

Inside National Service: AmeriCorps' Impact on Participants

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ABSTRACT

This study examines the short- and long-term impact of AmeriCorps participation on members' civic engagement, education, employment, and life skills. The analysis compares changes in the attitudes and behaviors of participants over time to those of individuals not enrolled in AmeriCorps, controlling for interest in national and community service, member and family demographics, and prior civic engagement. Results indicate that participation in AmeriCorps led to positive impacts on members, especially in the area of civic engagement, members' connection to community, knowledge about problems facing their community, and participation in community-based activities. AmeriCorps had some positive impacts on its members' employment-related outcomes. Few statistically significant impacts were found for measures of participants' attitude toward education or educational attainment, or for selected life skills measures. Within in a subset of community service programs that incorporate a residential component for members, the study also uncovered a short-term negative impact of participation on members' appreciation for ethnic and cultural diversity which disappeared over time. The implications of these findings for future research on national service are discussed.

INTRODUCTION

Does national service develop the potential of the young people who serve in programs like AmeriCorps? This question was the starting point for our research into the impact of the AmeriCorps experience on members' attitudes and behavior. While there are many possible ways to define the impacts of national service, we focus here on four critical member outcomes that were identified through a review of prior research and interviews with leading practitioners in the field: civic engagement, education, employment, and teamwork and other life skills. Our research questions track closely these four main areas. We ask: 1. Does the AmeriCorps experience lead to an increase in civic engagement? 2. Does the AmeriCorps experience lead to an increase in educational attainment? 3. Does the AmeriCorps experience lead to improvements in work skills and positive attitudes toward employment? 4. Does the AmeriCorps experience lead to better life skills, including teamwork and tolerance of others? and 5. When do the effects of the AmeriCorps experience become manifest, and to what extent do these effects persist? Given the prior research, both theoretical and empirical, we expected former AmeriCorps participants to excel in the areas of civic engagement, education, employment, and teamwork skills in comparison to nonparticipants. The results we report here of a large study of AmeriCorps participants (Abt Associates, 2004, 2008) alternately support and challenge our assumptions about the role of national service in shaping the attitudes and behavior of young people.

EMPIRICAL AND THEORETICAL BACKGROUND

In more than 50 countries around the world, from North America to Western Europe and from Africa to Latin America, some variation on national service can be found (McBride & Sherraden, 2004; McBride, Sherraden, Benitez, & Johnson, 2004). Within the U.S., there is longstanding debate among policy makers about whether there should be national service, how these programs should be structured, and what effects these efforts should have on volunteers, the organizations

that host volunteers, and the communities where the service is completed. (Barber, 1998; Janowitz, 1983; Moskos, 1988). National service has been seen as a vehicle for building everything from citizenship to nonprofit capacity to social capital (Frumkin, 2004; Perry & Thomson, 2004; Thomson & Perry, 1998; Wofford & Waldman, 1996).

In the U.S., national service takes many forms. AmeriCorps, a national program administered by the Corporation for National and Community Service, provides grants to public and nonprofit organizations to support community service. AmeriCorps comprises three major programs: AmeriCorps-State and National, AmeriCorps-VISTA, and AmeriCorps-National Civilian Community Corps (NCCC). In exchange for a year of full-time or sustained part-time service, AmeriCorps participants, referred to as members, receive an education award that can be used toward higher education or vocational training, or to repay qualified student loans. Members also receive a subsistence stipend while they serve. A key goal of AmeriCorps is to develop members' ethic of service and civic responsibility and to increase their educational opportunities and engagement in service with people of diverse backgrounds. AmeriCorps-State and National and AmeriCorps-VISTA members serve with hundreds of local community-based organizations and national organizations including Habitat for Humanity, the American Red Cross, and Boys and Girls Clubs. While AmeriCorps-VISTA focuses on high poverty communities, AmeriCorps-NCCC has a residential component and members live and work together during their service.

AmeriCorps members serve in teams and meet community needs in cooperation with nonprofit organizations and state and local agencies. (Aguirre International, 1996; Neumann, 1995; Perry, Thompson, Tschirhart, Mesch, & Lee, 1999; Shumer & Matland, 1995, 1996; Shumer & Rental, 1997). Examples of the kind of work performed by AmeriCorps members includes assisting elderly residents by providing transportation to medical appointments and doing house repairs (Turner, 1997) and working in elementary schools (Cassidy, Hicks, Hall,

Farran, & Gray, 1998), among many other tasks. Given the fact that work is a key component of service, many existing studies on national service examine the effects of this work on the organizations and communities in which members serve (Checkoway, 1997; Glatz, MacAllum, & Strang, 1997; Perry & Thomson, 2004). A study by Perry and Thompson (1997) examines the community-building effects of the AmeriCorps program in five locations. Findings revealed that school leaders reported their students' attendance had improved at all six schools in which Corps members worked. In addition, teachers perceived better attitudes and eagerness to learn among students. Other research has considered the benefits of national service social service programs, and the broader communities in which the programs operate (Perry & Imperial, 1999; Perry & Katula, 2001; Perry & Thompson, 1997). AmeriCorps members can benefit communities by building problem-solving capacity and by meeting concrete public needs.

The intended program effects of national service are not just on the community, however. There has been considerable research on both formal and informal forms of volunteering that has focused on individual-level outcomes (Wilson, 2000; Wilson & Musick, 1997a, 1997b, 1998). In addition, there is a broad body of literature on community service that theorizes about and tests the impact of service on the specific area of civic responsibility and political engagement (Barber, 1998; Bellah, Madsen, Sullivan, Swidler, & Tipton, 1985; Furco, Muller, & Ammon, 1998; Galston, 2001; Youniss & Yates, 1997; Zaff & Michelsen, 2002). This theory and research emphasizes the link between service to others and democratic practices, focusing on the way a connection to others creates a commitment to political participation and civic activism. Prior empirical work on the effects of service also shows that AmeriCorps service positively predicts civic participation regardless of race, gender, or political orientation (Simon, 2002). One study of AmeriCorps members looked at whether their goals for service were related to their subsequent service outcomes, satisfaction, and intention to volunteer in the future. The findings were that members' satisfaction with their service was very much related to their having specific goals

about what they hoped to gain from their experience. The presence of goals is also positively related to the likelihood that national service participants would volunteer in the future (Tschirhart, Mesch, Perry, Miller, & Lee, 2001). Neither partisan in intent nor committed to any particular ideology (Simon & Wang, 1999a, 1999b, 2002), national service experiences draw people out of the confines of their usual cultural and economic context and creates the preconditions for participation in politics and civic affairs. We would thus expect national service to increase civic engagement because service exposes young people to politics and teaches them to take their place in community and public life.

