Moreover, voluntary contributions offer an alternative way to support the provision of public goods, those goods that are nonrival and nonexcludable in consumption. Most often, taxes come to mind when considering the provision of public goods. Households also have the option to give voluntarily, and can choose between donating money and/or time. Though many early studies focus on monetary contributions to public good provision (Bernheim (1986), for example), more recent work expands the scope to include donations of time as well. Instead of a monetary gift to aid the provision of the public good, individuals provide in-kind service—they serve meals at a soup kitchen instead of writing a check in support of the organization. There are

[2] Examples based on research by the Center for Information and Research on Civic Learning and Engagement (CIRCLE), School of Public Policy, University of Maryland, at http://www.civicyouth.org

[3] See, for example, Dee (2003, 2005), DiPasquale and Glaeser (2000), Costa and Kahn (2003), Helliwell and Putnam (1995), and Helliwell (2005) for a sampling. Durlauf and Fafchamps (2004) provides a substantial review and critique of existing literature addressing social capital.

[4] Source: National Service-Learning Clearinghouse (n.d.), found at http://servicelearning.org.

several economic papers that examine the tradeoff between the donation of time versus money in charitable giving, philanthropy, and religious participation. For examples, see Freeman (1987), Duncan (1999), and Gruber (2004).

One key concern with public good provision—the free rider problem—may also affect volunteering. In fact, Freeman (1987) directly links volunteering to public goods, and the potential for free riders:

> "Volunteering and other charitable activity that people do largely when asked are 'conscience goods': public goods to which people give time or money because they recognize the moral case for doing so and for which they feel social pressure to undertake when asked, but whose provision they would just as soon let someone else do." (p. S141)

This dissertation focuses on the measurement of volunteering (the giving of time), and the impact of mandates on this time donation by teenagers. By better understanding volunteer activity, we will gain insight into the decision-making of individuals with respect to this key component of charitable giving.

In Chapter 2, I evaluate the impact of mandated service in public schools. Historically, only private schools required volunteer activity of their students. Since many private schools are sectarian, they intend to develop in students a concern for others.[5] In recent years, public schools began instituting service requirements.

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[5] One recent economics paper (Dee, 2005) approaches the civic engagement and private schooling issue from another angle. He examines the impact of private Catholic schooling on civic engagement, to test whether they have a detrimental impact. Since a major goal of public schools is to develop good citizens, it is possible that private, religious schools will not accomplish the indoctrination goal of education as effectively. He finds mixed results; Catholic school students are more likely to vote, yet not to volunteer.

Beginning with the graduating class of 1997, Maryland public students had to complete locally-designed service programs that included both community service and service-learning activities. Proposals similar to the Maryland law are now being considered in Illinois and school districts in New York, New Jersey, and Massachusetts, among others. Proponents of legislation like the Maryland program note that individual volunteer activity is highly correlated over time and therefore, the hope is that students who volunteer at a young age will become lifetime volunteers. Previous literature demonstrates that the observed characteristics of students who volunteer are very different from those who do not. Therefore, it is possible that unobserved characteristics drive the correlation in service over time and the policy will not increase future service.

Using data from the Monitoring the Future surveys for 1991 through 2003, I evaluate the impact of the mandate of community service activity on eighth- and twelfth-grade students in Maryland. I find a robust, statistically significant, positive policy impact on all measures of volunteer activity among eighth-grade students. However, by the twelfth grade, I find the law has at best no impact on volunteering activity, and in some specifications, I find the law reduced volunteering. In contrast to the goal of creating lifelong volunteers, my results are consistent with the hypothesis that the mandate did not alter overall volunteer activity among affected students, but instead changed the timing of that activity.

Through an understanding of the impact of mandated service on public school students in this particular case, policymakers and educators can improve upon the design of the program in Maryland. With limited education budgets, knowing the impact such a resource-intensive policy might have on students is essential to making efficient

decisions. Since previous work does not utilize a quasi-experimental framework, the results found therein are limited in their contribution to the understanding the impact of volunteering programs on students.

The persistent economic concern with correlation versus causation cannot be addressed without careful studies. Many prior studies on volunteering confuse the two and attribute causation when only correlation has been established. An exogenous change is needed to begin to untangle the relationship. The Maryland program provides the opportunity to complete such a study.

In Chapter 3, coauthored with Katharine Abraham and Stanley Presser, we examine the impact of survey nonresponse on inferences about volunteer behavior. Since the same qualities that would lead a person to respond to a survey (i.e., voluntarily giving time and attention to something from which he will not personally benefit) likely influence that same person's decision to volunteer, we posit that estimates of volunteer activity are biased upward. The nonresponse bias exaggerates involvement in volunteering in the general population.

Due to sampling procedures, a random subsample of individuals who were selected for the Current Population Survey (CPS) September Volunteer Supplement was also selected for the American Time Use Survey (ATUS) in the following year. We find that reported volunteering is higher in the ATUS compared to the CPS, but the response rate is much lower in the ATUS. Due to the sampling procedure, we can compare the reported volunteer activity (as found in the CPS) for individuals who complete an ATUS survey to those who are nonrespondents. The unique relationship between the CPS and ATUS provide the opportunity to exploit additional, typically unobservable information

about individuals selected for a survey. We identify individuals who answered the CPS but did not complete the ATUS survey, and compare their volunteer outcomes to individuals who answered both surveys.

Our results suggest that the unobserved characteristics that help determine an individual's decision to take part in a voluntary survey may also factor into the individual's decision to volunteer. Survey respondents are more likely to volunteer, and have higher average hours of volunteering than nonrespondents. These differences persist across narrowly-defined demographic groups. Since no observable characteristics are capable of eliminating the differences between respondents and nonrespondents, re-weighting the data to account for nonresponse cannot correct the upward bias in the estimates.

In order to determine whether unobservable characteristics could be responsible for the discrepancy, we turn to regression analysis. We compare the results from using the full overlap sample (including both respondents and nonrespondents) to results from using respondents only. Since the typical ATUS user will not have access to nonrespondents, we can infer the impact of nonresponse bias by comparing results from the two samples. We utilize the Tobit censored regression model, and subsequently the two-part model, to examine the implications of the nonresponse bias in the multivariate framework. We aim to illuminate potential problems with the use of the ATUS in the study of volunteering. We find that the marginal effects of household and personal characteristics are generally similar in sign for the entire CPS-ATUS sample (including both ATUS respondents and nonrespondents) compared to the ATUS-respondent sample. However, many of the characteristics that influence an individual's propensity to respond

to the survey have coefficients that vary in magnitude between the two samples considered. This implies that the estimates obtained by the typical ATUS user are subject to nonresponse bias.

Chapter 3 contributes to the existing literature on both volunteering and on survey methodology. Estimates of volunteer activity vary widely depending on the dataset used. One Independent Sector survey reports that 67 percent of 16-year-olds volunteer, National Center for Education Statistics surveys generally come in lower, at 45-61 percent for teenagers, and Current Population Survey estimates are lower still, at 30 percent for teenagers.[6] Researchers who study volunteering look to use the estimate which most accurately reflects the true level of volunteering. Our research method allows us to cross-check volunteering estimates from two different surveys, using the same sample. Our results are promising, since the estimates from the two surveys are consistent when we limit the calculation to identical samples.

We are also able to address the deeper methodological issue of survey nonresponse bias in estimates of volunteer activity. Previous studies find that with most survey topics, nonresponse bias does not have a significant impact on estimates.[7] However, since the traits that impact an individual's decision to volunteer are also those that influence his likelihood of answering a voluntary survey, special consideration should be extended to surveys of volunteer activity. We compare estimates of volunteering from a time-diary survey (the ATUS) to a questionnaire on volunteering (the CPS), and find similarities between the answers individuals give in the two surveys. However, overall survey nonresponse biases estimates of volunteer participation upward,

[6] See Table 2-1 for more information.

[7] For example, see Keeter et al. (2000), Curtin, Presser and Singer (2000), and Merkle and Edelman (2002).

since volunteers are more likely to participate in the time-diary survey. The direction of the influence of various demographic characteristics are consistent regardless of the sample used, though the size of the coefficients vary for some.

There are few empirical analyses of volunteering using the economic approach, though the topic has been studied by several related social sciences. Studies in sociology, psychology, education, and public policy have a more lengthy history in the study of volunteering. The application of economic analysis to the study of volunteer activity expands our understanding of volunteering and survey methodology.

Chapter 2: Involuntary Volunteering: The Impact of Mandated Service in Public Schools

2.1. Introduction:

Growing in popularity over the last fifteen years, community service activities are not only encouraged of middle and high school students, but are a graduation requirement at an ever-increasing number of public high schools (Kleiner and Chapman, 1999). For example, the state of Maryland and the cities of Philadelphia, Chicago, Atlanta, Cincinnati, and Washington, DC, have mandatory service components of their public high school graduation requirements (Andersen and Murphy, 1999). While long a part of private and religious school requisites, the movement toward such policies in public schools is a recent trend.

The debate over such policies has spread from the local school board and Parent-Teacher Association meetings, to the courts. In two court cases, the Washington, DC-based Institute for Justice helped individual students and their families sue the public school systems imposing service requirements—in New York, the case of Immediato v. Rye Neck School District (1996; Docket No. 95-7237), and in North Carolina, the case of Herndon v. Chapel Hill-Carrboro City (1996; Docket No. 95-2525). In both cases, district courts and the US Circuit Court of Appeals ruled that the requirements were not a violation of the 'involuntary servitude' amendment of the Constitution, but that they are consistent with the goals associated with educating tomorrow's citizens (Hall (1996); Pines (1996); Saslow (1994)).

Currently, there are a number of states and smaller public school districts considering similar graduation requirements, including Illinois and districts in New York, New Jersey, and Massachusetts. The proposed programs vary in terms of implementation—some require all of the activity to be extracurricular, while others place the emphasis on classroom programs centered on service learning. Regardless of program structure, one goal of these policies is to increase civic involvement and community awareness among the nation's teenagers. The civic engagement of today's youth has been studied extensively, particularly following Robert Putnam's *Bowling Alone* (2000). Many view service requirements as a tool to boost Putnam's idea of social capital, the idea that "connections among individuals—social networks and the norms of reciprocity and trustworthiness that arise from them— " enable society to be more efficient (p. 19, 21). Furthermore, many proponents argue that mandated service leads to improved educational outcomes.

This study investigates whether mandatory service impacts a student's propensity to volunteer. Using restricted-access data, I consider the impact of Maryland's service requirement on the volunteering behavior of public school students in Maryland. The Maryland mandate provides an exogenous change in the factors that influence a student's decision to allocate time to service activity.

Earlier studies show that students who volunteer are generally more successful in school, more involved in extracurricular activities both at school and in the community, more informed about the news and the world, better connected to their families, and engage in fewer risky behaviors (Keeter, et al. (2002); Niemi and Chapman (1998); Kirby (2001); Fiske (2001)). Other studies find that earlier involvement in community service

is associated with future involvement; that is, high school students who volunteer grow into adults who volunteer (Planty and Regnier (2003)). It is unclear whether the correlation in volunteer activity over time is because of some underlying characteristic—perhaps compassion or generosity—or because the earlier volunteering exposed them to the benefits of volunteering. My study may help distinguish between the effect of underlying characteristics of individuals choosing to volunteer, and the effect of the volunteering in and of itself. Because I focus on mandatory service, I am able to avoid a common pitfall of studies on community service—the population now volunteering is not just a group of especially motivated and caring students.

I find that the service mandate in Maryland increased the level of volunteering among eighth-grade students subject to the requirement. In contrast, I find that there is no evidence of a positive impact on affected twelfth-grade students. At best, there is no effect, and in several specifications, I find the mandate reduced volunteering among twelfth-grade students.

In the sections that follow, I outline previous work and describe this study. In Section 2.2, I discuss prior work on community service and volunteerism. Section 2.3 describes the Maryland service requirement. Section 2.4 outlines the model used, Section 2.5 describes the data, and Section 2.6 presents the results. Section 2.7 discusses the results, acknowledges the limitations of this study, and concludes.

2.2. Mandated volunteer service

While there are many definitions for 'service-learning,' 'volunteerism' and 'community service,' I will use the definitions from the National Service-Learning Clearinghouse.

> Volunteerism is "the performance of formal service to benefit others or one's community without receiving any external rewards; such programs may or may not involve structured training and reflection."
>
> "Community Service is volunteerism that occurs in the community--action taken to meet the needs of others and better the community as a whole."
>
> "Service-learning combines service objectives with learning objectives with the intent that the activity change both the recipient and the provider of the service. This is accomplished by combining service tasks with structured opportunities that link the task to self-reflection, self-discovery, and the acquisition and comprehension of values, skills, and knowledge content."
>
> (Source: http://servicelearning.org (n.d.))

For example, community service includes environmental cleanups, building and renovating houses, working in soup kitchens, or helping with a religious youth group. Service learning includes writing about the service activity, talking about it in a classroom or group setting, making a poster presentation about the project, and more.

In part due to a lack of consensus on the definition of volunteering, estimates of youths' participation in community service vary widely across surveys. Table 2-1 lists the estimates from surveys most commonly used in the study of volunteering among young people.

The profiles of volunteers are consistent across studies. Adult volunteer rates are higher among whites, females, and those with a college education, married and with children, employed full-time, and those who attend religious services at least once a week (BLS (2003); Keeter, et al. (2002)). Among teenagers, volunteering rates are higher

among females, those who attend religious services regularly, participate in school organizations, earn high grades, and those from homes where a parent volunteers (Metz and Youniss (2003); Nolin, et al. (1997); Planty and Regnier (2003)). Students working part-time also volunteer at higher rates than students who do not work, suggesting that some people are simply more active than others (Nolin, et al. (1997)).

Some have used the descriptive information presented above as argument for mandatory service requirements. The suggested benefits range from feeling good about oneself, to being more attached to one's community, to the better educational outcomes correlated with service. Proponents argue that if volunteering has a causal impact on outcomes, then mandating service can enable the entire youth population to garner the benefits. One group of researchers point out that the appropriate level of school involvement in service activities depends on the objective of the exercise. Requirements may address a lack of motivation, whereas school coordination may simply lower the cost of being involved or remove barriers to youth involvement (Nolin, et al. (1997)). The results of one study seem to support the latter, as school arrangement of service activities appears to encourage more volunteerism than simply requiring a minimum level of service (Nolin, et al. (1997)). Further, many believe focusing on the youth will target expenditures toward a group that is in the formative stages of adolescence (Nolin, et al. (1997); Youniss, McLellan and Yates (1997)).

In one political science study, researchers found that a requirement enacted in one Boston-area public school led to higher levels of volunteer activity, extending beyond the mandated hours. Further, they found that those students deemed "less-inclined" to

volunteer were more likely to expect to volunteer in the future, while there was no effect on those "more-inclined" to volunteer (Metz and Youniss (2003)).

While the data are clear that students with higher grades provide more volunteer work, it is difficult to conclude that this relationship is causal. It is plausible that these correlations can simply reflect the non-random selection of students into volunteer activity; that is, the students most likely to take part in service activities are those that have an underlying drive that also leads them to participate in other extracurricular activities. If this is the case, the lure of mandatory service is diminished.

Not only may there be underlying differences among individuals, but the individual schools that require volunteer activity of their students also may differ from schools that do not mandate service. Currently, the vast majority of public schools arrange service for their students, though only about one-fifth require it. These proportions have risen over time (see Table 2-2). In a mail survey conducted by the National Center for Education Statistics, 64 percent of responding public primary and secondary schools reported student participation in 'community service activities recognized by and/or arranged through the school' (Skinner and Chapman (1999)). From the NCES survey, it is apparent that there are differences between schools that organize community service for their students and those that do not. In schools where less than 50 percent of the population qualified for free or reduced-price lunch, the school was more likely to report student involvement in community service activities, when compared to schools with more than 50 percent of students eligible for the lunch program (Skinner and Chapman (1999)).

Though service mandates are a contentious issue, there are clear differences between individuals who support volunteer requirements and those who do not. A national survey shows that as age rises from 15 years to 25 years, favorable views toward mandatory service requirements rise monotonically, from 32 percent to 49 percent. Furthermore, those with more political knowledge, and those who consider themselves educationally successful are more likely to favor mandatory volunteering (Lopez (2002)).

Volunteer activity is only recently the topic of research, largely in psychology, human development, political science and public policy. Resounding throughout the extant economics literature is the lack of substantial, high-quality, quantitative work on the issue of mandated service and the civic engagement of youths—both on the impact of mandated service on current and future volunteering behavior, and on the impact of service—voluntary or mandated—on educational and behavioral outcomes.

Evaluating the effect of a mandatory volunteering program can help to disentangle which outcomes result from the service activity itself, and which outcomes are a consequence of the underlying differences between volunteer and non-volunteer students.

2.3 The Maryland Service Requirement

Maryland is currently the only state that requires all public school students to complete a minimum amount of service activity as a requisite for high school graduation. In 1992, the Maryland State Legislature approved a measure which mandated that beginning with the high school graduating class of 1997, all Maryland public school students would be obliged to complete service activities in order to graduate. Students must perform 75 hours of community service and service learning to meet diploma

requirements, or complete a different requirement specified by the local school board and approved by the state superintendent of schools (COMAR (1992)).[8] In Maryland, local school districts are formed at the county level.[9] Each of the 24 districts (23 counties plus Baltimore City) chose to implement its own service requirement. While there are differences between the counties' programs, there are common components to all. For example, each district includes both community service and service learning in the requirement. The number of hours spent completing requirements in the classroom varies across districts, as does the number of hours required in service activities outside the classroom. Only five of the 24 districts keep track of service hours completed independently of course curriculum, while the other nineteen districts infuse the requirement in its entirety into coursework.[10] In nearly every district, hours are fulfilled by the time students complete the tenth grade (MSSA (n.d.)). See Table 2-3 for more information on each school district's implementation of the policy.

The Maryland requirement was not unilaterally supported by the school districts. In 1992, all 24 district school boards and 22 of 24 superintendents in the state opposed the measure.[11] Districts may have simply been reflecting what parents and students felt about the program. Several quotes from local papers demonstrate the public's reception of the policy:

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[8] See Appendix A for more detailed information on the timeline of the Maryland policy.

[9] See Figure 2-1 for a map of Maryland counties. See Appendix A for a listing of Maryland counties by public school enrollment.

[10] For example, many of the districts incorporate the service requirement into science classes, requiring students to complete projects relating to preservation of the Chesapeake Bay. Also common are projects in ninth or eleventh grade government courses that help students meet the requirement. Many districts also offer courses which focus entirely on service-learning.

[11] Litvan, L. M. (1992, July 30). "Schools mandate service; Volunteer work must for diploma," *The Washington Times*, A1.

- "What we have so far is a well-intentioned mess that varies dramatically from school to school, and even from teacher to teacher."[12]
- According to one county's student school board member, "students lie about the activities they've done, and parents sign off on them."[13]
- One student received credit for his work on the crew of a school theater production. His thoughts: "I don't know how they really twisted it, but they gave me [service] credit. It's a joke."[14]

Given the controversy surrounding the policy, economic analysis can help determine the impact of the policy, and address some of the criticisms of the policy.

2.4 Model

I used a difference-in-difference model to examine the impact of the Maryland mandatory service requirement. Specifically, I compared the volunteer activity of Maryland students before and after the policy was put into effect to the activity of non-Maryland students before and after the policy. I used state and year fixed effects to control for general time trends and persistent differences across states, and allowed the standard errors of individual states to be correlated across time. The use of data from other states is crucial in this analysis. If I were to simply compare volunteer activity among Maryland youth before and after the policy began, I risk attributing program impacts to general trends in volunteer activity over time. In fact, volunteer activity shows a slight general upward trend in much of the country during my period of analysis. The

[12] Editor. (1994, June 19). "School community service program sinks into chaos." *The Capital*, A10.

[13] Gross, L. (1996, February 11). "Community service requirement not working in assembly." *The Capital (Annapolis, Maryland)*, D1.

[14] Perlstein, L. (1999, June 28). "'Serving the community'—without leaving school." *The Washington Post*, A01.

model implicitly assumes that the trends in the comparison states are the trends that would have occurred in Maryland absent the passage of the mandatory service requirement. Although I cannot test this hypothesis directly, a graphical analysis presented below indicates that pretreatment levels and trends in service activity in Maryland look similar to values in the comparison states.

I will estimate models separately for each grade. Within a grade, data varies across students (indexed by i) and state (j) and year (t). The basic within-grade model can be characterized by the following equation:

$$Y_{ijt} = \alpha * POST(G)_{ijt} * MD_{ijt} + \beta * X_{ijt} + u_i + v_t + \varepsilon_{it}$$

where Y is a measure of service, X is a vector of individual characteristics, u and v are state and year effects, respectively, and ε is a random error. The impact of the law is measured by the parameter α which is the coefficient on the interaction term for a Maryland dummy variable and a year dummy variable that equals 1 in years when the students from grade (G) are subject to the service requirement. The dependent variable, Y_{ijt}, is one of three dichotomous measures of participation in service activity. The reported coefficients are the result of linear probability regression models.[15]

The first cohort subject to the 1992 service mandate was the graduating class of 1997. For students in grade G = 12 – T,

POST(G) = 1 in (1997 – T) and subsequent years.

To evaluate the impact of Maryland's mandatory service requirement requires a dataset that spans the years before and after law went into effect, has a sizeable number of Maryland students, and a sufficient number of students from other states to use as a

[15] I also used a probit model for each specification. The probit results are consistent with the linear probability results.

comparison group. These requirements are met in restricted-use versions of the Monitoring the Future study run by the Institute for Social Research at the University of Michigan.

2.5 Data

Monitoring the Future: A Continuing Study of the Lifestyles and Values of Youth (MTF) is a yearly survey of eighth, tenth and twelfth grade students. MTF is a multi-stage, nationally-representative survey of all high school students. In the first stage of the survey, regions are selected according to population. In the second stage, schools are weighted according to population, and then specific schools are drawn at random using the weights. Finally, within each school, particular classrooms are selected. No more than 350 students are sampled in any one school; if fewer than 350 students attend a particular school, generally all students are surveyed.

The study began in 1975 as a survey of high school seniors, and in 1991 surveys of eighth- and tenth-grade students were added. There are typically six versions of the survey administered to twelfth grade students in any given year, and two to three forms given to the eighth and tenth grade students. Each survey, regardless of form number, asks standard questions on demographic information and alcohol, cigarette, and drug use. Community service questions appear on two of the six surveys given to seniors, and on about half of the surveys given to the younger students. Each year, about 16,000 twelfth-grade students are surveyed, as are 17,000 tenth-grade students and 18,000 eighth-grade students.

The MTF data are available publicly, but the public-use data do not have all identifying demographic variables. In particular, and important for my analysis, the state

identifier is missing from the public data. Through a remote-access data agreement, I was able to utilize this geographic information for this study.[16] The nature of the remote-access data agreement had implications for my study. After receiving approval for access to the restricted-use data, I sent a list of the variables necessary for my analysis to an Institute for Social Research analyst, Mr. Timothy Perry. He constructed my dataset, and returned to me a data dictionary. Using the dictionary (but not the data), I created the code for my analysis. I sent Mr. Perry my computer code files, he would run them on the dataset created for me and return the results in text files. Thus, at all stages of the analysis I was forced to carefully consider how to best proceed. In addition, I made decisions at various points in the research process that would maximize the return on each interaction with ISR.[17]

The MTF surveys ask students a series of questions about time usage and items about involvement in community service activities are part of this battery. The question reads: "The next questions ask about the kinds of things you might do. How often do you do each of the following?" with such activities as "go to the movies," "go to rock concerts," and many others. For my study, I examined the activity "Participate in community affairs or do volunteer work." The possible answers given include "never," "few times a year," "once or twice a month," "once a week," and "near daily."

I transformed the responses to these questions into three dichotomous variables which are the key outcomes in this study:

[16] The MTF design does not sample at the state level (rather at the regional level), and thus their data do not comprise a representative sample of Maryland. In addition, the data from year to year may shift in its degree of representativeness of the state of Maryland because different schools are selected. This is discussed further in section 2-7.

[17] The data agreement was a major factor in my decision to proceed with and report the linear regression model instead of the probit model in my analysis.

Volunteered at least a few times a year

Volunteered at least once a month

Volunteered at least once a week

Given the way I have constructed these variables, a student can respond affirmatively to all three variables. These three volunteer measures were regressed against a consistent set of right-hand side variables. The explanatory variables included in the X vector are those that regularly show correlations with volunteer participation in previous studies. Specifically, I control for race, sex, age, parental education, household composition, and three variables to describe the religiosity of the student. The religiosity variables measure three dimensions: religious affiliation of the student, frequency of participation in religious services, and the importance the student places on religion in his/her life. The means for these control variables are found in Table 2-4.

Using three dependent variables enables me to examine the impact of the policy on both the extensive and intensive margins of involvement in volunteer activity. For example, I note in Table 2-5 that in the nationally-representative twelfth-grade MTF data from 1991 through 2003, 71.8 percent of students reported volunteer activity at least a few times a year, 28.9 percent reported doing community service at least monthly, and 11.7 percent reported doing the activity at least weekly. For tenth-grade students, the percentages were 68.4 percent, 27.3 percent, and 10.2 percent, for at least yearly, monthly, and weekly involvement, respectively. The eighth-grade students reported involvement of 65.0 percent, 25.9 percent, and 9.8 percent, respectively.

By comparing the service activity of Maryland students over time to students in other states, one can begin to get a sense of the program's impact. As will be

corroborated in regression analysis, there appears to be a positive policy impact among eighth-grade students. Figures 2-2a, 2-2b, and 2-2c report time plots of the percent of public eighth-grade students reporting service activity in each year, comparing Maryland students' responses to the rest of the country. Figure 2-2a shows the percentage of students who reported volunteering at least a few times a year, Figure 2-2b, those who reported volunteering at least monthly, and Figure 2-2c, those who reported volunteering at least weekly.

The treatment year for eighth-grade students is 1993, as shown in the figures. In all three figures, the volunteer rate of Maryland students hovers around national volunteer rates in the pre-treatment years. However, in all three cases, the post-program years show higher levels of volunteer involvement compared to the rest of the nation's eighth-grade students, peaking in 1997.

Though I intended to include an analysis using tenth-grade students, the tenth-grade data are not sufficient to evaluate the policy. From 1995 through 1998, no Maryland public school tenth-grade students received the relevant survey. Figures 2-3a, 2-3b, and 2-3c show participation rates, comparing rates for tenth-grade students in Maryland, with tenth-grade students in the rest of the country. The first class subject to the policy was in the tenth grade in 1995. Though hindered by sample limitations, Figures 2-3a and 2-3b show volunteer rates for Maryland students before 1995 close to or below the national rate, but higher than the national rate in the first two post-program years available in the data (1999 and 2000). Due to the insufficiency of data on tenth-grade students in public schools in Maryland, no further results for this group are reported.

Among twelfth-grade public school students, there is no evidence of a policy effect among Maryland students. See Figures 2-4a, 2-4b, and 2-4c for the corresponding time plots for twelfth-grade students. The first class subject to the service mandate was in the twelfth grade in 1997. The volunteer rates of Maryland twelfth-grade students do not show clear patterns when comparing pre- and post-treatment years.

2.6 Results

A. Eighth-grade results

Figures 2-2a, 2-2b, and 2-2c suggest that there was an increase in volunteer activity among eighth-grade students in the years after the Maryland requirement went into effect. I corroborate the pattern found in the figures by comparing the volunteer rates of Maryland and non-Maryland students before and after the policy began. All of the following results exclude students from private and Catholic schools. These samples were insufficient for meaningful analysis. The results of the difference-in-difference calculations are found in Table 2-6. As seen in the table, there is evidence of a robust, positive policy impact on all levels of volunteer involvement among eighth-grade students in Maryland. The imposition of the service requirement coincides with increased participation in all levels of service activity involvement among eighth-grade students. The tables show that the rise in the volunteer activity participation rates for the eighth-grade students in Maryland outpaced the rise in the national rates.

The linear probability regression models corroborate these results. In Appendix B, Table 2-B.1 presents the full results of the linear probability regressions when the full sample was used, and when the model was run separately for males and females. Each

column of Table 2-B.1 shows the results from using participation in service activities at least a few times in the past year as the dependent variable. In this regression, whether using the full sample of public students, or running the models separately for males and females, there is a positive, statistically significant treatment effect. After the program was enacted in Maryland, participation in service activities rose by 7.23 percentage points.

In all permutations of the model, the left-out groups were students who were male, white, Protestant, above 14 years of age,[18] and living in two-parent households; whose most highly-educated parent completed high school; who do not attend religious services at least monthly; and who reported that religion was somewhat or very important. As seen in Appendix B, Table 2-B.1, white students are more likely to volunteer, as are females. Living with only one parent is correlated with lower participation in volunteer activity. The negative impact is larger when the mother is absent, compared to when the father is absent. Compared to students whose most-educated parent completed high school, those students whose parent did not complete high school were less likely to volunteer (with a stronger negative effect on females). On the other hand, having a parent with a college degree or higher boosted the likelihood that the student participated in service activities over students whose parents were high school completers.

The strongest predictor of volunteer activity is the frequency of religious service attendance. Regular participants in religious services (defined as those attending services at least monthly) were close to twelve percentage points more likely to participate in

[18] For the twelfth-grade models, the left-out age group includes those above 18 years old.

service activities, which implies that regular religious participants are more than fifteen percent more likely to volunteer than their less religiously active classmates.

In addition to running the model on the full sample of public students, then separately for males and females, I ran the model using three alternative sets of comparison states. The three limited-comparison groups were chosen using different criteria. In nearly every case, the results did not substantially change when using the six different samples.

- The geographic sample contains comparison states that are geographically similar. The sample includes states that match Maryland in terms of location; it consists of all states in the middle Atlantic and south Atlantic regions of the US. The comparison sample is comprised of New York, New Jersey, Pennsylvania, Washington, DC, Virginia, West Virginia, and North Carolina.
- The demographic sample includes states that matched Maryland's fiscal and demographic characteristics as found in the Statistical Abstract of the United States (1996). This sample consists of Connecticut, Illinois, Massachusetts, Oregon, Rhode Island, and Virginia.
- The civic sample is comprised of states that were chosen according to volunteering levels in the state as reported in the Current Population Survey's September Volunteer Supplements of 2002 and 2003. These states include Indiana, Connecticut, Missouri, Kentucky, Mississippi, Vermont, Washington, Arizona, Michigan, Ohio, Pennsylvania, and Washington, DC.

