Research in Higher Education (2020) 61:603–627
https://doi.org/10.1007/s11162-020-09604-w

Global Learning for Local Serving: Establishing the Links Between Study Abroad and Post-college Volunteering

Radomir Ray Mitic[1]

Received: 30 July 2019 / Published online: 5 June 2020

Abstract
This study contributes new evidence on the factors associated with undergraduate study abroad participation and post-college volunteering. Drawing on Education Longitudinal Study 2002–2012 data, this study analyzes how students' ascribed characteristics, academic achievement, college environment, and participation in study abroad are associated with students' likelihood to volunteer after college. Grounded in human capital and status attainment theories, this study employs Astin's Inputs-Environment-Outcomes framework to isolate study abroad as a high-impact education practice associated with post-college volunteering. Controlling for service-learning, previous volunteering experience, and selection bias for study abroad using inverse propensity of treatment weighting (IPTW), this study provides some of the clearest evidence that study abroad is an educational experience that promotes democratic outcomes. For study abroad program providers, these results suggest that more intentional methods of engendering a desire to improve the local situation upon returning home can further promote civic engagement. On a larger scale, these results provide some relief to the worry that American higher education is not adequately preparing students for democratic citizenship while drawing attention to the fact that only a small subset of the undergraduate population participates in study abroad to receive these benefits.

Keywords Study abroad · Volunteerism · Civic engagement · Propensity score analysis

Introduction

Scholars have long argued that the backbone of a healthy democracy is an educated and civically engaged populace (Dewey 1916; Putnam 2000). Societies that have a more engaged citizenry are more apt to address pressing issues such as economic inequality (McMahon 2009), social tensions (Youniss et al. 1997), and the environment (Smith and Pangsapa 2008). They also tend to have a larger middle class, a respect for the rule of law, democratization, and human rights (McMahon 2009). Globally, the United Nations' 2030 Agenda for Sustainable Development declares "Volunteerism is a vehicle for sustainable

✉ Radomir Ray Mitic
rmitic@cgs.nche.edu

[1] Council of Graduate Schools, One Dupont Circle NW Suite 230, Washington, DC 20036, USA

development" and an important aspect of civic engagement (2016). Scholars such as Putnam (2000), however, have lamented the decline of American civic culture and argued that education is a means of reversing this disturbing trend. Although, higher education, overall, plays an important role in civic education and development (Bowman 2011; Brand 2010; Colby and Ehrlich 2000; Doyle and Skinner 2017; Ishitani and McKitrick 2013; Kuh 2008; Lott 2013; The National Task Force for Civic Learning and Democratic Engagement 2012), there is little research on which particular higher education experiences (or collection of experiences) may account for increased civic participation following college for American undergraduates (Mayhew et al. 2016).

While there is empirical evidence that service-learning is linked to increased civic engagement (Keen and Hall 2009; Myers et al. 2018; Prentice 2007), most assertions that other high-impact educational practices associated with civic engagement have been anecdotal (Association of American Colleges and Universities 2007). High-impact educational practices are defined as those that prepare students to live in an intercultural world, develop problem-solving ability, and instill skills that students possess over their lifetimes (Association of American Colleges and Universities 2007). Advocates of high-impact practices identify study abroad, first-year seminars, internships, and learning communities as the types of activities that help to develop students as engaged citizens (Finley and McNair 2013; Kilgo et al. 2015; Kuh 2008; Myers et al. 2018). Given study abroad's link to increased intercultural understanding and popular notions of global citizenship (Paige et al. 2009), it is reasonable to examine whether study abroad offers students the chance to develop greater civic engagement as evidenced in volunteerism after their study abroad experience (Lewin 2009). Using data from the Education Longitudinal Study (ELS: 2002), this study demonstrates that study abroad is related to post-college volunteering after accounting for prior volunteerism. As a result, scholars and practitioners can look to how study abroad engenders these civic values to create more effective programs even when students undertake short-term study abroad versus entire degrees seen in other national contexts (Engle and Engle 2003). Given these benefits, these findings further the need to expand access to larger portions of the undergraduate population in U.S. higher education.

Purpose and Significance

The purpose of this study is to establish what associations exist between various pre-college and college factors, most notably study abroad, to post-college volunteering. To achieve this purpose, this article addresses the following research question:

What is the relationship between studying abroad during college and volunteering within the first few years following college?

Although only about 10% of American undergraduates study abroad (Institute of International Education 2018), the demand for study abroad is increasing from both students and their prospective employers (Altbach and Knight 2007; Berdan 2015; Goldstein 2015; Institute of International Education 2003). Despite the variety of study abroad experiences to U.S. undergraduates (e.g. institutional and private providers, program length, destinations, and level of immersion), the U.S. higher education system has not yet found a way to make study abroad a more accessible part of the undergraduate experience. Initiatives like the Lincoln Commission and the Institute of International Education's "Generation Study Abroad" help promote diversifying and increasing the number of students who study abroad, but there has been little research on why studying abroad is so important. This

study provides empirical evidence to the civic benefits of study abroad as part of a larger argument in favor of expanding access to study abroad.

We need a longitudinal study that tracks students from high school through college and utilizes strong statistical controls, particularly for prior volunteerism which can obscure such analyses. In addition, we need a study that tracks students to their post-college lives to see if there is a link between study abroad participation and volunteering after college. Previous research on study abroad and civic engagement is often retrospective and rarely delves into the pre-college experience as contextual factors. Furthermore, most previous studies do not explore the relationship of pre-college characteristics and experiences with post-college civic engagement. The longitudinal nature of this study ensures robust empirical results in that it tracks students over ten years and controls for high school and college volunteering behavior to understand this relationship.

Literature Review

Studies across the fields of higher education, political science, and public policy have found a relationship between time spent in postsecondary education and civic behavior. Civic engagement includes actions such as voting, donating, and volunteering (Bowman 2011; Brand 2010; Ishitani and McKitrick 2013; Lott 2013). This study includes volunteer activities spanning political and non-political actions undertaken to improve the civic conditions in one's community (Colby and Ehrlich 2000). While studies explore a range of college experiences related with volunteerism specifically, this literature review conveys studies linking study abroad with similar acts in the service to others.

Civic Engagement

Overall, college attainment correlates highly with civic engagement (Astin and Sax 1998; Coley and Sum 2012) and volunteerism in particular (Doyle and Skinner 2017). In their critique of higher education, Astin and Astin (2000) lament a decline in civic engagement and a loss of higher education's civic mission. This disengagement with higher education's civic mission has led to an emphasis on empirically studying civic learning in college. Much of the literature on civic engagement focuses on civic attitudes and beliefs such as personal importance on civic activity (Lott 2013), plans to volunteer (Cruce and Moore 2007), or civic values (Rhee and Kim 2011) rather than concrete expressions of civic behavior such as volunteering (Bringle et al. 2011; Sax 2008).

Longitudinal studies that include post-college volunteerism are rare in the literature. In their study of six high-impact practices using longitudinal data from the Educational Longitudinal Study (ELS: 2002), Myers et al. (2018) utilized a dichotomous measure for volunteer behavior in the previous two years, eight years post-high school. The strength of this study is its longitudinal nature that considers a student's background (sex, race/ethnicity, socioeconomic status, and high school experience), the college environment, and post-college volunteer behavior. In individuals aged 29 to 33 who participated in the National Longitudinal Survey of Youth 1997, Doyle and Skinner (2017) categorized volunteerism by frequency and found a positive association between higher education attendance and volunteerism. This study also included sex and race/ethnicity as well as mother's education as controls. Astin, Sax, and Avalos (1999) utilized a longitudinal design to test the relationship of volunteerism in college with the hours per week in volunteer or community

service work in the past year while controlling for sociodemographic characteristics and high school experiences.

Cross-sectional studies provide insight into the associations of the undergraduate experience with civic engagement. Studies show that there are differences in civic learning by institutional type. For example, studies have shown that attendance at private institutions correlates with higher civic participation while public institutions stifle such engagement (Lott 2013; Sax 2008). Cruce and Moore (2007) found that smaller institutions saw higher rates of volunteerism. In terms of selectivity, higher selectivity led to lower levels of civic engagement (Astin and Antonio 2004; Lott 2013).

Studies that explore the within-college effects of college on civic engagement show differences between academic major and civic engagement. For example, lower civic participation has been tied to business, science, and engineering majors (Mayhew et al. 2016). Similarly, science majors were less civically involved than non-science majors (Rhee and Kim 2011). Ishitani and McKitrick (2013) also found a negative relationship between alumni of engineering, math, and physical sciences and civic participation while showing no relationship for alumni of the social sciences. However, Lott (2013) found that social science majors were more likely to be civically engaged. Education majors were particularly more likely to volunteer (Cruce and Moore 2012).