AmeriCorps was designed partially to encourage young people to serve and then pursue their education and careers with a broadened perspective. In at least one study, the education awards provided by CNCS to AmeriCorps members upon completion of service have been shown to drive college enrollment behavior (Selingo, 1998). In addition, research shows that community engagement and formal national service does motivate those who serve to continue doing so after their first service experience. One study found that volunteering in high school predicts quite strongly a willingness to do community work later in life (Youniss & Yates, 1997). Another study extended this finding by showing that attitudes toward citizenship is a powerful predictor of volunteering behavior in later life (Janoski, Musick, & Wilson, 1998). Overall, the act of serving has been theorized to motivate young people to pursue their educations and to gain an appreciation of the value of work. The education awards and the intensive year-long work experience of AmeriCorps would lead one to expect that positive attitudes about education and work would develop as a result of service to others.

Many studies have focused on the effects of volunteering, informal community service, and national service on participants' moral and personal development. Moral development involves the formation of attitudes, social values, and appreciation for difference, tolerance, respect, and compassion. Although service-learning is less intensive than programs like

AmeriCorps, research shows that participation in service-learning programs increases students' tolerance and favorable attitudes toward others (Morgan & Streb, 2001). Past research demonstrates clear linkages between a social justice experience in high school and attitudes later in life (Youniss & Yates, 1997). In another study, students who participated in service learning experiences increased pro-social reasoning, decision making, and responsibility (Batchelder & Root, 1994; Myers-Lipton, 1998). More broadly, shared values such as honesty and openness build a sense of trust between members of a community (Jones & George, 1998). In the areas of tolerance and appreciation of cultural diversity, we might expect that AmeriCorps would build the life skills of members by broadening their horizons and exposing them to people very different from themselves.

In sum, across the four areas of interest here, civic engagement, education, employment, and teamwork and tolerance, we would expect to find positive effects of service on members of AmeriCorps. Bearing in mind these predictions that emerge from theory and prior empirical work and employing an unusually large sample and a quasi-experimental design, our project went about testing whether these expectations of impact are actually met by AmeriCorps members.

STUDY DESIGN

To examine whether the effects are present, we focused on two of the AmeriCorps programs: AmeriCorps-State and National and AmeriCorps-National Civilian Community Corps (NCCC).¹ AmeriCorps-State and National is the largest of the AmeriCorps programs, supporting participants through a network of local community-based organizations, educational institutions, and other agencies. One-third of AmeriCorps-State and National grant funds are distributed by a population-based formula to governor-appointed state service commissions, which in turn make grants to local nonprofits and public agencies.² Participants in the State and National program must be at least 17 years of age, and there is no upper age limit. About three-quarters of the

members served full-time in the 1999–2000 program year, with the remaining members engaging in sustained part-time service. AmeriCorps-State and National programs address community needs in the areas of education, public safety, human needs, homeland security, and the environment. The organizations receiving grants, referred to here as *sponsoring organizations*, are responsible for recruiting, selecting, and supervising AmeriCorps members. In most programs, AmeriCorps members provide services at their sponsoring organization.

AmeriCorps- NCCC is a 10-month, full-time, residential service program for men and women between the ages of 18 and 24. Inspired by the Depression-era Civilian Conservation Corps, the program combines the best practices of civilian and military service. AmeriCorps-NCCC members live and train in teams at five regional campuses, and serve nonprofit organizations and government entities in communities across the country. During their service period, NCCC members spend considerable time off-campus providing services throughout the region, living temporarily in schools or other facilities provided by the community. Some NCCC members also participate in disaster relief efforts such as flood relief or fighting wildfires. In 1999–2000, NCCC members spent approximately half their time away from NCCC campuses providing services throughout the states in their regions.

The outcomes we address in this analysis fall into four categories: civic engagement, education, employment, and teamwork/life skills. Promoting civic engagement is a primary goal for all of the Corporation’s programs. CNCS’s programs are designed to enable members to see themselves as problem-solvers, become leaders, and take personal responsibility. Because of the importance of service and civic responsibility to the Corporation’s mission, over half of the outcomes measured focus on civic engagement. Second, every AmeriCorps member who completes a full term of service is eligible for an education award of \$4,725. The award can be used for education or training from qualified institutions, or to repay eligible student loans, for a period of seven years after completing service. The award is a clear indication of the

Corporation's commitment to advancing the educational prospects of members. Furthermore, individual AmeriCorps programs often support members' attempts to further their own education by providing opportunities to complete their GED or high school diploma. Consistent with this commitment, the study measured the effects of participation on members' attitudes toward their own ability to achieve educational milestones. Third, the Corporation is dedicated to improving the employment options available to AmeriCorps members through member development activities, skill-building service projects, and mentoring opportunities. Additionally, AmeriCorps members have the opportunity to work with public servants, who often supervise members or partner with AmeriCorps programs, providing exposure to potential careers in the public sector. Finally, the Corporation encourages its grantees to provide training, team-building, and reflection opportunities to support AmeriCorps members' ability to interact in team settings with groups of diverse individuals. The final set of outcome measures assessed by this study focused on respondents' interpersonal skills, including attitudes toward cultural and ethnic diversity and behavior in group/teamwork settings. Teamwork and trust is built on the interaction of people's values, attitudes, and emotions. In the research detailed here, we consider different ways of thinking about trust and teamwork in the context of the personal development of AmeriCorps members.

Studying volunteering and service is challenging. The ideal way to ensure that AmeriCorps members and non-members differ only in their participation and not some other vital feature would be to randomly assign subjects to either participant or nonparticipant groups. However, random assignment of subjects to AmeriCorps and to comparison group was obviously not possible. Given the voluntary character of the program, we were thus led to construct a quasi-experimental study to answer our core questions. Separate comparison groups, composed of persons who had expressed interest in national service programs but had not enrolled, were selected for State and National and NCCC because important differences exist in the nature of

the two programs and in the characteristics of their participants. Each individual has two potential conditions arising from the opportunity to join AmeriCorps, either participation or nonparticipation. The objective in composing the comparison groups was that the expected values of their outcomes should be the same as the expected values for the study group outcomes *if the AmeriCorps members had not chosen to participate in AmeriCorps*. Since the AmeriCorps members did choose to participate, our model identifies the changes that occurred as a result of participation as distinguished from those changes that would have occurred even in the absence of service. Therefore, this research builds upon a quasi-experimental design that estimates program impacts by comparing the changes that occur in AmeriCorps members (study group) with changes in a comparable group of individuals (comparison group).

The present study represents an improvement over past research for four reasons. First, we control for characteristics that predict who enters the AmeriCorps program. Second, we examine the type of program in which AmeriCorps members are engaged. Third, this study employs sophisticated propensity score methodology made possible by the presence of a comparison group and adds other statistical controls for factors that might bias the estimated impacts of serving in AmeriCorps. Fourth, the present study of AmeriCorps members and nonmembers has a large sample size and is not limited to one region or state of the U.S.

DATA

The study sample comprises a sample of more than 2,000 AmeriCorps members, drawn from over 100 AmeriCorps-State and National programs and three AmeriCorps-National Civilian Community Corps (NCCC) regional campuses, as well as almost 2,000 non-members in comparison groups. The study compares changes in the attitudes and behavior of AmeriCorps members over time to those of similarly interested individuals not enrolled in AmeriCorps, controlling for interest in national and community service, member and family demographics, and prior civic engagement. The data for this study was collected by Abt Associates Inc., an

independent social policy and research firm, under contract to the Corporation for National and Community Service.