For more information about the limited comparison groups, see Appendix C.

The models were repeated using these smaller samples in order to check the sensitivity of the results. Regardless of the sample used, I found a positive treatment effect for eighth-grade students on participation in service activities at least a few times a year. In Table 2-7, I report the treatment effect for identical models run with the six different samples.[19] The treatment effect ranged from 5.6 to 7.8 percentage points, depending on the sample used.

The treatment effect remains positive when using at least monthly participation in service activities as the dependent variable, as seen in Table 2-8. Among all public school students, the policy increased monthly volunteering by 3.97 percentage points. Full results are shown in Appendix B, Table 2-B.2. Parental education and household composition continue to operate in the expected manner, but race becomes less important. The religious variables continue to be the main story of the demographic characteristics, as they exert a strong positive influence on regular service activity.

As with the first set of models, the results are not sensitive to the use of alternative samples. All but one of the treatment effects are positive and statistically different from zero, with the only exception found when the demographic sample is used. The specifications with a positive, statistically-significant treatment effect had impacts that ranged from 2.1 to 5.1 percentage points.

The final reported model using the eighth-grade survey evaluated changes in the proportion of students reporting weekly participation in service activities. The results are shown in Table 2-9. As was true for the previous two measures of volunteer activity for eighth-grade students, I estimate that the mandatory service requirement generated a

[19] The six samples are: all public students; female public students; male public students; public students in the geographical sample; public students in the demographic sample; and public students in the civic sample.

positive and statistically significant impact on weekly volunteer activity. Among all public school students, the policy is estimated to have increased weekly volunteer activity by 3.57 percentage points. The sign of the coefficient on the race dummy variables changes with this last measure of volunteer activity, as does the size of the coefficients on the household characteristics.[20] The religiosity measures maintain their significance, in the direction expected.

Repeating the regression with the various samples yields an outcome similar to the previous volunteer measure. The positive program impact holds for all but one specification—when the demographic sample is used. The statistically-significant policy impact on the weekly volunteering of Maryland students ranged from 2.7 to 4.2 percentage points.

The three measures of volunteer activity all show positive policy impacts, and the analysis is not sensitive to the use of alternative samples. The impact of the service mandate on the volunteer activity of eighth-grade students in Maryland is robust, statistically significant, and positive.

B. Twelfth Grade Results

The calculations and models that were used in evaluating the impact of mandated volunteering on eighth-grade students are repeated using the twelfth-grade student data. The difference-in-difference calculations for twelfth-grade students are found in Table 2-6. There is no evidence of a positive policy impact on any of the three dichotomous

[20] Black students, though less likely to volunteer at least a few times last year, were more likely to volunteer at least weekly. Only those from the most highly-educated households are still impacted positively, while lower levels of household education are indistinguishable from one another.

measures of involvement in volunteer activity; rather, if there is any impact, it is negative. Linear probability regression analysis supports these results.

The linear probability regression models that follow are similar in form to the models used with the eighth-grade data. The only difference is that the twelfth-grade models include in the demographic controls a set of dummy variables to control for the student's number of siblings.

The model that uses participation in service activity at least a few times in the past year as the dependent variable shows a policy impact statistically indistinguishable from zero for twelfth-grade students. See Appendix B, Table 2-B.4 for the full linear probability regression results. As found using the eighth-grade surveys, the twelfth-grade students more likely to participate in service activities at least a few times a year were females, whites, students with more highly-educated parents, students living in a household with both parents, and students placing greater importance on religion. Students not living with their mother are impacted more negatively than those living with only their father. The strongest predictor of volunteer activity is the frequency of religious service attendance. Regular participants in religious services (defined as those attending services at least monthly) were about 14 percentage points more likely to participate in service activities, which implies that regular religious participants are close to 25 percent times more likely to volunteer than their less religiously active classmates. Moreover, students who place importance on religion in their own lives are more likely to participate in volunteer activities than students who report that religion is of little or no importance—on an order similar to that found in the parental education measures.

The model is repeated using the six samples as formulated for the eighth-grade student data. The impact of the policy on the likelihood a student volunteered at least a few times in the last year is found to be insignificantly different from zero for all six samples. What is striking about the results for twelfth graders is the fact that not only is the impact of the policy on overall service activity statistically insignificant, but the coefficients are miniscule. The impact of the policy, about one percentage point, is smaller than any other factor controlled for in the regression.

A different pattern emerges when volunteering at least monthly is used as the dependent variable. When there is a statistically-significant program impact, it is negative. The full results are found in Appendix B, Table 2-B.5. One interesting result is that the coefficient on regular religious participation actually increases though the likelihood of volunteering at least monthly is much lower than volunteering at least a few times in the year. Another remarkable contrast is the coefficient on the race measure—black males are not significantly different from white males when it comes to participating in any service activity, but are more likely to be regular volunteers.

I repeated the linear models using the six different samples. As seen in Table 2-11, except for the males-only regression, there is a statistically-significant, negative program impact. The effect is particularly large for the females-only regression. The only non-negative policy impact on at least monthly volunteer activity is found in the males-only regression, which had an impact statistically indistinguishable from zero.

Finally, I repeated the analysis using at least weekly participation in service activities as the dependent variable. The full results are reported in Appendix B, Table 2-B.6. The coefficients on the demographic controls generally mimic the results seen when

at least monthly volunteering is the dependent variable. One difference is that black students are more likely to participate in service activities at least weekly than are white students—whether male, female, or the combined group.

Table 2-12 displays the results from conducting the linear regression on the six samples. Mimicking the results for at least monthly volunteering, the program impact is negative for all specifications other than males-only, which shows a positive impact.

The impact of the service mandate on the volunteer activity of twelfth-grade students in Maryland is at best zero, and in many cases, is negative. The results are not sensitive to the use of alternative samples.

Out of concern that fluctuations in demographic characteristics across years drove my results, I conducted a number of specification checks. In addition to the community service question, the MTF survey also asks students about other uses of their time, such as going to the movies, spending time with friends, and participating in sports. The MTF survey asks all of the time-use questions in the same portion of the questionnaire and the answer possibilities are identical. I constructed binary measures that mimic the volunteering variables used in my analysis. Thus, for each of the activities included in the time-use section of the MTF survey, I created a measure indicating participation at all, a measure for participation at least monthly, and a measure for participation at least weekly. The means for these measures for eighth and twelfth grade students are reported in Table 2-13.

The volunteer mandate implemented in 1993 should not necessarily influence students' participation in other activities. While detailed measurements of these activities might show substitution across different uses of students' time, the measures I use are

aggregated to the extent that this does not seem problematic. For example, if I had information in the detail found in time diaries, additional/fewer hours spent in volunteer activity would necessarily change time spent in other activities; the MTF survey does not ask that level of detail. More importantly, if mandates increase volunteer activity, it should not be the case that mandates increase these activities unless they are complimentary to volunteerism. The treatment effect (Maryland * Post) should not be statistically different from zero. As seen in tables 2-14 and 2-15, displaying the specification checks for the eighth-grade and twelfth-grade students, respectively, such is not the case. While the twelfth-grade results do not cast doubt on my conclusions, the eighth-grade checks are troubling. Nearly every alternative measure is statistically significant in the eighth-grade data, though different activities display different signs. We would expect false positives at least 5% of the time but the persistence in statistically significant results across all activities suggests that maybe there is something about the sample that is driving the results.

Given the outcomes I find for the two grades, the specification checks conducted with alternative uses of students' time do not appear to threaten some of the major conclusions of the study. On the one hand, the results for the eighth grade introduce some reservations. However, the eighth-grade volunteering outcomes were positive in terms of their policy impact. In other words, at the least, the alternate time use regressions indicate that some caution is necessary when interpreting the positive outcomes I find. On the other hand, the twelfth-grade volunteering results were likely the more controversial, as they found that the policy either did not have an impact, or that it had a negative influence on students' volunteer activity. The twelfth-grade specification

checks have fewer "policy effects" than found in the eighth-grade models. Furthermore, only two of the other time uses (going to parties and spending leisure time alone) have more than one measure that is significant at the 99.0% level of confidence or higher. Together, these results do not undermine the twelfth-grade results.

2.7 Discussion and Conclusion

There were several reasons to expect a positive policy impact among twelfth-grade students. First, if students waited until the last minute to complete their requirement, there should be an increase in service activities among twelfth-grade students after the policy began. Second, if the policy exposed students to service activities and their merits, then regardless of the timing of the completion of the requirement, I expected to see an increase in the participation of service activities. This follows much of the education and human development literature that claims that if students are forced to participate in service activities, they will learn to appreciate the activities, leading to greater intentions to volunteer in the future, even after the service requirement is met (Nolin, et al. (1997); Zaff and Michelsen (2002); Planty and Regnier (2003); Stukas, Snyder and Clary (1999); Metz and Youniss (2003)). Even so, some studies suggest that mandatory volunteer activity is not associated with the same positive impacts on future volunteer activity (Planty and Regnier (2003). Third, some studies suggest that student involvement in service activities is hampered by a lack of information (Nolin, et al. (1997); Youniss, McLellan and Yates (1997)). When schools become involved in service opportunities, the costs associated with participation decline as students no longer have to seek out opportunities on their own, but instead can use the school's contacts to take part in service activities.

I consider a few explanations for my zero to negative policy effects on twelfth-grade students. One possible explanation is a theory that has been put forth in social psychology, called reactance theory (Brehm (1966)) which suggests that when individuals are forced to do something, the actual or perceived unfair loss of freedom leads to a negative reaction. The individual will rebel against the rule and, when possible, will take the opposite action in order to reassert his freedom and control. In other words, because the high school students are forced into service activities as part of their graduation requirements, they will volunteer less once the requirement is fulfilled, rebelling against the mandate and having been forced to do it in the first place.

One final theory counters that it is not that the policy actually reduces volunteer involvement, but rather that it changes the timing of the activity. Suppose a high school student knows that it is important to have service activities as part of her high school experience, for college admissions or job opportunities. The state now requires that she complete a minimum amount of service activity, and in most school districts, the requirement is fulfilled by coursework by the ninth or tenth grade. Thus, the student does not have to seek out alternative service activities and is able to complete service activities at minimal individual cost. If this theory holds, I expect to find that the policy effect on eighth-grade students is positive (when many students are taking classes that aid the completion of the requirement), while the impact on twelfth-grade students is zero or negative (at this point, students have completed the required service through previous coursework and outside activity). This is precisely what I find in the data.

While the results using the eighth grade and twelfth grade MTF surveys are consistent with the theory that mandated service changes the timing of service activities for high school students, there are several cautions to consider.

As is always a concern with these types of studies, the potential endogeniety of the passage of the policy threatens the validity of my results. If the policy passed in Maryland in 1992 because individuals in the state were placing more importance on volunteering, I will falsely assign an increase in volunteer activity to the policy, when in fact, policy or no, the same increase would have resulted. However, given my disparate results for twelfth-grade students compared to eighth-grade students, this does not seem likely. Further, there is not evidence of an upward movement of volunteer behavior among Maryland students prior to the first year of the program.

Spillover effects may also explain the negative and zero effects for twelfth-grade students. If the class of 1997 had to meet the service requirement, it could be that the classes of 1996, 1995, and 1994 were partially exposed to the 'treatment' if schools were more involved in the arrangement of service. Recall that the previous literature shows that when schools arrange service activities, there are higher levels of student participation in the activities. Even so, Maryland students display no obvious upward trend in volunteering in the years leading up to the passage of the mandate.

Another concern about a mandate that specifies a required minimum number of hours of volunteer activity is that the constraint may not bind. The policy, in most counties, is a curriculum adjustment and not something that students have to accomplish outside of the classroom. In such a case, the policy should not impact students' volunteering behavior and I should expect no treatment effect for students who have

already completed the requirement, i.e., twelfth-grade students. Alternatively, the constraint could be nonbinding if students completed the minimum required level of service activities before the policy was put into place. Nonetheless, neither of those can explain the consistent negative policy impact on the volunteer involvement of twelfth-grade students.

The other drawbacks of my study are due to the dataset used. The first drawback is the form of the community service question in the MTF surveys. The question asks "how often do you participate in community affairs or volunteer work" and does not have an exact measurement of hours. In this case, the only detection of shifts in behavior occurs when students cross from one group into another. I will not pick up on smaller differences in time spent in service activities. Further, because the data are repeated cross-section, and not longitudinal, I cannot determine who is moving from group to group, but can speak only to changes in the proportion of students in each group.

The other two data limitations are a consequence of the survey design and timing. The data for the eighth grade surveys are available only as far back as 1991. This allows for only two pre-treatment years for eighth-grade students. Moreover, the size of my treated group varies across years. Because the population of Maryland is not large, in this nationally-representative dataset the profile of surveyed students will vary from year to year. Maryland's small size makes my study vulnerable to fluctuations in the demographic characteristics of any one year's survey sample. Similarly, within each year there is not much variation in demographic characteristics across students within the state. As the number of schools sampled each year is small, students will not be a representative cross-section of the state's population.

A final caution concerns the generalizability of my results. The Maryland policy requires all students to take part in service learning. Thus, my results should not be extended to voluntary service activity. The benefits and negative impacts of this policy are specific to both the mandatory nature of this program, and to the implementation strategy utilized by the state of Maryland. There may be positive impacts on all students when they elect to take part in volunteer activity, both in terms of future volunteering behavior, and various other positive educational and behavioral outcomes (like higher grades, higher attendance rates, and fewer incidences of risky behavior).

Maryland ventured into uncharted territory in 1992 with its passage of a mandated service component of its public high school graduation requirements. The policy remains controversial. The results of this study indicate that the policy impacts students differently according to their age. There is a robust, positive policy impact on eighth-grade students, while there are both zero and negative impacts on students on the verge of graduation. The results support the theory that mandated service does not alter volunteer activity as a whole, but that it changes the timing of the activity. Further study is needed to determine whether other mandated service programs have similar impacts on affected students, and whether the positive behavioral and educational outcomes commonly associated with involvement in volunteer activities will extend to students who are required to take part in service activities.

Chapter 3: Effects of Survey Nonresponse on Inferences about Volunteer Work[21]

3.1 Introduction

Volunteer work is an important component of economic activity in the United States (Abraham and Mackie (2005), (Wilson (2000)). Americans spend a substantial portion of nonlabor time volunteering. Thus the amount and nature of volunteering, as well as their change over time, are of interest across the social sciences.

As is true for many other aspects of social life, information about the quantity of volunteering comes almost entirely from sample surveys. In this article, we show that survey respondents are much more likely than survey nonrespondents to engage in volunteer activities. This means that, net of other errors (of which the most likely is measurement error), surveys will usually overestimate volunteering. It also raises the question of whether conclusions about the determinants of volunteer work are affected. Moreover, since nonresponse rates have increased over time, inferences about the secular trend in volunteering may be distorted.

Trends in volunteer activities are especially relevant to the debate about civil society initiated by Robert Putnam's book *Bowling Alone*. Putnam (2000: p. 127) noted that "Trends in volunteering over the last several decades are more complicated and in some respects more intriguing than the uniform decline that characterizes most dimensions of social capital in America in this period." As shown in Figure 1, nationwide Gallup surveys recorded a pronounced *increase* between 1977 and 1991 in affirmative responses to the question "Do you, yourself, happen to be involved in any

[21] I coauthored Chapter 3 with Katharine Abraham and Stanley Presser.

charity or social service activities, such as helping the poor, the sick or the elderly?" During this same time period, however, survey response rates declined markedly due to increasing difficulties in both contacting people and persuading them to be interviewed (see Curtin, Presser, and Singer (2005), for the experiences of one major survey). Response rates are unavailable for the particular Gallup surveys drawn on in Figure 1, but the Gallup Organization experienced a decline over this period similar to that of most survey organizations.[22]

Although the *potential* for nonresponse bias grows as the level of nonresponse increases, several recent studies have found that *actual* nonresponse bias in topics other than volunteering was unaffected by increases in the nonresponse rate. Keeter et al. (2000), Curtin, Presser, and Singer (2000), and Merkle and Edelman (2002) reported little, if any, link between nonresponse rates and bias, and a meta-analysis by Groves (forthcoming) showed no relationship between nonresponse level and bias in studies that had validation measures. These results suggest that many of the variables measured in surveys are either uncorrelated, or only weakly correlated, with the causes of nonresponse.

Volunteering seems likely to be an exception to this pattern. Both contactability and amenability are probably influenced by the same factors that influence volunteering: social integration, altruism, and a sense of responsibility. Contactability refers to the ease

[22] The first five surveys in Fig. 1 (1977-1986) were conducted face-to-face (with Ns between 1004 and 1549), whereas the second four (1987-1991) were conducted by telephone (with Ns between 503 and 1230). Thus, apart from the general decline in response rates, the later studies would have had lower response rates than the earlier ones because response rates are virtually always lower on the phone than in-person (Groves and Kahn, 1979). In addition, the 1988 survey almost certainly had the lowest response rate, as it was conducted over only two days compared to four days for all the other surveys except the 1987 survey, which was done over seven days. (Shorter field periods produce lower response rates because they allow less time to contact and persuade respondents.) The estimates from (and information about) these Gallup surveys are from the Roper Center's electronic "Poll" data base accessed via Lexis Nexis.

with which an individual can be contacted. For example, a person with a telephone has higher contactability than one who does not. Amenability is a measure that indicates the degree to which, once successfully contacted, an individual will agree to cooperate with and participate in the survey. Indeed survey participation is similar to volunteering in that survey respondents are asked to help an organization by giving their time. We therefore expected that respondents would be more likely than nonrespondents to have worked as volunteers.

Nonresponse bias is not the only form of error that may affect the findings of surveys on volunteering. Survey reports are subject to both recall error and social desirability bias. These two problems are minimized in the American Time Use Survey (ATUS), which, beginning in 2003, obtained detailed reports from a sample of Americans about how they spent their time on the day preceding the interview. Recall error is curtailed because of the very short reference period, and over-reporting due to social desirability is unlikely because respondents are simply asked to report, in chronological order, everything they did during a single day. Only after all activities are reported does the interviewer ask whether any of them involved volunteering. However, because the ATUS has substantial nonresponse (the response rate has been about 55%), the ATUS estimate of volunteering may be subject to considerable nonresponse bias.

Assessing nonresponse error in the ATUS estimate of volunteering is possible because a random component of the ATUS sample responded to the preceding year's September Current Population Survey (CPS) Volunteering Supplement, which had lower nonresponse; the response rate was 81% in 2002 and 82% in 2003. Thus we are able to compare the CPS volunteering estimates for two groups: those who became ATUS

respondents and those who became ATUS nonrespondents. This revealed a large difference in the percent of individuals reporting volunteer activity and in the average annual hours an individual spent volunteering. In the CPS, ATUS respondents reported almost eighty percent more volunteer hours than did ATUS nonrespondents. This strongly suggests that the ATUS estimate of volunteering suffers from substantial nonresponse error.

We examined the contribution of the various sources of nonresponse to the overall result, and found that both refusals and individuals who could not be contacted reported less volunteering than did respondents, though the difference was greater for noncontacts. We also examined whether the nonresponse bias was concentrated in particular demographic or other subgroups and found it was not.

Finally, we investigated the impact of the nonresponse error on estimates of the correlates of volunteering activity in the regression framework. We compared models of volunteering in the CPS for ATUS respondents and nonrespondents. The results were similar in sign, though not in magnitude, suggesting that nonresponse bias in the ATUS may also impact inferences about characteristics that influence volunteering behavior.

3.2 Methods and Data

American Time Use Survey (ATUS)

Since 2003, the U.S. Census Bureau has conducted the American Time Use Survey (ATUS) annually for the Bureau of Labor Statistics. The ATUS sample is chosen randomly from households exiting the Current Population Survey (CPS), an area probability sample drawn from the 50 states and the District of Columbia. The ATUS sample is selected proportional to a state's population (thus correcting for the CPS

oversampling of residents of small states). In addition, households with a Hispanic or non-Hispanic black householder, as well as households with children, are oversampled. ATUS interviews are then administered by telephone, in English or Spanish, with one randomly designated person 15 years and older from each selected household. The roughly 5 percent of the sample for whom no telephone number is available are sent a letter asking them to call a toll free number on a specified day.

The interviews are distributed evenly across the weeks of the year, with random allocations to reporting days: one-quarter Saturdays, one-quarter Sundays, and one-half spread equally across the five weekdays. Respondents are asked to describe their primary activities, and how long each lasted, from 4:00 a.m. the previous day until 4:00 a.m. the interview day. After the 24 hours are accounted for, respondents are asked whether they did any "volunteer activities for or through an organization" during the day and those who say "No," are prompted with "Sometimes people don't think of activities they do for schools, or youth, or religious organizations as volunteer activities." Anyone answering affirmatively is then asked "Which of the activities you told me about were volunteer activities?"

In 2003, 20,720 interviews were completed, for a response rate of 56 percent. As a result of budget cuts, the number of interviews fell to 13,973 in 2004, for a response rate of 55 percent.[23]

Current Population Survey (CPS) Volunteering Supplement

Every month, the U.S. Census Bureau conducts the Current Population Survey, an area probability sample of households in the 50 states and the District of Columbia. The

[23] On the calculation of response rates see Abraham, Maitland and Bianchi (2005). For other survey details see Bureau of Labor Statistics and U.S. Census Bureau (2005).

majority of interviews are conducted by telephone but many are done in-person. In September 2002 and September 2003, a Volunteering Supplement was administered, in both English and Spanish, after the main interview. The response rate to the main interview was 93.4% in both years and to the Supplement it was 86.5% in 2002 and 87.8% in 2003, for overall Supplement response rates of 80.8% and 82.0%, respectively.

The first two questions in the Supplement were:

> Since September 1st of last year, have [you/NAME] done any volunteer activities through or for an organization? IF NO: Sometimes people don't think of activities they do infrequently or activities they do for children's schools, or youth organizations as volunteer activities. Since September 1st of last year, have [you/NAME] done any of these types of volunteer activities?

Respondents who replied affirmatively were then asked for the number of organizations for which they did volunteer work, and the numbers of weeks and hours per week they worked for each organization (or, if the respondent said the hours per week varied, the number of hours for the year).

Merged CPS Supplement-ATUS File

Households are selected every month for the CPS and are interviewed in four consecutive months, known as Months in Sample (MIS) 1-4. Then, after an eight-month break from CPS interviews, they are revisited for another 4 consecutive months (MIS 5-8), which occur exactly one year after MIS 1-4.[24] The ATUS sample is selected from households that complete the MIS-8 main CPS interview.[25]

[24] The CPS follows a physical housing unit, and not the individuals living in the household. Thus, as individuals move into or out of the physical housing unit, they will move into and out of the CPS sample.

A subset of the ATUS sample was eligible for the September CPS Volunteering Supplement. The subset for the 2003 ATUS consists of CPS September 2002 cases that were months-in-sample 3 through 8. However, households in months-in-sample 3 and 4 were eligible for both the 2002 *and* 2003 Volunteering Supplements. To simplify our 2003 ATUS analysis, as well as to minimize the time between the Volunteering Supplement and MIS-8 (from which, as described below, our other variables were taken) we excluded the MIS-3 and 4 cases. Thus our 2003 ATUS sample consists of CPS September 2002 Supplement cases that were months-in-sample 5-8. Likewise, our 2004 ATUS sample consists of CPS September 2003 Supplement cases that were months-in-sample 5-8.[26]

The ATUS selects households (and individuals within households) in the month following the household's final CPS month, and the majority of ATUS contacts are made in the two months following that. We can combine this information with the CPS months of involvement in order to determine the number of individuals who might appear in our merged data. This information is shown in Table 3-1. There are several reasons an individual who meets the timing requirements for the overlap sample might not appear in our data. The individual could: be a nonrespondent for both the CPS main and supplement interviews; be a nonrespondent for the supplement only; no longer be in the

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[25] The ATUS selects an individual within the household recorded in CPS MIS-8. Thus, while CPS follows the housing unit, ATUS selects an individual within the unit; if that individual moves out of the household or otherwise leaves the unit, no ATUS interview is attempted.

[26] September 2002 Supplement households that were MIS-1 through MIS-4 were eligible for the 2004 ATUS, but we did not include them because of the much longer elapsed time between the two surveys and because there is no comparable group for the 2003 ATUS. Likewise, although we have included September 2003 Supplement cases that were MIS-7 or MIS-8 in our 2004 ATUS sample, we did not include 2003 MIS-7 and 8 cases in our 2003 ATUS sample, though some were eligible for that survey, because there is no comparable group for the 2004 ATUS. The lack of comparability is due to 2003's being the initial year of the ATUS. Figure 2 shows which households are eligible for the September Volunteer Supplement by their month-in-sample.

household; or have been too young for inclusion in the CPS, but have reached the age threshold by the time the ATUS survey was administered.

Because the ATUS nonresponse categories reported by BLS combine different reasons for nonresponse, we recoded the outcomes as did Abraham, Maitland and Bianchi (2005):

- Complete or sufficient partial interview
- Refusal
- Contact not attempted
- No successful contact
- Inadequate contact information
- Other (usually language related).[27]

The category "contact not attempted" represents individuals no longer part of the household, for instance, those who move out, and those who are hospitalized. The "inadequate contact information" group includes those who could not be contacted due because of problems with the phone number, or phones with privacy detectors. The "unsuccessful contact" group is largely comprised of individuals with whom contact was never made.

BLS provides a joint ATUS-CPS file that contains identifying information from the ATUS, in addition to a battery of demographic and labor force participation items from the CPS final interview (MIS-8).[28] We used the variables as defined in Abraham,

[27] Their final category, ineligible (consisting of 37 cases from the 2002 CPS Supplement, and 17 from the 2003 Supplement), is not relevant for us as such individuals are neither ATUS respondents nor nonrespondents.

[28] We examined the correlations between the variables as measured in the month of the Volunteering Supplement and in the final month in sample, and generally found little change. The one exception is labor force participation, which shows movement mainly between adjacent categories of hours worked.

Maitland and Bianchi (2005).[29] We merged these variables from the joint ATUS-CPS file with the appropriate year's ATUS file and then linked the resulting file to the preceding year's CPS September Supplement file.[30]

There were 97,719 civilians aged 15 or older for whom information was gathered in the 2002 CPS September Volunteering Supplement. Of the 38,938 civilians 15 or older selected for the 2003 ATUS, 8,665 had CPS September 2002 Supplement records in months five through eight of CPS involvement.[31] The following year, there were 95,337 civilians 15 or older for whom information was collected in the 2003 CPS September Volunteering Supplement. Of the 27,004 civilians 15 or older selected for the 2004 ATUS, 6,905 had CPS September 2003 Supplement records in months five through eight of CPS involvement.

3.3 Results

Analysis of volunteer rates and mean annual hours spent volunteering

We begin by comparing estimates of volunteer activity from the two surveys for an identical sample. Table 3-2 shows average annual hours spent volunteering as measured in the CPS September Volunteer Supplement and as measured in the ATUS. Due to the structure of the ATUS data file, calculating average annual hours spent

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[29] A list of the variables, and the method of calculation, can be found in Appendix B of Abraham, Maitland, and Bianchi (2005).

[30] The ATUS file was linked to the ATUS-CPS file using the variables tucaseid and pulineno. This joined file was then linked to the CPS September supplement file using the variables hrhhid, pulineno, hrmonth, hryear, hrsersuf, and huhhnum.

[31] As mentioned earlier, for all following analyses, ATUS survey 'noneligibles' are excluded from all calculations. This group is relatively small, accounting for only 37 observations in the 2002 CPS/ 2003 ATUS sample, and 17 observations in the 2003 CPS/ 2004 ATUS sample.

volunteering—as found in the ATUS—took several steps. First, we determined which activities were considered volunteering by respondents.[32] Once we identified all volunteer activities for each individual, we summed the number of minutes spent volunteering in the diary day. Using the ATUS weights, which account for differing probabilities of selection into the ATUS sample, for the the oversampling of weekend days, and for survey nonresponse, we constructed an estimate of average minutes per day spent volunteering. Multiplying this estimate by 365/60 yields an estimate of average hours per year devoted to volunteer activity. As seen in Table 3-2, the estimates from the ATUS and CPS are very similar.

We calculate average annual hours because it is the only comparable measure that is possible from both datasets. Due to the nature of a time-diary survey, we are unable to construct a reasonable measure of the percent of individuals who volunteer during the course of a year using the data. Similarly, we are unable to calculate median annual hours spent volunteering, the typical statistic calculated in studies in this area.

The first row of calculations comes from the 2003 ATUS sample of completers who also completed the 2002 September Volunteer Supplement, while the second set of calculations reflects the responses of completers of the 2004 ATUS who also completed the 2003 September Volunteer Supplement. For example, the 2003 ATUS estimate of 43.1 annual hours spent volunteering is close to the 2002 CPS estimate of 49.2 hours. The 95 percent confidence interval of the ATUS estimate contains the CPS estimate for both survey years.

[32] These activities were identified by having a value of 15 for any of the variables "tutier1code_1-71" in the data.

We also include in Table 3-2 the CPS estimates using the full ATUS-CPS overlap sample for each year. As seen in the last column for both years, these numbers fall outside the 95 percent confidence interval, as they are statistically lower than estimates using the ATUS survey completers only. Because the estimates of volunteer activity are similar between the two surveys when calculated for identical samples, we are more confident to attribute further differences to sample selection and nonresponse, instead of survey design.

Next, we compare the estimates from the entire CPS supplement sample to the estimates from our subsample of those selected for the ATUS. Comparing the first two rows of Table 3-3, we see that the estimates from our sample are quite close to those from the full sample.[33]

In both 2002 and 2003, approximately 28 percent of individuals in our sample (of those drawn for the ATUS) report volunteering in the previous twelve months. On average, volunteers report spending approximately 130 hours per year in volunteer activity. Together, these lead to the observed mean for all individuals, where nonvolunteers are recorded with zero hours, of about 35 hours per year.