Experiences with diversity have been found to be positively correlated with post-college civic outcomes. Bowman, Denson, and Park (2016) found that participation in racial and cultural awareness workshops as undergraduates was positively associated with volunteer work. This study is notable as it employs a propensity score approach to account for selection bias into these workshops. Because study abroad has also been identified as an activity to increase cultural awareness and social issues (Clark et al. 2009; King and Baxter Magolda 2005; Hopkins 1999), there is a need to interrogate study abroad as an experience related to civic engagement outcomes such as post-college volunteering.

Study Abroad

Although there are few studies that directly interrogate the relationship between study abroad and volunteering, several studies have explored the link between study abroad and global and civic engagement more generally. Myers et al. (2018) found that study abroad was a significant predictor of volunteering after college when accounting for a host of pre-college and college inputs but failed to account for selection bias beyond the use of strict longitudinal control variables. Deardorff (2010) noted the importance of measuring short- and medium-term outcomes of study abroad while noting that longitudinal studies are necessary to measure long-term impact. The remaining studies in this line of work utilize a cross-sectional design or a pretest/posttest at a single institution.

The Study Abroad for Global Engagement (SAGE) study retrospectively surveyed nearly 6,400 alumni to find that alumni felt that their experience abroad influenced international civic engagement more than domestic civic engagement (Paige et al. 2009) but did not account for pre-college characteristics. Similarly, Hurtado and DeAngelo (2012) used Cooperative Institutional Research Program (CIRP) data to show that study abroad was one of several college experiences that were linked to civic awareness, defined as students' understanding of global, national, and local issues, but this study did not extend beyond the undergraduate experience.

The Georgia Learning Outcomes of Students Studying Abroad Initiative (GLOSSARI) represents one of the leading sources of pretest/posttest data from the state higher education

system assessing learning outcomes of study abroad, including global citizenship (Sutton and Rubin 2004). Several studies utilizing short-term study abroad data have found a positive association between study abroad and ecologically conscious consumer behavior, environmental citizenship, and pro-environmental behavioral intentions (Landon et al. 2017; Tarrant et al. 2014; Stoner et al. 2014). Such studies are innovative in their pretest/posttest design to assess student learning but do not take into account pre-college characteristics or study the long-term impact of study abroad beyond graduation.

Conceptual Framework

To study civic outcomes of study abroad requires the synthesis of multiple theoretical perspectives. Traditionally, human capital theory has held that the building of knowledge and skills during college makes the individual more productive and better able to obtain a higher paying job than if they had less education (Becker 1994). A modern human capital approach aims to explain the non-market benefits of education, including civic engagement (McMahon 2009). Study abroad is an activity that scholars recognize as one that increases an individual's human capital in traditional (income; Schmidt and Pardo 2017) and modern interpretations (intercultural competence; Salisbury et al. 2013). The current study extends the human capital approach to a civic activity, volunteering, similarly seen to studies into environmental and global citizenship (Landon et al. 2017; Tarrant et al. 2014; Stoner et al. 2014). However, human capital theory does not adequately consider the ways in which differences in social contexts – such as those formed by sex, class, or race – influence students' educational decision-making.

In order to account for these social contexts, status attainment theory serves as a model for exploring the relationship between pre-college and college environments and post-college outcomes. Tinto's (1975) research on college dropout uses status attainment theory as a lens to explore the pre-college characteristics of students, including parental educational, pre-college experiences, educational attainment expectations, socioeconomic status, among others. The present study includes pre-college and college characteristics to account for additional explanatory factors of civic development not normally associated with previous non-nationally representative studies into study abroad outcomes.

To isolate study abroad's role from pre-college and college factors as a civic education tool beyond the undergraduate years requires a conceptual framework adaptable to a longitudinal design (Myers et al. 2018; Salisbury et al. 2013). Rooted in modern human capital and status attainment traditions that account for pre-college, college, and post-college factors, this study employs Astin's (1993) Inputs-Environment-Outcomes (I-E-O) model. Past research on the effects of college on students highlights the importance of using methods that isolate the relationships between a given experience (or condition, such as study abroad) and an outcome (such as volunteerism), either through random assignment of students to treatment/control groups (i.e. experimental designs) or through statistical procedures that aim to approximate random assignment by "controlling for" confounds (i.e. multivariate methods and quasi-experimental designs) (Astin 1985; Mayhew et al. 2016). Therefore, this study employs the modified I-E-O model shown in Fig. 1. This model helps explain the impact of college and specific experiences while accounting for precollege and college factors, including selection bias for study abroad. The use of volunteerism in both high school and college as predictor variables in this study serves as a pretest of sorts. That is, these variables control for student behavior in previous time periods that is very similar

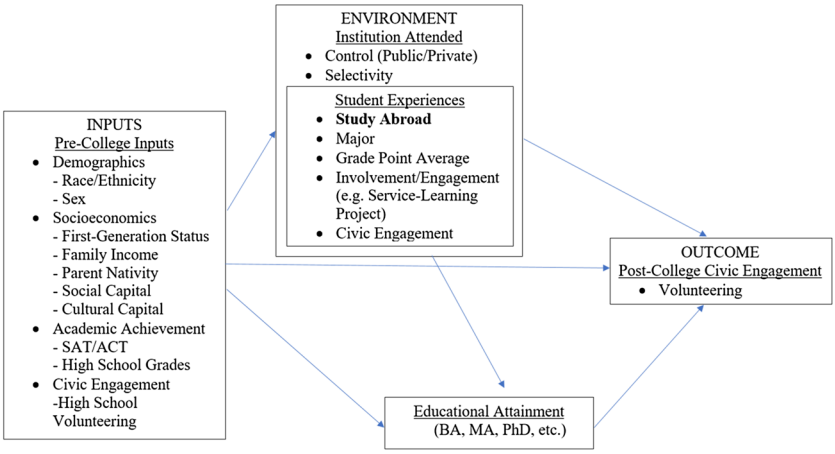

Fig. 1 Proposed conceptual model on the effects of study abroad on post-college civic engagement

to the behavior represented in the outcome variable, thus enhancing the robustness of the results.

Methods

Data and Sample

This study utilized data from the restricted-use Education Longitudinal Survey (ELS: 2002) which is the only longitudinal and nationally representative dataset that contains the information on both civic engagement outcomes and study abroad participation, along with the relevant pre-college and college variables needed to address the research question. ELS consists of nationally representative, longitudinal data collected as part of a project funded by the U.S. Department of Education designed to explore students' transitions from secondary school into postsecondary education and subsequently into the workforce and life after college. Begun in 2002 based on a sample of tenth graders, follow-up data were collected in 2004 and again in 2006, at which point the 2002 tenth grade sample potentially had progressed into their second year of college. A subsequent third follow-up survey was conducted in 2012, when the original sample was roughly ten years beyond high school. Their average age in 2012 was 26 years. The third follow-up survey collected information related to participants' undergraduate experiences (including study abroad) in addition to a host of career and other quality of life measures (including measures of civic engagement). The restricted-use dataset offers an expansive set of measures important for this study, including postsecondary transcripts that are not publicly available (National Center for Education Statistics [NCES] 2019).

Of the original longitudinal sample of 16,200 individuals in the United States, the analytic sample of 8,460 (figures rounded to the nearest 10 as per National Center for Education Statistics restricted data guidelines, NCES 2019) for the current study included students who participated in the base year in 2002 as 10th graders through the third follow-up in 2012, and who attended a postsecondary institution. Excluded participants were those

that did not complete all waves of the study, did not attend postsecondary education, or had missing information that was not suitable for missing data imputation.

Variables

The variables used in this study are conceptually grounded as illustrated in Fig. 1. Each variable was chosen and placed in the appropriate block based on the literature pertaining to study abroad and volunteerism. This study employed a binary dependent variable for post-college volunteering ("During the past two years, have you performed any unpaid volunteer or community service work through such organizations as youth groups, service clubs, church clubs, school groups, or social action groups?") measured at the third follow-up in 2012.

The main independent variable was a dichotomous response to the question "Did you participate in any of the following as part of your undergraduate/college education – Study abroad." Covariates were divided into several categories: ascribed characteristics, pre-college parental involvement and social capital, high school academic achievement and experiences, institutional controls, and college experiences. Barnhardt et al. (2015) employed a similar categorization in their study of civic engagement outcomes and served as a model for the current study. Myers et al. (2018) utilized a similar approach in their study showing the relationship of six high-impact educational practices, including study abroad, with post-college volunteering.