Baseline information was collected at the beginning of the members' term of service. Post-program information was collected from State and National members 1–2 months after completing service, from NCCC members during the final weeks of service, and from the comparison groups during a similar time period. This data, compared to the baseline survey data, is used in the analysis of the short-run effects of AmeriCorps participation. A post-program supplemental survey (PPSS) was conducted approximately three years after baseline to collect additional background information to address potential selection bias. A final follow-up survey of all study participants was carried out 8 years after the baseline survey, and tracked outcomes similar to those in the first post-program survey. Long-run effects reported in this paper are based on comparisons of this “final” wave of data to baseline data; medium-run effects are based on comparisons of the PPSS data to baseline data. Details of the sample of participants measured at baseline, after the PPSS, and after the final survey wave can be found in Table 1 of the Appendix.

The comparison group for the State and National program comprises individuals who contacted the Corporation's toll-free information line to request information about the program but did not enroll in AmeriCorps.³ The group is limited to those individuals who contacted the information line during the same period of time when future members were filling out applications and being accepted into AmeriCorps. The assumption implicit in the selection of this comparison group is that these individuals will be similar to members by virtue of expressing knowledge of, and interest in, the AmeriCorps program. Similarly, the NCCC comparison group included individuals who were accepted into the program but who did not enroll and eligible applicants on the wait list of the program. For the NCCC, the comparison group is composed of individuals who were selected for the 1999–2000 programs but did not

enroll. These individuals completed the entire application process and were determined by the Corps to be eligible for the program, but declined to enroll or did not enroll because of limited space in the program. We expect that this group is similar to program participants, by virtue of taking the time to complete the application and interview process, indicating a strong interest in the program and national service.

The final baseline sample of AmeriCorps members and comparison group members consists of 4,153 observations (see Table 1). These individuals completed a baseline survey in the period commencing in September of 1999, through March of 2000. The administration of the post-program survey began in September of 2000 and was completed by May of 2001, while the data collection effort associated with the post-program supplemental survey started in September 2002 and concluded in June 2003.⁴ Because of the difficulty in locating respondents for the final follow-up survey, the survey period lasted from March 2007 until September 2007.⁵ Of the initial respondents, 3,300 completed a post-program interview, 2,975 completed a post-program supplemental survey, and 2,240 completed the final survey.⁶ Table 1 shows the numbers of study participants who responded to each of the four surveys, after sample refinement.

<< Table 1 about here. >>

MEASURES

Composite Measures

Composite measures were created to characterize outcomes in the areas of civic engagement, education ambitions, employment status, and teamwork and other life skills. Each measure was constructed as the mean of the scaled values for selected items from the survey instrument. We selected items for inclusion in each composite measure based on their use in pre-existing surveys and consultation with outside experts. The composite measures were tested for internal consistency by calculating the Cronbach alpha coefficient. We found that most of these scales

showed a Cronbach alpha greater than 0.65, demonstrating adequate levels of internal consistency within the measures.⁷

We refined the composite measures used in our exploration of baseline survey data. We chose principal components analysis (PCA) for this task, because it allows us both to verify the strength and coherence of the baseline constructs and explore more complicated relationships among the variables of which they are composed. PCA generates a linear combination (principal component) of a set of related variables, retaining as much information from the original variables as possible.⁸

We conducted PCA on the baseline variables from each hypothesized composite measure. In addition, we graphed the eigenvector of the first principal component against that of the second principal component, which allowed us to see which variables belong together on the basis of their bivariate relationship. When significant subgroups of variables were identified, we used PCA on each group of variables to form more than one composite measure. While the results of the PCA on the baseline data were consistent with the original composite measures, they led us to a more fine-grained representation of the original composites. Specifically, in some cases, results showed that the composite measures were better represented by several discrete subconstructs. The subconstructs based on the PCA more accurately capture the information in the data. In order to verify this approach from a person-oriented perspective (i.e., do groups of people respond differently to certain questions), we also performed cluster analysis on each of the composite measures. The results of the cluster analysis confirmed the patterns observed in the PCA. We then reconfirmed all analyses by conducting a PCA of the post-program data; results were consistent with the patterns found in the baseline data. For the analysis of PPSS outcomes, missing values were replaced by the mean, median or mode of the non-missing observations' values for that variable; for the final wave, an iterative regression-based method

was used to impute missing values.⁹ In both waves, imputations were performed separately according to S&N or NCCC status.¹⁰

Civic Engagement Outcomes

The gain scores produced twenty-two outcomes of interest, 18 of which were also tracked during the final survey. Eight of these outcomes represent the respondents' attitudes towards civic engagement. They are (1) connection to community; (2) community problem identification; (3) neighborhood obligations; (4) civic obligation; (5) personal effectiveness of community service; (6) personal growth through community service; and (7) local civic efficacy; and (8) grassroots efficacy. The respondents' *connection to community* represents their opinion about the strength of his/her connection to the community, as represented by the strength of feelings toward the community, including attachment, awareness and commitment. *Community problem identification* represents the respondent's self-assessed understanding of social problems in his or her community, such as crime, healthcare, or the environment. Next, *neighborhood obligations* represent the respondent's opinion about the importance of being active in his/her neighborhood, including reporting crimes, keeping the neighborhood clean, and participating in neighborhood organizations. The respondent's opinion about the importance of participating in various civic activities, including voting in elections and serving on a jury are used to construct a measure of attitudes towards *civic obligations*. *Personal effectiveness of community service* represents the respondent's opinion about the impacts of his/her prior volunteer activities during the previous year with respect to making community contributions, developing attachments to the community, and making a difference. Furthermore, *personal growth through community service* represents the respondent's assessment of the impacts of his/her prior volunteer activities during the previous year with respect to personal growth, including exposure to new ideas, changing beliefs, and learning about the real world. *Local civic efficacy* represents the respondent's opinion about the feasibility of working with local or state government to meet a range of community needs,

such as fixing a pothole or getting an issue on a statewide ballot. And lastly, *grassroots efficacy* represents the respondent's opinion about the feasibility of starting a grassroots effort to meet a range of community needs, such as starting an after-school program or organizing a park cleanup program.

The four outcomes that characterize the respondents' behavior towards civic engagement are (1) community-based activism; (2) volunteering participation; (3) engagement in the political process; and (4) national voting participation. *Community-based activism* provides respondent's reports of the frequency with which he/she participates in community-based activities, including attending community meetings and writing to newspapers to voice opinions. Second, the respondent's reports of the frequency with which she/he participates in activities intrinsic to the political process, including learning about candidates and voting in local elections is tapped with *engagement in the political process*. Third, *volunteering participation* indicates whether the respondent served as a volunteer at any point during the two years following the fall of 2000 for the short term effects survey, and the previous 12 months for the long term effects survey. Finally, *national voting participation* represents whether the respondent voted in the national election most immediately preceding each survey.