The third and fourth rows of Table 3-2 examine whether respondents are more likely than nonrespondents to be volunteers. In both 2002 and 2003, ATUS respondents are more than 50 percent more likely than nonrespondents to report being a volunteer, a difference that far exceeds sampling error. In terms of hours of volunteering there are somewhat different patterns in the two years. In 2002, respondents report higher average hours of volunteering, whether including nonvolunteers (those with zero hours) or not.

[33] Although the differences are quite small, some are statistically significant as a result of the very large sample sizes.

However, in 2003, while the overall average of volunteer hours is higher for nonrespondents, there is little difference in the average hours of respondent and nonrespondent volunteers.

We gain additional insight from the comparison of volunteer rates and volunteer hours across the different nonresponse categories. For example, refusals and unsuccessful contacts look similar in both 2002 and 2003. Compared to other types of nonresponse, these two groups are more likely to volunteer and have higher average volunteer hours. Even though refusals and unsuccessful contacts are the more-inclined volunteers in the nonresponse group, their estimates remain lower than respondents. [34]

These results raise two important, inter-related questions. First, in terms of causation: Is the nonresponse bias located disproportionately in certain subgroups of the population? Second, in terms of consequences: Can the nonresponse bias be corrected by weighting adjustments? In order to address these questions we examined the volunteering estimates for a number of demographic subgroups. Following the variable grouping found in Musik, Wilson and Bynum (2000), we group our observed characteristics into three categories, all shown in previous work to impact volunteering.

The first group includes human capital indicators, which have been found to be positively correlated with volunteering. In the CPS, we use education, labor force participation, and household income to proxy for human capital.

The second group includes social capital indicators, which also have been found to be positively correlated with volunteering. Social capital is a measure of the integration of the individual into his community, and a measure of the degree of

interaction and connection the individual has with others. In order to capture this 'connectedness', we use marital status, children in the household, home ownership, urbanicity of residence, presence of other adults in the household, and presence of a telephone in the household.[35] Presumably, individuals who are married will be more connected to others; they are not only connected to their spouse, but, via their spouses, to others as well. Children in the household might work in two ways. On the one hand, the existence of young children may dampen social capital, as the early years of a child's life are labor intensive, and this labor largely takes place in the home. Once children reach the age of schooling, however, the influence should work in the opposite direction. Parents are often involved in school activities, whether through volunteering at the school or involvement in the parent-teacher association. Adding to the increased interaction in the community is the fact that once children reach schooling age, they have the opportunity to join recreational groups, such as sports teams, boy scouts, and girl scouts. Home ownership is thought to increase the incentive for investment in one's community.[36] Last, the presence of a telephone in the household allows us to measure contactability at a very basic level.

The third group, which we deem "Other Indicators," accounts for the remaining demographic variables that have consistently been found by prior studies to be correlated with volunteering. This group includes sex, age, race/ethnicity, and region of residence.

Table 3-4 shows volunteer rates for these various subgroups. The human capital, social capital, and other indicators all operate in the manner expected. For example, in

[35] For a more exhaustive discussion of the impact these measures have on contactability and volunteering, see Abraham, Maitland, and Bianchi (2005).

[36] Note: DiPasquale and Glaeser (2000) find mixed evidence of this supposition.

both years, individuals with more education are more likely to report volunteering, as are those with higher incomes, homeowners, nonurban residents, females, and non-Hispanic non-blacks.[37]

The more important result in Table 3-4, however, is that the discrepancy found in Table 3-3 between the reported volunteer activity of respondents and nonrespondents holds true for all the subgroups. Across all categories of these background variables, respondents report a higher likelihood of volunteering than nonrespondents. In fact, the proportion of respondents who report volunteering is consistently 50 to 100 percent higher than the proportion of nonrespondents who report volunteering. Table 3-4 provides compelling evidence that adjusting for differences in observable characteristics cannot correct for nonresponse bias in estimates of the volunteer rate and mean hours of volunteer activity since within demographic groups, nonrespondents volunteered less than respondents.

We next examined mean volunteer hours for volunteers, as seen in Table 3-5. Here the pattern is not as conclusive as that of Tables 3-3 and 3-4. While it is generally true that respondents volunteer more hours on average than nonrespondents, there are several breakdowns where this does not hold, though statistically we cannot reject the hypothesis that the sample means are the same. The implication of Table 3-5 is that although respondents are more likely to volunteer, there is no clear indication that, once volunteers, they invest more hours than nonrespondents.

[37] We repeated the analysis for CPS interviews that were self-reports only (thereby excluding proxy interviews) to ensure that our results are not driven by differences between self- and proxy-reports. We found that the results were not sensitive to the inclusion or exclusion of proxy-report interviews, and therefore all subsequent analyses will include both self- and proxy-reports.

In Table 3-6, we show average volunteer hours, with nonvolunteers included as zeros in the calculation. Table 3-6 combines the information found in Tables 3 and 4, for it accounts for the fact that respondents are more likely to volunteer (therefore having positive hours of volunteering), and for the hours reported by volunteers. Since respondents are so much more likely to volunteer, although mean hours of volunteers does not show a clear pattern, mean hours of the entire sample does exhibit predictable behavior. With a few exceptions, respondents record higher levels of mean volunteer hours than nonrespondents, as expected. The one statistically-significant exception is that among Hispanics in 2003, nonrespondents report 27.5 annual hours of volunteering, compared to 14.1 hours for respondents. Given the absence of a similar pattern in 2002, we believe this is best treated as sampling error.

Multivariate Analysis

One limitation of the results reported in Tables 3-3 to 3-6 is that we only compare volunteer activity across the samples for narrowly defined subsamples, one at a time. A multivariate analysis is required to determine the marginal effect of each of the covariates on volunteering activity, holding other factors constant. One question to be addressed through multivariate analysis is whether response status has a significant association with volunteer activity even after controlling for observable characteristics. This can be tested by adding a response status indicator to the model and then looking at whether its coefficient is statistically significant; if it is, then the difference between respondents and nonrespondents observed in the simple tabulations shown earlier cannot be fully attributed to differences in their observable characteristics.

A second question of interest is whether models estimated using the ATUS-respondent-only sample yield different conclusions about the factors that affect volunteer activity than models estimated using the full ATUS overlap sample. Suppose, for example, we found the impact of education on volunteering to be different in the model fit using the respondent-only sample compared to the model run with the full sample. This would imply that nonresponse bias in estimates of the determinants of volunteer activity is a serious concern. If, however, the coefficients on the controls that we employ are similar in the full sample and the respondent-only sample, there would be less reason for concern about nonresponse bias.

The Tobit model often is used for the analysis of censored continuous variables.[38] The Tobit model assumes that there is an underlying latent variable, observable only when it is above some censor point. The Tobit model can be denoted as:

$$y_i^* = x_i\beta + u_i,\ i = 1, 2, \ldots, n$$

$$y_i = y_i^* \text{ if } y_i^* > \alpha$$

$$y_i = 0 \text{ if } y_i^* \leq \alpha$$

where y_i^* is the latent variable, y_i is the observed variable, x_i is a vector of explanatory factors, β is a coefficient vector, α is the censoring threshold and u_i is assumed to be i.i.d. from a normal distribution with mean zero and variance sigma squared.[39] We are interested in volunteer activity. When the underlying latent variable exceeds the threshold value (zero in this case), we observe the variable y_i, equal to actual volunteer hours. Since hours of volunteering cannot be negative, all individuals who do not

[38] The Tobit model was developed in Tobin (1958). For a detailed treatment of the model and related issues, see Greene (2000).

[39] Notation found in Greene (2000) and Amemiya (1984).

volunteer have a value of zero for volunteer hours, and the volunteer hours measure is censored at zero.

In the Tobit model, the marginal effect on volunteer hours associated with any individual characteristic x_j is equal to the product of β times the cumulative standard normal density of $x_j \beta/\sigma$, which equals the probability that a person with given characteristics is a volunteer. As demonstrated by McDonald and Moffitt (1980), this effect can be decomposed into a piece attributable to the effect of the characteristic x_j on the probability of being a volunteer and the effect on hours of volunteer activity, given positive volunteer hours. A key assumption of the Tobit model is that the independent variables move both of these pieces in the same direction. The model does not allow, for example, for higher household income to increase the probability that you volunteer but decrease the hours volunteered. This is a significant restriction. If the assumptions that underlie the Tobit model are satisfied, however, it offers a convenient way to summarize the relationships in the data between personal characteristics and volunteer activity.[40]

In order to investigate the response-nonresponse issue in the multivariate context, we ran three versions of our Tobit model with volunteer hours as the dependent variable. In the first model, we control simultaneously for all of the factors used to account for human capital, social capital, and other characteristics, in order to identify the effects of each of the characteristics holding the others constant. The second model adds an indicator for whether the person was an ATUS respondent, in order to test whether there are differences between the volunteer behavior of respondents and nonrespondents even after controlling for observable characteristics. The third model is fit using the sample of

[40] We later address the possibility of misspecification.

ATUS respondents only. We compare the coefficients estimated for this model with those from the full-sample model to assess the potential for nonresponse bias in analyses of volunteer activity. We fit each of the three models separately using data from the 2002 CPS volunteer activity supplement together with data from the 2003 ATUS and data from the 2003 CPS volunteer activity supplement together with data from the 2004 ATUS.

Coefficient estimates from the first model, fit for the full CPS supplement-ATUS overlap sample, are reported in Table 3-7 (2002 supplement) and Table 3-8 (2003 supplement). These results show that, relative to those with a high school diploma, more highly educated individuals volunteer more, and less-educated individuals volunteer less. Compared to individuals not in the labor force or unemployed (which includes retirees and those involved in household production—stay-at-home parenting), part-time workers and those working 35 to 44 hours per week volunteer more, and those with other degrees of labor force involvement (including those working very high numbers of hours and those whose hours vary) volunteer less, though the estimates are not all statistically different. Higher household incomes increase volunteer activity. The presence of children in the household operates differentially depending on the age of the children. Adults with young children (birth to 5 years old) in the household spend less time engaged in volunteering, whereas adults with school-age children (age 6 to 17) invest substantially more hours. The presence of relatives and nonrelatives in the household both depress estimates of volunteer activity. This could be capturing many different things. On the one hand, the existence of nonrelatives in the household could indicate the presence of roommates, and arguably those with roommates tend to be more transient and on the earlier end of both career and life experiences. On the other hand, the existence of

adult relatives in the household could indicate both living with extended family (common among lower-income households), or the presence of an elderly or disabled adult who needs care. In most cases the estimated coefficients on the covariates have the same sign in both sample years, though in 2003 fewer coefficients are statistically significant. This is likely due to the smaller sample size of the second wave of the ATUS.

The findings just described generally are consistent with the findings elsewhere in the literature regarding the determinants of volunteer activity. Though much of the previous literature finds higher levels of volunteer involvement among whites, in the 2002 model the group best approximating whites in our model—non-Hispanic non-blacks—is statistically indistinguishable from non-Hispanic blacks. In contrast, Hispanics exhibit less involvement in volunteering than non-Hispanic non-blacks. The impact of race/ethnicity is different in 2003. Hispanics are again 6.1 percentage points less likely to volunteer, and given that they volunteer at all, spent 15.2 fewer hours than non-Hispanics non-blacks. The results for non-Hispanic blacks in these data more closely resemble results from other studies. In the 2003 CPS, non-Hispanic blacks were 4.8 percentage points less likely to volunteer, and given any volunteer activity, spent 12.0 fewer hours in volunteer activity.

Utilizing the McDonald-Moffitt decomposition, we can partition the impact of the control variables on expected volunteer behavior between the probability that an individual volunteers and the impact on the hours of volunteering for those who volunteer (expected hours conditional on being uncensored). Consider the estimates for the 2002 CPS model. For example, individuals with a graduate degree are 19.3 percentage points more likely to volunteer, and, given that they volunteer, spend 52.2 more hours per year

in that activity than high school graduates. On the other hand, males are 5.2 percentage points less likely to volunteer than females, and male volunteers spend 14.0 fewer hours volunteering than females.

Tables 3-9 and 3-10 display the results of models that include an indicator for whether the individual completed the ATUS survey or not. Adding this variable does not greatly alter any of the other coefficients, though the indicator itself is statistically significant at the 99.9 percent level of confidence. Our results indicate that ATUS survey completers are 6-7 percentage points more likely to volunteer than nonrespondents. Having volunteered, completers spend 16-17 more hours engaged in volunteering than nonrespondents. Interestingly, the coefficient on ATUS survey completion dwarfs most other coefficient estimates, with one notable exception being the coefficients on education levels.

The most important comparison we can make with the Tobit results involves comparing the results we obtain using the full CPS supplement-ATUS sample to the results we obtain when including only ATUS respondents. By comparing the results for the two groups, we can ascertain the potential nonresponse bias in inferences about volunteer activity. A finding of different multivariate results using the two different samples would have important implications for studies on the determinants of volunteering.

The Tobit results for completers are reported in Tables 3-11 and 3-12. In both years, the constant is substantially more negative in the full sample than in the completer sample. This is consistent with the basic pattern that survey completers are more involved in volunteer activity. Compared to the full-sample results in the relevant year,

the signs on the coefficients in the models for completers are unchanged, though the relative magnitudes of the coefficients vary. The one notable difference again lies with the race/ethnicity variable. While non-Hispanic blacks were statistically indistinguishable from non-Hispanic non-blacks in the full sample in 2002, they exhibit less volunteer activity relative to non-Hispanic non-blacks in the completer-only sample. In both sets of results from 2003, non-Hispanic blacks complete less volunteer activity than non-Hispanic non-blacks. In 2003, but not 2002, using completers only diminishes the estimated impact of education on volunteer behavior.

We use a -2 log likelihood test to determine whether the Tobit model is correctly specified. The Tobit model is a restricted model in that it constrains the impact of covariates on the probability of volunteering and on the hours spent volunteering given that the individual has positive hours to be identical. An unrestricted model allows covariates to differentially impact the propensity to volunteer and the intensity of volunteering. The unrestricted model combines estimates from two separate estimations. The model first employs a probit to determine the propensity to volunteer, succeeded by a truncated regression model that predicts hours spent volunteering given that an individual has positive hours. The sum of the log likelihoods from these two models is then the log likelihood from the unrestricted model.

The results from this specification test are reported in Table 3-13. Given the size of the -2 log likelihood statistics, we easily reject the null hypothesis that the Tobit model is correctly specified. Viewing the results for the two-part model in Tables 3-14 and 3-15, it is clear that the control variables exert different influences on the extensive and intensive margins. With our study, it implies that some covariates impact the likelihood

of volunteering differently than they impact the number of hours spent volunteering, given that the individual decided to volunteer.

Cragg (1971) is among the first to develop variations on the two-part model (sometimes referred to as a hurdle model) that health economists regularly use; for examples, see Ross and Chaloupka (2003), Han, Liu, and Gordon (2005), and Raptou, Mattas, Tsakiridou, and Katrakilidis (2005). In the two-part model, a probit model is first run. The probit estimation predicts the probability that an individual crosses the censor threshold, i.e., volunteers. Then, using only those individuals who volunteer, we run an ordinary least squares regression with annual hours spent volunteering as the dependent variable. With the two-part model, covariates can exert different influences on the extensive and intensive margins. Taken together, these results provide insight into determinants of volunteering. Our results from the two-part model are generally consistent in sign with our Tobit results, and our main conclusions do not appear to be compromised.

We report the results from the generalized two-part model in Tables 3-14 and 3-15. In these tables, we report the probit and OLS results. The hurdle of volunteering at all (explained by the probit results) drives most of the relationship between volunteering and individual and household characteristics, as seen in the greater number of statistically significant coefficients in the probit compared to the OLS results. Moreover, there are some characteristics that have different signs on the probit and OLS coefficient estimates. For example, some of the labor force status, household income, and household composition indicators have different signs on the probit and OLS coefficients. As such, the parameter estimates on these characteristics deviate most from the Tobit results.

Our two-part model results give three important results. First, the Tobit results are, for the most part, similar to the two-part model results, lending more confidence to the conclusions reached from the Tobit model. Second, there are some differences between the two models' outcomes, helping to partially explain why the Tobit specification test failed. Last, the conclusions we draw from the Tobit and two-part models are similar, in that both lead to the result that nonresponse is not correctable by re-weighting the data using observable characteristics. Moreover, it is likely that nonresponse bias impacts inferences about correlates of volunteering in multivariate studies of volunteer behavior using this survey data.

3.4 Conclusion

Using the data on ATUS survey participation, we are able to examine the effects of survey nonresponse on reports of volunteering in the CPS volunteer supplements. Participants who do not respond to time use surveys appear to volunteer much less than those who respond. Therefore, we find that survey nonresponse does have an impact on the estimations of volunteer activity, leading to an upward bias in the estimated amount of activity. However, the implications for the multivariate analysis are not as strong; in fact, we find that the signs of coefficients in the multivariate analysis are largely similar across the full sample versus the sample of ATUS respondents only, though the size of the coefficients varies across the samples. Further, we find that the differences in estimates of volunteer activity between respondents and nonrespondents persist through a variety of cuts of the data. This finding, together with the significant coefficient on the response indicator in the second set of Tobit and two-part models, which also control for a variety of individual and household characteristics, tell us that accounting for

observable differences between respondents versus the full sample will not correct fully for the nonresponse bias we have identified. In other words, the problematic characteristic that affects both response propensity and propensity to volunteer is unobserved and/or unmeasurable, and therefore cannot be corrected given the available information.

Chapter 4: Concluding Remarks

Volunteer activity is an important part of the lives of Americans, and yet there are few economic analyses on the topic. This dissertation employs economic analysis in the study of volunteering.

As school districts consider how to encourage civic engagement among students, the options available to them need to be carefully assessed. Previous literature had not rigorously evaluated the impact of mandated service on public school students. I exploit the change in Maryland law to address the question of the impact of mandated service. I find that the volunteer mandate—as implemented by Maryland—did not have the intended effect of promoting lifelong volunteers. While students early in their high school years exhibited higher levels of volunteering after the mandate, twelfth-grade students did not. Moreover, the effect on the older students is at best zero, and in many specifications is negative. Thus, one of the major goals of the legislation—to inspire a lifetime of service—does not extend through the final years of high school.

An overwhelming majority of studies of volunteer activity employ surveys in their research. Surveys are the lifeblood of social research. Understanding the impact of survey nonresponse greatly enhances the study of any topic. In the particular case of volunteering, we must address the potential for nonresponse bias in estimates of volunteer activity. Since the same (perhaps unobservable) characteristics that lead a person into volunteer activity likely influence their cooperation with surveys, researchers studying this topic must be especially aware of the possibility of nonresponse bias. Our results provide mixed feedback regarding this nonresponse bias. There is an upward nonresponse bias on estimates of volunteer activity, and the difference between

respondents and nonrespondents cannot be eliminated through individually controlling for a variety of individual and household characteristics. The multivariate analyses show that the direction of influence of the observable characteristics used as controls does not change between the full and respondent-only samples, however, the size of the coefficients varies between the two samples. Our results indicate that ATUS users cannot ignore the possibility of nonresponse bias in studies of volunteer activity, though it may not be as pervasive as originally thought.

Tables

Table 2-1: Measures of volunteer activity among young people

Name and year of survey	Percent reporting volunteer activity
Independent Sector (IS), 1992-1996	67
National Household Education Survey (NHES), 1996	45*, 56+
National Household Education Survey, 1999	50*, 61+
National Education Longitudinal Study (NELS:88), 1990 & 1992	44
Current Population Survey Volunteer Supplement (CPS), 2002	30[41]

Sources: IS (2001) Kleiner and Chapman (1999); Planty and Regnier (2003); Bureau of Labor Statistics (CPS September Supplement (2002)).

Note: All surveys ask about volunteer activity in the past calendar or school year. IS estimate corresponds to 16-year-old respondents. NHES estimates correspond to respondents in the (*) ninth and tenth grades, and (+) eleventh and twelfth grades. NELS:88 estimates correspond to individuals surveyed in 1990 and 1992, who were in the eighth grade in 1988. CPS estimate corresponds to 16- to 18-year-old respondents to the September Volunteer Supplement of 2002.

Table 2-2: Percent of sixth- through twelfth-grade public school students reporting that they attend a school that arranges and/or requires service activity

	Percent	
	1996	1999
School arranges but does not require service activity	70	70
School arranges and requires service activity	14	16
School requires but does not arrange service activity	2	2
School neither arranges nor requires service activity	15	12
Number of student respondents	23,343	24,618

Source: Kleiner and Chapman (1999).

[41] In the CPS, the parent answers on behalf of his child when a teenage or adult child of the person interviewed is not present. Since those not present are probably living away from home at a college or university, it seems likely that parents will not have an accurate estimate of their children's volunteer behavior (from conversation with Mark Lopez).

Table 2-3: Implementation of the Maryland service requirement for public school students in each school district

School District	Service-Learning Requirement
Allegany	Each MS designs its own program; some programs are curriculum-based, some require independent hours
Anne Arundel	75 hours, completed through curriculum, grades 5-10
Baltimore City	75 hours total: In MS, at least 50 hours completed through the curriculum. Students complete the remaining hours in HS.
Baltimore County	75 hours, completed through curriculum, grades 6-10.
Calvert County	Approx. 75 hours, completed through curriculum, grade 7
Caroline County	Completed through curriculum, grades 6-9
Carroll County	Two options: Independent Service Option and Course-Related Service Option (can be combined)
Cecil County	Completed through curriculum, grades 6-9
Charles County	Completed through curriculum, grades 6-9
Dorchester County	Completed through curriculum, grades kindergarten-9
Frederick County	Completed through curriculum, grades 9-12
Garrett County	35 hours, completed through curriculum, grades 6-8, 11. Students complete an additional 40 hours independently.
Harford County	Completed through curriculum, grades 6-12
Howard County	Approximately 75 hours, completed through curriculum, grades 6-8; each MS decides how program is implemented
Kent County	MS: 40 hours, completed through curriculum HS: 35 additional hours, completed through curriculum
Montgomery County	60 hours, completed through a combination of curriculum-based and independent hours, grades 5-12
Prince George's County	Approximately 40 hours, completed through curriculum, grades 7-9; Students complete an additional 36 hours independently
Queen Anne's County	Completed through curriculum, grades 6-10
Somerset County	MS: 60 hours, completed through curriculum Grade 9: 75 additional hours, completed through curriculum
St. Mary's County	MS: 30 hours, completed through curriculum Grade 9: 45 additional hours, completed through curriculum
Talbot County	MS: 15 hours completed in service-learning class HS: 75 additional hours, curriculum-based or independent
Washington County	MS: curriculum-based plus 15 additional hours completed independently Grade 10: 15 additional hours, completed through curriculum
Wicomico County	Completed through curriculum, grades 6-9
Worcester County	Completed through curriculum, grades 6-9

MS indicates grades six through eight; HS indicates grades nine through twelve.
An example of a curriculum-based is a science class unit studying the Chesapeake Bay, followed by a Bay cleanup activity on a school field trip.. An example of an independent activity is serving food in a soup kitchen..
Source: Maryland State Department of Education Service-Learning website.

Table 2-4: Demographic characteristics of public school students: Eighth-, tenth-, and twelfth- grade respondents, 1991-2003 MTF

	Means		
	Eighth Grade	Tenth Grade	Twelfth Grade
Male	0.487	0.484	0.478
White	0.569	0.649	0.641
Black	0.147	0.127	0.142
Other race	0.285	0.224	0.217
Parent education: less than high school diploma	0.078	0.075	0.079
Parent education: high school graduate	0.369	0.412	0.440
Parent education: college or higher	0.464	0.467	0.446
Parent education: missing measure	0.282	0.230	0.228
Both parents in household	0.730	0.741	0.684
No father in household	0.184	0.175	0.198
No mother in household	0.037	0.038	0.042
Neither parent in household	0.041	0.041	0.065
Attends religious services at least monthly	0.516	0.475	0.431
Religion a “little” or not important	0.357	0.367	0.370
Religion “very” or “somewhat” important	0.555	0.533	0.541
Baptist	0.206	0.199	0.195
Protestant	0.269	0.260	0.236
Roman Catholic	0.146	0.174	0.199
Other religion	0.125	0.118	0.120
Reports religious affiliation as “none”	0.126	0.131	0.149
Missing religious affiliation measure	0.129	0.119	0.101
Sample size	214229	176530	56046

Source: MTF surveys, eighth, tenth and twelfth grades, 1991-2003.

Table 2-5: Service activity involvement of public school students: Eighth-, tenth-, and twelfth-grade respondents, 1991-2003 MTF

	Percent		
	Eighth Grade	Tenth Grade	Twelfth Grade
Reports any volunteer activity in the past year	65.0	68.4	71.8
Reports volunteering at least monthly	25.9	27.3	28.9
Reports volunteering at least weekly	9.8	10.2	11.7

Source: MTF surveys, eighth, tenth and twelfth grades, 1991-2003.

Table 2-6: Difference-in-difference estimates of program impact

		8th Grade		12th Grade	
		MD	Non-MD	MD	Non-MD
Any service activity	Before	0.62	0.63	0.73	0.70
	After	0.71	0.65	0.76	0.75
	After – Before	0.09	0.02	0.03	0.05
Program impact	Diff. in diff.		0.07		-0.02
Service activity at least monthly	Before	0.25	0.25	0.34	0.27
	After	0.31	0.26	0.30	0.31
	After – Before	0.06	0.01	-0.04	0.04
Program impact	Diff. in diff.		0.05		-0.08
Service activity at least weekly	Before	0.10	0.10	0.18	0.10
	After	0.13	0.10	0.16	0.12
	After – Before	0.03	-0.004	-0.02	0.02
Program impact	Diff. in diff.		0.04		-0.04

Source: MTF surveys, eighth and twelfth grades, 1991-2003.

Table 2-7: Linear Probability Estimates, 8th grade sample
Dependent variable: Volunteer at least some time in the past year
Parameter estimates and (standard errors)

	Sample used					
Covariates	All	Females	Males	Geographic	Demographic	Civic
Treatment Effect (Post * Maryland)	0.072 * (0.007)	0.066* (0.010)	0.078 * (0.007)	0.056 * (0.008)	0.063 * (0.005)	0.070 * (0.011)
Constant	0.560 * (0.007)	0.570 * (0.011)	0.650 * (0.010)	0.773 * (0.015)	0.564 * (0.028)	0.734 * (0.024)
N	208961	101723	107238	43856	27442	61273
Pseudo R^2	0.0732	0.0534	0.0699	0.074	0.070	0.068

Source: MTF eighth-grade surveys, 1991-2003.
* indicates significance at the 99.0% level of confidence, + at the 95.0% level, and ^ at the 90.0% level
Also controlled for gender, race, parent's education, household composition, religiosity

Table 2-8: Linear Probability Estimates, 8th grade sample
Dependent variable: Volunteer at least monthly
Parameter estimates and (standard errors)

	Sample used					
Covariates	All	Females	Males	Geographic	Demographic	Civic
Treatment Effect (Post * Maryland)	0.040 * (0.007)	0.033 * (0.008)	0.047 * (0.008)	0.021 + (0.008)	0.009 (0.022)	0.051 * (0.008)
Constant	0.194 * (0.007)	0.228 * (0.009)	0.217 * (0.009)	0.381 * (0.009)	0.161 * (0.026)	0.169 * (0.012)
N	208961	107238	101723	43856	27442	40736
Pseudo R^2	0.0369	0.0369	0.0287	0.0425	0.0372	0.0347

Source: MTF eighth-grade surveys, 1991-2003.
* indicates significance at the 99.0% level of confidence, + at the 95.0% level, and ^ at the 90.0% level
Also controlled for gender, race, parent's education, household composition, religiosity

Table 2-9: Linear Probability Estimates, 8th grade sample
Dependent variable: Volunteer at least weekly
Parameter estimates and (standard errors)

	Sample used					
Covariates	All	Females	Males	Geographic	Demographic	Civic
Treatment Effect (Post * Maryland)	0.036 * (0.004)	0.042 * (0.005)	0.030 * (0.004)	0.027 * (0.003)	0.018 (0.011)	0.030 * (0.007)
Constant	0.078 * (0.006)	0.083 * (0.008)	0.092 * (0.004)	0.059 * (0.004)	0.038 * (0.017)	0.205 * (0.010)
N	208961	107238	101723	43856	27442	61273
Pseudo R^2	0.0133	0.0119	0.0111	0.0154	0.0173	0.0153

Source: MTF eighth-grade surveys, 1991-2003.
* indicates significance at the 99.0% level of confidence, + at the 95.0% level, and ^ at the 90.0% level
Also controlled for gender, race, parent's education, household composition, religiosity

Table 2-10: Linear Probability Estimates, 12th grade sample
Dependent variable: Volunteer at least some time in the past year
Parameter estimates and (standard errors)

	Sample Used					
	All	Females	Males	Geographic	Demographic	Civic
Treatment Effect (Post * Maryland)	-0.010 (0.007)	0.000 (0.009)	-0.012 (0.010)	-0.003 (0.012)	-0.011 (0.009)	0.011 (0.015)
Constant	0.532 * (0.010)	0.585 * (0.014)	0.584 * (0.014)	0.629 * (0.016)	0.516 * (0.030)	0.723 * (0.028)
N	54772	28574	26198	11883	8393	15057
Pseudo R^2	0.0859	0.0760	0.0725	0.0919	0.0921	0.0958

Source: MTF twelfth-grade surveys, 1991-2003.
* indicates significance at the 99.0% level of confidence, + at the 95.0% level, and ^ at the 90.0% level
Also controlled for gender, race, parent's education, household composition, number of siblings, religiosity

Table 2-11: Linear Probability Estimates, 12th grade sample
Dependent variable: Volunteer at least monthly
Parameter estimates and (standard errors)

	Sample used					
Covariates	All	Females	Males	Geographic	Demographic	Civic
Treatment Effect (Post * Maryland)	-0.064 *	-0.119 *	0.011	-0.064 +	-0.063 +	-0.042 +
	(0.010)	(0.010)	(0.011)	(0.019)	(0.025)	(0.014)
Constant	0.037 *	0.083 *	0.073 *	0.193 *	0.162 *	0.302 *
	(0.013)	(0.016)	(0.016)	(0.035)	(0.024)	(0.030)
N	54772	28574	26198	11883	8393	15057
Pseudo R^2	0.0696	0.0688	0.0546	0.0709	0.0688	0.0716

Source: MTF twelfth-grade surveys, 1991-2003.
* indicates significance at the 99.0% level of confidence, + at the 95.0% level, and ^ at the 90.0% level
Also controlled for gender, race, parent's education, household composition, number of siblings, religiosity

Table 2-12: Linear Probability Estimates, 12th grade sample
Dependent variable: Volunteer at least weekly
Parameter Estimates and (standard errors)

	Sample used					
Covariates	All	Females	Males	Geographic	Demographic	Civic
Treatment Effect (Post * Maryland)	-0.039 *	-0.079 *	0.026 *	-0.040 *	-0.030	-0.038 *
	(0.006)	(0.007)	(0.007)	(0.010)	(0.018)	(0.006)
Constant	0.016	0.022 ^	0.046 *	0.047	0.084 +	0.163 *
	(0.010)	(0.012)	(0.013)	(0.021)	(0.029)	0.013
N	54772	28574	26198	11883	8393	15057
Pseudo R^2	0.0321	0.0372	0.0232	0.0439	0.0309	0.0338

Source: MTF twelfth-grade surveys, 1991-2003.
* indicates significance at the 99.0% level of confidence, + at the 95.0% level, and ^ at the 90.0% level
Also controlled for gender, race, parent's education, household composition, number of siblings, religiosity

Table 2-13: Activities of 8th and 12th grade students

	Percent participating in activity:					
	8th grade			12th grade		
Dependent variable	In past year	At least monthly	At least weekly	In past year	At least monthly	At least weekly
Go to parties or other social affairs	94.8	74.4	33.3	93.9	70.2	35.0
Spend at least an hour of leisure time alone	83.8	76.5	64.9	93.8	87.7	73.9
Go shopping or window-shopping	87.9	78.8	44.9	44.4	39.1	17.9
Get together with friends, informally	90.3	86.6	76.3	98.3	95.4	85.2
Actively participate in sports, athletics or exercising	92.5	81.3	72.4	90.6	79.0	66.1
Ride around in a car (or motorcycle) just for fun	62.9	56.2	41.9	99.1	98.0	94.4
Go to the movies	97.2	69.7	19.7	97.1	64.7	8.4
Watch television *				99.1	98.0	94.4
Participate in community affairs or volunteer work	65.0	25.9	9.8	71.8	28.9	11.7
N	214229	214229	214229	56046	56046	56046

* The eighth-grade MTF survey question about television watching differs from the other measures used, therefore I do not report those calculations.