Ascribed Characteristics

Ascribed characteristics were obtained from the base year 2002 administration, when participants were in the 10th grade, with an average age of 16. Ascribed characteristics included: biological sex (0 = male, 1 = female), race/ethnicity, parental income, and parental nativity (0 = both parents born in the U.S.; 1 = at least one parent foreign born). Race/ethnicity was dummy-coded into six categories (American Indian/Alaska Native, Asian and Pacific Islander, Black, Hispanic, Multiracial, and White) with White as the reference group. First-generation college student status was calculated based on neither parent having attended postsecondary education (Choy 2001). Parental income was transformed from the original 13-item categorial measure (1 = $0; 2 = $1–$999; 3 = $1000–4999; 4 = $5000–$9999; 5 = $10,000–$14,999; 6 = $15,000–$19,999; 7 = $20,000–$24,999; 8 = $25,000–$34,999; 9 = $35,000–$49,999; 10 = $50,000–74,999; 11 = $75,000–$99,999; 12 = $100,000–$199,999; 13 = $200,000 or more) to the midpoint dollar value of each of the first 12 categories. The midpoint of the open-ended final category was estimated to be $392,374 using the Pareto approximation technique (Parker and Fenwick 1983; Wolniak et al. 2008). This technique has been shown to offer better estimates for top-coded earnings information in survey data over other estimation techniques such as a fixed multiple above the highest coded data point (Armour et al. 2014).

High School Academic Achievement and Experiences

High school academic achievement is a common indicator of college and post-college outcomes (Mayhew et al. 2016). Therefore, high school grade point average and a standardized SAT/ACT composite score were included as measures of high school academic

achievement. Finally, to account for a predisposition for volunteering, pre-college volunteering was included as a control (0 = Did not volunteer in high school, 1 = Volunteered in high school) as a baseline measure (Myers et al. 2018).

Social and cultural capital were included as additional variables to account for the context in which the participants lived. Simon and Ainsworth (2012) identified parental involvement and social networks as important predictors of study abroad participation beyond financial capital and were thus included as controls. In the current study, sources of college entrance information were included as a proxy for social capital. To measure this form of cultural capital, whether students went on family vacations or day trips in the 10th grade was included as a predictor despite the limitation that the measure did not specifically address whether or not these trips were abroad. Family vacations were dummy-coded into four categories consistent with the Simon and Ainsworth study using the NELS dataset (Never, Rarely, Sometimes, Frequently) with Frequently as the reference group.

Undergraduate Institution

As part of the overall environment in which students spend their formative years, college represents the kinds of environments students experience that have been shown to influence students' post-college outcomes (Mayhew et al. 2016). Postsecondary institutional measures for the last institution attended were added to control for differences in the types of colleges and universities students attended (Toutkoushian et al. 2018). Institutional control was dummy-coded into three categories (private, public, and for-profit with private at the reference group). Consistent with much of the higher education literature (Mayhew et al. 2016), institutional selectivity derived from the Integrated Postsecondary Education Data System (IPEDS) was dummy-coded into four categories (highly selective, moderately selective, inclusive, and other with highly selective as the reference group) (Myers et al. 2018).

College Experiences

To further ascertain the influence of college, undergraduate major and academic achievement were included from postsecondary transcript data. Twenty-four major categories were collapsed into eight dummy-coded categories (STEM, Social Sciences, Education, Business, Arts & Humanities, Health & Human Services, Other, and Missing with Social Sciences as the reference group). Undeclared and undecided majors were originally classified as "General Studies" which were grouped in the Other category. Appendix 1 provides the full groupings of majors. In addition, transcript data provided college grade point average as a measure of achievement. Study abroad participation was also included in this category of variables.

Additional college experience controls were added for previous civic engagement, including whether the student participated in a community-based project in college or whether the student performed any unpair volunteer or community service while in college (Kuh 2008; Mayhew et al. 2016; Walpole 2003). These controls serve as a proxy pretest for the outcome of interest in this study, post-college volunteering.

Analyses

To answer the research question, a four-phased approach was utilized. This section presents these four phases: data preparation, initial analyses, regression analyses, and propensity score analysis.

Data Preparation

The first data analytic phase consisted of data cleaning and an examination of missing data. Of the initial 16,200 cases, those who did not complete all waves of the survey or did not attend postsecondary education were discarded. The sample was further reduced through listwise deletion for cases in which participants had small amounts (less than 10%) of missing values for non-imputable data (e.g. institutional control, institutional selectivity, high school volunteering, college volunteering, participation in a community-based project in college). In addition, all cases in which the participant indicated they were a college graduate but reported a grade point average under 2.0, the grade point average was coded as missing as graduation is contingent upon having a grade point average 2.0 or above. The 2.0 GPA cutoff is consistent with the minimum requirement to graduate across postsecondary institutions across the U.S. and is a traditional cutoff in higher education research (Ishitani 2003). After listwise deletion, the analytic sample was 8460.

For variables in which there was a substantial amount of missing data (e.g. greater than 10%), a chained regression approach was used to impute missing values under the assumption that the data are missing at random (Manly and Wells 2015). In a multiple imputation procedure, missing completely at random is not a requirement. As per Allison (2002), the assumption that the data are missing at random is needed for optimal estimation of missing information and is a required assumption to perform multiple imputation. A variable is said to be missing at random if other variables (but not the variable itself) in the dataset can be used to predict missingness on a given variable. Accordingly, the imputation model included all variables, including the dependent variable, from the final analytic model as well as auxiliary variables to ensure that the model includes everything that would predict missingness (Graham 2009). In doing so, the imputed values will adjust for any unobservable difference between the observed and the missing values. The auxiliary variables included postsecondary degree attainment, socioeconomic status, high school control, high school urbanicity, high school region, two-parent household, and disability status. Because the ELS dataset features complex survey design, the panel weight, strata, and primary sampling units were included in the imputation model to improve the imputation process (Azur et al. 2011; Heeringa et al. 2010; Zhou et al. 2016). Missing data ranged from 6% to 22.5%. When there is a high amount of missing information, more imputations are typically necessary to achieve adequate efficiency for parameter estimates and well-estimated standard errors. Accordingly, using Stata version 15′s ‘mi impute chained’ program, the number of imputation samples was set at $m = 25$ (Graham 2009; Manly and Wells 2015; StataCorp 2011).

The data from the 25 imputation datasets were then pooled and compared to the non-imputed values (Rubin 1987). No significant differences appeared between the imputed and non-imputed data. Table 1 provides the means and standard deviations of the imputed and non-imputed datasets to show to what extent the imputation sample is similar to the original complete case dataset on key variables in terms of these summary statistics. Furthermore,

Table 1 Comparison between imputed and non-imputed datasets. *Source* ELS 2002 restricted dataset

Variable	Imputed		Non-imputed	
	M	SD	M	SD
High school GPA	2.59	0.77	2.85	0.75
SAT composite	9.25	1.96	10.36	2.02
College GPA	2.70	0.89	2.91	0.87
Family vacations (continuous)	2.10	0.74	2.18	0.79
How often parent checks homework	0.33	0.42	0.32	0.47
How often parent helps with homework	0.54	0.45	0.59	0.49
How often discussed school courses with parents	0.41	0.44	0.42	0.49
How often discussed school activities with parents	0.27	0.40	0.27	0.44
How often discussed things studied in class with parents	1.82	0.96	1.86	1.06
How often discussed grades with parents	1.46	0.87	1.47	0.92
How often discussed ACT/SAT prep with parents	1.10	0.60	1.17	0.66
How often discussed going to college with parents	1.16	0.63	1.27	0.69
How often discussed current events with parents	1.09	0.58	1.16	0.65
How often discussed troubling things with parents	1.42	0.54	1.47	0.60
Source of college entrance information: teacher	0.74	0.63	0.82	0.72
Source of college entrance information: parent	1.34	0.59	1.41	0.63
Source of college entrance information: friend	0.91	0.64	1.01	0.71
Source of college entrance information: other relative	1.02	0.62	1.04	0.70

the regression results based on a complete case analysis and those on the imputed data set analysis were found also to be quite similar. Accordingly, given that the imputed dataset has a larger sample size than the non-imputed dataset, with greater resulting power, results based on the imputed dataset are the ones presented in the following sections.

Initial Analyses

Univariate and bivariate descriptive statistics were computed on all items in the imputed dataset and results are provided in Table 2 for the entire sample as a whole. Table 3 breaks down these results by study abroad participation.

An independent samples *t*-test was used to compare the mean volunteering responses. There was a significant difference between study abroad ($M = 0.634$, $SD = 0.482$) and non-study abroad ($M = 0.435$, $SD = 0.496$); $t(8426) = -11.598$, $p < 0.001$. These results suggest that study abroad participants are more likely to volunteer than their non-study abroad counterparts.