Education Outcomes

Measures of education outcomes consist of two attitude measures and one tapping behavior. Having *confidence in ability to obtain an education* represents the respondent's opinion about the feasibility of pursuing and obtaining an education. In addition, *acceptance of responsibility for educational success* represents the respondent's judgment about the extent to which he/she is personally responsible for his/her academic achievements. Educational behavior is measured as *educational progress* and indicates the level of education attained at the time of each survey.

Employment Outcomes

Constructs representing the employment outcomes of respondents are *importance of service-oriented careers* represents the respondent's opinion about the importance of working in a position that contributes to others and *acceptance of responsibility for employment success* represents the respondent's judgment about the extent to which he/she is personally responsible for his/her success in getting a job. Both measures indicate attitudes towards employment, while two additional measures examine behavior. These are *basic work skills* identifies the amount of experience respondents have with fundamental work skills, including gathering and analyzing information, motivating co-workers, and managing time. Additionally, *public service employment* indicates whether the respondent was employed in the public sector at the time of the survey.¹¹ Public sector employment was defined as education, social work, public safety, arts, religion, or full-time military service.

Outcomes Related to Teamwork and Other Life Skills

Three measures represent how well respondents worked with a team and other skills of group interaction. To measure attitude towards teamwork, *appreciation of cultural and ethnic diversity* represents the respondent's opinion about the importance and desirability of relationships between people who do not share the same cultural and/or ethnic background. *Constructive group interactions* presents respondents' reports of the frequency with which they participated in group situations during which constructive interactions, such as working out conflicts and sharing ideas, occurred. Lastly, *constructive personal behavior in groups* provides respondents' reports the frequency with which he/she personally uses techniques for encouraging constructive group interactions, such as encouraging participation by other team members and supporting others' right to be heard.

METHODS

The impact analysis estimated the effects of participation by comparing changes in the outcomes for AmeriCorps participants over time with changes in the outcomes for similar individuals who

did not enroll in AmeriCorps (comparison groups), using Propensity Score Analysis (PSA) to address possible selection bias.¹² The use of a comparison group enables the description of the *average effects of the “treatment” on the treated*. The effects of participation were estimated separately for State and National and NCCC programs. For medium-term outcomes, PPSS program outcomes were analyzed in terms of *gains*—the changes from baseline to post-program and baseline to long term values of the same measures. These gains (which could be negative as well as positive) were then compared between program members and comparison group members. For the final wave of data analysis, additional statistical controls were imposed to minimize the threat to validity posed by selection bias.

Propensity score analysis

Propensity Score Analysis (PSA) estimates the effects of program participation on member outcomes by matching participants and nonparticipants according to background and motivational factors. PSA estimates treatment effects by comparing treatment cases with comparison group cases that have a similar probability of selection into the study. The use of PSA allows us to compare study individuals with comparison individuals with similar probabilities of service in order to focus on the impact of the AmeriCorps service program rather than simply reflecting the underlying differences between the study and comparison groups¹³ PSA begins with a logistic or similar equation to predict the probability of selection into study, conditional on pre-study characteristics, or propensity score.¹⁴ In our propensity score model, we included baseline demographic measures, pre-program background measures, and measures of alternative opportunities that could potentially affect both participation and post-program outcomes.

We estimated the propensity score in two steps. First, we calculated a logistic model using variables and respondents from the Baseline Survey. In general, we did not exclude variables from the logistic model merely because of lack of significance. All pretest variables

were included regardless of whether they predicted participation. We accepted collinearity among the predictors because the model was not intended to predict anything outside the sample space. In the second step, we added selected variables from the Post Program Supplemental Survey (PPSS) to the first model.¹⁵ Propensity scores were calculated separately for State and National and NCCC samples.

Substantial numbers of participants in both NCCC and the State and National programs have patterns of characteristics that are associated with very high probabilities of participation. For example, in the second wave of the study, more than a third of the participants in both the State and National programs and NCCC had estimated participation probabilities between 90 and 100 percent (Table 2). Very few people with these characteristics inquired about AmeriCorps but then decided not to serve. Consequently we know almost nothing about how people like these participants fared when they chose not to participate.

<< Table 2. about here >>

Stratification

After careful consideration, we decided to use *stratification* as our method of adjustment for pre-existing differences between members of the comparison and study groups.¹⁶ For both the PPSS and the final wave of survey data, we divided each program's sample into strata within which participants and members of the comparison group had equal mean propensity scores. Within each of these strata we then tested for significant differences between participants and nonparticipants on any variable. We continued adjusting the model until all such differences were removed. In the analysis of PPSS data, for each program, participants were divided into seven (State and National) or six (NCCC) strata based on their propensity scores. Research has indicated that at least five strata are generally sufficient for removing 90 percent or more of the bias due to the covariates (Becker & Ichino, 2002; Rosenbaum & Rubin, 1983); tests indicated that this stratification method managed to achieve substantial equivalence between the two groups.

For the final wave of data, stratification worked less well, due to the lower response rates, and additional statistical controls were employed. The propensity scores were used to create four strata for the State and National program sample, while only two strata were used for the NCCC sample. Standardized difference statistics were used to test whether each of the PSA-model variables were balanced within each stratum. While most of the variables in the State and National model were balanced, there were many more unbalanced variables in the NCCC model, even when additional strata were created. Thus, to produce better estimates of program effects, additional statistical controls were employed.

Estimation of Program Effects

In each wave of data analysis, the PCA procedure standardized each of the survey item variables at baseline (mean=0, standard deviation=1) and then identified the linear combination with maximum variance—the first principal component. Each individual’s value on the first principal component was his or her baseline score. The post-program survey data on the same variables were transformed correspondingly (standardized relative to the baseline mean and standard deviation, and combined using the loadings of the first principal component from baseline).

For the PPSS data, most of the dependent variables were constructed as gain scores. For each variable, the gain scores were generated from its respective baseline and post-program scores, as follows :

$$\text{Let } x_{tki} = \frac{w_{tki} - \overline{w_{0k}}}{s_{0k}}$$

where w_{tki} is the value of item k for individual i at time t (0=baseline, 1=post-program),

$\overline{w_{0k}}$ is the pretest mean of item k across individuals, and

s_{0k} is the pretest standard deviation of item k

Then:

Pre-program score:

$$C_{0i} = \sum_{k=1}^n a_k x_{0ki}$$

Post-program score ($t=1$ and 2):

$$C_{ti} = \sum_{k=1}^n a_k x_{tki}$$

where n = number of items in a construct.

Change (gain) score for $t=1$ and 2 :

$$\Delta C = C_{ti} - C_{0i}$$

We included terms for these strata in our regression models to estimate treatment effects on gain score outcomes within each stratum, as shown in the following equation:

$$X_i = \beta_0 + \sum_{j=1}^{s-1} \hat{\beta}_{1j} Q_{ji} T_i + \sum_{j=1}^{s-1} \hat{\beta}_{2j} Q_{ji} + u_i$$

where X_i is the outcome for individual i , Q_{ji} is an indicator that individual i is in stratum j , T_i is an indicator of whether individual i served in AmeriCorps, s is the number of propensity strata, $\hat{\beta}$ is the set of parameter estimates, and u_i is the residual. The overall treatment effects were estimated by taking an average of the estimated treatment effects weighted by the number of treated observations within each stratum.