Table 2-14: Specification Check
Eighth-grade public school students
Parameter estimates and (standard errors)

Dependent variable-- Participate in activity:	Treatment Effect: (Post*Maryland)								
	At all			At least monthly			At least weekly		
	Coef.		R^2	Coef.		R^2	Coef.		R^2
Go to parties or other social affairs	0.037	*	0.015	-0.014	*	0.017	0.023	*	0.017
	(0.005)			(0.002)			(0.005)		
Spend at least an hour of leisure time alone	-0.048	*	0.166	-0.034	*	0.420	-0.046	*	0.281
	(0.006)			(0.003)			(0.004)		
Go shopping or window-shopping	0.010		0.126	-0.015	*	0.571	-0.007		0.331
	(0.007)			(0.002)			(0.004)		
Get together with friends, informally	0.081	*	0.258	-0.002		0.733	0.024	*	0.508
	(0.006)			(0.002)			(0.003)		
Actively participate in sports, athletics or exercising	0.061	*	0.055	0.005		0.027	0.033	*	0.046
	(0.007)			(0.003)			(0.007)		
Ride around in a car (or motorcycle) just for fun	0.100	*	0.022	0.083	*	0.084	0.086	*	0.059
	(0.005)			(0.009)			(0.008)		
Go to the movies	-0.084	*	0.026	-0.005		0.017	-0.009		0.031
	(0.007)			(0.002)			(0.010)		
Participate in community affairs or volunteer work	0.031	*	0.013	0.072	*	0.073	0.040	*	0.036
	(0.004)			(0.007)			(0.007)		

Notes: Each row denotes a separate regression, with the indicated dependent variable.
N = 208961 in all models
The models control for all of the covariates controlled for in the volunteering regressions.
* indicates significance at the 99.9% confidence level, + at the 99.0% level, and ^ at the 95.0% level

Table 2-15: Specification Checks
Twelfth-grade public school students
Parameter estimates and (standard errors)

Dependent variable-- Participate in activity:	Treatment Effect: (Post*Maryland) At all			At least monthly			At least weekly		
	Coef.		R^2	Coef.		R^2	Coef.		R^2
Go to parties or other social affairs	-0.007		0.014	-0.040	*	0.026	-0.043	*	0.039
	(0.004)			(0.008)			(0.009)		
Spend at least an hour of leisure time alone	-0.018	*	0.016	-0.016	*	0.017	-0.053	*	0.013
	(0.003)			(0.004)			(0.007)		
Go shopping or window-shopping	-0.007	^	0.067	-0.007		0.061	0.006		0.041
	(0.003)			(0.004)			(0.003)		
Get together with friends, informally	-0.003		0.009	-0.011		0.020	-0.026	*	0.030
	(0.002)			(0.003)			(0.004)		
Actively participate in sports, athletics or exercising	0.013	*	0.032	0.011		0.055	0.009		0.067
	(0.003)			(0.006)			(0.009)		
Ride around in a car (or motorcycle) just for fun	0.001		0.093	-0.008	*	0.006	-0.002		0.010
	(0.001)			(0.002)			(0.003)		
Go to the movies	0.006	^	0.013	0.033	+	0.026	0.006		0.010
	(0.003)			(0.010)			(0.005)		
Watch television	0.001		0.005	-0.008	*	0.006	-0.002		0.010
	(0.001)			(0.002)			(0.003)		
Participate in community affairs or volunteer work	-0.010		0.086	-0.064	*	0.069	-0.039	*	0.032
	(0.007)			(0.010)			(0.006)		

Notes: Each row denotes a separate regression, with the indicated dependent variable.
N = 54772 in all models
The models control for all of the covariates controlled for in the volunteering regressions.
* indicates significance at the 99.9% confidence level, + at the 99.0% level, and ^ at the 95.0% level

Table 3-1: 2003 ATUS interview completion
By month and year of outgoing CPS interview

Year/Month	Completed diary		Total
2002	**No**	**Yes**	
August	205	20	225
September	758	285	1043
October	1313	1552	2865
November	1527	1743	3270
December	1576	1707	3283
Total	5379	5307	10686
2003			
January	1534	1747	3281
February	1555	1713	3268
March	1598	1680	3278
April	1586	1704	3290
May	1540	1709	3249
June	1515	1732	3247
July	1540	1734	3274
August	1313	1674	2987
September	574	1411	1985
October	84	309	393
Total	12839	15413	28252
Total	18218	20720	38938

Source: ATUS 2003 and 2004

Table 3-2: Comparison of mean annual volunteer hours, Calculated from the ATUS and CPS

2003 ATUS Respondents Only (N=4633)		Full 2003 ATUS Overlap Sample (N=8665)
2003 ATUS estimates	2002 CPS estimates	2002 CPS estimates
Mean	Mean	Mean
43.1	49.2	38.6
(3.7)	(2.8)	(1.7)

2004 ATUS Respondents Only (N=3521)		Full 2004 ATUS Overlap Sample (N=6905)
2004 ATUS estimates	2003 CPS estimates	2003 CPS estimates
Mean	Mean	Mean
53.0	42.9	34.6
(4.7)	(2.7)	(1.8)

Source: ATUS 2003 and 2004
Note: All estimates are unweighted. Standard errors are reported in parenthesis, and have not been adjusted to take the clustering of the CPS sample into account.

Table 3-3: Volunteer rates and mean hours spent volunteering, 2002 and 2003 CPS Volunteer Supplements

	2002 CPS Volunteer Supplement				2003 CPS Volunteer Supplement			
		Percent	Volunteer Hours			Percent	Volunteer Hours	
	N	Who Volunteer	Volunteer Mean	Overall Mean	N	Who Volunteer	Volunteer Mean	Overall Mean
All volunteer supplement respondents	97719	29.4	140.1	39.2	95337	30.5	137.2	39.6
		(0.1)	(1.7)	(0.5)		(0.1)	(1.7)	(0.5)
Volunteer supplement respondents in ATUS sample	8665	28.4	136.5	38.6	6905	28.5	122.5	34.6
		(0.5)	(5.7)	(1.7)		(0.5)	(5.8)	(1.8)
ATUS respondents	4633	34.1	144.5	49.2	3521	35.7	120.7	42.9
		(0.7)	(7.6)	(2.8)		(0.8)	(6.9)	(2.7)
ATUS nonrespondents	4032	22.0	121.4	26.4	3384	20.9	125.7	26.0
		(0.7)	(8.5)	(2.0)		(0.7)	(10.3)	(2.3)
Refusals	1780	25.8	129.2	33.0	1259	24.4	140.2	33.7
		(1.0)	(12.0)	(3.3)		(1.2)	(17.0)	(4.4)
Contact not attempted	807	18.1	111.2	20.1	772	18.4	119.2	21.8
		(1.4)	(21.20)	(4.1)		(1.4)	(17.2)	(3.5)
Inadequate/missing contact information	593	13.5	119.9	16.0	751	16.6	105.0	17.5
		(1.4)	(28.8)	(4.2)		(1.4)	(17.4)	(3.2)
Unsuccessful contact	727	25.2	115.4	28.9	518	24.5	122.1	29.7
		(1.6)	(17.7)	(4.8)		(1.9)	(30.8)	(7.8)
Other	125	12.8	64.9	8.3	84	7.1	48.6	3.5
		(3.0)	(33.2)	(4.6)		(2.8)	(21.3)	(2.1)

Source: ATUS 2003 and 2004

Note: Reported estimates of volunteer activity are based on responses to the CPS September 2002 or September 2003 volunteer supplement. The 2002 supplement had a nonresponse rate of 19.2 percent and the 2003 supplement a nonresponse rate of 18.0 percent, accounting both for Nonresponse to the basic CPS (6.6 percent in both years) and additional supplement nonresponse. Volunteer hours are imputed for individuals who report that they volunteer but do not report the amount of time they spent. All estimates are unweighted. Standard errors reported in parentheses have not been adjusted to take the clustering of the CPS sample into account.

Table 3-4: Volunteer rates calculated from the 2002 and 2003 CPS volunteer supplements By demographic characteristics, for ATUS sample members, respondents and nonrespondents

	2002 CPS Volunteer Supplement						2003 CPS Volunteer Supplement					
	Full 2003 ATUS Overlap Sample		2003 ATUS Respondents		2003 ATUS Nonrespondents		Full 2004 ATUS Overlap Sample		2004 ATUS Respondents		2004 ATUS Nonrespondents	
	N	Rate (s.e.)	N	Rate (s.e.)	N	Rate (s.e.)	N	Rate (s.e.)	N	Rate (s.e.)	N	Rate (s.e.)
Full sample	8665	28.4 (0.5)	4633	34.1 (0.7)	4032	21.9 (0.7)	6905	28.5 (0.5)	3521	35.7 (0.8)	3384	20.9 (0.7)
Human Capital Indicators												
Education												
Less than high school	1653	14.2 (0.9)	766	18.4 (1.4)	887	10.6 (1.0)	1314	16.0 (1.0)	585	22.9 (1.7)	729	10.5 (1.1)
High school graduate	2631	20.8 (0.8)	1314	25.3 (1.2)	1317	16.4 (1.0)	2112	21.2 (0.9)	987	25.6 (1.4)	1125	17.2 (1.1)
Some college	2337	32.9 (1.0)	1278	37.9 (1.4)	1059	26.8 (1.4)	1805	32.5 (1.1)	940	38.2 (1.6)	865	26.4 (1.5)
Bachelor's degree	1344	42.9 (1.4)	807	46.8 (1.8)	537	37.1 (2.1)	1123	42.6 (1.5)	655	50.4 (2.0)	468	31.6 (2.2)
Graduate degree	700	47.9 (1.9)	468	51.9 (2.3)	232	39.7 (3.2)	551	44.1 (2.1)	354	51.4 (2.7)	197	31.0 (3.3)
Labor force status												
Not in labor force	3234	24.0 (0.8)	1709	30.0 (1.1)	1525	17.3 (1.0)	2665	24.1 (0.8)	1313	32.4 (1.3)	1352	16.0 (1.0)
Work <35 hrs/wk	787	42.1 (1.8)	463	49.2 (2.3)	324	31.8 (2.6)	623	37.9 (1.9)	357	41.7 (2.6)	266	32.7 (2.9)
Work 35-44 hrs/wk	3137	26.5 (0.8)	1593	30.7 (1.2)	1544	22.1 (1.1)	2429	27.2 (0.9)	1217	34.1 (1.4)	1212	20.3 (1.2)
Work 45 plus hrs/wk	1077	36.9 (1.5)	631	42.3 (2.0)	446	29.1 (2.2)	819	36.9 (1.7)	449	42.3 (2.3)	370	30.3 (2.4)
Work hours vary	430	30.2 (2.2)	237	35.0 (3.1)	193	24.4 (3.1)	369	33.9 (2.5)	185	42.7 (3.6)	184	25.0 (3.2)

Household income												
Missing	1241	20.0	491	24.6	750	16.9	1086	21.6	447	30.4	639	15.5
		(1.1)		(1.9)		(1.4)		(1.3)		(2.2)		(1.4)
Under $20,000	1609	18.6	787	22.9	822	14.5	1297	18.2	564	22.9	733	14.6
		(1.0)		(1.5)		(1.2)		(1.1)		(1.8)		(1.3)
$20,000 to $39,999	2061	23.4	1068	27.3	993	19.2	1618	22.9	830	25.8	788	19.8
		(0.9)		(1.4)		(1.3)		(1.0)		(1.5)		(1.4)
$40,000 to $74,999	2087	33.7	1229	38.8	858	26.5	1615	33.8	900	41.3	715	24.3
		(1.0)		(1.4)		(1.5)		1.2		1.6		1.6
$75,000 or more	1667	43.8	1058	48.1	609	36.3	1289	44.8	780	52.2	509	33.6
		(1.2)		(1.5)		(2.0)		(1.4)		(1.8)		(2.1)
Social Capital Indicators												
Marital status												
Married	4269	34.2	2468	39.7	1801	26.5	3307	34.0	1881	40.5	1426	25.5
		(0.7)		(1.0)		(1.0)		(0.8)		(1.1)		(1.2)
Widowed	706	22.4	377	31.6	329	11.9	547	23.9	276	33.7	271	14.0
		(1.6)		(2.4)		(1.8)		(1.8)		(2.9)		(2.1)
Divorced	1051	25.7	542	29.9	509	21.2	891	24.8	443	31.4	448	18.3
		(1.3)		(2.0)		(1.8)		(1.4)		(2.2)		(1.8)
Spouse absent	461	18.4	197	19.3	264	17.8	344	23.0	157	25.5	187	20.9
		(1.8)		(2.8)		(2.4)		(2.3)		(3.5)		(3.0)
Never married	2178	22.6	1049	26.6	1129	19.0	1816	22.6	764	29.5	1052	17.6
		(0.9)		(1.4)		(1.2)		(1.0)		(1.7)		(1.2)
Children in household												
No children under age 6	6926	28.2	3727	33.9	3199	21.5	5544	27.7	2829	35.2	2715	19.9
		(0.5)		(0.8)		(0.7)		(0.6)		(0.9)		(0.8)
Children under age 6	1739	29.5	906	34.9	833	23.6	1361	31.5	692	37.9	669	25.0
		(1.1)		(1.6)		(1.5)		(1.3)		(1.8)		(1.7)
No children age 6-17	5428	23.6	2917	29.0	2511	17.4	4512	23.9	2283	30.6	2229	17.0
		(0.6)		(0.8)		(0.8)		(0.6)		(1.0)		(0.8)
Children age 6-17	3237	36.5	1716	42.7	1521	29.5	2393	37.1	1238	45.2	1155	28.4
		(0.8)		(1.2)		(1.2)		(1.0)		(1.4)		(1.3)

Housing tenure												
Missing	--	--	--	--	--	--	258	33.3	142	42.3	116	22.4
		--		--		--		(2.9)		(4.2)		(3.9)
Owner	6066	32.0	3497	37.4	2569	24.8	4660	31.3	2520	38.4	2140	22.9
		(0.6)		(0.8)		(0.9)		(0.7)		(1.0)		(0.9)
Renter	2599	20.0	1136	23.9	1463	17.0	1987	21.2	859	26.8	1128	16.9
		(0.8)		(1.3)		(1.0)		(0.9)		(1.5)		(1.1)
Urbanicity of residence												
Central city	2191	23.1	1066	27.4	1125	19.0	1730	23.5	787	30.9	943	17.4
		(0.9)		(1.4)		(1.2)		(1.0)		(1.6)		(1.2)
Balance of MSA	3612	30.8	1947	36.6	1665	24.1	2922	30.5	1521	38.1	1401	22.3
		(0.8)		(1.1)		(1.0)		(0.9)		(1.2)		(1.1)
Other metropolitan	1210	28.4	683	34.6	527	20.5	957	28.8	497	36.4	460	20.7
		(1.3)		(1.8)		(1.8)		(1.5)		(2.2)		(1.9)
Non-metropolitan	1630	30.3	923	36.2	707	22.6	1282	30.1	708	35.6	574	23.3
		(1.1)		(1.6)		(1.6)		(1.3)		(1.8)		(1.8)
Not identified	22	27.3	14	28.6	8	25.0	14	28.6	8	37.5	6	16.7
		(9.7)		(12.5)		(16.4)		(12.5)		(18.3)		(16.7)
Others in household												
No relatives	7022	30.4	3842	36.1	3180	23.5	5514	29.6	2882	36.7	2632	21.8
		(0.5)		(0.8)		(0.8)		(0.6)		(0.9)		(0.8)
One or more relatives	1643	20.1	791	24.4	852	16.1	1391	23.8	639	31.1	752	17.6
		(1.0)		(1.5)		(1.3)		(1.1)		(1.8)		(1.4)
No non-relatives	8026	29.2	4354	34.6	3672	22.7	6347	29.5	3302	36.8	3045	21.6
		(0.5)		(0.7)		(0.7)		(0.6)		(0.8)		(0.7)
One or more non-relatives	639	19.4	279	25.8	360	14.4	558	16.1	219	19.2	339	14.2
		(1.6)		(2.6)		(1.9)		(1.6)		(2.7)		(1.9)
Telephone status												
Telephone household	8343	29.1	4537	34.4	3806	22.7	6572	29.2	3425	36.2	3147	21.6
		(0.5)		(0.7)		(0.7)		(0.6)		(0.8)		(0.7)
Non-telephone household	322	11.8	96	17.7	226	9.3	333	13.8	96	18.8	237	11.8
		(1.8)		(3.9)		(1.9)		(1.9)		(4.0)		(2.1)

Other Characteristics												
Sex												
Male	3914	24.2	2057	29.4	1857	18.5	3127	24.8	1538	32.5	1589	17.3
		(0.7)		(1.0)		(0.9)		(0.8)		(1.2)		(0.9)
Female	4751	31.9	2576	37.8	2175	24.9	3778	31.5	1983	38.2	1795	24.1
		(0.7)		(1.0)		(0.9)		(0.8)		(1.1)		(1.0)
Age												
Age 15-30	2035	23.2	931	28.6	1104	18.8	1641	25.2	724	30.4	917	21.0
		(0.9)		(1.5)		(0.2)		(1.1)		(1.7)		(1.3)
Age 31-45	2957	35.0	1597	40.5	1360	28.5	2217	34.2	1133	42.5	1084	25.6
		(0.9)		(1.2)		(1.2)		(1.0)		(1.5)		(1.3)
Age 46-55	1475	28.9	819	33.1	656	23.8	1136	31.9	626	38.5	510	23.7
		(1.2)		(1.6)		(1.7)		(1.4)		(1.9)		(1.9)
Age 56-65	904	26.9	557	31.6	347	19.3	815	25.9	492	32.5	323	15.8
		(1.5)		(2.0)		(2.1)		(1.5)		(2.1)		(2.0)
Over age 65	1294	22.2	729	30.0	565	12.0	1096	20.2	546	28.6	550	11.8
		(1.2)		(1.7)		(1.4)		(1.2)		(1.9)		(1.4)
Race/ethnicity												
Hispanic	1056	17.0	476	20.0	580	14.7	873	16.2	390	18.7	483	14.1
		(1.2)		(1.8)		(1.5)		(1.2)		(2.0)		(1.6)
Non-Hispanic black	1354	20.5	559	22.0	795	19.4	1028	19.4	407	23.8	621	16.4
		(1.1)		(1.8)		(1.4)		(1.2)		(2.1)		(1.5)
Non-Hispanic non-black	6255	32.1	3598	37.8	2657	24.3	5004	32.5	2724	39.9	2280	23.6
		(0.6)		(0.8)		(0.8)		(0.7)		(0.9)		(0.9)
Region of residence												
Northeast	1794	26.9	966	33.5	828	19.2	1334	25.7	692	32.7	642	18.2
		(1.0)		(1.5)		(1.4)		(1.2)		(1.8)		(1.5)
South	2003	32.4	1133	39.1	870	23.7	1583	32.7	876	41.3	707	21.9
		(1.0)		(1.5)		(1.4)		(1.2)		(1.7)		(1.6)
West	3105	26.2	1584	31.5	1521	20.6	2577	26.6	1220	33.0	1357	20.9
		(0.8)		(1.2)		(1.0)		(0.9)		(1.3)		(1.1)
Midwest	1763	29.5	950	32.9	813	25.5	1411	29.8	733	36.6	678	22.4
		(1.1)		(1.5)		(1.5)		(1.2)		(1.8)		(1.6)

Table 3-5: Mean volunteer hours reported by volunteers in the 2002 and 2003 CPS Volunteer Supplements By demographic characteristics, for ATUS sample respondents and nonrespondents

	2002 CPS Volunteer Supplement						2003 CPS Volunteer Supplement					
	Full 2003 ATUS Overlap Sample		2003 ATUS Respondents		2003 ATUS Nonrespondents		Full 2004 ATUS Overlap Sample		2004 ATUS Respondents		2004 ATUS Nonrespondents	
	N	Mean (s.e.)	N	Mean (s.e.)	N	Mean (s.e.)	N	Mean (s.e.)	N	Mean (s.e.)	N	Mean (s.e.)
Full sample	2452	136.5 (5.7)	1574	144.9 (7.6)	878	121.4 (8.5)	1953	122.5 (5.8)	1252	120.7 (6.9)	701	125.7 (10.3)
Human Capital Indicators												
Education												
Less than high school	232	117.2 (20.0)	140	107.9 (27.5)	92	131.4 (28.4)	207	78.1 (8.0)	132	81.4 (11.0)	75	72.2 (10.8)
High school graduate	544	139.7 (12.0)	330	150.4 (16.4)	214	123.2 (17.1)	447	127.6 (14.1)	253	140.0 (22.0)	194	111.3 (15.4)
Some college	766	126.1 (9.4)	483	133.0 (11.4)	283	114.4 (16.2)	583	125.5 (11.3)	358	116.2 (13.5)	225	140.2 (19.9)
Bachelor's degree	575	134.1 (11.1)	378	145.2 (15.0)	197	113.0 (14.7)	474	134.8 (12.1)	328	128.4 (10.9)	146	149.1 (30.7)
Graduate degree	335	172.4 (19.1)	243	182.3 (24.4)	92	146.5 (25.4)	242	119.6 (12.4)	181	117.2 (14.1)	61	127.0 (26.2)
Labor force status												
Not in labor force	769	181.3 (12.6)	509	184.0 (15.3)	260	176.1 (22.0)	639	160.3 (13.0)	423	159.7 (16.0)	216	161.4 (22.3)
Work <35 hrs/wk	328	113.1 (11.5)	226	121.3 (14.5)	102	94.8 (18.4)	232	121.6 (19.3)	147	104.6 (14.5)	85	150.9 (46.4)
Work 35-44 hrs/wk	829	113.4 (8.7)	489	124.2 (12.8)	340	97.9 (10.3)	658	92.4 (6.6)	414	86.6 (8.0)	244	102.2 (11.6)
Work 45 plus hrs/wk	396	118.2 (13.0)	267	130.5 (17.9)	129	92.7 (15.2)	300	114.3 (13.2)	189	118.7 (17.5)	111	106.8 (19.5)
Work hours vary	130	133.3 (23.2)	83	138.2 (32.8)	47	124.6 (28.3)	124	108.9 (13.7)	79	125.2 (19.5)	45	80.3 (15.5)

Household income												
Missing	246	135.1	120	154.5	126	116.5	231	143.8	134	126.8	97	167.2
		(15.2)		(25.9)		(16.5)		(20.2)		(15.9)		(42.7)
Under $20,000	296	165.5	179	166.4	117	164.2	235	155.1	128	137.0	107	176.7
		(21.7)		(30.4)		(29.5)		(25.4)		(33.0)		(39.6)
$20,000 to $39,999	483	131.9	292	130.9	191	133.6	370	135.1	214	147.1	156	118.6
		(12.6)		(14.6)		(22.7)		(12.9)		(19.2)		(15.5)
$40,000 to $74,999	702	137.5	477	145.5	225	120.6	543.00	112.7	370	122.0	173	93.0
		(11.0)		(14.2)		(16.6)		(10.7)		(14.3)		(13.3)
$75,000 or more	725	127.1	506	142.6	219	91.4	574	101.6	406	98.4	168	109.3
		(9.3)		(12.3)		(11.0)		(6.5)		(7.1)		(14.2)
Social Capital Indicators												
Marital status												
Married	1455	141.1	980	152.0	475	118.6	1118	119.9	757	120.7	361	118.3
		(7.4)		(9.7)		(11.1)		(7.2)		(8.6)		(13.1)
Widowed	158	187.6	119	182.5	39	203.3	130	192.3	92	201.4	38	170.4
		(29.7)		(35.0)		(56.4)		(26.2)		(32.0)		(45.5)
Divorced	268	130.8	161	129.7	107	132.4	219	116.9	138	110.5	81	127.9
		(14.7)		(18.2)		(24.9)		(14.7)		(17.5)		(26.4)
Spouse absent	82	110.8	37	158.9	45	71.2	79	91.6	40	66.2	39	117.7
		(30.3)		(64.1)		(15.3)		(18.7)		(15.9)		(33.8)
Never married	489	113.7	277	110.8	212	117.5	407	116.2	225	103.7	182	131.6
		(12.2)		(16.4)		(18.2)		(15.3)		(18.8)		(25.0)
Children in household												
No children under age 6	1939	145.7	1258	155.1	681	128.1	1525	128.8	990	126.2	535	133.5
		(6.6)		(8.8)		(9.3)		(6.8)		(8.4)		(11.4)
Children under age 6	513	101.9	316	104.3	197	97.9	428	99.9	262	99.7	166	100.3
		(11.1)		(13.3)		(19.7)		(10.8)		(9.9)		(23.2)
No children age 6-17	1278	140.1	843	146.5	435	127.9	1071	132.9	696	126.1	375	145.5
		(8.0)		(10.3)		(12.3)		(8.3)		(9.5)		(15.8)
Children age 6-17	1174	132.5	731	143.2	443	114.9	882	109.8	556	113.9	326	102.8
		(8.2)		(11.2)		(11.6)		(7.9)		(10.2)		(12.6)

Housing tenure												
Missing	--	--	--	--	--	--	86	110.9	60	85.8	26	168.8
		--		--		--		(21.6)		(14.7)		(62.3)
Owner	1934	134.0	1303	147.8	631	105.5	1446	119.1	962	119.3	484	118.7
		(6.2)		(8.2)		(8.7)		(6.2)		(7.4)		(11.3)
Renter	518	145.9	271	131.2	247	161.9	421	136.3	230	135.5	191	137.3
		(13.9)		(19.4)		(20.1)		(15.7)		(21.3)		(23.4)
Urbanicity of residence												
Central city	501	153.5	291	150.9	210	157.1	404	131.4	241	142.9	163	114.3
		(14.1)		(18.7)		(21.4)		(13.9)		(21.2)		(14.2)
Balance of MSA	1109	130.7	710	142.0	399	110.6	885	115.3	576	116.2	309	113.6
		(8.6)		(11.4)		(12.3)		(8.0)		(9.8)		(13.7)
Other metropolitan	344	161.1	236	173.8	108	133.4	276	114.6	181	109.8	95	123.9
		(17.6)		(23.2)		(24.1)		(12.7)		(16.3)		(19.6)
Non-metropolitan	492	114.1	333	126.8	159	87.4	384	136.2	251	118.4	133	169.7
		(8.9)		(12.1)		(10.0)		(15.3)		(11.9)		(38.0)
Not identified	6	211.2	4	31.8	2	570.0	4	33.8	3	35.0	1	30.0
		(184.4)		(13.6)		(562.0)		(14.7)		(20.7)		(n.a.)
Others in household												
No relatives	2125	139.2	1383	145.9	742	126.9	1623	125.0	1053	121.8	570	130.8
		(6.3)		(8.1)		(9.6)		(6.6)		(7.9)		(12.0)
One or more relatives	327	118.6	191	138.1	136	91.3	330	110.1	199	114.6	131	103.3
		(13.4)		(20.2)		(15.2)		(10.4)		(12.5)		(17.8)
No non-relatives	2328	138.5	1502	147.0	826	122.9	1863	120.9	1210	118.2	653	125.9
		(6.0)		(7.9)		(8.8)		(5.7)		(6.5)		(10.8)
One or more non-relatives	124	99.5	72	101.7	52	96.4	90	154.8	42	191.7	48	122.5
		(13.2)		(13.7)		(25.3)		(45.4)		(90.7)		(31.4)
Telephone status												
Telephone household	2414	137.0	1557	145.9	857	120.7	1907	123.3	1234	121.5	673	126.8
		(5.8)		(7.6)		(8.5)		(5.9)		(7.0)		(10.6)
Non-telephone household	38	105.3	17	54.0	21	146.8	28	99.1	18	65.2	46	85.8
		(38.0)		(11.6)		(67.4)		(44.5)		(22.3)		(28.4)