Regression Analyses

To answer the research question involving the dichotomous dependent variable of post-college volunteering, this study used hierarchical logistic regression to yield regression coefficients and odds ratios (Keith 2015). The first block consisted of all pre-college variables, including sex, race/ethnicity, first-generation college student status, family income, parental nativity, parental involvement, social capital, high school grade point average, SAT

Table 2 Descriptive statistics of study variables based on all cases

Variable	Min	Max	Mean	SE
Pre-college characteristics				
Female	0	1	0.565	0.005
Male (0)	0	1	0.435	0.005
American Indian/Alaskan Native	0	1	0.006	0.001
Asian/Pacific Islander	0	1	0.098	0.003
Black	0	1	0.113	0.003
Hispanic	0	1	0.118	0.004
Multiracial/other	0	1	0.042	0.002
White (0)	0	1	0.622	0.005
Income (in thousands of USD)	0	392.37	79.603	0.876
First-generation college student	0	1	0.194	0.004
Parent nativity (at least one foreign-born parent)	0	1	0.197	0.004
Missing: parent nativity	0	1	0.086	0.003
Parental involvement	0	22	12.622	0.050
Social capital	0	4	1.580	0.014
High school grade point average	0.17	4.00	2.839	0.008
SAT Composite Score (in 100-point increments)	4.2	16	9.929	0.022
Family vacations: never	0	1	0.036	0.002
Family vacations: rarely	0	1	0.108	0.003
Family vacations: sometimes	0	1	0.523	0.005
Family vacations: frequently (0)	0	1	0.333	0.005
College environment and experiences				
College type: public	0	1	0.670	0.005
College type: private (0)	0	1	0.215	0.004
College type: for-profit	0	1	0.115	0.003
College selectivity: highly selective (0)	0	1	0.197	0.004
College selectivity: moderate	0	1	0.269	0.005
College selectivity: inclusive	0	1	0.093	0.003
College selectivity: other	0	1	0.441	0.005
Major: STEM	0	1	0.112	0.003
Major: social science (0)	0	1	0.130	0.004
Major: education	0	1	0.060	0.003
Major: business	0	1	0.143	0.004
Major: arts & humanities	0	1	0.074	0.003
Major: health & human services	0	1	0.170	0.004
Major: other	0	1	0.127	0.004
Major: missing	0	1	0.185	0.004
College grade point average	0	4.00	2.866	0.009
Study abroad	0	1	0.111	0.003
Post-college civic engagement outcome				
Volunteering	0	1	0.457	0.005
Control variables				
Volunteered in high school	0	1	0.703	0.005
Volunteered in college	0	1	0.512	0.005
Community-based project	0	1	0.192	0.004

Table 2 (continued)

Unweighted $N = 8460$. Weighted $N = 1{,}942{,}650$. *Source* ELS 2002 Restricted Dataset

(0) denotes the reference group

composite score, frequency of family day vacations/day trips, and high school volunteering was added as a control variable. The second block consisted of college variables, including postsecondary institution control, selectivity, major, and college grade point average. The third block consisted of specific college activity variables, such as study abroad participation and control variables that measured whether students participated in a community-based project (service-learning) and whether the student volunteered while in college. The logistic regression model may be expressed as follows:

$$\ln \frac{Prob(Volunteering)}{(1 - Prob(Volunteering)} = b_0 + b_1 P + b_2 C + b_3 E,$$

where the outcome variable is the logit of post-college volunteering, P is the set of all pre-college variables, C is the set of college variables, and E is the set of college experience variables (including study abroad).

Propensity Score Analysis

Because study abroad is an optional educational experience in which a student can choose to participate, selection bias may be present beyond the characteristics already controlled for in the regression model. Study abroad researchers have acknowledged that self-selection to study abroad can produce biased estimates of the regression coefficients in the model due to an imbalance between the treated (study abroad) and untreated (no study abroad) groups (Salisbury et al. 2013; Schneider et al. 2007; Waibel et al. 2018). With study abroad participation being the "treatment" of interest, an approach that goes beyond controlling for selected covariates through regression analysis is necessary to account for the decision to study abroad (Murnane and Willett 2011). Rosenbaum and Rubin's (1983) development of a propensity, or balancing, score procedure based on observed baseline covariates helps to alleviate some of the problems created by selection bias although it still does not fully address the bias in these estimates produced by an imbalance of unobserved variables such as risk-taking, a love of languages and travel, and whether the participant already owned passport. Recognizing this issue related to the unobserved variables, the use of propensity score analysis on a set of observed variables was carried out to address the research question as an attempt to help reduce the bias in the regression coefficient estimates created by self-selection.

Although propensity score analysis is commonly used in observational research (Schafer and Kang 2008; Shadish et al. 2002), there is no single approach used in connection with this type of analysis. For example, some studies have used various forms of local linear modeling and visual examination of propensity score distributions per group to determine a region of common support or balance between groups, others have used inverse probability weights based on the propensity score obtained, and still others have included a propensity score into the regression model to achieve the desired correction (Reynolds and DesJardins 2009; Yang and Schafer 2007).

Table 3 Descriptive statistics of study variables by study abroad participation. *Source* ELS 2002 Restricted Dataset

	Study abroad (N = 930)		Non-study abroad (N = 7,530)	
Variable	Mean	SE	Mean	SE
Pre-college characteristics				
Female[a]	0.675	0.015	0.551	0.006
Male[a]	0.325	0.015	0.449	0.006
American Indian/Alaskan Native[a]	0.001	0.001	0.007	0.001
Asian/Pacific Islander	0.087	0.009	0.100	0.003
Black[a]	0.055	0.007	0.120	0.004
Hispanic[a]	0.084	0.009	0.122	0.004
Multiracial/other	0.033	0.006	0.043	0.002
White[a]	0.740	0.014	0.608	0.006
Income (in thousands of USD)[a]	116.26	3.485	75.05	0.871
First-generation college student[a]	0.091	0.009	0.207	0.005
Parent nativity (at least one foreign-born parent)	0.186	0.013	0.198	0.005
Missing: parent nativity[a]	0.059	0.008	0.089	0.003
Parental involvement[a]	13.618	0.144	12.499	0.053
Social capital[a]	1.725	0.040	1.563	0.014
High school grade point average[a]	3.291	0.020	2.783	0.009
SAT Composite Score (in 100-point increments)[a]	11.452	0.064	9.740	0.023
Family vacations: never[a]	0.014	0.004	0.038	0.002
Family vacations: rarely[a]	0.061	0.008	0.113	0.004
Family vacations: sometimes	0.494	0.016	0.527	0.006
Family vacations: frequently[a]	0.431	0.016	0.321	0.005
College environment and experiences				
College type: public[a]	0.505	0.016	0.691	0.005
College type: private[a]	0.436	0.016	0.187	0.004
College type: for-profit[a]	0.059	0.008	0.122	0.004
College selectivity: highly selective[a]	0.484	0.016	0.161	0.004
College selectivity: moderate	0.274	0.015	0.268	0.005
College selectivity: inclusive[a]	0.048	0.007	0.099	0.003
College selectivity: other[a]	0.194	0.013	0.472	0.006
Major: STEM	0.101	0.010	0.113	0.004
Major: social science[a]	0.264	0.014	0.114	0.004
Major: education	0.064	0.008	0.059	0.003
Major: business	0.153	0.012	0.141	0.004
Major: arts & humanities[a]	0.159	0.012	0.064	0.003
Major: health & human services[a]	0.137	0.011	0.174	0.004
Major: other[a]	0.047	0.007	0.137	0.004
Major: missing[a]	0.075	0.009	0.198	0.005
College grade point average[a]	3.316	0.019	2.810	0.010
Post-college civic engagement outcome				
Volunteering[a]	0.634	0.016	0.435	0.006
Control variables				
Volunteered in high school[a]	0.876	0.011	0.682	0.005
Volunteered in college[a]	0.721	0.015	0.486	0.006
Community-based project[a]	0.382	0.016	0.168	0.004

Table 3 (continued)

[a]Significant mean difference between study abroad and non-study abroad participants

This study employed inverse probability of treatment weighting (IPTW). Unlike other propensity score methods such as matching, IPTW does not discard a large number of unmatched cases, thus maintaining close to the analytical sample and external validity (Murnane and Willett 2011). The propensity score is the participant's probability of selection into the treatment, in this case, study abroad participation, based on regression modelling using observed covariates (Austin 2011; Austin and Stuart 2015). The propensity score is defined as:

$$p = Prob(\text{Study Abroad} = 1).$$

As a probability, p, ranges from 0 to 1. The inverse of p, the probability of receiving study abroad as the treatment, is defined as:

$$w = \frac{Study\,Abroad}{p + \frac{(1 - Study\,Abroad)}{(1-p)}}$$

Accordingly, for those who studied abroad, Study Abroad = 1, and $w = 1/p$; for those who did not study abroad, Study Abroad = 0, and $w = 1/(1 - p)$.