For the analysis of the final wave of data, the outcome equations were specified differently due to the large number of unbalanced variables. First, the regression model used to estimate treatment effects includes variables that were unbalanced in one or more strata. Second, a vector of important demographic correlates of civic engagement—age, marital status, education, parenthood—were added as control variables. Finally, the logit of the propensity score itself was added to each equation. These changes to the specification of the outcome equations offer additional safeguards against the selection bias that might be caused by nonequivalence between the control and treatment groups. While these steps were necessary

because of the presence of unbalanced variables within each stratum, recent scholarship on treatment effect estimation suggests that a combination of remedies allows for “doubly robust” estimates. For instance, regression-based controls for unbalanced variables, along with PSA-based “data preprocessing” using matching or stratification, offer “two chances to get it [the treatment effect] right,” or estimated without bias.

For State and National, the full regression model has the following specification:

$$Y_i^{PIII} = \beta_0 + \beta_1 T_i + \sum_{j=1}^3 \beta_{(1+j)} S_i^j + \sum_{j=1}^3 \beta_{(4+j)} S_i^j T_i + \beta_8 Y_i^B + \quad \text{[Equation 1]}$$

$$\beta_9 \text{Logit}\left(\hat{PS}_i\right) + \sum_{n=1}^N \beta_{(9+n)} UBCov_i^n + \sum_{k=1}^K \beta_{(9+N+k)} X_i^k + \varepsilon_i$$

where

Y_i^{PIII} is the long-term value of the outcome of interest for individual i ;

T_i is the treatment indicator for individual i (1 = AmeriCorps member, 0 = comparison group member);

S_i^j is the indicator (dummy) variable for the j^{th} propensity score stratum;

Y_i^B is the baseline value of the outcome of interest for individual i ;

$\text{Logit}\left(\hat{PS}_i\right)$ is the logit of the estimated propensity score of individual i ;

$UBCov_i^n$ ($n = 1, 2, \dots, N$) is a vector of unbalanced covariates from the propensity score analysis;

X_i^k ($k = 1, 2, \dots, K$) is a vector of other demographic covariates (such as gender, age, etc.) which serve as control variables; and

ε_i is the usual error term for individual i .

For NCCC, the first two sums have fewer terms because there are only two strata instead of four.

The model controls for baseline values of the outcome variables, when these are available, by placing them on the right-hand side of the equation. This *analysis of covariance* approach to controlling for initial differences in outcomes is a departure from the *gain-score* approach used to estimate short-run program effects. With analysis of covariance, the same regression specification can be used for all outcome equations, even for outcomes for which baseline values are not available. Robustness checks suggest that the main substantive results hold when the gain-score approach is used instead. Additional robustness checks suggest that creating additional strata does not change the basic results; that the choice of functional form for the propensity-score covariate is not consequential; and that the final regression specification succeeds in balancing the baseline values of almost all outcomes. These results increase our confidence that these methods minimize selection bias, and that our estimated program effects are unbiased.

For the final wave of data, all outcome equations are estimated using a method that takes the survey weights and the complex sample design into account. The overall treatment effect (TE) is a weighted version of the estimated treatment effects for each stratum. For example, for State and National outcomes:

$$TE = \frac{N^T \hat{\beta}_1 + N_1^T \hat{\beta}_5 + N_2^T \hat{\beta}_6 + N_3^T \hat{\beta}_7}{N^T} \quad \text{[Equation 2]}$$

where

$\hat{\beta}_1$, $\hat{\beta}_5$, $\hat{\beta}_6$, and $\hat{\beta}_7$ are estimated coefficients corresponding to the treatment indicator T_i and the (stratum \times treatment) interaction terms $S_j^i T_i$ (for $j = 1, 2, 3$) from the fitted model;

N^T is the weighted total number of treatment group members in the State and National analysis sample;

N_1^T is the weighted number of treatment group members in the first State and National stratum (organized by propensity score);

N_2^T is the weighted number of treatment group members in the second State and National stratum; and

N_3^T is the weighted number of treatment group members in the third State and National stratum.

Tables 4 and 5 in the report contain both treatment effect estimates and effect sizes for all outcomes. For the final wave of analysis, standard errors for treatment effects are calculated directly using Equation 2, using a method that takes into account the variance and covariance among the parameter estimates, the survey weights, and the complex sampling design.¹⁷

For dichotomous variables, we report the treatment effect estimate and the percentage point difference between AmeriCorps participants and comparison group members. For continuous variables, we report the treatment effect estimates as well as effect sizes—treatment effects expressed in standard deviation units, using the following formula:

$$ES = \frac{TE}{\text{Pooled SD}} \quad \text{[Equation 3]}$$

where TE is calculated as shown in equation 2, and

$$\text{Pooled SD} = \sqrt{\frac{(N_t - 1)(S_t^2) + (N_c - 1)(S_c^2)}{(N_t - 1) + (N_c - 1)}}, \text{ where}$$

N_t = unweighted sample size of treatment group;

N_c = unweighted sample size of comparison group;

S_t^2 = unweighted and unadjusted variance for treatment group; and

S_c^2 = unweighted and unadjusted variance for comparison group.

Treatment effects and effect sizes were calculated in a similar fashion for NCCC results, except that there were only two strata instead of four.

RESULTS

Outcomes of AmeriCorps Participation

The study found that participation in AmeriCorps-State and National programs and AmeriCorps-NCCC results in both short- and long-term impacts on members that are generally positive. The short-term effects of participation were largely positive for the State and National programs across the outcome measures, with over half of the outcomes being positive and statistically significant. Long term results were fairly consistent with short term results for State and National. While the short term effects of participation in NCCC were more mixed, results were by and large positive, with almost one-third of the outcomes demonstrating positive and statistically significant effects on participants. Compared to the State and National results, the NCCC long term results were relatively less consistent with short term outcomes. Several outcomes retained or gained statistical significance in the long run, but some outcomes lost significance.

Tables 3 and 4 present the findings for individual outcome measures, organized by the four outcome groups. Findings in this study reflect the initial results of a long-term, longitudinal assessment of the effects of participation in AmeriCorps. Table 3 indicates short- and long-run results from analysis using propensity score matching, as described in the previous section, for members of State and National programs as compared to the specially chosen sample of nonmembers. Table 4 indicates short- and long-run results for members assigned to NCCC programs, compared to the NCCC comparison group.

