Comparing the Effects of Community Service and Service-Learning

Lori J. Vogelgesang and **Alexander W. Astin**
University of California, Los Angeles

This paper presents results from a study that compares course-based service-learning and generic community service. The study was a quantitative, longitudinal look at over 22,000 students at diverse colleges and universities. Student outcome comparisons are made related to values and beliefs, academic skills, leadership, and future plans. Of particular interest is the finding that connecting service with academic course material does indeed enhance the development of cognitive skills. Limitations and directions for future research are identified.

Service-learning represents a potentially powerful form of pedagogy because it provides a means of linking the academic with the practical. The more abstract and theoretical material of the traditional classroom takes on new meaning as the student "tries it out," so to speak, in the "real" world. At the same time, the student benefits from the opportunity to connect the service experience to the intellectual content of the classroom. By emphasizing cooperation, democratic citizenship and moral responsibility through service-learning, higher education connects to the wider community and enables students to contribute to the alleviation of society's urgent needs.

There is a mounting body of evidence documenting the efficacy of participating in service during the undergraduate years (Astin, Sax & Avalos, 1999; Batchelder & Root, 1994; Eyler, Giles & Braxton, 1997; Eyler & Giles, 1999; Hesser, 1995; Rhoads, 1997; Sax, Astin & Astin, 1996). Yet, though there is broad support for engaging students in community service, there has been some resistance to incorporating service into academic courses. The thinking has been that the place for service is outside the classroom—done on a student's "own time." Those who doubt that service-learning belongs in undergraduate curricula ask, What is the "value-added" for course-based service? For proponents of service-learning, it is important to be able to know whether engaging in service *as part of an academic course* has benefits over and above those of co-curricular community service.

This study directly compares service-learning and co-curricular community service, in order to identify the unique contributions, if any, of course-based service beyond those of community service.[1] We address these issues through a quantitative longitudinal study of a national sample of students at diverse colleges and universities.

Research that contributes to understanding the educational value of course-based service is important for several reasons. First, it contributes to our understanding of how student learning takes place. Second, such understanding directly addresses faculty concerns about the value of participating in service as part of a course. As a recent study of federally funded service-learning programs points out, "at the institutional level, the most serious obstacle [to expanding and sustaining service programs] is faculty resistance to service-learning. Faculty are reluctant to invest the extra time that teaching service-learning courses entails, and many are skeptical of the educational value of service-learning" (Gray et. al., 1999, p. 103). As a result of research on service-learning, faculty may not only gain a broader understanding of how learning takes place, but also be more likely to support service-learning if they see evidence documenting its educational value.

Method

In this article, we report the results of quantitative analyses which directly compare service-learning and community service. For this purpose we do a longitudinal comparison of three student groups: service-learning participants, "generic" community service participants, and non-service participants.

Participants

The data from this study were collected as part of the Cooperative Institutional Research Program (CIRP), with sponsorship from the American Council on Education. Conducted by the Higher Education Research Institute (HERI) at the University of California, Los Angeles, the CIRP annually collects data on entering first-year students using the Student Information Form (SIF), a questionnaire which is designed as a pre-test for longitudinal assessments of the impact of college on students. The College Student Survey (CSS), which provides longitudinal follow-up data, is typically

TABLE 1
Description of Study Sample by Institutional Type

Type of Institution	Number of Institutions	Number of Students	% of Sample
Public university	9	2,435	9.7
Private university	12	4,364	17.5
Public College	11	1,317	5.6
Non-sectarian private college	35	4,445	21.2
Catholic college	33	4,338	21.2
Protestant college	71	5,064	23.5
Predominantly Black College	1	111	.5
Public two-year college	3	64	.3
Private two-year college	2	98	.4
Total	177	22,236	100

administered four years after college entry.

This study uses 1998 CSS data, and draws on SIF data from 1991 through 1997. Most students who participated in the 1998 CSS completed their SIF in 1994 (69%). The remaining cases either entered college before 1994 (8%), or were at institutions that administer the CSS to students less than four years after college entry (22%). For instance, some schools administer the CSS to students at the end of their sophomore year. The total number of students in this study is 22,236. Detailed information on the data collection process for the 1998 CSS is available from HERI.

The sample represents most institutional types and selectivity levels, but two-year institutions are only marginally represented, and among four-year institutions, private four-year colleges are over-represented. Table 1 shows the number of institutions and students from each institutional type that participated in the study.