Unlike traditional model-fitting techniques that rely on parsimony to find the best fitting model, estimating the propensity score relies on variable selection to increase the explanatory power of the propensity score to improve balance between groups (Reynolds and DesJardins 2009). As such, the propensity score model included the pre-treatment ascribed characteristics of sex, race, income, first-generation status, parental nativity, parental involvement and social capital. The model also included high school grade point average and SAT composite score. The frequency of family day trips or vacations was also included in the model. Additional pre-college variables that were not previously found to be statistically significant but are discussed in the study abroad literature, such as family composition (i.e. coming from a two-parent household) or being diagnosed with a disability, were also included in the propensity score model (Simon and Ainsworth 2012). High school volunteering was included in the model as students may consider international volunteering as part of their decision to study abroad (Institute of International Education 2016). In addition, the same college variables, including institutional control, selectivity, major, and college grade point average were included in the propensity score model. The resulting propensity score (p) was the predicted value of the dependent variable (whether or not an individual participated in study abroad).

Two diagnostics were performed to assure the IPTW analysis conformed to the assumptions of common support and covariate balance. Figure 2 presents a histogram of propensities across the region of overlapping propensity scores (between 0.0035 and 0.7521) demonstrating that the treatment and control groups have similar probabilities of treatment. Approximately 60 observations fell outside of this common range and were thus dropped, resulting in an analytical sample of 8,400. IPTW has the advantage over nearest neighbor matching methods that can drop thousands of observations, depending on the precision of calipers (Murnane and Willett 2011). In addition to the preference to maintain external validity of the large dataset, the use of these weights does not suffer from the limitation of some matching techniques, such as kernel matching and local linear regression that must

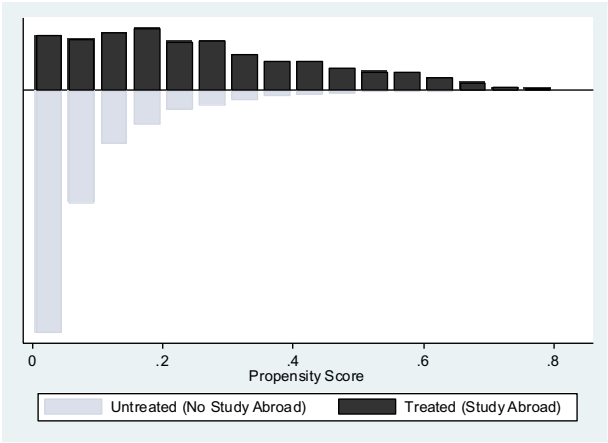

Fig. 2 Histogram depicting common support

estimate a counterfactual for each treated observation (Reynolds and DesJardins 2009). To assess covariate balance, a comparison of means of baseline variables for treatment and control groups in the unweighted and weighted was performed (Austin and Stuart 2015). Table 4 shows how covariate balance was achieved between treated and control groups after weighting.

Results

Table 5 presents the findings of the main effects model for predicting post-college volunteering behavior showing strong relationships between college experiences and post-college volunteering. Model IV contains the results of the full regression model using IPTW to account for selection bias discussed below.

In answering this study's research question, students who studied abroad were 26% more likely to volunteer after college than their counterparts who did not study abroad (*OR* 1.262, $p < 0.05$). This result is above and beyond the relationships found in other college experiences. Students who volunteered in college were more than 96% more likely to volunteer after college than those students who did not volunteer during college (*OR* 1.962, $p < 0.001$). Students who participated in a community-based project were more than twice as likely to volunteer after college than their colleagues who did not undertake this experience (*OR* 2.113, $p < 0.001$). Considering the model included controls for volunteering and service learning in the form of a community-based project, the effect of study abroad on post-college volunteering is novel.

Model fit statistics suggest that the college experience plays a large role in predicting post-college volunteering. Pre-college factors, including high school volunteering, accounted for 11% (Nagelkerke-$R^2 = 0.114$) of the model whereas the model that includes college major, institutional type, and grade point average accounted for 13% (Nagelkerke-$R^2 = 0.131$). Adding college experiences such as study abroad and participating in a community-based project, and volunteering during college accounted for the largest jump in variance explained in the propensity score weighted and unweighted samples (Nagelkerke-$R^2 = 0.186$).

Table 4 Standardized bias (SB) before and after weighting. *Source* ELS 2002 restricted dataset

Variable	Before weighting			After weighting		
	Treatment	Control	SB	Treatment	Control	SB
Pre-college characteristics						
Female	0.675	0.551	25.552	0.673	0.665	1.658
Male	0.325	0.449	− 25.552	0.327	0.335	− 1.658
American Indian/Alaskan Native	0.001	0.007	− 9.002	0.001	0.001	− 0.125
Asian/Pacific Islander	0.087	0.100	− 4.438	0.087	0.091	− 1.329
Black	0.055	0.325	− 23.464	0.055	0.059	− 1.954
Hispanic	0.084	0.122	− 12.464	0.085	0.083	0.616
Multiracial/other	0.033	0.043	− 5.301	0.033	0.034	− 0.077
White	0.740	0.608	28.518	0.738	0.732	1.539
Income (in thousands of USD)	116.260	75.048	44.614	115.682	116.456	− 0.723
First-generation college student	0.091	0.207	− 33.019	0.091	0.095	− 1.373
Parent nativity (at least one foreign-born parent)	0.186	0.198	− 3.017	0.185	0.190	− 1.334
Missing: parent nativity	0.059	0.089	− 11.516	0.059	0.063	− 1.724
Parental involvement	13.618	12.499	24.963	13.607	13.525	1.882
Social capital	1.725	1.563	13.096	1.725	1.714	0.887
High school grade point average	3.291	2.783	74.151	3.287	3.281	1.027
SAT Composite Score (in 100-point increments)	11.452	9.740	86.643	11.431	11.459	− 1.457
Family vacations: never	0.014	0.038	− 15.330	0.014	0.015	− 0.470
Family vacations: rarely	0.061	0.113	− 18.651	0.061	0.061	0.167
Family vacations: sometimes	0.494	0.527	− 6.603	0.497	0.502	− 0.982
Family vacations: frequently	0.431	0.321	22.799	0.427	0.422	1.025
College environment and experiences						
College type: public	0.505	0.691	− 38.603	0.508	0.504	0.893
College type: private	0.436	0.187	55.807	0.433	0.436	− 0.695
College type: for-profit	0.059	0.122	− 22.158	0.059	0.060	− 0.431
College selectivity: highly selective	0.484	0.161	73.656	0.481	0.480	0.273
College selectivity: moderate	0.274	0.268	1.213	0.276	0.273	0.574
College selectivity: inclusive	0.048	0.099	− 19.490	0.048	0.050	− 0.566
College selectivity: other	0.194	0.472	− 61.751	0.195	0.198	− 0.680
Major: STEM	0.101	0.113	− 4.103	0.101	0.103	− 0.535
Major: social science	0.264	0.114	39.198	0.263	0.259	0.804
Major: education	0.064	0.059	2.153	0.065	0.064	0.378
Major: business	0.153	0.141	3.303	0.154	0.150	1.164
Major: arts & humanities (A&H)	0.159	0.064	30.818	0.157	0.161	− 0.925
Major: health & human services (H&HS)	0.137	0.174	− 10.200	0.138	0.142	− 1.113
Major: other	0.047	0.137	− 31.607	0.047	0.048	− 0.170
Major: missing	0.075	0.198	− 36.525	0.075	0.075	0.223
College grade point average	3.316	2.810	68.717	3.313	3.313	0.082
Control variables						
Volunteered in high school	0.876	0.682	48.149	0.875	0.873	0.532
Volunteered in college	0.721	0.486	49.361	0.719	0.647	15.474

Table 4 (continued)

Variable	Before weighting			After weighting		
	Treatment	Control	SB	Treatment	Control	SB
Community-based project	0.382	0.168	49.230	0.384	0.243	30.786

In comparing the hierarchical models, several other interesting findings emerged. When considering only pre-college and college environmental factors, first-generation college student status was negatively statistically significant in predicting post-college volunteering. However, once taking into account specific college experiences such as study abroad, volunteering in college, and participating in a community-based project, first-generation college student status loses statistical significance. This change across the models suggests that these college experiences subsumes the negative effect of first-generation college student status in predicting post-college volunteering.

Among pre-college factors, few characteristics yielded statistically significant results. Among ascribed characteristics, Black students were nearly 40% more likely to volunteer after college than their White counterparts (*OR* 1.397, $p < 0.01$). In addition, students with higher parental involvement were more likely to volunteer than students with lower levels of parental involvement (*OR* 1.014, $p < 0.05$). Students with higher levels of social capital were also more likely to volunteer after college (*OR* 1.065, $p < 0.01$). Furthermore, higher SAT scores were positively associated with post-college volunteering (*OR* 1.048, $p < 0.05$). As expected, students who volunteered in high school were nearly 87% more likely to volunteer after college (*OR* 1.868, $p < 0.001$), demonstrating that inclusion of this variable was a strong control for volunteering tendencies.