<< Table 3 about here >>

<< Table 4 about here >>

Civic Engagement

We anticipated that those taking part in AmeriCorps would show an increase in civic engagement. In the short run across both programs, the majority of outcomes in the eight attitudinal areas of civic engagement were positive. Among members from the State and National sample, all eight measures were statistically significant. By contrast, among the NCCC group, members showed statistically significant positive affects of participation in just four of the measures, and positive but not significant affects in the other four relative to the comparison group. The four outcomes associated in the short term with significant improvements for members of NCCC were connection to community, community problem identification, personal growth through community service, and local civic efficacy.

In the long run the civic engagement effects tended to be less pronounced. While each of the composite measures retained positive signs in both AmeriCorps programs, half of the measures failed to retain statistical significance in the State and National sample. Five of the measures had significance in the NCCC sample, but these measures did not tend to match up with the measures that were significant in the short-run data. Due to the smaller sample size in the NCCC analysis, this is perhaps not surprising. Local civic efficacy and connection to community were the two composite measures that retained statistical significance across the two programs and in both the short- and long-run.

The four outcomes addressing civic engagement behaviors produce a similarly mixed set of results. The long run composite measure for engagement in the political process was not calculable based on the survey data collected in 2007. Of the three remaining measures, none were consistently significant, though half of the measures were positive and statistically significant in both the short and long run.

Education

We expected that AmeriCorps service would lead to an increase in education progress, at least in the long run as members find time to take advantage of the education award they receive.

Overall, the study found that in both over the short and over the long term, AmeriCorps participation had no significant impacts on measures of educational attitudes or degree attainment.

Employment

We anticipated that the AmeriCorps experience would lead to improvements in work skills, optimistic attitudes towards employment, and an increased proclivity for employment in public service. The study found that AmeriCorps participation had an impact on both attitudinal and behavioral employment outcomes in the State and National program, particularly for entrance into public service careers. NCCC members did not report statistically significant employment outcomes following their experience in AmeriCorps relative to the comparison group. Members in State and National programs scored higher than the comparison group on acceptance of responsibility for employment success, however only at the $p < .10$ level. As seen in Table 3, State and National participants also exhibit elevated levels of public service employment in relation to the comparison group for both time horizons. The same outcome for NCCC participants lacked statistical significance, but retained a positive sign over the short and long term.

Teamwork and Other Life Skills

We expected that the AmeriCorps experience would lead to better teamwork and tolerance of others. Participation in NCCC yielded the only statistically significant negative result in the study, and it was for respondents' appreciation of ethnic and cultural diversity. *Appreciation of cultural and ethnic diversity* represents the respondent's opinion about the importance and desirability of relationships between people who do not share the same cultural and/or ethnic background. We find that the effect for State and National participation is not significant. In

contrast, NCCC participation results in a short-term medium-sized statistically significant negative effect for this outcome ($p < .001$). On average, respondents from the NCCC study group became less positive in their appreciation for diversity during their participation in the program, while the comparison group's mean score did not change. It is important to note the post-program survey of NCCC members was administered during their last week or two of participation in the program, a period emotionally charged for many members, and the timing may have influenced their responses to the survey. In contrast, most State and National members completed their post-program survey several months after they had left the program.

One possible explanation for this striking finding may be related to social identity theory (Ashforth & Mael, 1989), which holds that individuals categorize or classify themselves in specific ways in relation to what they perceive as classification systems in use around them (Turner, Hogg, Oakes, Reicher, & Wetherell, 1987). Through a process of social comparison, individuals who are deemed similar to the person forming a social identity are categorized and labeled as the "in-group." Persons who are different from the self are labeled as part of the "out-group" (Turner et al., 1987). The consequences of this process of self-categorization can be ethnocentrism and stereotyping (Cox, Lobel, & McLeod, 1991). The stereotyped perceptions of out-group members can be amplified by identification with the in-group. In all these cases, social identity theory predicts that formation of an in-group will substantially heighten suspicion and separation from the out-group. NCCC members may construct strong "in-groups" (Waldzus, Mummendey, Wenzel, & Weber, 2002) because members live and work in extremely close proximity to one another. This dynamic may lead to challenges in the form of tension between NCCC members and citizens of the community in which they serve. We suspect that these challenges may lead to short-term disillusion with the concept of working in diverse groups (Mummendey & Wenzel, 1999), a theory supported by the loss of statistical significance and change of sign associated with the long term impact.

Over time, this lone significant negative effect in the study disappears among NCCC members, suggesting that the participants' perspectives on the diversity issue change with time. Other measures of teamwork and life skills lacked statistical significance. This may be indicative of the challenge in measuring relatively intangible skills, or point to an area where AmeriCorps program design could be improved.

CONCLUSIONS

This paper started with a review some of the broad claims about the value of service and offered a new methodological twist to the analysis of the effects of national service on members. In so doing, we have tried shed some new light on issues related to the effective design and implementation of national service programs by pointing to areas where AmeriCorps is succeeding and to areas where it is falling short. Now, at a time when the call to service is being sounded ever more loudly and these programs are scheduled for expansion, we need a clear understanding of how these programs are performing and how to effectively direct existing and new resources into the programs that lie at the center of the idea of national service.

Across the two major programs we studied, important differences emerged. By and large, the State and National programs appear to be generating more positive results in the short term than the NCCC programs, with both programs having similar positive results in the long term. Several reasons may account for these differences in outcomes. As noted earlier, they are two different programs, operating in different contexts, and enrolling members with quite different demographics. In addition, the study sample for State and National is much larger than that for the smaller NCCC program. It is possible to detect smaller differences between the treatment and comparison groups when using larger samples.

This study yielded some promising findings about the effects of AmeriCorps participation on members' attitudes and behaviors. In the short term, participation in the State and National program generates positive and statistically significant impacts for over half of all

outcomes, and participation in NCCC yields positive and statistically significant impacts for over one-third of all outcomes. In the long term, some of these results remained measurably positive while other effects decayed, and some outcomes lacking short term impact actually gained statistical significance with time. Notably, we find numerous positive impacts on civic engagement and some impacts in employment outcomes, which are both priority areas for AmeriCorps programs and the Corporation for National and Community Service. These findings illustrate the effectiveness of the AmeriCorps program model, which emphasizes service, civic engagement, and hands-on experience. The results for education and teamwork and other life skills are less impressive, with few statistically significant results, highlighting areas where the Corporation for National and Community Service can target future improvements.

We believe that our analysis raises as many new interesting questions for future research as it answers about what benefits members gain from AmeriCorps. One thing is certain: future research should examine different types of national service programs. The present study shows that program structure does indeed matter. Program design is a relevant factor in what skills, values, and experience participants gain from service. Furthermore, national service is complex enough that multiple methods of measuring impacts are all but surely going to be needed in the future, including qualitative field work. Qualitative research via participant observations or in-depth interviews with members and program directors would shed useful light on many of the patterns observed in the present study. In addition, qualitative research might also illuminate how racial composition of AmeriCorps programs influences what participants gain from the experience.