Other Characteristics												
Sex												
Male	946	138.2	604	155.8	342	107.3	773	122.0	498	121.3	275	123.2
		(9.4)		(13.2)		(11.3)		(8.8)		(11.3)		(14.3)
Female	1506	135.4	970	138.2	536	130.3	1180	122.8	754	120.3	426	127.2
		(7.2)		(9.1)		(11.8)		(7.6)		(8.8)		(14.3)
Age												
Age 15-30	469	94.5	264	88.4	205	102.4	412	107.1	220	103.9	192	110.7
		(8.8)		(10.5)		(15.0)		(14.8)		(19.5)		(22.6)
Age 31-45	1029	123.5	646	127.4	383	116.9	754	101.8	480	95.7	274	112.6
		(8.5)		(10.8)		(13.8)		(7.2)		(7.5)		(14.8)
Age 46-55	426	139.7	271	158.9	155	106.0	359	128.4	239	133.3	120	118.5
		(11.8)		(16.8)		(13.1)		(14.7)		(20.2)		(18.1)
Age 56-65	243	175.3	176	194.9	67	123.7	207	139.8	157	122.4	50	194.4
		(23.3)		(30.3)		(27.5)		(17.8)		(17.3)		(49.4)
Over age 65	285	214.6	217	207.8	68	236.5	221	195.7	156	200.1	65	185.1
		(23.2)		(27.1)		(45.4)		(19.6)		(22.8)		(38.1)
Race/ethnicity												
Hispanic	179	104.6	94	98.9	85	110.9	140	134.1	73	75.2	67	198.2
		(14.2)		(17.1)		(23.3)		(25.5)		(16.0)		(49.5)
Non-Hispanic black	275	158.3	122	148.7	153	165.9	197	117.5	96	111.3	101	123.3
		(19.3)		(24.6)		(28.6)		(21.4)		(21.2)		(36.7)
Non-Hispanic non-black	1998	136.3	1358	147.8	640	112.1	1616	122.1	1083	124.6	533	117.0
		(6.4)		(8.4)		(8.8)		(6.1)		(7.7)		(9.8)
Region of residence												
Northeast	482	149.8	324	163.2	158	122.5	342	119.4	226	131.6	116	95.6
		(14.9)		(20.6)		(16.5)		(11.6)		(13.9)		(21.0)
South	646	108.4	442	114.0	204	96.4	512	108.7	358	100.3	154	128.3
		(8.5)		(10.3)		(15.0)		(8.3)		(8.8)		(18.6)
West	806	146.1	496	157.6	310	127.6	681	123.8	401	112.4	280	140.0
		(10.4)		(13.5)		(16.2)		(11.4)		(13.0)		(20.4)
Midwest	518	144.1	312	149.6	206	135.9	418	139.7	267	151.2	151	119.3
		(13.0)		(18.1)		(18.1)		(14.0)		(20.0)		(15.7)

Table 3-6: Overall mean volunteer hours reported in the 2002 and 2003 CPS Volunteer Supplements, By demographic characteristics, for ATUS respondents and nonrespondents

	2002 CPS Volunteer Supplement						2003 CPS Volunteer Supplement					
	Full 2003 ATUS Overlap Sample		2003 ATUS Respondents		2003 ATUS Nonrespondents		Full 2004 ATUS Overlap Sample		2004 ATUS Respondents		2004 ATUS Nonrespondents	
	N	Mean (s.e.)	N	Mean (s.e.)	N	Mean (s.e.)	N	Mean (s.e.)	N	Mean (s.e.)	N	Mean (s.e.)
Full sample	8665	38.6 (1.7)	4633	49.2 (2.8)	4032	26.4 (2.0)	6905	34.6 (1.8)	3521	42.9 (2.7)	3384	26.0 (2.3)
Human Capital Indicators												
Education												
Less than high school	1653	16.5 (3.0)	766	19.7 (5.2)	887	13.6 (3.2)	1314	12.3 (1.5)	585	18.4 (2.8)	729	7.4 (1.4)
High school graduate	2631	28.9 (2.7)	1314	37.8 (4.5)	1317	20.0 (3.0)	2112	27.0 (3.2)	987	35.9 (5.9)	1125	19.2 (2.9)
Some college	2337	41.3 (3.3)	1278	50.3 (4.7)	1059	30.6 (4.6)	1805	40.5 (3.9)	940	44.2 (5.4)	865	36.5 (5.6)
Bachelor's degree	1344	57.4 (5.1)	807	68.0 (7.4)	537	41.4 (5.9)	1123	56.9 (5.5)	655	64.3 (6.0)	468	46.5 (10.1)
Graduate degree	700	82.5 (9.7)	468	94.6 (13.4)	232	58.1 (11.1)	551	52.5 (6.0)	354	59.9 (7.8)	197	39.3 (9.1)
Labor force status												
Not in labor force	3234	43.1 (3.3)	1709	54.8 (5.0)	1525	30.0 (4.1)	2665	38.4 (3.4)	1313	51.4 (5.6)	1352	25.8 (3.9)
Work <35 hrs/wk	787	47.1 (5.2)	463	59.2 (7.6)	324	29.9 (6.3)	623	45.3 (7.6)	357	43.1 (6.6)	266	48.2 (15.4)
Work 35-44 hrs/wk	3137	30.0 (2.5)	1593	38.1 (4.2)	1544	21.6 (2.5)	2429	25.0 (2.0)	1217	29.5 (3.0)	1212	20.6 (2.6)
Work 45 plus hrs/wk	1077	43.4 (5.1)	631	55.2 (8.0)	446	26.8 (4.8)	819	41.9 (5.2)	449	50.0 (7.9)	370	32.0 (6.4)
Work hours vary	430	40.3 (7.6)	237	48.4 (12.2)	193	30.3 (7.9)	369	36.6 (5.3)	185	53.5 (9.5)	184	19.6 (4.5)

Household income												
Missing	1241	26.8	491	37.8	750	19.6	1086	30.6	447	38.0	639	25.4
		(3.4)		(7.0)		(3.2)		(4.6)		(5.5)		(6.9)
Under $20,000	1609	30.5	787	37.8	822	23.4	1297	28.1	564	31.1	733	25.8
		(4.3)		(7.3)		(4.6)		(4.9)		(7.8)		(6.2)
$20,000 to $39,999	2061	30.9	1068	35.8	993	25.7	1618	30.9	830	37.9	788	23.5
		(3.2)		(4.4)		(4.7)		(3.3)		(5.4)		(3.5)
$40,000 to $74,999	2087	46.3	1229	56.5	858	31.6	1615	37.9	900	50.1	715	22.5
		(4.0)		(5.9)		(4.7)		(3.8)		(6.2)		(3.5)
$75,000 or more	1667	55.3	1058	68.2	609	32.9	1289	45.2	780	51.2	509	36.1
		(4.3)		(6.3)		(4.3)		(3.2)		(4.1)		(5.2)
Social Capital Indicators												
Marital status												
Married	4269	48.1	2468	60.4	1801	31.3	3307	40.5	1881	48.6	1426	29.9
		(2.7)		(4.1)		(3.2)		(2.6)		(3.7)		(3.6)
Widowed	706	42.0	377	57.6	329	24.1	547	45.7	276	67.1	271	23.9
		(7.3)		(11.9)		(7.5)		(7.1)		(12.1)		(7.3)
Divorced	1051	33.3	542	38.5	509	27.8	891	28.7	443	34.4	448	23.1
		(4.1)		(6.0)		(5.7)		(4.0)		(6.0)		(5.3)
Spouse absent	461	19.7	197	29.9	264	12.1	344	21.0	157	16.9	187	24.5
		(5.7)		(12.7)		(3.1)		(4.7)		(4.6)		(7.8)
Never married	2178	25.5	1049	29.3	1129	22.1	1816	26.0	764	29.5	1052	22.8
		(2.9)		(4.6)		(3.7)		(3.6)		(5.8)		(4.6)
Children in household												
No children under age 6	6926	40.8	3727	52.4	3199	27.3	5544	35.4	2829	44.2	2715	26.3
		(2.0)		(3.2)		(2.2)		(2.0)		(3.1)		(2.5)
Children under age 6	1739	30.0	906	36.4	833	23.2	1361	31.4	692	37.7	669	24.9
		(3.5)		(4.9)		(4.9)		(3.6)		(4.2)		(6.0)
No children age 6-17	5428	33.0	2917	42.3	2511	22.2	4512	31.5	2283	38.4	2229	24.5
		(2.0)		(3.2)		(2.3)		(2.1)		(3.1)		(2.9)
Children age 6-17	3237	48.1	1716	61.0	1521	33.5	2393	40.5	1238	51.2	1155	29.0
		(3.2)		(5.1)		(3.6)		(3.1)		(4.9)		(3.8)

Housing tenure												
Missing	--	--	--	--	--	--	258	37.0	142	36.2	116	37.8
		--		--		--		(7.9)		(7.2)		(15.2)
Owner	6066	42.7	3497	55.1	2569	25.9	4660	37.0	2520	45.5	2140	26.9
		(2.1)		(3.3)		(2.3)		(2.1)		(3.1)		(2.8)
Renter	2599	29.1	1136	31.3	1463	27.3	1987	28.9	859	36.3	1128	23.3
		(3.0)		(4.9)		(3.7)		(3.6)		(6.0)		(4.2)
Urbanicity of residence												
Central city	2191	35.1	1066	41.2	1125	29.3	1730	30.7	787	43.8	943	19.8
		(3.5)		(5.5)		(4.4)		(3.5)		(6.9)		(2.8)
Balance of MSA	3612	40.1	1947	51.8	1665	26.5	2922	34.9	1521	44.0	1401	25.0
		(2.8)		(4.5)		(3.2)		(2.6)		(4.0)		(3.3)
Other metropolitan	1210	45.8	683	60.1	527	27.3	957	33.1	497	40.0	460	25.6
		(5.4)		(8.6)		(5.4)		(4.0)		(6.4)		(4.7)
Non-metropolitan	1630	34.4	923	45.7	707	19.7	1282	40.8	708	42.0	574	39.3
		(3.0)		(4.8)		(2.6)		(4.9)		(4.7)		(9.3)
Not identified	22	57.6	14	9.1	8	142.5	14	9.6	8	13.1	6	5.0
		(51.3)		(5.3)		(141.4)		(5.7)		(9.3)		(5.0)
Others in household												
No relatives	7022	42.1	3842	52.5	3180	29.6	5514	36.8	2882	44.5	2632	28.3
		(2.0)		(3.1)		(2.4)		(2.1)		(3.1)		(2.8)
One or more relatives	1643	23.6	791	33.3	852	14.6	1391	26.1	639	35.7	752	18.0
		(2.9)		(5.3)		(2.7)		(2.8)		(4.4)		(3.4)
No non-relatives	8026	40.2	4354	50.7	3672	27.7	6347	35.5	3302	43.3	3045	27.0
		(1.9)		(2.9)		(2.2)		(1.8)		(2.6)		(2.5)
One or more non-relatives	639	19.3	279	26.3	360	13.9	558	25.0	219	36.8	339	17.3
		(3.0)		(4.4)		(4.0)		(7.7)		(18.0)		(5.0)
Telephone status												
Telephone household	8343	39.6	4537	50.1	3806	27.2	6572	35.8	3425	43.8	3147	27.1
		(1.8)		(2.8)		(2.1)		(1.8)		(2.7)		(2.4)
Non-telephone household	322	12.4	96	9.6	226	13.6	333	11.9	96	12.2	237	11.7
		(4.8)		(2.9)		(6.8)		(4.2)		(4.8)		(5.6)

Other Characteristics												
Sex												
Male	3914	33.4	2057	45.7	1857	19.8	3127	30.2	1538	39.3	1589	21.3
		(2.5)		(4.2)		(2.3)		(2.4)		(3.9)		(2.7)
Female	4751	42.9	2576	52.0	2175	32.1	3778	38.3	1983	45.7	1795	30.2
		(2.5)		(3.7)		(3.2)		(2.6)		(3.6)		(3.6)
Age												
Age 15-30	2035	21.8	931	25.1	1104	19.0	1641	26.9	724	31.6	917	23.2
		(2.2)		(3.3)		(3.0)		(3.9)		(6.2)		(4.9)
Age 31-45	2957	43.0	1597	51.5	1360	32.9	2217	34.6	1133	40.5	1084	28.5
		(3.1)		(4.6)		(4.1)		(2.6)		(3.5)		(4.0)
Age 46-55	1475	40.3	819	52.6	656	25.1	1136	40.6	626	50.9	510	27.9
		(3.8)		(6.1)		(3.6)		(5.0)		(8.1)		(4.8)
Age 56-65	904	47.1	557	61.6	347	23.9	815	35.5	492	39.1	323	30.1
		(6.8)		(10.3)		(5.9)		(5.0)		(6.1)		(8.5)
Over age 65	1294	47.3	729	61.9	565	28.5	1096	39.5	546	57.2	550	21.9
		(5.7)		(8.8)		(6.3)		(4.6)		(7.6)		(5.2)
Race/ethnicity												
Hispanic	1056	17.7	476	19.5	580	16.2	873	21.5	390	14.1	483	27.5
		(2.7)		(3.8)		(3.8)		(4.4)		(3.3)		(7.5)
Non-Hispanic black	1354	32.1	559	32.5	795	31.9	1028	22.5	407	26.3	621	20.1
		(4.3)		(5.9)		(6.0)		(4.3)		(5.5)		(6.2)
Non-Hispanic non-black	6255	43.6	3598	55.8	2657	27.0	5004	39.4	2724	49.5	2280	27.3
		(2.2)		(3.4)		(2.3)		(2.1)		(3.3)		(2.5)
Region of residence												
Northeast	1794	40.3	966	54.7	828	23.4	1334	30.6	692	43.0	642	17.3
		(4.3)		(7.3)		(3.6)		(3.3)		(5.1)		(4.0)
South	2003	35.0	1133	44.5	870	22.6	1583	35.2	876	41.0	707	28.0
		(3.0)		(4.3)		(3.8)		(3.0)		(3.9)		(4.5)
West	3105	37.9	1584	49.4	1521	26.0	2577	32.7	1220	37.0	1357	28.9
		(2.9)		(4.6)		(3.5)		(3.2)		(4.5)		(4.5)
Midwest	1763	42.4	950	49.1	813	34.4	1411	41.4	733	55.1	678	26.6
		(4.1)		(6.3)		(5.0)		(4.5)		(7.8)		(4.0)

Table 3-7: Tobit Estimates, 2002 CPS, Full sample

	Latent Variable		Marginal Effects: Unconditional expected hours		Marginal Effects: Hours conditional on hours > 0		Marginal Effects: Probability hours > 0	
	dF/dx (s.e.)		dF/dx (s.e.)		dF/dx (s.e.)		dF/dx (s.e.)	
Human Capital Indicators								
Education								
Less than high school	-94.4	*	-18.6	*	-20.5	*	-0.075	*
	(18.0)		(4.0)		(4.1)		(0.015)	
Some college	92.0	*	22.0	*	21.8	*	0.081	*
	(13.5)		(3.0)		(3.1)		(0.011)	
Bachelor's degree	150.1	*	40.3	*	37.5	*	0.140	*
	(15.8)		(3.5)		(3.6)		(0.013)	
Graduate degree	197.4	*	59.0	*	52.2	*	0.193	*
	(19.4)		(4.3)		(4.4)		(0.016)	
Labor force status								
Work < 35 hrs/wk	44.5	+	10.5	+	10.5	^	0.039	^
	(18.1)		(4.0)		(4.1)		(0.015)	
Work 35-44 hrs/wk	-57.1	*	-12.2	*	-12.8	*	-0.047	*
	(14.1)		(3.1)		(3.2)		(0.012)	
Work 45 plus hrs/wk	-17.1		-3.7		-3.9		-0.014	
	(18.3)		(4.0)		(4.2)		(0.015)	
Work hours vary	-8.4		-1.8		-1.9		-0.007	
	(24.3)		(5.4)		(5.5)		(0.021)	
Household income								
Missing	-99.3	*	-19.1	*	-21.3	*	-0.077	*
	(17.8)		(3.9)		(4.1)		(0.015)	
Under $20,000	-56.3	+	-11.6	+	-12.5	+	-0.046	+
	(18.7)		(4.1)		(4.3)		(0.016)	
$20,000 to $39,999	-46.7	+	-9.8	+	-10.4	+	-0.038	+
	(15.0)		(3.3)		(3.4)		(0.013)	
$75,000 or more	8.4		1.9		1.9		0.007	
	(14.6)		(3.2)		(3.3)		(0.012)	
Social Capital Indicators								
Marital status								
Widowed	-13.3		-2.9		-3.0		-0.011	
	(23.2)		(5.1)		(5.3)		(0.020)	
Divorced	-26.3		-5.6		-5.9		-0.022	
	(17.3)		(3.8)		(3.9)		(0.015)	
Spouse absent	-68.2	+	-13.4	^	-14.8	^	-0.054	^
	(26.2)		(5.8)		(6.0)		(0.022)	
Never married	0.0		0.0		0.0		0.000	
	(16.9)		(3.7)		(3.9)		(0.014)	
Children in household								
Children under age 6	-38.1	+	-8.0	+	-8.5	+	-0.031	+
	(14.2)		(3.1)		(3.2)		(0.012)	
Children age 6-17	122.5	*	28.8	*	28.8	*	0.107	*
	(12.0)		(2.6)		(2.7)		(0.010)	

Housing tenure								
Renter	-23.4		-5.1		-5.3		-0.020	
	(13.5)		(3.0)		(3.1)		(0.011)	
Urbanicity of residence								
Central city	-10.4		-2.3		-2.4		-0.009	
	(13.4)		(3.0)		(3.1)		(0.011)	
Other metropolitan	17.1		3.9		3.9		0.015	
	(15.5)		(3.4)		(3.5)		(0.013)	
Non-metropolitan	27.1		6.2	^	6.3		0.023	
	(14.1)		(3.1)		(3.2)		(0.012)	
Not identified	40.3		9.6		9.5		0.036	
	(97.7)		(21.6)		(22.3)		(0.083)	
Others in household								
One or more relatives	-78.6	*	-15.8	*	-17.2	*	-0.063	*
	(14.7)		(3.2)		(3.4)		(0.012)	
One or more nonrelatives	-58.1	+	-11.7	^	-12.7	^	-0.046	^
	(22.5)		(5.0)		(5.1)		(0.019)	
Telephone status								
Non-telephone household	-85.5	+	-16.2	^	-18.2	^	-0.066	^
	(34.0)		(7.5)		(7.8)		(0.029)	
Other Characteristics								
Sex								
Male	-63.8	*	-13.9	*	-14.5	*	-0.054	*
	(10.7)		(2.4)		(2.4)		(0.009)	
Age								
Age 15-30	-15.2		-3.3		-3.4		-0.013	
	(16.0)		(3.5)		(3.6)		(0.014)	
Age 46-55	-1.8		-0.4		-0.4		-0.002	
	(15.6)		(3.4)		(3.6)		(0.013)	
Age 56-65	29.7		6.8		6.9		0.026	
	(20.1)		(4.4)		(4.6)		(0.017)	
Over age 65	35.7		8.3		8.3		0.031	
	(22.8)		(5.0)		(5.2)		(0.019)	
Race/ethnicity								
Hispanic	-66.0	*	-13.2	*	-14.4	*	-0.053	*
	(18.6)		(4.1)		(4.3)		(0.016)	
Non-Hispanic black	-18.6		-4.0		-4.2		-0.016	
	(16.1)		(3.5)		(3.7)		(0.014)	
Region of residence								
Northeast	-4.9		-1.1		-1.1		-0.004	
	(14.3)		(3.1)		(3.3)		(0.012)	
Midwest	23.9		5.4		5.5		0.021	
	(13.4)		(3.0)		(3.1)		(0.011)	
West	24.2		5.5		5.6		0.021	
	(14.4)		(3.2)		(3.3)		(0.012)	
Constant	-242.8	*	-53.5	*	-55.4	*	-0.205	*
	(23.9)		(5.3)		(5.4)		(0.020)	

Statistical significance: * ($\alpha \leq 0.001$), + ($\alpha \leq 0.01$), ^ ($\alpha \leq 0.05$)
Pseudo $R^2 = 0.0208$, N = 8665

Table 3-8: Tobit Estimates, 2003 CPS, Full sample

			Marginal Effects					
	Latent variable		Unconditional expected hours		Hours conditional on hours > 0		Probability hours > 0	
	dF/dx (s.e.)		dF/dx (s.e.)		dF/dx (s.e.)		dF/dx (s.e.)	
Human Capital Indicators								
Education								
Less than high school	-90.9	*	-18.0	*	-19.8	*	-0.079	*
	(18.2)		(4.0)		(4.2)		(0.017)	
Some college	79.7	*	19.2	*	18.9	*	0.078	*
	(13.8)		(3.1)		(3.1)		(0.013)	
Bachelor's degree	141.0	*	38.2	*	35.4	*	0.145	*
	(15.7)		(3.5)		(3.6)		(0.015)	
Graduate degree	139.0	*	39.2	*	35.6	*	0.146	*
	(20.0)		(4.4)		(4.6)		(0.019)	
Labor force status								
Work < 35 hrs/wk	18.7		4.3		4.4		0.018	
	(18.6)		(4.1)		(4.2)		(0.017)	
Work 35-44 hrs/wk	-64.5	*	-13.8	*	-14.5	*	-0.059	*
	(14.2)		(3.1)		(3.2)		(0.013)	
Work 45 plus hrs/wk	-23.7		-5.1		-5.3		-0.022	
	(18.4)		(4.1)		(4.2)		(0.017)	
Work hours vary	-6.3		-1.4		-1.4		-0.006	
	(23.6)		(5.2)		(5.4)		(0.022)	
Household income								
Missing	-18.0		-3.9		-4.1		-0.017	
	(17.6)		(3.9)		(4.0)		(0.016)	
Under $20,000	-13.3		-2.9		-3.0		-0.012	
	(17.7)		(3.9)		(4.1)		(0.017)	
$40,000 to $74,999	44.3	+	10.3	+	10.4	+	0.043	+
	(15.2)		(3.4)		(3.5)		(0.014)	
$75,000 or more	59.2	*	14.2	*	14.0	*	0.058	*
	(17.1)		(3.8)		(3.9)		(0.016)	
Social Capital Indicators								
Marital status								
Widowed	59.7	+	14.7	+	14.3	+	0.059	+
	(23.2)		(5.2)		(5.3)		(0.022)	
Divorced	-15.3		-3.3		-3.5		-0.014	
	(17.4)		(3.9)		(4.0)		(0.016)	
Spouse absent	-4.7		-1.0		-1.1		-0.004	
	(26.0)		(5.8)		(6.0)		(0.024)	
Never married	-1.4		-0.3		-0.3		-0.001	
	(17.0)		(3.8)		(3.9)		(0.016)	
Children in household								
Children under age 6	-13.0		-2.8		-2.9		-0.012	
	(14.2)		(3.2)		(3.3)		(0.013)	
Children age 6-17	98.6	*	23.4	*	23.3	*	0.095	*
	(12.1)		(2.7)		(2.8)		(0.011)	

Housing tenure								
Missing	17.1		3.9		4.0		0.016	
	(25.8)		(5.7)		(5.9)		(0.024)	
Renter	-20.2		-4.4		-4.6		-0.019	
	(12.9)		(2.9)		(2.9)		(0.012)	
Urbanicity of residence								
Central city	-12.4		-2.7		-2.8		-0.012	
	(13.6)		(3.0)		(3.1)		(0.013)	
Other metropolitan	15.9		3.6		3.7		0.015	
	(15.7)		(3.5)		(3.6)		(0.015)	
Non-metropolitan	40.1	+	9.4	+	9.4	+	0.039	+
	(14.4)		(3.2)		(3.3)		(0.013)	
Not identified	-42.5		-8.6		-9.3		-0.038	
	(117.1)		(26.0)		(26.8)		(0.110)	
Others in household								
One or more relatives	-49.5	*	-10.3	*	-11.0	*	-0.045	*
	(14.0)		(3.1)		(3.2)		(0.013)	
One or more nonrelatives	-74.3	*	-14.5	+	-16.1	+	-0.064	+
	(22.4)		(5.0)		(5.1)		(0.021)	
Telephone status								
Non-telephone household	-75.3	+	-14.5	^	-16.2	+	-0.065	^
	(29.5)		(6.6)		(6.7)		(0.028)	
Other Characteristics								
Sex								
Male	-46.7	*	-10.3	*	-10.6	*	-0.043	*
	(10.9)		(2.4)		(2.5)		(0.010)	
Age								
Age 15-30	21.4		4.9		4.9		0.020	
	(16.3)		(3.6)		(3.7)		(0.015)	
Age 46-55	29.2		6.8		6.8		0.028	
	(15.9)		(3.5)		(3.6)		(0.015)	
Age 56-65	3.7		0.8		0.8		0.003	
	(19.6)		(4.4)		(4.5)		(0.018)	
Over age 65	-21.4		-4.6		-4.8		-0.020	
	(22.4)		(5.0)		(5.1)		(0.021)	
Race/ethnicity								
Hispanic	-69.8	*	-13.9	*	-15.2	*	-0.061	*
	(18.5)		(4.1)		(4.2)		(0.017)	
Non-Hispanic black	-54.3	*	-11.1	+	-12.0	+	-0.048	+
	(16.6)		(3.7)		(3.8)		(0.016)	
Region of residence								
Northeast	-29.3		-6.3		-6.6		-0.027	
	(14.9)		(3.3)		(3.4)		(0.014)	
Midwest	8.9		2.0		2.1		0.008	
	(13.5)		(3.0)		(3.1)		(0.013)	
West	11.9		2.7		2.7		0.011	
	(14.3)		(3.2)		(3.3)		(0.013)	
Constant	-256.0	*	-56.9	*	-58.6	*	-0.240	*
	(25.1)		(5.6)		(5.7)		(0.023)	

Statistical significance: * ($\alpha \leq 0.001$), + ($\alpha \leq 0.01$), ^ ($\alpha \leq 0.05$), Pseudo $R^2 = 0.0187$, N = 6905

Table 3-9: Tobit Estimates, 2002 CPS, Full sample, ATUS response indicator

	Latent Variable		Marginal Effects: Unconditional expected hours		Marginal Effects: Hours conditional on hours > 0		Marginal Effects: Probability hours > 0	
	dF/dx (s.e.)		dF/dx (s.e.)		dF/dx (s.e.)		dF/dx (s.e.)	
Human Capital Indicators								
Education								
Less than high school	-94.5	*	-18.5	*	-20.5	*	-0.075	*
	(18.0)		(3.9)		(4.1)		(0.0)	
Some college	89.2	*	21.2	*	21.0	*	0.079	*
	(13.5)		(2.9)		(3.1)		(0.0)	
Bachelor's degree	145.7	*	38.7	*	36.3	*	0.136	*
	(15.8)		(3.5)		(3.6)		(0.0)	
Graduate degree	190.3	*	56.1	*	49.9	*	0.185	*
	(19.3)		(4.2)		(4.4)		(0.0)	
Labor force status								
Work < 35 hrs/wk	42.1	^	9.9	^	9.9	^	0.037	^
	(18.1)		(4.0)		(4.1)		(0.0)	
Work 35-44 hrs/wk	-55.1	*	-11.7	*	-12.4	*	-0.046	*
	(14.1)		(3.1)		(3.2)		(0.0)	
Work 45 plus hrs/wk	-17.5		-3.8		-3.9		-0.015	
	(18.2)		(4.0)		(4.1)		(0.0)	
Work hours vary	-9.1		-2.0		-2.1		-0.008	
	(24.3)		(5.3)		(5.5)		(0.0)	
Household income								
Missing	-85.4	*	-16.6	*	-18.5	*	-0.067	*
	(17.9)		(3.9)		(4.1)		(0.0)	
Under $20,000	-53.7	+	-11.0	+	-11.9	+	-0.044	+
	(18.7)		(4.1)		(4.2)		(0.0)	
$20,000 to $39,999	-43.9	+	-9.2	+	-9.8	+	-0.036	+
	(15.0)		(3.3)		(3.4)		(0.0)	
$75,000 or more	8.1		1.8		1.9		0.007	
	(14.5)		(3.2)		(3.3)		(0.0)	
Social Capital Indicators								
Marital status								
Widowed	-12.5		-2.7		-2.8		-0.010	
	(23.2)		(5.1)		(5.3)		(0.0)	
Divorced	-24.8		-5.2		-5.5		-0.020	
	(17.3)		(3.8)		(3.9)		(0.0)	
Spouse absent	-63.3	^	-12.4	^	-13.7	^	-0.050	^
	(26.1)		(5.7)		(5.9)		(0.0)	
Never married	-1.8		-0.4		-0.4		-0.002	
	(16.9)		(3.7)		(3.8)		(0.0)	
Children in household								
Children under age 6	-38.2	+	-8.0	+	-8.5	+	-0.031	+
	(14.1)		(3.1)		(3.2)		(0.0)	
Children age 6-17	122.3	*	28.6	^	28.6	*	0.107	*
	(12.0)		(2.6)		(2.7)		(0.0)	