Institutional type also played a role. Compared to students who attended a private institution, students who attended for-profit colleges were more than 25% less likely to volunteer after college (*OR* 0.744, $p < 0.05$). Interestingly, neither institutional selectivity nor major yielded statistically significant results. College grade point average, however, was a strong positive predictor of post-college volunteering (*OR* 1.178, $p < 0.001$).

Limitations

The results above must be interpreted in light of several limitations related to the ELS: 2002 dataset. First, the dichotomous study abroad treatment variable does not capture the heterogeneity of study abroad experiences, such as study abroad sponsor (home institution, another institution, or third-party provider), program length (year-long, semester, or short-term), destination (popular European locations or non-Western locales), or the level of immersion (homestay, enrolling into a foreign university, or an isolated campus of only American undergraduates). Increased program length, for example, has been linked to greater tolerance and social awareness (Dwyer 2004). Future research would benefit from more robust measures of study abroad experiences. Second, although 58% of the sample attended multiple undergraduate institutions, the dataset does not elucidate the movement of students within American higher education, including transfer, dual enrollment, and enrolling in another institution's study abroad program. Future research should consider study abroad participation among transfer students and dual enrolled students that make up such a large share of the sample. Third, the dataset has incomplete U.S. citizenship/

Table 5 Estimated main effects predicting post-college volunteering

	Model I		Model II		Model III		Model IV (IPTW)	
	B	*OR*	*B*	*OR*	*B*	*OR*	*B*	*OR*
Pre-college characteristics								
Female	0.115	1.122	0.051	1.052	0.043	1.044	0.045	1.046
American Indian/Alaskan Native	− 0.381	0.683	− 0.397	0.672	− 0.427	0.653	− 0.414	0.661
Asian/Pacific Islander	0.124	1.131	0.143	1.154	0.107	1.113	0.099	1.105
Black	0.389***	1.476	0.416***	1.515	0.347***	1.414	0.335**	1.397
Hispanic	− 0.100	0.905	− 0.063	0.939	− 0.072	0.931	− 0.098	0.907
Multiracial/other	− 0.116	0.891	− 0.075	0.928	− 0.088	0.916	− 0.086	0.918
First-generation college student	− 0.181*	0.834	− 0.156*	0.856	− 0.131	0.878	− 0.127	0.881
Income (in thousands of USD)	0.000	1.000	0.000	1.000	0.000	1.000	0.000	1.000
Parent nativity (at least one foreign-born parent)	− 0.038	0.962	− 0.074	0.928	− 0.053	0.949	− 0.035	0.965
Missing: parent nativity	− 0.183	0.833	− 0.205	0.815	− 0.176	0.839	− 0.164	0.849
Parental involvement	0.027***	1.027	0.024***	1.024	0.015*	1.015	0.014*	1.014
Social capital	0.075**	1.078	0.075**	1.078	0.063**	1.065	0.063**	1.065
High school grade point average	0.120*	1.128	− 0.039	0.962	− 0.079	0.924	− 0.078	0.925
SAT Composite Score (in 100-point increments)	0.101***	1.106	0.065**	1.067	0.049*	1.050	0.047	1.048
Family vacations: never	− 0.020	0.980	− 0.042	0.959	− 0.015	0.985	− 0.028	0.972
Family vacations: rarely	0.031	1.032	0.027	1.027	0.080	1.083	0.072	1.075
Family vacations: sometimes	− 0.051	0.950	− 0.047	0.954	− 0.005	0.995	− 0.011	0.989
Volunteered in high school	0.828***	2.288	0.811***	2.249	0.617***	1.854	0.625***	1.868
College environment and major								
College type: public			− 0.231**	0.794	− 0.128	0.880	− 0.127	0.880
College type: for-profit			− 0.418***	0.658	− 0.301**	0.740	− 0.296*	0.744
College selectivity: moderate			0.018	1.018	0.057	1.058	0.058	1.060
College selectivity: inclusive			− 0.155	0.856	− 0.105	0.900	− 0.098	0.907
Major: STEM			− 0.147	0.863	− 0.103	0.902	− 0.096	0.909

Table 5 (continued)

	Model I		Model II		Model III		Model IV (IPTW)	
	B	*OR*	*B*	*OR*	*B*	*OR*	*B*	*OR*
Major: education			0.240	1.271	0.143	1.154	0.134	1.144
Major: business			− 0.082	0.921	− 0.021	0.979	− 0.018	0.982
Major: arts & humanities (A&H)			− 0.197	0.821	− 0.210	0.811	− 0.204	0.816
Major: health & human services (H&HS)			0.066	1.068	− 0.031	0.970	− 0.027	0.973
Major: other			− 0.163	0.850	− 0.133	0.875	− 0.128	0.880
College GPA			0.188***	1.207	0.159	1.172	0.164***	1.178
College experiences								
Study abroad					0.236*	1.266	0.233*	1.262
Volunteered in college					0.679***	1.973	0.674***	1.962
Community-based project					0.750***	2.117	0.748***	2.113
Model fit (*Nagelkerke-R^2*)		0.114		0.131		0.186		0.186

Unweighted $N = 8460$ (8400 in Model IV). Weighted $N = 1{,}942{,}650$ (1,927,270 in Model IV). *Source* ELS 2002 Restricted Dataset. Reference categories are race/ethnicity: White = 0; family vacations: frequent = 0; college type: private = 0; college selectivity: high = 0; major: social sciences = 0. Additional variables for "Missing" major and "Other" selectivity were included in the model but not shown in the table

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

residency data. Although volunteering does not suffer from the same prohibitions for non-U.S. citizens, including the undocumented, as voting does, volunteerism as measured in ELS: 2002 reflects an American social norm. The inclusion of parental nativity (having at least one foreign-born parent) is used as a proxy as such norms are often passed from parents to children. Fourth, given the strong association with service-learning, it is impossible to know if there is an interaction between study abroad and service-learning through a community-based project while abroad. While the statistical model looked at study abroad and community-based projects experiences separately, it is unknown if a student's study abroad experience had a service-learning component as part of the program. Given that study abroad and service-learning are both examples of experiential learning, future research should examine if there is an advantage to having the experiences simultaneously.

Fifth, because this study relies on observational data that does not account for unobserved factors, the results should be interpreted as correlational, rather than causal. These unobserved variables could include whether students travelled internationally prior to college, whether they already owned a passport, intercultural competence or appreciation of diversity, or levels of risk-taking or adventurousness. Notwithstanding this limitation, the use of propensity scores, proxy pre-tests for high school and college volunteering, and strong personal and institutional controls improves the robustness of the results not seen in similar studies.

Discussion

While much of the established literature has found that service-learning and volunteering in college are linked with an increased likelihood of volunteering after college, this study found that study abroad participants were more likely to volunteer after college even when accounting for prior volunteer behavior. These findings build off prior research linking study abroad to more general concepts of global and environmental citizenship (Landon et al. 2017; Tarrant et al. 2014; Stoner et al. 2014). In addition, these findings contribute to the modern human capital theory explanation of non-market benefits to education (McMahon 2009; Salisbury et al. 2013). Moreover, the current study moves the discourse away from civic attitudes and self-perceptions (Bringle et al. 2011; Cruce and Moore 2007; Lott 2013; Paige et al. 2009; Rhee and Kim 2011; Sax 2008) towards clear manifestations of civic behavior. Given the trend of U.S. students going abroad for shorter periods over the past two decades (Engle and Engle 2003), these programs must be very intentionally designed to realize the benefits of study abroad.

Methodologically, this study overcomes two key limitations of research into higher education outcomes. First, the longitudinal approach controlling for sex, race/ethnicity, parental education, income, institutional type, etc. to isolate the unique contributions of study abroad to student learning lends additional credence to Astin's (1993) Inputs-Environment-Outcomes model. This approach is not normally seen in evaluative studies of short-term study abroad programs (Deardorff 2010). Moreover, the controls for high school and college volunteering strengthen the claims of a significant relationship between study abroad and post-college volunteering in a way that emulates pretest/posttest studies of global learning outcomes (Landon et al. 2017; Tarrant et al. 2014; Stoner et al. 2014). Second, the use of the nationally representative ELS: 2002 dataset allows for a more generalized discussion of these results that adds to the literature on the outcomes of high-impact practices, namely study abroad (Myers et al. 2018). Third, the inverse probability of treatment

weight (IPTW) approach further strengthens the veracity of the associations found between study abroad and post-college volunteering by reducing the effect of selection bias which clouds much of the research into high-impact practices (Bowman et al. 2016; Salisbury et al. 2013; Waibel et al. 2018). By attending to these concerns with an observational study, we can now make stronger claims as to the use of study abroad as a civic education tool.

This association between study abroad and post-college volunteering suggests that the study abroad experience engenders individual action towards ameliorating a social problem. While there is debate as to whether using longitudinal data from correlational studies within Astin's Inputs-Environment-Outcomes framework can be used to make causal claims in research (Gillespie et al. 1999; Myers et al. 2018), practitioners can note the use of the IPTW to control for selection bias when making causal statements while evaluating study abroad programs. That being said, it appears that after students come back to the United States after studying abroad, they give their time to connect with the community and improve the lives of others.