The findings from this study confirm that service creates an opportunity for young people to work on public problems and allows individuals from very different backgrounds to have the opportunity to work together in a structured and supportive environment. As AmeriCorps members experience making a difference for others, we found that they can and do grow. To

maximize these benefits, the national service movement must work to ensure that they are distributed evenly across members and across programs. In addition, in order for these programs to succeed and continue to improve, researchers must continue to work in the years ahead to develop a deeper and fuller understanding of the many complex dimensions of national service.

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Table 1. Participant and Comparison Group Samples

	State and National Members	State and National Comparison Group	NCCC Members	NCCC Comparison Group	Total
Baseline sample	1752	1524	476	401	4153
Post-program sample	1385	1153	461	301	3300
Post-program supplemental sample	1242	1032	419	282	2975
Observations in first three survey samples	1120	904	409	254	2687
Observations after top 10% of propensity score distribution eliminated	682	818	233	237	1970
Final Follow-Up Survey	1001	696	349	194	2240
Observations after top propensity scores from treatment group eliminated	882	696	289	194	2061

NOTE: For analysis of data from the final followup survey, AmeriCorps member observation were eliminated if the propensity score was higher than the maximum propensity score for the program's comparison group.

Table 2 Distribution of Analysis Sample, by Survey Wave, Program and Propensity Score

State and National (PPSS)			NCCC (PPSS)		
Propensity score	Sample size		Propensity score	Sample size	
	Comparison	Participants		Comparison	Participants
0–0.2	325	35	0–0.2	72	11
0.2–0.4	225	96	0.2–0.4	63	27
0.4–0.6	40	165	0.4–0.6	55	53
0.6–0.8	100	223	0.6–0.8	37	83
0.8–0.9	28	163	0.8–0.9	10	59
0.9–0.95	15	148	0.9–1.00	5	172
0.95–1.00	5	288			
Total	838	1118	Total	242	405

State and National (Final)			NCCC (Final)		
Propensity score	Sample size		Propensity score	Sample size	
	Comparison	Participants		Comparison	Participants
0–0.714	297	98	0–0.714	143	99
0.714–0.906	216	178	0.714–1.00	51	190
0.907–0.968	128	267			
0.968–1.00	55	339			
Total	696	882	Total	194	289

Table 3. Detailed Results from Impact Analysis, State and National

	PPSS (Analytic Sample)			Final (Analytic Sample)		
	ATT	p-value	Effect Size	ATT	p-value	Effect Size
COMPOSITE MEASURES						
CIVIC ENGAGEMENT						
Connection to Community	0.80	0.0001	0.51 (**)	0.24	0.004	0.24 (**)
Community Problem Identification	0.50	0.0001	0.30 (**)	0.25	0.030	0.26 (**)
Neighborhood Obligations	0.43	0.0001	0.27 (**)	0.03	0.627	0.03
Civic Obligations	0.20	0.012	0.16 (*)	0.06	0.410	0.06
Personal Effectiveness of Community Service	0.52	0.001	0.38 (**)	0.02	0.879	0.02
Personal Growth through Community Service	0.51	0.006	0.31 (**)	0.04	0.786	0.04
Local Civic Efficacy	0.27	0.002	0.21 (**)	0.28	0.008	0.28 (**)
Grassroots Efficacy	0.48	0.0001	0.33 (**)	0.25	0.001	0.25 (**)
Community-Based Activism	0.23	0.007	0.16 (**)	0.19	0.013	0.19 (*)
Volunteering Participation (c)	0.07	0.052	N/A	0.03	0.487	N/A
Engagement in the Political Process	0.14	0.088	0.10	0.16	0.142	0.16
National Voting Participation (c)	0.01	0.81	N/A	-0.02	0.463	N/A
EDUCATION OUTCOMES						
Confidence in Ability to Obtain an Education (b)	0.07	0.413	0.06		N/A	
Accept Responsibility for Educational Success (b)	0.08	0.445	0.05		N/A	
Educational Progress (c), (a)	-0.03	0.756	N/A	-0.14	0.511	-0.07
EMPLOYMENT OUTCOMES						
Accept Responsibility for Employment Success (b)	0.39	0.002	0.23 (**)		N/A	
Importance of Service-Oriented Careers (a)	0.13	0.203	0.10	0.21	0.075	0.21
Basic Work Skills (b)	0.27	0.025	0.15 (*)		N/A	
Public Service Employment (a)	0.07 (*)	0.035	N/A	0.13 (**)	0.002	N/A
TEAMWORK and LIFE SKILLS						
Appreciation of Ethnic and Cultural Diversity	0.06	0.638	0.03	0.04	0.528	0.04
Constructive Group Interactions	0.03	0.827	0.02	0.24	0.117	0.23
Constructive Personal Behavior in Groups	0.10	0.43	0.06	0.27	0.055	0.26

** Indicates statistical significance at the 0.01 level.

* Indicates statistical significance at the 0.05 level.

(a) Outcome has been modified for 2007 analysis.

(b) NA indicates "Not Applicable" because this outcome was not measured on all surveys.

(c) For dichotomous outcomes, the ATT is the difference between the treatment group mean and the comparison group mean. Effect sizes are not reported for dichotomous outcomes.

Table 4. Detailed Results from Impact Analysis, NCCC

	PPSS (Analytic Sample)			Final (Analytic Sample)		
	ATT	p-value	Effect Size	ATT	p-value	Effect Size
COMPOSITE MEASURES						
CIVIC ENGAGEMENT						
Connection to Community	0.61	0.002	0.39 (**)	0.36	0.001	0.37 (**)
Community Problem Identification	0.45	0.01	0.29 (*)	0.10	0.376	0.10
Neighborhood Obligations	0.13	0.398	0.08	0.27	0.038	0.26 (*)
Civic Obligations	0.12	0.418	0.09	0.18	0.106	0.19
Personal Effectiveness of Community Service	-0.05	0.825	-0.03	0.45	0.026	0.51 (*)
Personal Growth through Community Service	1.03	0.001	0.58 (**)	0.10	0.566	0.10
Local Civic Efficacy	0.42	0.02	0.34 (*)	0.40	0.001	0.42 (**)
Grassroots Efficacy	0.29	0.111	0.21	0.46	0.001	0.53 (**)
Community-Based Activism	0.57	0.001	0.44 (**)	0.17	0.112	0.18
Volunteering Participation (c)	0.16 (**)	0.005	N/A	0.14	0.028	N/A
Engagement in the Political Process	-0.34	0.053	-0.249	0.14	0.175	0.15
National Voting Participation (c)	0.10	0.079	N/A	-0.02	0.587	N/A
Social Trust (b)		N/A		0.14	0.007	0.36 (**)
EDUCATION OUTCOMES						
Confidence in Ability to Obtain an Education (b)	0.07	0.685	0.049		N/A	
Accept Responsibility for Educational Success (b)	0.15	0.37	0.112		N/A	
Educational Progress (c), (a)	-0.04	0.808	N/A	-0.02	0.896	-0.01
EMPLOYMENT OUTCOMES						
Accept Responsibility for Employment Success (b)	-0.19	0.23	-0.13		N/A	
Importance of Service-Oriented Careers (a)	-0.26	0.157	-0.20	0.21	0.067	0.22
Basic Work Skills (b)	0.76	0.001	0.46		N/A	
Public Service Employment (a)	0.08	0.201	N/A	0.07	0.290	N/A
TEAMWORK and LIFE SKILLS						
Appreciation of Ethnic and Cultural Diversity	-0.72	0.001	-0.39 (**)	0.17	0.080	0.19
Constructive Group Interactions	-0.17	0.358	-0.119	0.13	0.174	0.16
Constructive Personal Behavior in Groups	-0.26	0.169	-0.16	0.08	0.507	0.09

** Indicates statistical significance at the 0.01 level.

* Indicates statistical significance at the 0.05 level.