Housing tenure								
Renter	-18.2		-3.9		-4.1		-0.015	
	(13.5)		(3.0)		(3.1)		(0.0)	
Urbanicity of residence								
Central city	-10.5		-2.3		-2.4		-0.009	
	(13.4)		(2.9)		(3.0)		(0.0)	
Other metropolitan	14.0		3.1		3.2		0.012	
	(15.4)		(3.4)		(3.5)		(0.0)	
Non-metropolitan	23.7		5.4		5.5		0.020	
	(14.1)		(3.1)		(3.2)		(0.0)	
Not identified	35.1		8.2		8.2		0.031	
	(97.4)		(21.3)		(22.2)		(0.1)	
Others in household								
One or more relatives	-75.2	*	-15.1	*	-16.4	*	-0.060	*
	(14.7)		(3.2)		(3.3)		(0.0)	
One or more nonrelatives	-53.9	^	-10.8	^	-11.8	^	-0.043	^
	(22.5)		(4.9)		(5.1)		(0.0)	
Telephone status								
Non-telephone household	-76.0	^	-14.5		-16.3	^	-0.059	^
	(34.1)		(7.5)		(7.7)		(0.0)	
Other Characteristics								
Sex								
Male	-62.0	*	-13.5	*	-14.0	*	-0.052	*
	(10.7)		(2.3)		(2.4)		(0.0)	
Age								
Age 15-30	-12.1		-2.6		-2.7		-0.010	
	(16.0)		(3.5)		(3.6)		(0.0)	
Age 46-55	-3.7		-0.8		-0.8		-0.003	
	(15.6)		(3.4)		(3.5)		(0.0)	
Age 56-65	23.3		5.3		5.4		0.020	
	(20.0)		(4.4)		(4.6)		(0.0)	
Over age 65	29.4		6.7		6.8		0.025	
	(22.8)		(5.0)		(5.2)		(0.0)	
Race/ethnicity								
Hispanic	-62.5	*	-12.5	+	-13.7	*	-0.050	*
	(18.6)		(4.1)		(4.2)		(0.0)	
Non-Hispanic black	-10.4		-2.3		-2.4		-0.009	
	(16.1)		(3.5)		(3.7)		(0.0)	
Region of residence								
Northeast	-7.1		-1.5		-1.6		-0.006	
	(14.3)		(3.1)		(3.2)		(0.0)	
Midwest	20.7		4.6		4.7		0.018	
	(13.4)		(2.9)		(3.0)		(0.0)	
West	23.3		5.3		5.4		0.020	
	(14.3)		(3.1)		(3.3)		(0.0)	
Completed ATUS Survey	70.3	*	15.3	*	15.9	*	0.059	*
	(10.4)		(2.3)		(2.4)		(0.0)	
Constant	-284.2	*	-62.3	*	-64.7	*	-0.240	*
	(24.8)		(5.4)		(5.6)		(0.0)	

Statistical significance: * ($\alpha \leq 0.001$), + ($\alpha \leq 0.01$), ^ ($\alpha \leq 0.05$)
Pseudo $R^2 = 0.0187$, N = 8665

Table 3-10: Tobit Estimates, 2003 CPS, Full sample, ATUS response indicator

			Marginal Effects					
	Latent Variable		Unconditional expected hours		Hours conditional on hours > 0		Probability hours >)	
	dF/dx (s.e.)		dF/dx (s.e.)		dF/dx (s.e.)		dF/dx (s.e.)	
Human Capital Indicators								
Education								
Less than high school	-94.9	*	-18.5	*	-20.5	*	-0.082	*
	(18.2)		(4.0)		(4.2)		(0.017)	
Some college	76.0	*	18.1	*	17.9	*	0.074	*
	(13.8)		(3.0)		(3.1)		(0.013)	
Bachelor's degree	133.3	*	35.4	*	33.2	*	0.137	*
	(15.7)		(3.5)		(3.6)		(0.015)	
Graduate degree	128.4	*	35.3	*	32.5	*	0.134	*
	(20.0)		(4.4)		(4.6)		(0.019)	
Labor force status								
Work < 35 hrs/wk	17.2		3.9		4.0		0.016	
	(18.5)		(4.1)		(4.2)		(0.017)	
Work 35-44 hrs/wk	-62.7	*	-13.3	*	-14.0	*	-0.057	*
	(14.2)		(3.1)		(3.2)		(0.013)	
Work 45 plus hrs/wk	-20.4		-4.4		-4.6		-0.019	
	(18.4)		(4.1)		(4.2)		(0.017)	
Work hours vary	-3.9		-0.8		-0.9		-0.004	
	(23.6)		(5.2)		(5.4)		(0.022)	
Household income								
Missing	-10.2		-2.2		-2.3		-0.009	
	(17.7)		(3.9)		(4.0)		(0.016)	
Under $20,000	-9.9		-2.1		-2.2		-0.009	
	(17.7)		(3.9)		(4.0)		(0.017)	
$40,000 to $74,999	41.9	+	9.7	+	9.7	+	0.040	+
	(15.2)		(3.3)		(3.5)		(0.014)	
$75,000 or more	56.1	*	13.3	*	13.2	*	0.054	*
	(17.1)		(3.8)		(3.9)		(0.016)	
Social Capital Indicators								
Marital status								
Widowed	59.2	^	14.5	*	14.2	+	0.058	+
	(23.2)		(5.1)		(5.3)		(0.022)	
Divorced	-14.6		-3.1		-3.3		-0.013	
	(17.4)		(3.8)		(4.0)		(0.016)	
Spouse absent	-0.7		-0.2		-0.2		-0.001	
	(26.0)		(5.7)		(5.9)		(0.024)	
Never married	1.7		0.4		0.4		0.002	
	(17.1)		(3.8)		(3.9)		(0.016)	
Children in household								
Children under age 6	-12.4		-2.7		-2.8		-0.011	
	(14.2)		(3.1)		(3.2)		(0.013)	
Children age 6-17	98.0	*	23.0	*	23.0	*	0.094	*
	(12.1)		(2.7)		(2.8)		(0.011)	

Housing tenure								
Missing	15.3		3.5		3.5		0.015	
	(25.8)		(5.7)		(5.9)		-0.024	
Renter	-16.6		-3.6		-3.8		(0.015)	
	(12.9)		(2.8)		(2.9)		-0.012	
Urbanicity of residence								
Central city	-10.9		-2.4		-2.5		-0.010	
	(13.6)		(3.0)		(3.1)		(0.013)	
Other metropolitan	13.7		3.1		3.2		0.013	
	(15.8)		(3.5)		(3.6)		(0.015)	
Non-metropolitan	36.4	^	8.4	+	8.5	+	0.035	+
	(14.4)		(3.2)		(3.3)		(0.013)	
Not identified	-52.4		-10.3		-11.4		-0.046	
	(117.2)		(25.8)		(26.7)		(0.109)	
Others in household								
One or more relatives	-45.8	*	-9.5	+	-10.2	*	(0.041)	+
	(14.0)		(3.1)		(3.2)		-0.013	
One or more nonrelatives	-68.2	+	-13.3	+	-14.7	+	(0.059)	+
	(22.4)		(4.9)		(5.1)		-0.021	
Telephone status								
Non-telephone household	-64.6	^	-12.5		-13.9	^	-0.056	^
	(29.5)		(6.5)		(6.7)		(0.028)	
Other Characteristics								
Sex								
Male	-44.7	*	-9.8	*	-10.2	*	-0.041	*
	(10.9)		(2.4)		(2.5)		(0.010)	
Age								
Age 15-30	22.8		5.2		5.3		0.022	
	(16.3)		(3.6)		(3.7)		(0.015)	
Age 46-55	25.4		5.8		5.9		0.024	
	(15.9)		(3.5)		(3.6)		(0.015)	
Age 56-65	-4.0		-0.9		-0.9		-0.004	
	(19.6)		(4.3)		(4.5)		(0.018)	
Over age 65	-22.3		-4.7		-5.0		-0.020	
	(22.4)		(4.9)		(5.1)		(0.021)	
Race/ethnicity								
Hispanic	-66.8	*	-13.2	*	-14.5	*	-0.058	*
	(18.6)		(4.1)		(4.2)		(0.017)	
Non-Hispanic black	-48.1	+	-9.8	+	-10.6	+	-0.043	+
	(16.6)		(3.7)		(3.8)		(0.016)	
Region of residence								
Northeast	-32.4	^	-6.8	^	-7.3	^	-0.029	^
	(14.9)		(3.3)		(3.4)		(0.014)	
Midwest	3.7		0.8		0.9		0.004	
	(13.5)		(3.0)		(3.1)		(0.013)	
West	9.8		2.2		2.3		0.009	
	(14.4)		(3.2)		(3.3)		(0.013)	
ATUS completer	77.5	*	17.0	*	17.6	*	0.072	*
	(10.5)		(2.3)		(2.4)		(0.010)	

Constant	-297.0	*	-65.3	*	-67.7	*	-0.277	*
	(25.9)		(5.7)		(5.9)		(0.024)	

Statistical significance: * ($\alpha \leq 0.001$), + ($\alpha \leq 0.01$), ^ ($\alpha \leq 0.05$)
Pseudo $R^2 = 0.0203$, N = 6905

Table 3-11: Tobit Estimates, 2002 CPS, ATUS respondents-only sample

	Latent Variable		Marginal Effects: Unconditional expected hours		Marginal Effects: Hours conditional on hours > 0		Marginal Effects: Probability hours > 0	
	dF/dx (s.e.)		dF/dx (s.e.)		dF/dx (s.e.)		dF/dx (s.e.)	
Human Capital Indicators								
Education								
Less than high school	-101.1	*	-24.0	*	-23.8	*	-0.086	*
	(25.7)		(6.9)		(6.4)		(0.023)	
Some college	85.4	*	24.3	*	22.0	*	0.080	*
	(18.5)		(4.9)		(4.6)		(0.017)	
Bachelor's degree	140.2	*	43.5	*	37.8	*	0.136	*
	(21.3)		(5.7)		(5.3)		(0.019)	
Graduate degree	193.3	*	66.3	*	55.1	*	0.194	*
	(25.1)		(6.7)		(6.3)		(0.023)	
Labor force status								
Work < 35 hrs/wk	45.4		12.9	^	11.7	^	0.043	^
	(23.8)		(6.3)		(5.9)		(0.022)	
Work 35-44 hrs/wk	-69.3	*	-17.8	*	-17.0	*	-0.062	*
	(19.4)		(5.2)		(4.8)		(0.018)	
Work 45 plus hrs/wk	-27.4		-7.1		-6.7		-0.025	
	(24.1)		(6.4)		(6.0)		(0.022)	
Work hours vary	-20.7		-5.3		-5.1		-0.019	
	(32.5)		(8.7)		(8.1)		(0.030)	
Household income								
Missing	-102.2	*	-23.7	*	-23.9	*	-0.086	*
	(26.1)		(7.0)		(6.5)		(0.024)	
Under $20,000	-59.1	^	-14.7	^	-14.3	^	-0.052	^
	(25.5)		(6.8)		(6.4)		(0.023)	
$20,000 to $39,999	-64.6	+	-16.2	+	-15.6	+	-0.057	+
	(20.3)		(5.4)		(5.1)		(0.018)	
$75,000 or more	3.6		1.0		0.9		0.003	
	(18.8)		(5.0)		(4.7)		(0.017)	
Social Capital Indicators								
Marital status								
Widowed	17.1		4.7		4.3		0.016	
	(30.0)		(8.0)		(7.5)		(0.027)	
Divorced	-28.6		-7.3		-7.0		-0.026	
	(23.9)		(6.4)		(5.9)		(0.022)	
Spouse absent	-65.7		-15.8		-15.6		-0.057	
	(39.6)		(10.6)		(9.9)		(0.036)	
Never married	-19.2		-5.0		-4.7		-0.017	
	(23.6)		(6.3)		(5.9)		(0.021)	
Children in household								
Children under age 6	-43.9	^	-11.2	^	-10.7	^	-0.039	^
	(19.6)		(5.2)		(4.9)		(0.018)	
Children age 6-17	134.1	*	38.0	*	34.5	*	0.125	*
	(16.4)		(4.4)		(4.1)		(0.015)	
Housing tenure								

Renter	-34.5		-8.9		-8.5		-0.031	
	(19.2)		(5.1)		(4.8)		(0.018)	
Urbanicity of residence								
Central city	-13.1		-3.4		-3.2		-0.012	
	(18.5)		(4.9)		(4.6)		(0.017)	
Other metropolitan	19.8		5.4		5.0		0.018	
	(20.3)		(5.4)		(5.1)		(0.018)	
Non-metropolitan	30.9		8.5		7.8		0.029	
	(18.7)		(5.0)		(4.7)		(0.017)	
Not identified	-66.1		-15.7		-15.6		-0.057	
	(131.1)		(34.9)		(32.7)		(0.119)	
Others in household								
One or more relatives	-69.8	+	-17.2	+	-16.8	*	-0.061	*
	(20.4)		(5.4)		(5.1)		(0.019)	
One or more nonrelatives	-27.7		-7.1		-6.8		-0.025	
	(32.3)		(8.6)		(8.1)		(0.029)	
Telephone status								
Non-telephone household	-50.5		-12.4		-12.1		-0.044	
	(57.5)		(15.3)		(14.3)		(0.052)	
Other Characteristics								
Sex								
Male	-54.2	*	-14.3	*	-13.5	*	-0.049	*
	(14.4)		(3.8)		(3.6)		(0.013)	
Age								
Age 15-30	-7.5		-2.0		-1.9		-0.007	
	(22.7)		(6.0)		(5.6)		(0.021)	
Age 46-55	-2.3		-0.6		-0.6		-0.002	
	(21.2)		(5.6)		(5.3)		(0.019)	
Age 56-65	37.7		10.6		9.6		0.035	
	(26.3)		(7.0)		(6.6)		(0.024)	
Over age 65	47.0		13.2		12.0		0.044	
	(30.0)		(8.0)		(7.5)		(0.027)	
Race/ethnicity								
Hispanic	-70.8	+	-17.1	^	-16.8	^	-0.061	^
	(27.1)		(7.2)		(6.8)		(0.025)	
Non-Hispanic black	-66.5	+	-16.2	^	-15.9	+	-0.058	+
	(24.3)		(6.5)		(6.1)		(0.022)	
Region of residence								
Northeast	1.0		0.3		0.2		0.001	
	(19.2)		(5.1)		(4.8)		(0.017)	
Midwest	19.9		5.4		5.0		0.018	
	(17.9)		(4.8)		(4.5)		(0.016)	
West	-1.6		-0.4		-0.4		-0.001	
	(19.6)		(5.2)		(4.9)		(0.018)	
Constant	-207.0	*	-55.2	*	-51.6	*	-0.188	*
	(32.3)		(8.6)		(8.1)		(0.029)	

Statistical significance: * ($\alpha \leq 0.001$), + ($\alpha \leq 0.01$), ^ ($\alpha \leq 0.05$)
Pseudo $R^2 = 0.020$, N = 4633

Table 3-12: Tobit Estimates, 2003 CPS, ATUS respondents-only sample

			Marginal Effects					
	Latent Variable		Unconditional Expected Value		Conditional on being uncensored		Probability uncensored	
	dF/dx (s.e.)		dF/dx (s.e.)		dF/dx (s.e.)		dF/dx (s.e.)	
Human Capital Indicators								
Education								
Less than high school	-68.8	+	-17.6	+	-16.8	+	-0.075	+
	(23.8)		(6.7)		(6.1)		(0.027)	
Some college	65.2	*	19.5	*	17.2	*	0.076	*
	(17.4)		(4.9)		(4.5)		(0.020)	
Bachelor's degree	128.7	*	42.6	*	35.9	*	0.156	*
	(19.4)		(5.5)		(5.0)		(0.022)	
Graduate degree	128.7	*	44.3	*	36.7	*	0.159	*
	(23.5)		(6.6)		(6.0)		(0.027)	
Labor force status								
Work < 35 hrs/wk	-22.2		-6.0		-5.6		-0.025	
	(22.6)		(6.4)		(5.8)		(0.026)	
Work 35-44 hrs/wk	-74.9	*	-20.2	*	-18.8	*	-0.083	*
	(17.6)		(5.0)		(4.5)		(0.020)	
Work 45 plus hrs/wk	-43.2		-11.4		-10.7		-0.048	
	(22.4)		(6.3)		(5.7)		(0.026)	
Work hours vary	-6.1		-1.7		-1.6		-0.007	
	(29.3)		(8.2)		(7.5)		(0.033)	
Household income								
Missing	-57.4	+	-14.8	^	-14.1	^	-0.063	^
	(21.8)		(6.1)		(5.6)		(0.025)	
Under $20,000	-78.1	*	-19.7	+	-19.0	*	-0.084	+
	(23.3)		(6.6)		(6.0)		(0.027)	
$20,000 to $39,999	-66.3	*	-17.4	*	-16.4	*	-0.073	*
	(18.7)		(5.3)		(4.8)		(0.021)	
$75,000 or more	0.4		0.1		0.1		0.000	
	(17.7)		(5.0)		(4.5)		(0.020)	
Social Capital Indicators								
Marital status								
Widowed	81.6	+	26.3	*	22.4	+	0.099	+
	(27.9)		(7.8)		(7.1)		(0.032)	
Divorced	-7.0		-1.9		-1.8		-0.008	
	(21.4)		(6.0)		(5.5)		(0.024)	
Spouse absent	-21.7		-5.9		-5.5		-0.024	
	(34.8)		(9.8)		(8.9)		(0.040)	
Never married	1.8		0.5		0.5		0.002	
	(21.9)		(6.2)		(5.6)		(0.025)	
Children in household								
Children under age 6	-16.7		-4.6		-4.2		-0.019	
	(18.1)		(5.1)		(4.6)		(0.021)	
Children age 6-17	101.3	*	30.4	*	26.8	*	0.118	*
	(15.2)		(4.3)		(3.9)		(0.017)	
Housing tenure								

Missing	11.0		3.2		2.9		0.013	
	(30.9)		(8.7)		(7.9)		(0.035)	
Renter	-11.0		-3.1		-2.8		-0.012	
	(16.4)		(4.6)		(4.2)		(0.019)	
Urbanicity of residence								
Central city	7.2		2.0		1.8		0.008	
	(17.2)		(4.8)		(4.4)		(0.020)	
Other metropolitan	17.8		5.2		4.6		0.021	
	(19.2)		(5.4)		(4.9)		(0.022)	
Non-metropolitan	25.0		7.3		6.5		0.029	
	(17.5)		(4.9)		(4.5)		(0.020)	
Not identified	-37.0		-9.7		-9.1		-0.041	
	(132.1)		(37.2)		(33.8)		(0.151)	
Others in household								
One or more relatives	-29.4		-8.0		-7.4		-0.033	
	(17.5)		(4.9)		(4.5)		(0.020)	
One or more nonrelatives	-65.7	^	-16.4		-15.9	^	-0.070	^
	(30.6)		(8.6)		(7.8)		(0.035)	
Telephone status								
Non-telephone household	-69.6		-17.1		-16.7		-0.074	
	(45.6)		(12.9)		(11.7)		(0.052)	
Other Characteristics								
Sex								
Male	-33.3	^	-9.3	^	-8.5	^	-0.038	^
	(13.3)		(3.8)		(3.4)		(0.015)	
Age								
Age 15-30	13.6		3.9		3.5		0.016	
	(21.4)		(6.0)		(5.5)		(0.024)	
Age 46-55	24.4		7.1		6.4		0.028	
	(19.6)		(5.5)		(5.0)		(0.022)	
Age 56-65	5.6		1.6		1.4		0.006	
	(23.5)		(6.6)		(6.0)		(0.027)	
Over age 65	4.0		1.1		1.0		0.005	
	(27.6)		(7.8)		(7.1)		(0.031)	
Race/ethnicity								
Hispanic	-113.9	*	-26.7	*	-26.7	*	-0.117	*
	(24.9)		(7.0)		(6.4)		(0.028)	
Non-Hispanic black	-65.2	+	-16.6	+	-15.9	+	-0.070	+
	(22.7)		(6.4)		(5.8)		(0.026)	
Region of residence								
Northeast	-12.7		-3.5		-3.2		-0.014	
	(18.3)		(5.2)		(4.7)		(0.021)	
Midwest	12.1		3.4		3.1		0.014	
	(16.5)		(4.6)		(4.2)		(0.019)	
West	28.6		8.3		7.5		0.033	
	(17.9)		(5.0)		(4.6)		(0.020)	
Constant	-157.7	*	-44.4	*	-40.4	*	-0.180	*
	(29.9)		(8.4)		(7.7)		(0.034)	

Statistical significance: * ($\alpha \leq 0.001$), + ($\alpha \leq 0.01$), ^ ($\alpha \leq 0.05$)
Pseudo $R^2 = 0.0165$, N = 3521

Table 3-13: Log-Likelihood Specification Test

-2 Log likelihood test of model specification		2003 ATUS	2004 ATUS
Log likelihood			
Unrestricted model (two parts)			
(1)	Probit (volunteer indicator)	-4580.6	-3686.7
(2)	Truncated model (hours of volunteers)	-14336.1	-11215.8
(3)	(1) + (2)	-18916.7	-14902.5
Restricted model			
(4)	Tobit	-20164.9	-15897.2
Specification test:			
(4) – (3)		-1248.2	-994.6
$\lambda = -2^* [(4) - (3)]$		2496.5	1989.3
Degrees of freedom (df)		36	37
Critical value: Prob($\chi^2_{df} \leq$ critical value) = 0.05		23.27	24.07
Result		Reject null	Reject null

Strongly reject the null that the Tobit model is correctly specified in both years

Table 3-14: Two-Part Models, 2002 CPS Volunteer Supplement

Dependent variable	Full Sample: Probit Vol. (0/1) dF/dx		Full Sample: OLS Vol. hrs Coef.		Full Sample, Response Indicator: Probit Vol. (0/1) dF/dx		Full Sample, Response Indicator: OLS Vol. hrs Coef.		ATUS Completers only: Probit Vol. (0/1) dF/dx		ATUS Completers only: OLS Vol. hrs Coef.	
Human Capital Indicators												
Education												
Less than high school	-0.077	*	-29.2		-0.077	*	-30.1		-0.089	*	-41.1	
	(0.015)		(24.8)		(0.015)		(24.8)		(0.024)		(34.9)	
Some college	0.112	*	-5.8		0.110	*	-6.5		0.120	*	-11.7	
	(0.014)		(16.0)		(0.014)		(16.0)		(0.020)		(21.9)	
Bachelor's degree	0.190	*	16.3		0.185	*	15.6		0.185	*	16.9	
	(0.018)		(18.0)		(0.018)		(18.0)		(0.025)		(24.4)	
Graduate degree	0.235	*	42.6	^	0.227	*	41.1		0.241	*	38.4	
	(0.023)		(21.1)		(0.024)		(21.2)		(0.030)		(27.8)	
Labor force status												
Work < 35 hrs/wk	0.096	*	-48.1	+	0.094	*	-48.8	^	0.116	*	-41.5	
	(0.020)		(19.5)		(0.020)		(19.5)		(0.028)		(25.4)	
Work 35-44 hrs/wk	-0.041	*	-54.7	*	-0.039	+	-54.1	*	-0.061	+	-48.4	^
	(0.014)		(16.5)		(0.014)		(16.5)		(0.020)		(22.5)	
Work 45 plus hrs/wk	0.009		-55.3	+	0.009		-55.5	+	0.000		-53.6	^
	(0.018)		(20.3)		(0.018)		(20.3)		(0.026)		(26.5)	
Work hours vary	0.003		-31.1		0.002		-31.2		-0.007		-35.2	
	(0.024)		(27.7)		(0.024)		(27.7)		(0.034)		(37.1)	
Household income												
Missing	-0.093	*	-17.5		-0.081	*	-13.8		-0.116	*	-3.2	
	(0.015)		(21.3)		(0.015)		(21.5)		(0.023)		(31.3)	
Under $20,000	-0.064	*	19.5		-0.062	*	20.1		-0.083	*	25.6	
	(0.017)		(22.7)		(0.017)		(22.7)		(0.025)		(30.8)	
$20,000 to $39,999	-0.048	*	-8.2		-0.046	*	-7.1		-0.074	*	-12.1	
	(0.014)		(17.6)		(0.014)		(17.6)		(0.020)		(23.8)	

$75,000 or more	0.033	^	-20.8		0.032	^	-20.6		0.029		-20.0	
	(0.015)		(15.5)		(0.015)		(15.5)		(0.021)		(20.1)	
Social Capital Indicators												
Marital status												
Widowed	-0.008		-16.8		-0.007		-17.3		0.025		-15.6	
	(0.022)		(28.6)		(0.023)		(28.6)		(0.033)		(35.7)	
Divorced	-0.019		-17.3		-0.018		-16.7		-0.017		-29.1	
	(0.016)		(20.2)		(0.016)		(20.2)		(0.025)		(27.9)	
Spouse absent	-0.052	^	-32.6		-0.048	^	-30.6		-0.077	^	23.2	
	(0.022)		(33.0)		(0.023)		(33.1)		(0.036)		(51.8)	
Never married	0.005		-14.2		0.002		-13.7		-0.022		-14.5	
	(0.016)		(20.4)		(0.016)		(20.4)		(0.024)		(28.7)	
Children in household												
Children under age 6	-0.031	^	-28.8		-0.031	^	-28.7		-0.040		-30.0	
	(0.013)		(15.9)		(0.013)		(15.9)		(0.020)		(21.9)	
Children age 6-17	0.137	*	31.0	^	0.136	*	31.2	^	0.158	*	40.4	^
	(0.012)		(13.9)		(0.012)		(13.9)		(0.018)		(18.9)	
Housing tenure												
Renter	-0.041	+	27.3		-0.035	+	28.5		-0.044	^	2.8	
	(0.013)		(16.3)		(0.013)		(16.3)		(0.020)		(23.0)	
Urbanicity of residence												
Central city	-0.018		16.4		-0.019		16.4		-0.023		10.0	
	(0.013)		(15.7)		(0.013)		(15.7)		(0.019)		(21.5)	
Other metropolitan	0.006		21.6		0.003		20.6		0.009		24.8	
	(0.015)		(17.7)		(0.015)		(17.7)		(0.022)		(22.9)	
Non-metropolitan	0.045	+	-20.0		0.041	+	-20.9		0.053	+	-16.3	
	(0.015)		(15.9)		(0.015)		(15.9)		(0.021)		(21.0)	
Not identified	-0.001		68.5		-0.007		68.4		-0.016		-140.1	
	(0.097)		(115.6)		(0.095)		(115.5)		(0.131)		(150.7)	
Others in household												
One or more relatives	-0.084	*	-3.9		-0.081	*	-3.1		-0.086	*	2.8	
	(0.012)		(18.1)		(0.013)		(18.1)		(0.019)		(24.8)	

One or more nonrelatives	-0.056	+	-12.9		-0.052	+	-12.9		-0.026		-6.5	
	(0.019)		(28.0)		(0.019)		(28.0)		(0.033)		(39.1)	
Telephone status												
Non-telephone household	-0.074	+	-32.9		-0.065	^	-31.2		-0.024		-71.6	
	(0.027)		(47.0)		(0.028)		(47.0)		(0.056)		(74.6)	
Other Characteristics												
Sex												
Male	-0.083	*	11.0		-0.081	*	11.3		-0.089	*	21.3	
	(0.010)		(12.5)		(0.010)		(12.5)		(0.015)		(16.6)	
Age												
Age 15-30	-0.016		-21.2		-0.012		-20.8		-0.008		-20.7	
	(0.015)		(19.1)		(0.015)		(19.1)		(0.024)		(26.9)	
Age 46-55	-0.016		15.9		-0.018		15.7		-0.032		32.6	
	(0.015)		(17.7)		(0.015)		(17.7)		(0.022)		(23.9)	
Age 56-65	0.002		50.2	^	-0.005		48.7	^	-0.002		69.5	^
	(0.020)		(23.5)		(0.020)		(23.5)		(0.028)		(30.5)	
Over age 65	0.001		72.1	+	-0.005		70.1	^	0.014		68.8	
	(0.022)		(27.5)		(0.022)		(27.6)		(0.032)		(35.2)	
Race/ethnicity												
Hispanic	-0.057	*	-25.9		-0.054	*	-24.8		-0.060	^	-41.5	
	(0.016)		(23.2)		(0.016)		(23.2)		(0.026)		(33.9)	
Non-Hispanic black	-0.026	^	11.2		-0.018		14.3		-0.072	+	-9.6	
	(0.015)		(19.4)		(0.015)		(19.6)		(0.023)		(29.9)	
Region of residence												
Northeast	-0.007		0.1		-0.010		-0.7		-0.002		1.0	
	(0.014)		(16.5)		(0.014)		(16.5)		(0.021)		(21.9)	
Midwest	0.047	*	-30.0	^	0.044	*	-30.8	^	0.058	+	-41.1	^
	(0.014)		(15.3)		(0.014)		(15.3)		(0.020)		(20.2)	
West	0.026		3.8		0.025		4.1		-0.001		-2.4	
	(0.015)		(16.4)		(0.015)		(16.4)		(0.021)		(22.5)	

Completed ATUS Survey				0.072	*	17.2						
				(0.010)		(12.3)						
Constant		157.0	*			145.6	*			159.4	*	
		(27.1)				(28.3)				(36.8)		
N	8665	2452		8665		2452		4633		1574		
R2	0.113	0.0378		0.1179		0.0239		0.1111		0.0166		

Coefficients and (standard errors)

Statistical significance: * ($\alpha \leq 0.001$), + ($\alpha \leq 0.01$), ^ ($\alpha \leq 0.05$)

Table 3-15: Two-Part Models, 2003 CPS Volunteer Supplement

	Full Sample				Full Sample, Response Indicator				ATUS Completers only			
Dependent variable	Probit Vol. (0/1) dF/dx		OLS Vol. hrs Coef.		Probit Vol. (0/1) dF/dx		OLS Vol. hrs Coef.		Probit Vol. (0/1) dF/dx		OLS Vol. hrs Coef.	
Human Capital Indicators												
Education												
Less than high school	-0.061	*	-75.6	+	-0.065	*	-74.7	+	-0.041		-73.6	^
	(0.017)		(24.3)		(0.017)		(24.4)		(0.029)		(31.7)	
ome college	0.101	*	3.8		0.096	*	4.3		0.115	*	-15.1	
	(0.016)		(16.3)		(0.016)		(16.3)		(0.024)		(20.5)	
Bachelor's degree	0.185	*	29.8		0.174	*	30.6		0.221	*	7.1	
	(0.020)		(17.8)		(0.020)		(17.8)		(0.028)		(21.7)	
Graduate degree	0.190	*	20.4		0.174	*	21.5		0.220	*	5.3	
	(0.026)		(22.0)		(0.026)		(22.0)		(0.034)		(25.7)	
Labor force status												
Work < 35 hrs/wk	0.051	^	-28.6		0.048	^	-28.9		0.009		-40.2	
	(0.022)		(20.4)		(0.022)		(20.4)		(0.031)		(24.6)	
Work 35-44 hrs/wk	-0.044	+	-64.9	*	-0.042	+	-65.2	^	-0.070	+	-65.5	*
	(0.015)		(16.4)		(0.015)		(16.4)		(0.023)		(20.0)	
Work 45 plus hrs/wk	-0.004		-50.4	^	0.000		-51.1		-0.044		-39.6	
	(0.020)		(20.4)		(0.020)		(20.5)		(0.029)		(24.5)	
Work hours vary	0.028		-51.6	^	0.032		-52.0		0.016		-20.9	
	(0.027)		(26.2)		(0.027)		(26.2)		(0.041)		(31.7)	
Household income												
Missing	-0.019		9.8		-0.008		9.6		0.039		-17.5	
	(0.018)		(21.7)		(0.019)		(21.7)		(0.031)		(27.5)	
Under $20,000	-0.018		16.4		-0.014		16.3		-0.003		-8.4	
	(0.018)		(22.3)		(0.019)		(22.3)		(0.030)		(28.3)	
$40,000-$74,999	0.071	*	-15.1		0.069	*	-14.5		0.127	*	-18.0	
	(0.017)		(17.6)		(0.017)		(17.7)		(0.026)		(21.7)	