On a programmatic level, integrating civic learning objectives into study abroad programs marks an important challenge. With many competing objectives including content knowledge, language acquisition, cultural appreciation, etc., institutions and providers must find ways to weave civic learning into the experience and to make study abroad widespread in the undergraduate experience. Despite calls for "global citizenship," higher education institutions graduate individuals that will live in local or national communities where their impact will be most felt vis-à-vis the social problems in that setting. While graduates have long attributed their new perspective on social problems to their study abroad experience (Paige et al. 2009), it remains incumbent upon study abroad programs to make these connections intentional parts of the experience abroad. Study abroad programs that incorporate service-learning, an activity that has been shown to be linked with civic engagement (Keen and Hall 2009; Kuh 2008; Mayhew et al. 2016; Prentice 2007), can be the first step. Study abroad programs can also be intentional through different modes of delivery such as coursework that requires reflection on societal problems at home and abroad or discussions with local residents. Regardless of program type, study abroad professionals can find more ways to promote civic learning during the student's time abroad.

Conclusion

Altogether, results from this study provide new information that demonstrate a relationship between undergraduate study abroad and post-college volunteering. While most of the literature suggests that service-learning is a primary vehicle for promoting post-college civic engagement, this study goes one step further by presenting evidence that study abroad merits additional study as a civic learning tool. Among the most important implications of this finding is that it holds on average after controlling for major and institutional selectivity. Furthermore, these findings buttress against some of the concerns of Dewey, Putnam, and Astin of a loss of civic culture. In this national dataset, the evidence suggests a positive relationship of college attendance, particularly through high-impact educational practices, and post-college volunteering.

These results should bring service-learning and study abroad practitioners together to examine ways to integrate these experiences within the entire college experience. For example, an engineering student who studied abroad can engage in a humanitarian engineering project in a marginalized community during their senior year upon return or a

foreign language student who studied abroad in Spain could volunteer with an immigrants' rights organization in Texas. It is vital to view study abroad through a lens that extends well beyond the temporal and physical boundaries of the study abroad experience itself.

Looking to the future, practitioners and researchers can look at this study as new empirical evidence of the value of study abroad as a civic education tool. While this study leaves many questions unanswered as to how to best serve students during a study abroad experience, it brings the conversation to a point where we see the intersecting planes of study abroad and civic engagement. As the world becomes smaller and the problems at home come to our doorsteps, higher education can use innovative practices to affect diverse students in ways we can see when they enter post-college life. In short, a global experience can make a difference in our local setting.

Appendix 1: List of College Majors by Major Category

See Table 6.

Table 6 List of college majors by major category. *Source* ELS 2002 restricted dataset

Arts & humanities
Humanities
Architecture
Design and applied arts
Theology and religious vocations
Business
Business/management/marketing/related
Education
Education
Health & Human Services
Health care fields
Public administration and social services
Social Science
Social sciences
Psychology
History
Communications
Law and legal studies
STEM
Computer and information sciences
Engineering and engineering technology
Biological and physical science, science tech
Mathematics
Agriculture and natural resources
Other
General studies and other
Personal and consumer services
Manufacturing, construction, repair, and trans
Military technology and protective services

References

Allison, P. D. (2002). *Missing data*. Thousand Oaks, CA: Sage Publications.

Altbach, P. G., & Knight, J. (2007). The internationalization of higher education: Motivations and realities. *Journal of Studies of International Education, 11*(3–4), 290–305.

Armour, P., Burkhauser, R. V., & Larrimore, J. (2014). *Using the Pareto estimation to improve estimates of topcoded earnings (Center for Economic Studies 14–21)*. Washington, DC: Center for Economic Studies.

Association of American Colleges & Universities. (2007). *College learning for the new global century: A report from the National Leadership Council for Liberal Education America's Promise (LEAP)*. Washington, DC: AAC&U.

Astin, A. (1985). Student involvement: A developmental theory for higher education. *Journal of College Student Personnel, 25*, 297–308.

Astin, A. (1993). *What matters in college?*. San Francisco, CA: Jossey-Bass.

Astin, H. S., & Antonio, A. L. (2004). The impact of college on character development. In: J. C. Dalton, T. R. Russell, & S. Kline (Eds.), *Assessing character outcomes in college*. New directions for institutional research no. 122 (pp. 55–64). San Francisco, CA: Jossey-Bass.

Astin, A. W., & Astin, H. S. (2000). *Leadership reconsidered: Engaging higher education in social change*. Battle Creek, MI: W.K. Kellogg Foundation.

Astin, A. W., Sax, L. J., & Avalos, J. (1999). Long-term effects of volunteerism during the undergraduate years. *The Review of Higher Education, 22*(2), 187–202.

Austin, P. C. (2011). An introduction to propensity score methods for reducing the effects of confounding in observational studies. *Multivariate Behavioral Research, 46*, 399–424.

Austin, P. C., & Stuart, E. A. (2015). Moving towards best practices when using inverse probability of treatment weighting (IPTW) using the propensity score to estimate causal treatment effects in observational studies. *Statistics in Medicine, 34*, 3661–3679.

Azur, M. J., Stuart, E. A., Frangakis, C., & Leaf, P. J. (2011). Multiple imputation by chained equations: What is it and how does it work? *International Journal of Methods in Psychiatric Research, 20*(1), 40–49.

Barnhardt, C. S., Sheets, J. E., & Pasquesi, K. (2015). You expect what? Students' perceptions as resources in acquiring commitments and capacities for civic engagement. *Research in Higher Education, 56*, 622–644.

Becker, G. S. (1994). *Human capital: A theoretical and empirical analysis with special reference to education* (3rd ed.). Chicago: University of Chicago Press.

Berdan, S. N. (2015). Study abroad could be so much better. *The Chronicle of Higher Education*, April 13. Retrieved December 21, 2018 from https://www.chronicle.com/article/Study-Abroad-Could-Be-So-Much/229273.

Bowman, N. A. (2011). Promoting participation in a diverse democracy: A meta-analysis of college diversity experiences and civic engagement. *Review of Educational Research, 40*(1), 29–68.

Bowman, N. A., Denson, N., & Park, J. J. (2016). Racial/cultural awareness workshops and post-college civic engagement: A propensity score matching approach. *American Educational Research Journal, 53*(6), 1556–1587.

Brand, J. E. (2010). Civic returns to higher education: A note on heterogeneous effects. *Social Forces, 89*(2), 417–433.

Bringle, R. G., Student, M., Wilson, J., Clayton, P. H., & Steinberg, K. W. (2011). Designing programs with a purpose: To promote civic engagement for life. *Journal of Academic Ethics, 9*(2), 149–164.

Choy, S. (2001). *Students whose parents did not go to college: Postsecondary access, persistence, and attainment*. Washington, DC: National Center for Education Statistics.

Clark, I., Flaherty, T. B., Wright, N. D., & McMillen, R. M. (2009). Student intercultural proficiency from study abroad programs. *Journal of Marketing Education, 31*(2), 173–181.

Colby, A., & Ehrlich, T. (2000). Higher education and the development of civic responsibility. In T. Ehrlich (Ed.), *Civic responsibility and higher education* (pp. 21–42). Phoenix, AZ: American Council on Education/Oryx Press.

Cruce, T. M., & Moore, J. V. (2007). First-year students' plans to volunteer: An examination of the predictors of community service participation. *Journal of College Student Development, 48*(6), 655–673.

Deardorff, D. K. (2010). *Understanding the challenges of assessing global citizenship*. Strasbourg: Council of Europe.

Dewey, J. (1916). *Democracy and education*. Carbondale, IL: Southern Illinois University Press.