(a) Outcome has been modified for 2007 analysis.

(b) NA indicates “Not Applicable” because this outcome was not measured on all surveys.

(c) For dichotomous outcomes, the ATT is the difference between the treatment group mean and the comparison group mean. Effect sizes are not reported for dichotomous outcomes.

NOTES

¹ The third AmeriCorps program, Volunteers in Service to America (VISTA), is authorized under the Domestic Volunteer Service Act of 1973, and was not included in this study. VISTA is a highly decentralized program; its members serve individually or in small groups and focus primarily on building capacity in local communities. In contrast, State and National and NCCC members focus on the provision of direct services. Since the VISTA experience and member profiles differ appreciably from the other programs, the effects of service participation may be different from those for State and National and NCCC members. Additional information about AmeriCorps programs and structure can be found at www.nationalservice.org.

² Roughly 23 percent of grant funds are awarded to national nonprofits operating national service projects in two or more states. The remaining grant funds are awarded to state service commissions on a competitive basis to fund local nonprofit and public entities operating community service programs. AmeriCorps-State and National members are recruited by nonprofits, schools, and other agencies to help address local community needs.

³ The reasons that applicants did not eventually enroll in AmeriCorps are not clear. But, these applicants are not systematically different from those who eventually did enroll in the program.

⁴ The attacks of September 11, 2001, may have shaped attitudes toward civic engagement, volunteering and trust in both the groups we tracked studied. This is a possible confounding factor that we acknowledge.

⁵ Response rates for the final survey wave were lower than in past waves; about 58 percent of respondents who completed the baseline survey in 1999 were interviewed in 2007. Most of the nonrespondents were members of the members of the original treatment and comparison groups who could not be located, or were located but could not be reached by interviewers. A nonresponse analysis for the State and National treatment and comparison groups reported statistically significant results for 7 covariates altogether, across both programs, none of which was significant for both groups. A similar nonresponse analysis for NCCC turned up no significant differences between respondents and nonrespondents.

⁶ This analysis includes member-level weights. For producing weights using population-based estimates, each program in the sample as well as each member in that program received a sampling weight. The final sampling weight combined the base sampling weight, which reflects the probability of selection and an adjustment for non-responding members. The base sampling weight for a program selected in the sample reflects the probability of selection of a program in the stratum. In this case, it is simply the ratio of the number of programs in the population divided by the number selected in the sample. The weights are used to compute the estimates of population parameters relating to member characteristics described in this analysis.

⁷ Cronbach's alpha measures how well a set of items (or variables) measures a single one-dimensional latent construct. When data have a multidimensional structure, Cronbach's alpha will usually be low. Cronbach's alpha is a coefficient of reliability (or consistency). When the number of items increases, Cronbach's alpha will increase. A reliability coefficient of .70 or higher is considered "acceptable" in most social science research literature. However, some composite measures were created using three items while others were created using six to ten items. Therefore, if composite measures indicated a Cronbach's alpha value of .65, we accepted it as reliable internal consistency. For the final survey wave, twelve of the sixteen main outcomes were constructed using the same survey items as in the previous analysis. Two, "importance of service-related careers" and "educational progress," were reformulated,

and two were newly created for this wave. The Cronbach's alpha measures were generally high, as in previous waves, but five of the sixteen variables had alpha scores below 0.65.

⁸ The PCA procedure first standardizes the observed variables, so that each variable contains one unit of variance. The information in this variance is then redistributed among a number of composites. The composites formed by the process are a weighted linear combination of the standardized variables. The criterion for optimality is maximum variance (maximum information), so that the optimal component is the one that contains the maximum proportion of the original units of variance. This component is called the first principal component. The variances of the components are shown as eigenvalues; typically, only those components with more than one unit of variance (i.e., eigenvalue > 1) are retained. The eigenvectors for each principal component contain the weight of each variable in that component.

⁹ We retained indicators to test whether non-response to a particular item was related to participation. In cases where it was, we incorporated the fact of non-response in the model.

¹⁰ Imputed means represented only between 1 and 3 percent of values across the groups, in both survey waves.

¹¹ For the PPSS survey wave, public sector employment was defined as education, social work, public safety, arts, religion, or full-time military service. For the final survey wave, the definition was expanded to add respondents who worked in nursing, counseling, and government.

¹² The quasi-experimental design that has been chosen for this study can be highly sensitive to selection bias based on such characteristics as basic demographics, background history, and motivation to participate. We expect that the use of PSA reduced the selection bias associated with the use of the comparison group, because it makes full use of the measured variables to distinguish between participants and nonparticipants. It is important to note that if any unmeasured variables significantly affect both the likelihood of participation and outcomes of interest, then PSA does not protect against selection bias from that source.

¹³ The authors weighed the decision to use propensity scores rather than other approaches (such as Heckman) for conducting this analysis. It is our professional opinion that propensity score matching is the most appropriate method for the analysis. A major concern for this analysis is selection bias. Instrumental variables techniques (IV) can in principle cure selection bias. They require that the researcher find a variable (the instrument) that causally affects participation but does not affect the outcome. Variations in outcome associated with variations in this variable then represent effects of participation. Yet, this requirement poses an extremely strict condition. Variables that do not causally affect outcomes, but are correlated with outcomes, are not legitimate instruments. IV assumes that all of the relationship between the instrument and the outcome is due to program participation. But two variables can be correlated if they are effects of the same cause, even if neither causes the other. It is impossible to be certain that the non-correlation condition is met.

¹⁴ The Post-Program Supplemental Survey was designed to collect a great deal of information about background and motivational characteristics that might affect both selection into treatment and the outcomes of interest; this information was used in the PSA.

¹⁵ Baseline survey variables entered the second model in two ways. First, the linear combination produced by applying the first model to their values was included as a single measure. Second, the race and ethnicity indicators were entered separately because they appeared in interactions with some of the PPSS measures.

¹⁶ Several methods of adjustment using propensity scores were considered, including matching, stratification, weighting, and regression adjustment. Stratification was chosen because it provides for the inclusion of the largest number of cases and does not impose a functional form (for example, linear) on the relationship between propensity to participate and treatment effect.

¹⁷ For the original analysis of the PPSS data, these standard errors were calculated via the bootstrap method, following Becher and Ichino (2002). However, more recent research has shown that bootstrapping produces biased variance estimates for treatment effects.