$75,000 or more	0.115	*	-29.7	0.112	*	-29.1	0.170	*	-47.1	^
	(0.021)		(19.5)	(0.021)		(19.5)	(0.029)		(23.6)	
Social Capital Indicators										
Marital status										
Widowed	0.062	^	24.5	0.062	^	24.8	0.104	+	33.2	
	(0.027)		(28.2)	(0.027)		(28.2)	(0.040)		(32.5)	
Divorced	-0.011		-13.3	-0.010		-13.2	0.013		-28.7	
	(0.018)		(20.3)	(0.018)		(20.3)	(0.029)		(24.7)	
Spouse absent	0.009		-30.1	0.014		-30.6	0.012		-61.1	
	(0.028)		(31.0)	(0.028)		(31.0)	(0.046)		(41.1)	
Never married	-0.006		6.6	-0.001		6.4	0.015		-21.0	
	(0.018)		(20.8)	(0.018)		(20.9)	(0.029)		(26.4)	
Children in household										
Children under age 6	-0.005		-15.8	-0.004		-15.9	-0.014		-10.2	
	(0.015)		(16.1)	(0.015)		(16.1)	(0.024)		(20.1)	
Children age 6-17	0.129	*	15.1	0.128	*	15.0	0.154	*	30.6	
	(0.014)		(13.8)	(0.014)		(13.8)	(0.021)		(17.1)	
Housing tenure										
Missing	0.027		-2.0	0.026		-1.6	0.051		-25.7	
	(0.030)		(28.3)	(0.030)		(28.4)	(0.044)		(32.7)	
Renter	-0.036	+	15.9	-0.031	^	15.7	-0.032		19.2	
	(0.013)		(15.5)	(0.013)		(15.5)	(0.021)		(19.1)	
Urbanicity of residence										
Central city	-0.017		6.0	-0.015		5.9	-0.003		28.4	
	(0.014)		(16.0)	(0.014)		(16.0)	(0.023)		(19.6)	
Other metropolitan	0.021		-1.7	0.018		-1.4	0.033		-1.5	
	(0.018)		(17.9)	(0.018)		(17.9)	(0.026)		(21.3)	
Non-metropolitan	0.043	+	15.7	0.038	^	16.0	0.046		-4.5	
	(0.016)		(16.4)	(0.016)		(16.4)	(0.024)		(19.5)	
Not identified	0.019		-87.7	0.007		-86.9	0.045		-59.4	
	(0.130)		(128.1)	(0.127)		(128.1)	(0.186)		(142.6)	

Others in household									
One or more relatives	-0.060	*	-7.4	-0.056	*	-7.7	-0.054	^	1.0
	(0.014)		(16.4)	(0.014)		(16.4)	(0.022)		(19.7)
One or more nonrelatives	-0.101	*	29.2	-0.095	*	28.5	-0.146	*	81.2 ^
	(0.019)		(29.4)	(0.019)		(29.4)	(0.032)		(40.2)
Telephone status									
Non-telephone household	-0.066	^	-46.9	-0.055		-48.1	-0.085		-44.8
	(0.027)		(39.1)	(0.027)		(39.2)	(0.051)		(60.1)
Other Characteristics									
Sex									
Male	-0.070	*	13.8	-0.067	*	13.8	-0.064	*	10.1
	(0.012)		(12.7)	(0.012)		(12.7)	(0.018)		(15.2)
Age									
Age 15-30	0.016		8.0	0.016		7.5	-0.013		26.8
	(0.018)		(19.8)	(0.018)		(19.8)	(0.028)		(26.0)
Age 46-55	0.019		30.4	0.013		30.6	0.000		45.5
	(0.018)		(17.7)	(0.018)		(17.7)	(0.027)		(21.3)
Age 56-65	-0.013		33.8	-0.024		34.5	-0.016		29.8
	(0.021)		(22.8)	(0.020)		(22.8)	(0.031)		(26.5)
Over age 65	-0.053	^	50.6	-0.054	^	50.9	-0.049		62.4
	(0.022)		(27.1)	(0.022)		(27.1)	(0.035)		(32.1)
Race/ethnicity									
Hispanic	-0.088	*	9.6	-0.086	*	9.0	-0.131	*	-60.5
	(0.017)		(23.6)	(0.017)		(23.6)	(0.027)		(30.9)
Non-Hispanic black	-0.061	*	-15.5	-0.054	*	-16.3	-0.090	*	-17.0
	(0.016)		(20.6)	(0.016)		(20.6)	(0.026)		(27.8)
Region of residence									
Northeast	-0.034	^	-13.8	-0.038	^	-13.5	-0.034		10.9
	(0.015)		(17.4)	(0.015)		(17.4)	(0.024)		(21.0)
Midwest	0.027		-23.7	0.021		-23.1	0.046	^	-25.9
	(0.015)		(15.3)	(0.015)		(15.3)	(0.023)		(18.2)

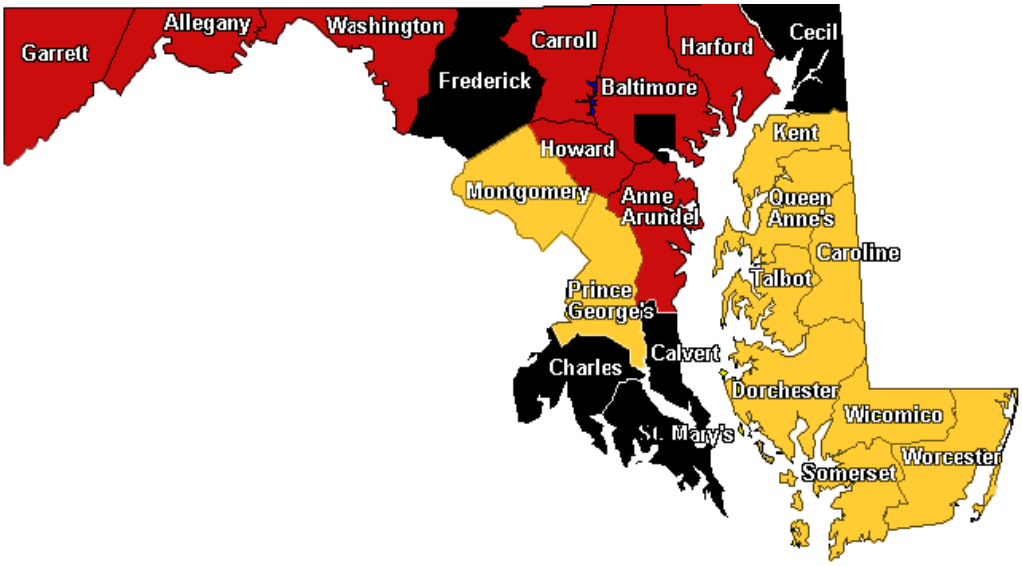
West	0.006		8.2		0.003		8.5		0.016		25.2	
	(0.016)		(16.5)		(0.016)		(16.5)		(0.024)		(20.2)	
Completed ATUS Survey					0.103	*	-7.4					
					(0.011)		(12.4)					
Constant			141.5	*			145.6	*			149.4	*
			(28.6)				(29.4)				(36.3)	
N	6905		1953		6905		1953		3521		1252	
R^2	0.1049		0.0197		0.115		0.0194		0.1062		0.057	

Coefficients and (standard errors)

Statistical significance: * ($\alpha \leq 0.001$), + ($\alpha \leq 0.01$), ^ ($\alpha \leq 0.05$)

Figures

Figure 2-1: Map of Maryland Counties



Source: Maryland Department of Education, http://www.marylandpublicschools.org (n.d.)

Figure 2-2a

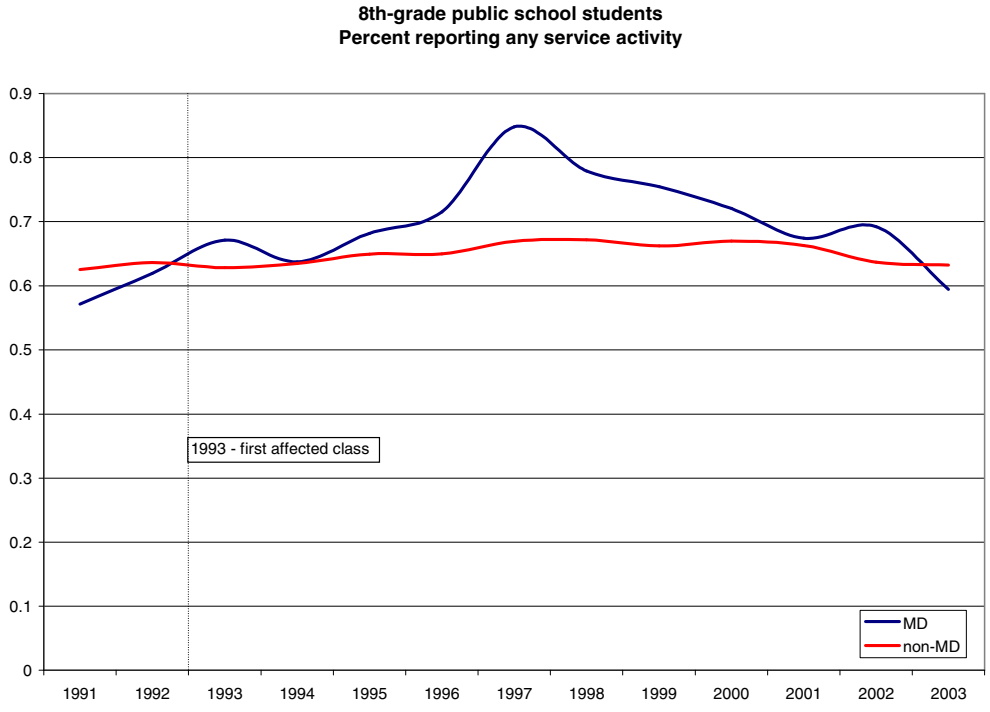


Figure 2-2b

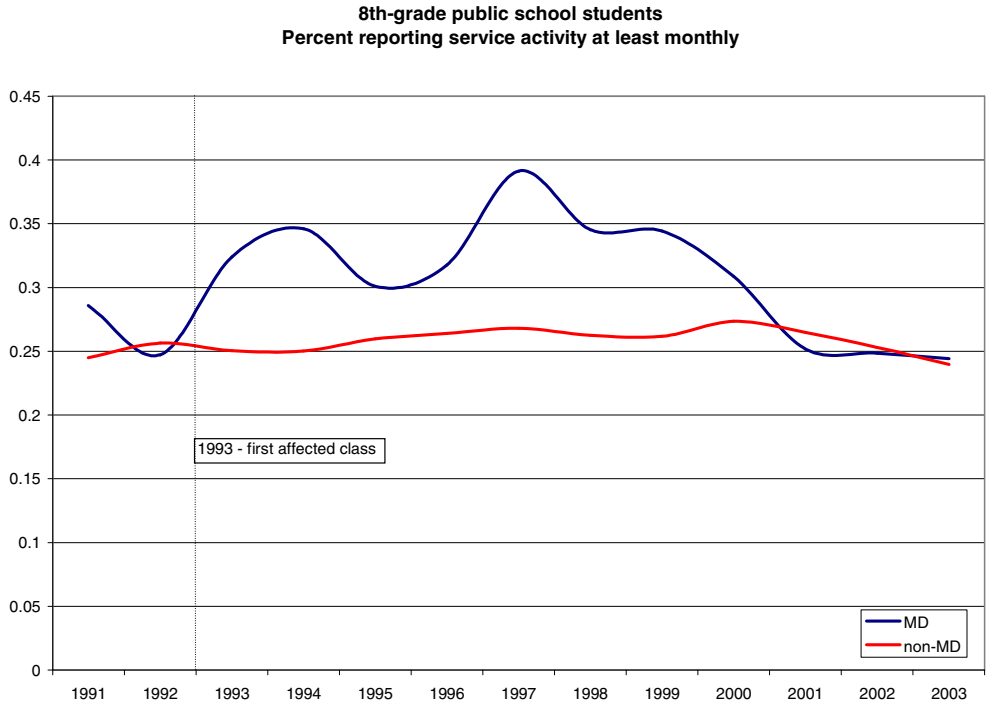


Figure 2-2c

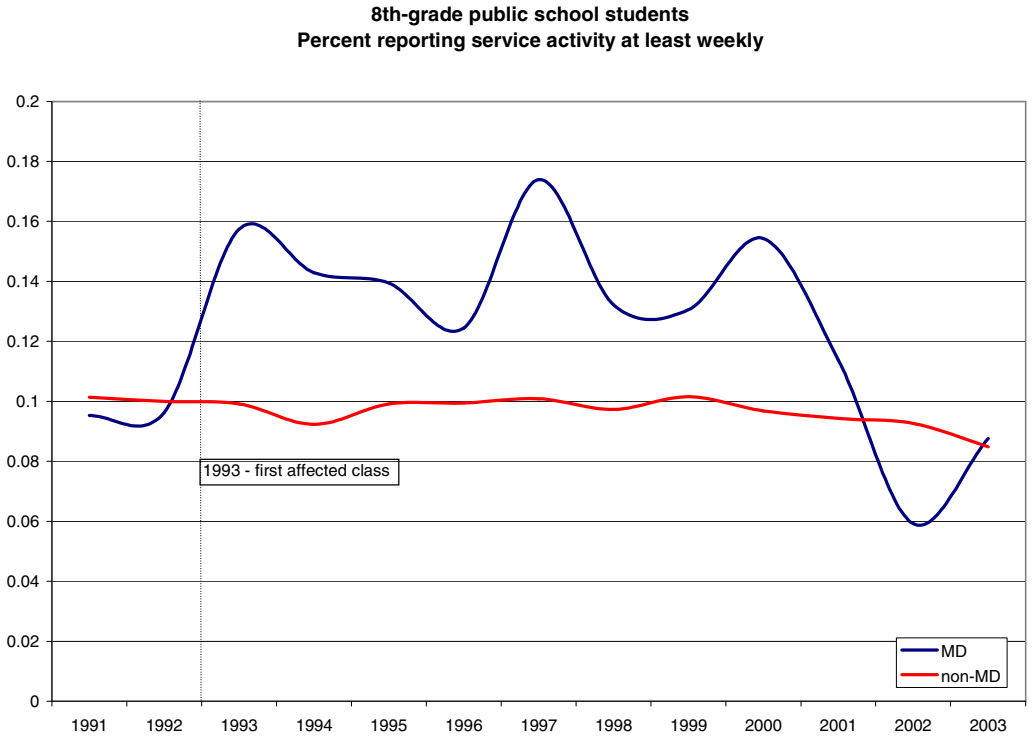


Figure 2-3a

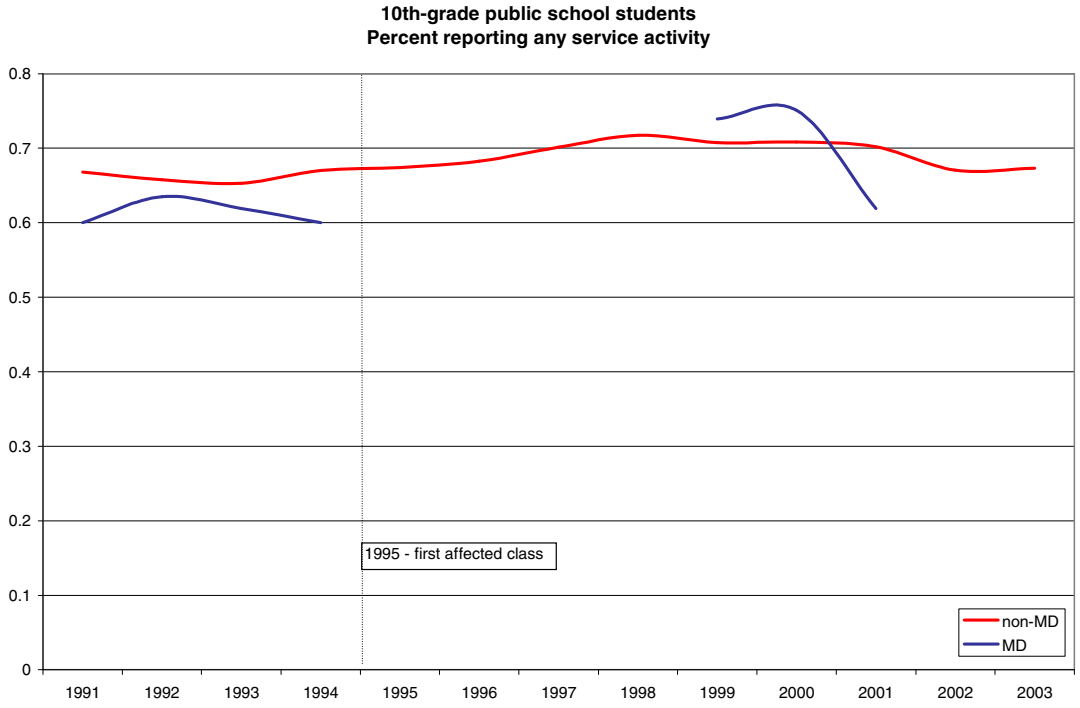


Figure 2-3b

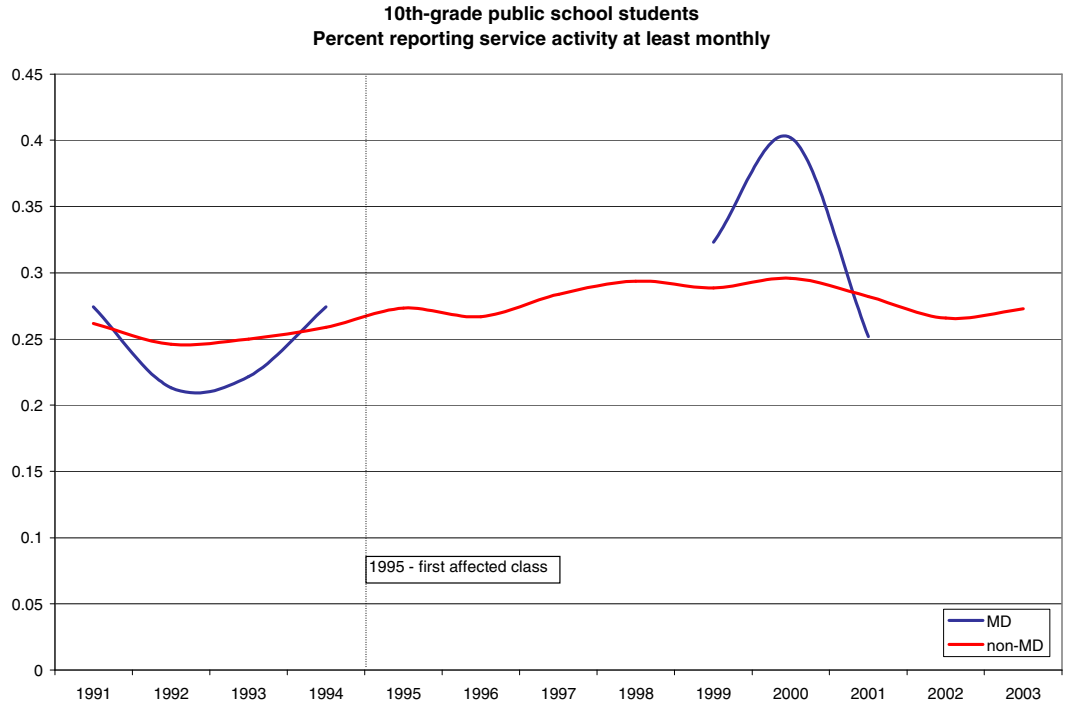


Figure 2-3c

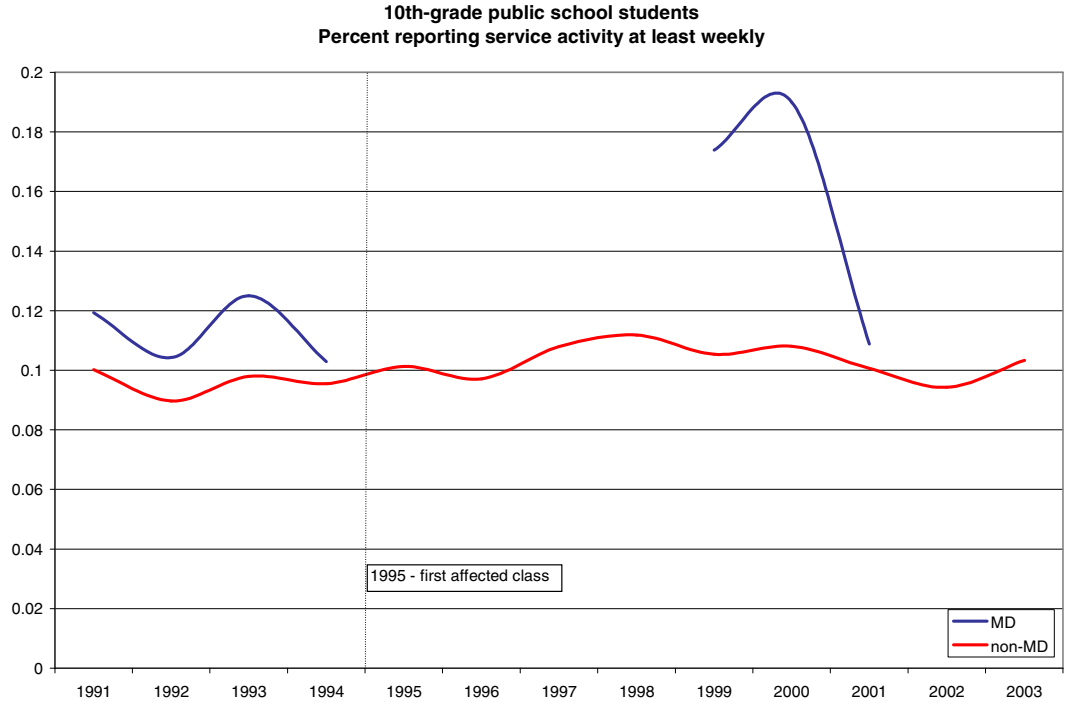


Figure 2-4a

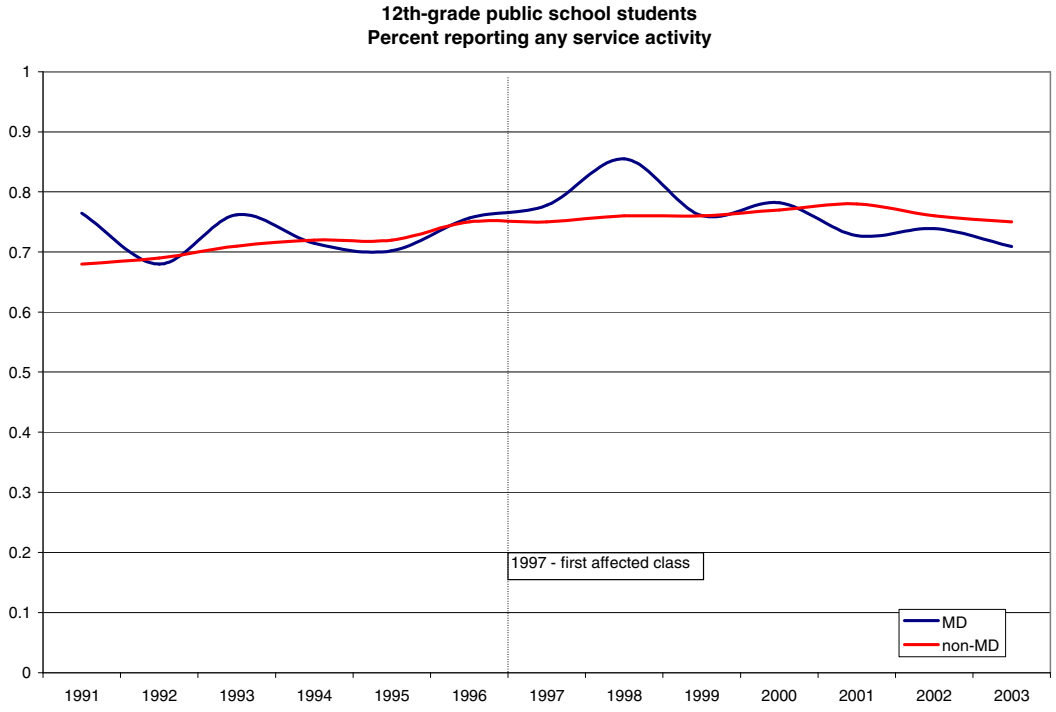


Figure 2-4b

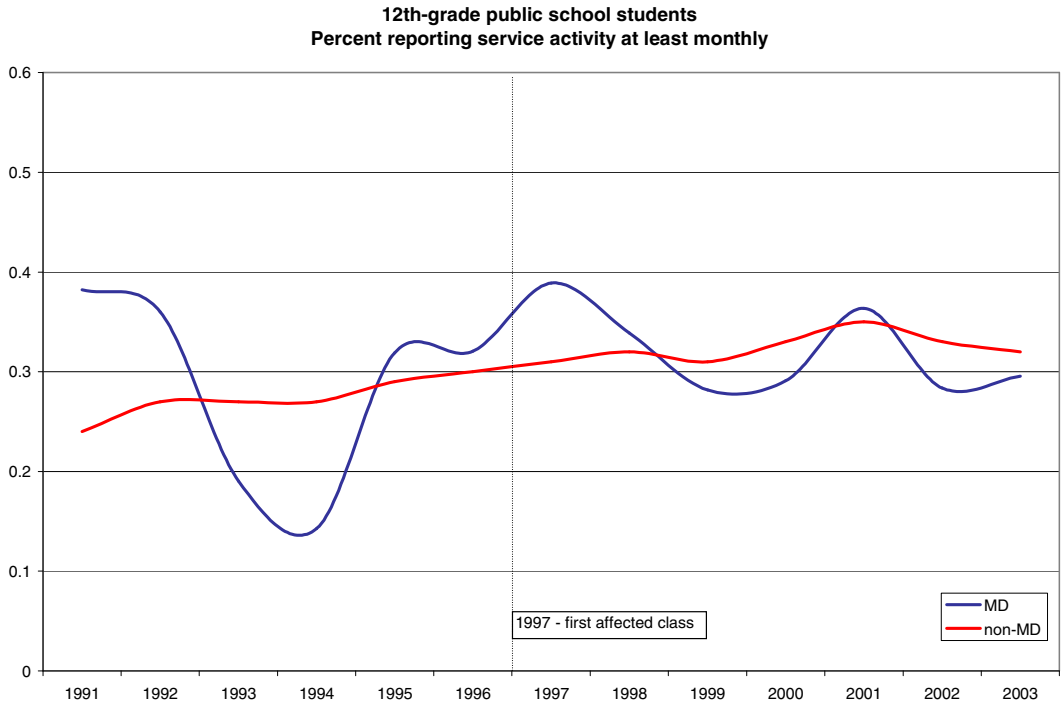
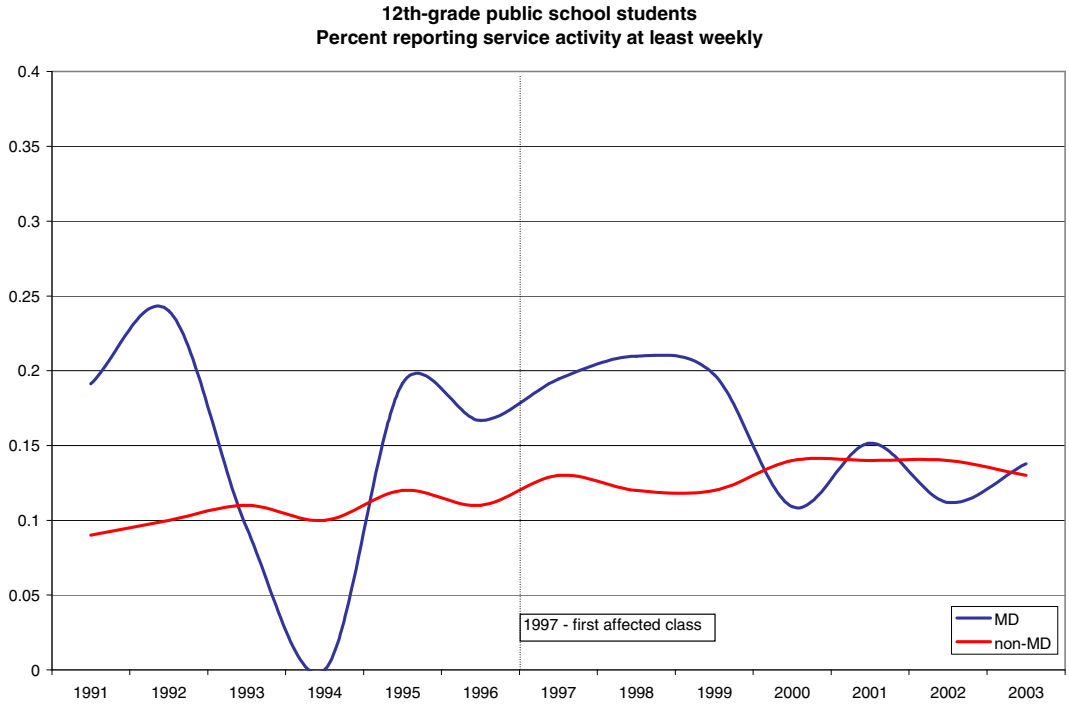
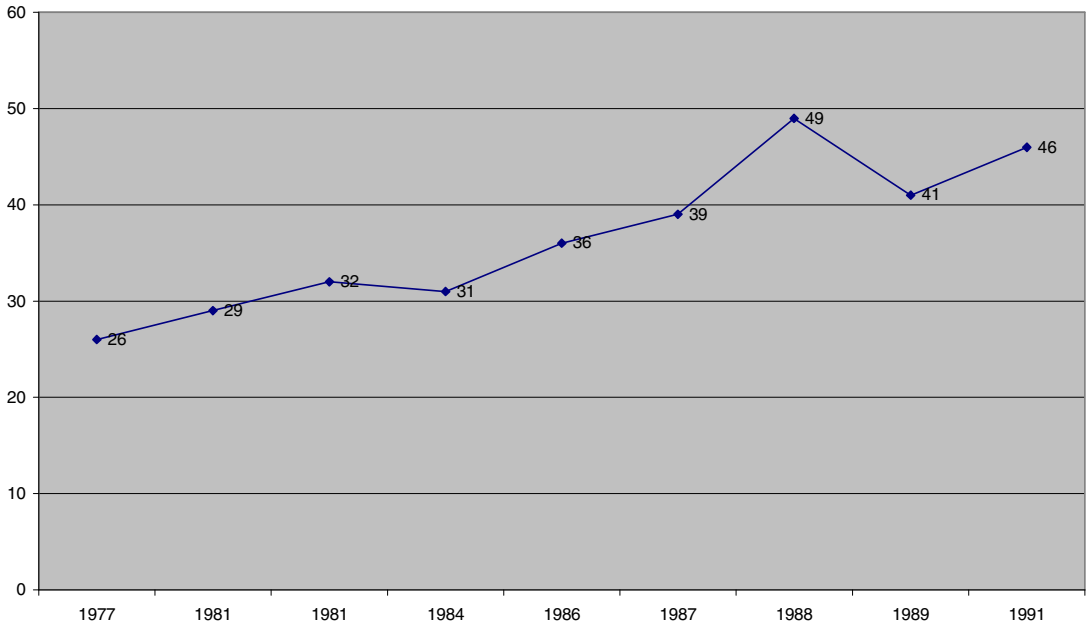


Figure 2-4c



Source, Figures 1.a through 3.c: MTF surveys, eighth, tenth and twelfth grades, 1991-2003.