Doyle, W. R., & Skinner, B. T. (2017). Does postsecondary education result in civic benefits? *The Journal of Higher Education, 88*(6), 863–893.
Dwyer, M. M. (2004). More is better: The impact of study abroad program duration. *Frontiers: The Interdisciplinary Journal of Study Abroad, 10*, 151–163.
Engle, L., & Engle, J. (2003). Study abroad levels: Toward a classification of program types. *Frontiers: The Interdisciplinary Journal of Study Abroad, 9*, 1–20.
Finley, A., & McNair, T. (2013). *Assessing underserved students' engagement in high-impact practices*. Washington, DC: Association of American Colleges and Universities.
Gillespie, J., Braskamp, L., & Braskamp, D. (1999). Evaluation and study abroad: Developing assessment criteria and practices to promote excellence. *Frontiers: The Interdisciplinary Journal of Study Abroad, 5*(2), 101–127.
Goldstein, S. B. (2015). Predictors of preference for the exported campus model of study abroad. *Frontiers: The Interdisciplinary Journal of Study Abroad, 26,* 1–16.
Graham, J. W. (2009). Missing data analysis: Making it work in the real world. *Annual Review of Psychology, 69*, 549–576.
Heeringa, S., West, B. T., & Berglund, P. A. (2010). *Applied survey data analysis*. London: Chapman & Hall.
Hopkins, J. R. (1999). Study abroad as a form of experiential education. *Liberal Education, 85*(3), 36–41.
Hurtado, S., & DeAngelo, L. (2012). Linking diversity and civic-minded practices with student outcomes: New evidence from national surveys. *Liberal Education, 98*(2), 14–23.
Institute of International Education. (2018). Open doors data. Retrieved January 9, 2019 from https://www.iie.org/Research-and-Publications/Open-Doors/Data/US-Study-Abroad#.WGa_JvkrKUl.
Ishitani, T. T. (2003). A longitudinal approach to assessing attrition behavior among first generation students: Time-varying effects of pre-college characteristics. *Research in Higher Education, 44*(4), 433–449.
Ishitani, T. T., & McKitrick, S. A. (2013). The effects of academic programs and institutional characteristics on postgraduate civic engagement behavior. *Journal of College Student Development, 54*(4), 379–396.
Keen, C., & Hall, K. (2009). Engaging with difference matters: Longitudinal student outcomes of co-curricular service-learning programs. *The Journal of Higher Education, 80*(1), 59–79.
Keith, T. Z. (2015). *Multiple regression and beyond: An introduction to multiple regression and structural equation modeling*. London: Routledge.
Kilgo, C. A., Ezell Sheets, J. K., & Pascarella, E. T. (2015). The link between high-impact practices and student learning: Some longitudinal evidence. *Higher Education, 69*(4), 509–525.
King, P. M., & Baxter Magolda, M. B. (2005). A developmental model of intercultural maturity. *Journal of College Student Development, 46*(6), 571–592.
Kuh, G. D. (2008). *High-impact educational practices: What they are, who has access to them, and why they matter*. Washington, DC: Association of American Colleges and Universities.
Landon, A. C., Tarrant, M. A., Rubin, D. L., & Stoner, L. (2017). Beyond 'just do it': Fostering higher-order learning outcomes in short-term study abroad. *AERA Open, 3*(1), 1–7.
Lewin, R. (2009). Transforming the study abroad experience into a collective priority. *Peer Review, 11*(4), 8–11.
Lott, J. L., II. (2013). Predictors of civic values: Understanding student-level and institutional-level effects. *Journal of College Student Development, 54*(1), 1–16.
Manly, C. A., & Wells, R. S. (2015). Reporting the use of multiple imputation for missing data in higher education research. *Research in Higher Education, 56*(4), 397–409.
Mayhew, M. J., Rockenbach, A. N., Bowman, N. A., Seifert, T. A., Wolniak, G. C., Pascarella, E. T., et al. (2016). *How college affects students: 21st century evidence that higher education works* (Vol. 3). San Francisco, CA: Jossey-Bass.
McMahon, W. W. (2009). *Higher learning, greater good: The private and social benefits of higher education*. Baltimore, MD: Johns Hopkins University Press.
Murnane, R. J., & Willett, J. B. (2011). *Methods matter: Improving causal inference in educational and social science research*. Oxford: Oxford University Press.
Myers, C. B., Myers, S. M., & Peters, M. (2018). The longitudinal connections between undergraduate high impact curriculum practices and civic engagement in adulthood. *Research in Higher Education, 60*, 83–110. https://doi.org/10.1007/s11162-018-9504-4.
National Center for Education Statistics. (2019). Education longitudinal survey of 2002 (ELS: 2002). Retrieved January 10, 2019 from https://nces.ed.gov/surveys/els2002/.
Paige, R. M., Fry, G. W., Stallman, E. M., Josic, J., & Jon, J. E. (2009). Study abroad for global engagement: The long-term impact of mobility experiences. *International Education, 20*, 29–44.
Parker, R. N., & Fenwick, R. (1983). The pareto curve and its utility for open-ended income distributions in survey research. *Social Forces, 61*, 872–885.
Prentice, M. (2007). Social justice through service-learning: Community colleges as ground zero. *Equity and Excellence in Education, 40*, 266–273.

Putnam, R. D. (2000). *Bowling alone: The collapse and revival of the American community*. New York: Simon & Schuster.
Reynolds, C. L., & DesJardins, S. L. (2009). The use of matching methods in higher education: Answering whether attendance at a 2-year institution results in differences in educational attainment. *Higher Education: Handbook of Theory and Practice, 24*, 47–97.
Rhee, B. S., & Kim, A. (2011). Collegiate influences on the civic values of undergraduate students in the U.S. revisited. *Asia Pacific Education Review, 12*(3), 345–362.
Rosenbaum, P. R., & Rubin, D. B. (1983). Assessing sensitivity to an unobserved binary covariate in an observational study with binary outcome. *Journal of the Royal Statistical Society, Series B, 45*, 212–218.
Rubin, D. B. (1987). *Multiple imputation for nonresponse in surveys*. London: Wiley.
Salisbury, M. H., An, B. T., & Pascarella, E. T. (2013). The effect of study abroad on intercultural competence among undergraduate college students. *Journal of Student Affairs Research and Practice, 50*(1), 1–20.
Sax, L. J. (2008). *The gender gap in college: Maximizing the developmental potential of women and men*. San Francisco, CA: Jossey-Bass.
Schafer, J. L., & Kang, J. (2008). Average causal effects from nonrandomized studies: A practical guide and simulated example. *Psychological Methods, 13*, 523–539.
Schmidt, S., & Pardo, M. (2017). The contribution of study abroad to human capital formation. *The Journal of Higher Education, 88*(1), 135–157.
Schneider, B., Carnoy, M., Kilpatrick, J., Schmidt, W. H., & Shavelson, R. J. (2007). *Estimating causal effects using experimental and observational designs*. Washington, DC: American Educational Research Association.
Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. Belmont, CA: Wadsworth.
Simon, J., & Ainsworth, J. W. (2012). Race and socioeconomic status differences in study abroad participation: The role of habitus, social networks, and cultural capital. *International Scholarly Research Network*. https://doi.org/10.5402/2012/413896.
Smith, M. J., & Pangsapa, P. (2008). *Environment and citizenship: Integrating justice, responsibility and civic engagement*. London: Zed Books.
StataCorp, L. P. (2011). *Stata multiple-imputation reference manual: Release 12*. College Station, TX: Stata Press.
Stoner, K. R., Tarrant, M. A., Perry, L., Stoner, L., Wearing, S., & Lyons, K. (2014). Global citizenship as a learning outcome of educational travel. *Journal of Teaching in Travel & Tourism, 14*(2), 149–163.
Sutton, R. C., & Rubin, D. L. (2004). The GLOSSARI project: Initial findings from a system-wide research initiative on study abroad learning outcomes. *Frontiers: The Interdisciplinary Journal of Study Abroad, 10*, 65–82.
Tarrant, M. A., Rubin, D. L., & Stoner, L. (2014). The value added of study abroad: Fostering a global citizenry. *Journal of Studies in International Education, 18*(2), 141–161.
The National Task Force on Civic Learning and Democratic Engagement. (2012). *A crucible moment: College learning and democracy's future*. Washington, DC: Association of American Colleges and Universities.
Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of Educational Research, 45*(1), 89–125.
Toutkoushian, R. K., Stollberg, R. A., & Slaton, K. A. (2018). Talking 'bout my generation: Defining "first-generation college students" in higher education research. *Teachers College Record, 120*(4), 1–38.
United Nations Volunteers. (2016). *Volunteering as essential in achieving sustainable development: UNV responding to the 2030 agenda*. UNV discussion paper. Bonn: United Nations Volunteers.
Waibel, S., Petzold, K., & Rüger, H. (2018). Occupational status benefits of study abroad and the role of occupational specificity—A propensity score matching approach. *Social Science Research, 74*, 45–61.
Walpole, M. (2003). Socioeconomic status and college: How SES affects college experiences and outcomes. *The Review of Higher Education, 27*(1), 45–73.
Wolniak, G. C., Seifert, T. A., Reed, E. J., & Pascarella, E. T. (2008). College majors and social mobility. *Research in Social Stratification and Mobility, 26*, 123–139.
Yang, J. D. Y., & Schafer, J. L. (2007). Demystifying double robustness: A comparison of alternative strategies for estimating a population mean from incomplete data. *Statistical Science, 22*, 523–539.
Youniss, J., McLellan, J. A., & Yates, M. (1997). What we know about engendering civic identity. *American Behavioral Scientist, 40*(5), 620–631.
Zhou, H., Elliott, M. R., & Raghunathan, T. E. (2016). Synthetic multiple-imputation procedure for multistage complex samples. *Journal of Official Statistics, 32*(1), 231–256.