Figure 3-1: Percent Volunteers in Gallup Surveys



SOURCE: Roper Center Accession Nos. 0047361, 0031892, 0030064, 0032803, 0026314, 0026426, 0047980, 0028183, and 0236260

Figure 3-2: Month-in-sample for CPS households
September 2002 – December 2003

CPS Month and Year	Household's month-in-sample							
September 2002	8	7	6	5	4	3	2	1
October 2002		8	7	6		4	3	2
November 2002			8	7			4	3
December 2002				8				4
January 2003								
February 2003								
March 2003								
April 2003								
May 2003								
June 2003					5			
July 2003					6	5		
August 2003					7	6	5	
September 2003					8	7	6	5
October 2003						8	7	6
November 2003							8	7
December 2003								8

Appendices

Appendix A: Background Information

History of Maryland service-learning requirement

1983-1984	Unsuccessful attempt to adopt a mandatory service requirement for all public high school students
1985	State Board of Education requires all school systems to offer community service opportunities for high school students for credit
1992	The State Board of Education adopts the current mandatory service requirement which becomes effective in 1993 and affects the graduating class of 1997 and beyond. Twenty-two of twenty-four local school boards opposed the measure.
March 1993	Each of the 24 local school districts design and submit their own versions of the service-learning mandate
June 1997	Nearly all of the 42,000 Maryland public high school students graduate with their service-learning requirement fulfilled; 49 students in the state failed to fulfill their requirement and thus did not graduate solely for that reason.

Source: Maryland State Department of Education Service-Learning website (n.d.).

Enrollment in Maryland Public Schools, By District (County)

Enrollment in 2004	Total	Grades 7-12
Total State	869,113	402,465
Montgomery	139,201	65,372
Prince George's	137,285	63,283
Baltimore	108,523	51,059
Baltimore City	91,738	39,421
Anne Arundel	74,508	35,306
Howard	47,833	22,517
Harford	40,200	18,554
Frederick	38,950	18,073
Carroll	28,832	13,996
Charles	25,610	12,374
Washington	20,338	9,479
Calvert	17,423	8,368
Cecil	16,475	7,598
St. Mary's	16,261	7,420
Wicomico	14,402	6,311
Allegany	9,926	4,753
Queen Anne's	7,526	3,507
Worcester	6,783	3,336
Caroline	5,400	2,543
Garrett	4,810	2,176
Dorchester	4,803	2,353
Talbot	4,459	2,116
Somerset	2,951	1,292
Kent	2,565	1,258

Source: Maryland Report Card, 2004, www.mdreportcard.org (2004)

Appendix B: Full Regression Results

Table 2-B.1: Linear Probability Estimates, Volunteered at least some time in the past year, 8th Grade Sample, 1993-2003 MTF
Parameter Estimates and (standard errors)

Covariates	All		Females		Males	
Constant	0.5599	***	0.6503	***	0.5695	***
	(0.0070)		(0.0095)		(0.0114)	
Female	0.1057	***				
	(0.0036)					
Less than 14 years of age	0.0125	***	0.0131	***	0.0109	***
	(0.0023)		(0.0038)		(0.0041)	
Race (left-out is white)						
Black	-0.0513	***	-0.0766	***	-0.0225	***
	(0.0083)		(0.0103)		(0.0078)	
Not black or white	-0.0580	***	-0.0703	***	-0.0453	***
	(0.0066)		(0.0068)		(0.0069)	
Educational attainment of most educated parent (left-out is HS graduate)						
Less than HS diploma	-0.0541	***	-0.0650	***	-0.0367	***
	(0.0057)		(0.0063)		(0.0072)	
College or higher	0.0707	***	0.0790	***	0.0624	***
	(0.0045)		(0.0046)		(0.0055)	
Missing measure	0.0015		-0.0090	**	0.0118	***
	(0.0030)		(0.0039)		(0.0043)	
Household composition (left-out is 2-parent household)						
No father in household	-0.0343	***	-0.0355	***	-0.0323	***
	(0.0031)		(0.0037)		(0.0057)	
No mother in household	-0.0431	***	-0.0637	***	-0.0281	***
	(0.0054)		(0.0090)		(0.0091)	
Neither parent in household	-0.0466	***	-0.0390	***	-0.0556	***
	(0.0067)		(0.0088)		(0.0104)	
Missing household composition	-0.0844	***	-0.0972	***	-0.0799	***
	(0.0142)		(0.0233)		(0.0175)	
Frequency of religious service attendance						
Attend services 1-2 times/month or more	0.1175	***	0.1164	***	0.1193	***
	(0.0046)		(0.0042)		(0.0076)	
Missing frequency	0.0752	***	0.0701	***	0.0794	***
	(0.0146)		(0.0197)		(0.0186)	
Religious importance (left-out is very or somewhat important)						
Religion a 'little' or not important	-0.0709	***	-0.0629	***	-0.0781	***
	(0.0049)		(0.0056)		(0.0057)	
Missing importance of religion measure	-0.0200		-0.0133		-0.0269	
	(0.0165)		(0.0171)		(0.0223)	
Religious affiliation (left-out is Protestant)						
Baptist	-0.0225	***	-0.0311	***	-0.0109	
	(0.0051)		(0.0053)		(0.0073)	
Roman Catholic	-0.0090		-0.0185	***	0.0023	
	(0.0055)		(0.0055)		(0.0072)	
Jewish, Muslim, Buddhist, E. Orthodox, Mormon,	-0.0395	***	-0.0402	***	-0.0386	***
Unitarian Universalist, Other	(0.0063)		(0.0076)		(0.0082)	
None	-0.0540	***	-0.0556	***	-0.0501	***
	(0.0058)		(0.0071)		(0.0074)	
Missing religious affiliation	-0.0406	***	-0.0507	***	-0.0305	***
	(0.0058)		(0.0073)		(0.0080)	
Treatment effect (Post * Maryland)	0.0723	***	0.0658	***	0.0781	***
	(0.0074)		(0.0101)		(0.0073)	
N	208961		107238		101723	
Pseudo R^2	0.0732		0.0699		0.0534	

Source: MTF eighth-grade surveys, 1991-2003.
Includes state and year fixed effects. Standard errors are clustered on state.
*** indicates significance at the 99 percent level of confidence
** indicates significance at the 95 percent level of confidence

Table 2-B.2: Linear Probability Estimates, Volunteered at least once a month in the past year, 8th Grade Sample, 1993-2003 MTF
Parameter Estimates and (standard errors)

Covariates	All		Females		Males	
Constant	0.1936	***	0.2280	***	0.2168	***
	(0.0072)		(0.0092)		(0.0089)	
Female	0.0636	***				
	(0.0042)					
Less than 14 years of age	0.0011		0.0021		-0.0004	
	(0.0025)		(0.0044)		(0.0033)	
Race (left-out is white)						
Black	0.0092		-0.0097		0.0307	***
	(0.0070)		(0.0081)		(0.0080)	
Not black or white	-0.0093	**	-0.0232	***	0.0048	
	(0.0046)		(0.0058)		(0.0048)	
Educational attainment of most educated parent (left-out is HS graduate)						
Less than HS diploma	-0.0229	***	-0.0321	***	-0.0060	
	(0.0040)		(0.0056)		(0.0047)	
College or higher	0.0382	***	0.0453	***	0.0311	***
	(0.0032)		(0.0045)		(0.0033)	
Missing measure	0.0193	***	0.0162	***	0.0218	***
	(0.0028)		(0.0042)		(0.0036)	
Household composition (left-out is 2-parent household)						
No father in household	-0.0180	**	-0.0242	***	-0.0098	**
	(0.0035)		(0.0041)		(0.0040)	
No mother in household	-0.0125	***	-0.0295	***	-0.0009	
	(0.0059)		(0.0074)		(0.0098)	
Neither parent in household	0.0084		-0.0040		0.0187	**
	(0.0055)		(0.0090)		(0.0082)	
Missing household composition	-0.0103		-0.0189		-0.0072	
	(0.0103)		(0.0145)		(0.0116)	
Frequency of religious service attendance						
Attend services 1-2 times/month or more	0.0892	***	0.1034	***	0.0751	***
	(0.0033)		(0.0039)		(0.0039)	
Missing frequency	0.0634	**	0.0666	***	0.0595	***
	(0.0126)		(0.0139)		(0.0147)	
Religious importance (left-out is very or somewhat important)						
Religion a 'little' or not important	-0.0647	***	-0.0654	***	-0.0630	***
	(0.0036)		(0.0052)		(0.0042)	
Missing importance of religion measure	-0.0303	***	-0.0341	**	-0.0268	*
	(0.0115)		(0.0148)		(0.0143)	
Religious affiliation (left-out is Protestant)						
Baptist	-0.0172	***	-0.0235	***	-0.0082	
	(0.0042)		(0.0056)		(0.0068)	
Roman Catholic	-0.0207	***	-0.0249	***	-0.0153	***
	(0.0055)		(0.0082)		(0.0047)	
Jewish, Muslim, Buddhist, E. Orthodox, Mormon, Unitarian	-0.0320	***	-0.0410	***	-0.0221	***
Universalist, Other	(0.0053)		(0.0063)		(0.0067)	
None	-0.0168	***	-0.0264	***	-0.0095	**
	(0.0041)		(0.0059)		(0.0043)	
Missing religious affiliation	-0.0247	***	-0.0267	***	-0.0219	***
	(0.0059)		(0.0085)		(0.0071)	
Treatment effect (Post * Maryland)	0.0397	***	0.0330	***	0.0473	***
	(0.0073)		(0.0076)		(0.0081)	
N	208961		107238		101723	
Pseudo R^2	0.0369		0.0369		0.0287	

Source: MTF eighth-grade surveys, 1991-2003.
Includes state and year fixed effects. Standard errors are clustered on state.
*** indicates significance at the 99 percent level of confidence
** indicates significance at the 95 percent level of confidence
* indicates significance at the 90 percent level of confidence

Table 2-B.3: Linear Probability Estimates, Volunteered at least once a week in the past year, 8th Grade Sample, 1993-2003 MTF Public School Students
Parameter Estimates and (standard errors)

Covariates	All		Females		Males	
Constant	0.0775	***	0.0825	***	0.0919	***
	(0.0057)		(0.0079)		(0.0043)	
Female	0.0221	***				
	(0.0026)					
Less than 14 years of age	-0.0057	***	-0.0070	***	-0.0045	**
	(0.0014)		(0.0024)		(0.0022)	
Race (left-out is white)						
Black	0.0324	***	0.0296	***	0.0361	***
	(0.0052)		(0.0057)		(0.0064)	
Not black or white	0.0102	***	0.0063	*	0.0141	***
	(0.0028)		(0.0035)		(0.0031)	
Educational attainment of most educated parent (left-out is HS graduate)						
Less than HS diploma	-0.0016		-0.0075		0.0083	*
	(0.0035)		(0.0045)		(0.0049)	
College or higher	0.0106	***	0.0131	***	0.0081	***
	(0.0016)		(0.0025)		(0.0018)	
Missing measure	0.0120	***	0.0145	***	0.0093	***
	(0.0017)		(0.0027)		(0.0029)	
Household composition (left-out is 2-parent household)						
No father in household	-0.0025		-0.0028		-0.0020	
	(0.0025)		(0.0033)		(0.0031)	
No mother in household	0.0052		-0.0040		0.0113	*
	(0.0043)		(0.0055)		(0.0062)	
Neither parent in household	0.0182	***	0.0187	***	0.0165	**
	(0.0037)		(0.0062)		(0.0057)	
Missing household composition	0.0125		-0.0119		0.0266	***
	(0.0104)		(0.0141)		(0.0111)	
Frequency of religious service attendance						
Attend services 1-2 times/month or more	0.0312	***	0.0385	***	0.0240	***
	(0.0021)		(0.0028)		(0.0021)	
Missing frequency	0.0247	***	0.0241	**	0.0246	**
	(0.0073)		(0.0113)		(0.0098)	
Religious importance (left-out is very or somewhat important)						
Religion a 'little' or not important	-0.0305	***	-0.0333	***	-0.0272	***
	(0.0019)		(0.0025)		(0.0026)	
Missing importance of religion measure	-0.0141	***	-0.0125		-0.0145	
	(0.0070)		(0.0127)		(0.0111)	
Religious affiliation (left-out is Protestant)						
Baptist	-0.0031		-0.0078	**	0.0030	
	(0.0023)		(0.0037)		(0.0039)	
Roman Catholic	-0.0072	***	-0.0036		-0.0108	***
	(0.0025)		(0.0039)		(0.0030)	
Jewish, Muslim, Buddhist, E. Orthodox, Mormon,	-0.0038		-0.0048		-0.0025	
Unitarian Universalist, Other	(0.0025)		(0.0031)		(0.0041)	
None	0.0044	**	0.0026		0.0052	
	(0.0024)		(0.0044)		(0.0040)	
Missing religious affiliation	-0.0022		-0.0009		-0.0032	
	(0.0043)		(0.0057)		(0.0056)	
Treatment Effect (Post * Maryland)	0.0357	***	0.0420	***	0.0294	***
	(0.0040)		(0.0052)		(0.0043)	
N	208961		107238		101723	
Pseudo R^2	0.0133		0.0136		0.0128	

Source: MTF eighth-grade surveys, 1991-2003.
Includes state and year fixed effects. Standard errors are clustered on state.
*** indicates significance at the 99 percent level of confidence
** indicates significance at the 95 percent level of confidence
* indicates significance at the 90 percent level of confidence

Table 2-B.4: Linear Probability Estimates, Volunteered at least some time in the past year, 12th Grade Sample, 1993-2003 MTF Public School Students
Parameter Estimates and (standard errors)

Covariates	All		Females		Males	
Constant	0.5325	***	0.5857	***	0.5844	***
	(0.0102)		(0.0142)		(0.0139)	
Female	0.1020	***				
	(0.0045)					
Less than 18 years of age	0.0195	***	0.0284	***	0.0087	
	(0.0036)		(0.0038)		(0.0065)	
Race (left-out is white)						
Black	-0.0253	***	-0.0392	***	-0.0061	
	(0.0079)		(0.0104)		(0.0113)	
Not black or white	-0.0279	***	-0.0252	***	-0.0317	***
	(0.0065)		(0.0088)		(0.0101)	
Educational attainment of most educated parent (left-out is HS graduate)						
Less than HS diploma	-0.0461	***	-0.0528	***	-0.0336	**
	(0.0118)		(0.0126)		(0.0165)	
College or higher	0.0540	***	0.0488	***	0.0604	***
	(0.0059)		(0.0071)		(0.0080)	
Missing measure	0.0222	***	0.0100		0.0347	***
	(0.0071)		(0.0091)		(0.0079)	
Household composition (left-out is 2-parent household)						
No father in household	-0.0321	***	-0.0416	***	-0.0208	**
	(0.0052)		(0.0070)		(0.0082)	
No mother in household	-0.0629	***	-0.0641	***	-0.0598	***
	(0.0118)		(0.0169)		(0.0143)	
Neither parent in household	-0.0790	***	-0.1001	***	-0.0598	***
	(0.0101)		(0.0124)		(0.0145)	
Missing household composition	-0.0651	***	-0.1110	***	-0.0261	
	(0.0231)		(0.0349)		(0.0227)	
Number of siblings (left-out is one sibling)						
Only child	-0.0071		-0.0179		0.0039	
	(0.0138)		(0.0144)		(0.0172)	
2 siblings	-0.0074		-0.0021		-0.0133	
	(0.0076)		(0.0087)		(0.0087)	
3 or more siblings	-0.0122	**	-0.0101		-0.0143	*
	(0.0056)		(0.0073)		(0.0072)	
Frequency of religious service attendance						
Attend services 1-2 times/month or more	0.1391	***	0.1373	***	0.1428	***
	(0.0044)		(0.0067)		(0.0076)	
Missing frequency	0.0406		0.0915		0.0001	
	(0.0574)		(0.1072)		(0.0467)	
Religious importance (left-out is very or somewhat important)						
Religion a 'little' or not important	-0.0589	***	-0.0419	***	-0.0758	***
	(0.0055)		(0.0062)		(0.0078)	
Missing importance of religion measure	-0.0045		-0.0377		0.0177	
	(0.0529)		(0.0996)		(0.0433)	
Religious affiliation (left-out is Protestant)						
Baptist	-0.0339	***	-0.0202	**	-0.0472	***
	(0.0074)		(0.0085)		(0.0110)	
Roman Catholic	-0.0207	***	-0.0053		-0.0376	***
	(0.0072)		(0.0073)		(0.0100)	
Jewish, Muslim, Buddhist, E. Orthodox, Mormon,	-0.0281	***	-0.0166	*	-0.0388	***
Unitarian Universalist, Other	(0.0095)		(0.0084)		(0.0145)	
None	-0.0576	***	-0.0250	**	-0.0839	***
	(0.0103)		(0.0119)		(0.0143)	
Missing religious affiliation	-0.0437	**	-0.0186		-0.0673	**
	(0.0190)		(0.0240)		(0.0256)	
Treatment effect (Post * Maryland)	-0.0098		-0.0004		-0.0117	
	(0.0068)		(0.0087)		(0.0103)	
N	54772		28574		26198	
Pseudo R^2	0.0859		0.0760		0.0725	

Source: MTF twelfth-grade surveys, 1991-2003.
Includes state and year fixed effects. Standard errors are clustered on state.
** indicates significance at the 99 percent level of confidence
* indicates significance at the 95 percent level of confidence

Table 2-B.5: Linear Probability Estimates, Volunteered at least once a month in the past year, 12th Grade Sample, 1993-2003 MTF Public School Students
Parameter Estimates and (standard errors)

Covariates	All		Females		Males	
Constant	0.0367		0.0834	***	0.0728	***
	(0.0130)		(0.0160)		(0.0155)	
Female	0.0862	***				
	(0.0056)					
Less than 18 years of age	0.0094		0.0165	***	0.0011	
	(0.0056)		(0.0066)		(0.0073)	
Race (left-out is white)						
Black	0.0160	*	-0.0018		0.0377	***
	(0.0092)		(0.0143)		(0.0082)	
Not black or white	-0.0026		-0.0138	*	0.0062	
	(0.0066)		(0.0081)		(0.0083)	
Educational attainment of most educated parent (left-out is HS graduate)						
Less than HS diploma	-0.0377	***	-0.0393	***	-0.0304	***
	(0.0060)		(0.0116)		(0.0098)	
College or higher	0.0387	***	0.0548	***	0.0211	***
	(0.0059)		(0.0083)		(0.0063)	
Missing measure	0.0401	***	0.0468	***	0.0335	***
	(0.0071)		(0.0096)		(0.0074)	
Household composition (left-out is 2-parent household)						
No father in household	-0.0256	***	-0.0385	***	-0.0108	
	(0.0048)		(0.0071)		(0.0069)	
No mother in household	-0.0519	***	-0.0531	***	-0.0503	***
	(0.0101)		(0.0152)		(0.0140)	
Neither parent in household	-0.0461	***	-0.0705	***	-0.0230	**
	(0.0092)		(0.0132)		(0.0101)	
Missing household composition	-0.1023	***	-0.1408	***	-0.0703	***
	(0.0191)		(0.0276)		(0.0259)	
Number of siblings (left-out is one sibling)						
Only child	0.0126		0.0104		0.0146	
	(0.0134)		(0.0191)		(0.0136)	
2 siblings	-0.0172	***	-0.0173	*	-0.0178	***
	(0.0064)		(0.0090)		(0.0065)	
3 or more siblings	-0.0212	***	-0.0223	**	-0.0184	***
	(0.0056)		(0.0088)		(0.0068)	
Frequency of religious service attendance						
Attend services 1-2 times/month or more	0.1469	***	0.1628	***	0.1306	***
	(0.0049)		(0.0078)		(0.0080)	
Missing frequency	0.0399		0.1005	***	-0.0146	
	(0.0299)		(0.0375)		(0.0415)	
Religious importance (left-out is very or somewhat important)						
Religion a 'little' or not important	-0.0588	***	-0.0548	***	-0.0602	***
	(0.0056)		(0.0070)		(0.0076)	
Missing importance of religion measure	-0.0200		-0.0510		0.0336	
	(0.0165)		0.0391		0.0364	
Religious affiliation (left-out is Protestant)						
Baptist	-0.0120		-0.0083		-0.0136	*
	(0.0080)		(0.0123)		(0.0081)	
Roman Catholic	-0.0206	***	-0.0122		-0.0298	***
	(0.0065)		(0.0087)		(0.0088)	
Jewish, Muslim, Buddhist, E. Orthodox, Mormon,	0.0244	***	0.0178	*	0.0331	***
Unitarian Universalist, Other	(0.0084)		(0.0095)		(0.0118)	
None	-0.0092		-0.0054		-0.0141	*
	(0.0064)		(0.0105)		(0.0083)	
Missing religious affiliation	-0.0107		0.0019		-0.0224	
	(0.0218)		(0.0256)		(0.0278)	
Treatment effect (Post * Maryland)	-0.0638	***	-0.1192	***	0.0111	
	(0.0096)		(0.0105)		(0.0105)	
N	54772		28574		26198	
Pseudo R^2	0.0696		0.0688		0.0546	

Source: MTF twelfth-grade surveys, 1991-2003. Includes state and year fixed effects. Standard errors are clustered on state.
*** indicates significance at the 99 percent level of confidence
** indicates significance at the 95 percent level of confidence
* indicates significance at the 90 percent level of confidence

Table 2-B.6: Linear Probability Estimates, Volunteered at least once a week in the past year, 12th Grade Sample, 1993-2003 MTF Public School Students
Parameter Estimates and (standard errors)

Covariates	All		Females		Males	
Constant	0.0154	***	0.0216	*	0.0459	***
	(0.0100)		(0.0121)		(0.0128)	
Female	0.0386	***				
	(0.0036)					
Less than 18 years of age	-0.0016		0.0024		-0.0064	
	(0.0035)		(0.0043)		(0.0050)	
Race (left-out is white)						
Black	0.0280	***	0.0291	***	0.0267	***
	(0.0070)		(0.0103)		(0.0072)	
Not black or white	0.0131	***	0.0042		0.0209	***
	(0.0056)		(0.0078)		(0.0066)	
Educational attainment of most educated parent (left-out is HS graduate)						
Less than HS diploma	-0.0206	***	-0.0180	**	-0.0213	***
	(0.0047)		(0.0071)		(0.0078)	
College or higher	0.0148	***	0.0251	***	0.0040	
	(0.0040)		(0.0056)		(0.0049)	
Missing measure	0.0290	***	0.0360	***	0.0216	***
	(0.0053)		(0.0082)		(0.0049)	
Household composition (left-out is 2-parent household)						
No father in household	-0.0142	***	-0.0249	***	-0.0019	
	(0.0037)		(0.0055)		(0.0066)	
No mother in household	-0.0228	***	-0.0246	**	-0.0214	**
	(0.0075)		(0.0117)		(0.0096)	
Neither parent in household	-0.0176	***	-0.0301	***	-0.0053	
	(0.0066)		(0.0085)		(0.0081)	
Missing household composition	-0.0482	***	-0.0616	***	-0.0360	*
	(0.0129)		(0.0224)		(0.0185)	
Number of siblings (left-out is one sibling)						
Only child	0.0132		0.0146		0.0108	
	(0.0084)		(0.0102)		(0.0103)	
2 siblings	-0.0076		-0.0071		-0.0087	*
	(0.0043		(0.0064)		(0.0047)	
3 or more siblings	-0.0079	***	-0.0105	***	-0.0040	
	(0.0029		(0.0039)		(0.0046)	
Frequency of religious service attendance						
Attend services 1-2 times/month or more	0.0595	***	0.0715	***	0.0462	***
	(0.0040		(0.0051)		(0.0057)	
Missing frequency	0.0186		0.0582	**	-0.0147	
	(0.0193		(0.0273)		(0.0347)	
Religious importance (left-out is very or somewhat important)						
Religion a 'little' or not important	-0.0316	***	-0.0366	***	-0.0255	***
	(0.0044		(0.0063)		(0.0051)	
Missing importance of religion measure	-0.0045		-0.0377		0.0177	
	(0.0529		(0.0996)		(0.0433)	
Religious affiliation (left-out is Protestant)						
Baptist	-0.0038		-0.0030		-0.0038	
	(0.0052)		(0.0084)		(0.0066)	
Roman Catholic	-0.0102	***	-0.0073		-0.0132	**
	(0.0046)		(0.0061)		(0.0064)	
Jewish, Muslim, Buddhist, E. Orthodox, Mormon,	0.0187	***	0.0125		0.0268	***
Unitarian Universalist, Other	(0.0062)		(0.0095)		(0.0088)	
None	-0.0037		0.0002		-0.0081	
	(0.0050)		(0.0079)		(0.0057)	
Missing religious affiliation	0.0098		0.0121		0.0054	
	(0.0119)		(0.0186)		(0.0143)	
Treatment effect: (Post * Maryland)	-0.0390	***	-0.0791	***	0.0262	***
	(0.0055)		(0.0070)		(0.0069)	
N	54772		28574		26198	
Pseudo R^2	0.0321		0.0372		0.0232	

Source: MTF twelfth-grade surveys, 1991-2003. Includes state and year fixed effects. Standard errors are clustered on state.
*** indicates significance at the 99 percent level of confidence
** indicates significance at the 95 percent level of confidence
* indicates significance at the 90 percent level of confidence

Appendix C: Limited control groups.

The first group is the geographic sample, which includes states in the middle and south Atlantic regions of the United States. These states include New York, New Jersey, Pennsylvania, Washington, DC, Virginia, West Virginia, and North Carolina. Washington, DC implemented its own mandatory service program over the time period of the data, as did Philadelphia, Pennsylvania, a large school district in the state of Pennsylvania. Due to concern that the treatment effect would be contaminated by these states' programs, the programs were run both including and excluding Pennsylvania and Washington, DC. The results did not change significantly in the two cases.

The demographic sample includes states that are similar to Maryland along several dimensions. Using data found in the 1996 Statistical Abstract of the United States, I compared states across a number of demographic measures, including educational attainment of the state's population, salary of teachers, per capita expenditure for public schools (kindergarten through twelfth grade), and per capita income. The educational measures included the percent of each state's population falling into one of several possible categories, ranging from high school dropout to those having advanced postsecondary degrees. The teacher salaries used for comparison included all teacher salaries (kindergarten through twelfth grade), then separately considering salaries for elementary teachers (kindergarten through fifth grade), and salaries for secondary teachers (sixth through twelfth grades). For each of these measures, I determined which states most closely resembled Maryland. After

completing the comparison for each of the measures, I included states that matched Maryland along at least five of the measures used. The states in the demographic sample are Connecticut, Illinois, Massachusetts, Oregon, Rhode Island, and Virginia. Delaware and Alaska also met the requirement, but are not sufficient in the data to include in the analysis. Chicago (IL) Public Schools implemented a mandate, beginning in 1998, which imposed a service learning requirement on high school graduates of 2001 and later. As such, the model was run including and excluding Illinois. The results did not change significantly in the two cases.

The civic sample included states that have similar volunteer rates to Maryland in the Current Population Survey's 2002 and 2003 September Volunteer Supplements. The September Supplements enable the calculation of volunteer rates for different age groups within each state. I calculated the volunteer rate for individuals aged 25 years and older within each state. After ranking the states according to the volunteer rate for this group, I selected states that were similar to Maryland in its rate, which was 33 percent in 2002, and 31 percent in 2003. This group included Indiana, Connecticut, Missouri, Kentucky, Mississippi, Vermont, Washington, Arizona, Michigan, Ohio, Pennsylvania, and Washington, DC. Again, due to programs in large public school districts, Ohio (Cleveland), Pennsylvania (Philadelphia), and Washington, DC were excluded from one set of regressions. The results did not change significantly in the two cases.

Although there was concurrent legislation in school districts in some of the comparison states, the results did not differ drastically according to the inclusion or exclusion of the relevant states in the linear probability model. Thus, I report the

results from the regressions run including all of the comparison states in Tables 7 through 12.

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