Measures

Principal Independent Variables

The main independent variables used in this study come from the 1998 CSS instrument: "generic" community service and "course-based" service (or service-learning). To measure the frequency of "generic" community service, students were asked: "Please indicate how often you performed volunteer work during the past year," and students could mark *frequently, occasionally,* or *not at all*.

To determine participation in service-learning, students were asked, "Since entering college, have you performed any community/ volunteer service? If yes, how was the service performed?" Students were instructed to mark all that applied: as part of a course or class; as part of a collegiate-sponsored activity (sorority, campus org., etc.); or independently through a non-collegiate group (church, family, etc.). Students who indicated they had performed community/ volunteer service as part of a course (regardless of whether they also marked another choice) were considered to have participated in service-learning.

These two service variables were coded into two partially overlapping variables:

- "Generic" service participation: participated in service (including service-learning) frequently (score 3), occasionally (score 2) or not at all (score 1).
- Service-learning: a dichotomous variable in which those who took one or more service-learning courses (score 2) were contrasted with non-service-learning participants (score 1) (i.e., non-service participants plus community service participants who were not in a service-learning course).

Note that these two variables differ only in the placement of the community service participants who did not take a service-learning course (see below for how these two variables were used in the analysis).

Dependent Variables

Existing research on community service influenced our choice of dependent variables. Since the study seeks to compare the effect of course-based service with the effect of "generic" community service, we chose outcomes that have been shown to be impacted by participation in any type of service.

Given the existing research, we chose eleven dependent measures, reflecting behavioral and cognitive outcomes as well as values and beliefs. Many of these items were pretested when students entered college. Dependent variables include:

Three measures of values and beliefs:

- degree of commitment to the goal of promoting racial understanding (4 = *essential*, 3 = *very important*, 2 = *somewhat important*, 1 = *not important*)

- degree of commitment to activism (see below)
- agreement with the statement "realistically, an individual can do little to bring about changes in our society" (4 = *agree strongly*, 3 = *agree somewhat*, 2 = *disagree somewhat*, 1 = *disagree strongly*);

Three measures of academic skills:

- GPA (grade-point-average)
- growth in writing skills ("compared with when you entered college as a freshman, how would you now describe your writing skills?" 5 = *much stronger*, 4 = *stronger*, 3 = *no change*, 2 = *weaker*, 1 = *much weaker*)
- critical thinking skills ("compared with when you entered college as a freshman, how would you now describe your ability to think critically?" 5 = *much stronger*, 4 = *stronger*, 3 = *no change*, 2 = *weaker*, 1 = *much weaker*);

Three measures of leadership:

- growth in interpersonal skills ("compared with when you entered college as a freshman, how would you now describe your interpersonal skills?" 5 = *much stronger*, 4 = *stronger*, 3 = *no change*, 2 = *weaker*, 1 = *much weaker*)
- leadership activities (see below)
- leadership ability ("compared with when you entered college as a freshman, how would you now describe your leadership abilities?" 5 = *much stronger*, 4 = *stronger*, 3 = *no change*, 2 = *weaker*, 1 = *much weaker*);

And two measures of future plans:

- career choice (see below)
- plans to engage in community service during the forthcoming year (see below).

Several of the dependent variables reflect responses to more than one survey item. Commitment to activism is a composite measure of the eight items listed below. The first seven items are responses (4 = *essential*, 3 = *very important*, 2 = *somewhat important,* 1 = *not important*) to the item "indicate the importance to you personally of each of the following:" The last item (about politics) is a response to, "for the activities listed below, please indicate how often you engaged in each during the past year" (3 = *frequently*, 2 = *occasionally*, 1 = *not at all*)

- influencing the political structure
- influencing social values
- helping others who are in difficulty
- becoming involved in programs to clean up the environment
- participating in a community action program
- keeping up to date with political affairs
- becoming a community leader
- frequency of discussing politics

The activism composite measure was factorially derived (alpha =.8021). The composite measure "leadership activities" was derived in an *a priori* manner, and includes the following dichotomous items:

- participating in student government,
- being elected to student office, and
- participating in leadership training

The composite measure of "plans to engage in community service the following year," also derived in an *a priori* manner, includes:

- plans to do volunteer work, and
- plans to participate in a community service organization.

Other Independent Variables

In addition to the two principal independent variables—"generic" community service participation and taking a service-learning course—several freshman "input" or "control" variables were included in the analysis to minimize the potentially biasing effect of characteristics such as previously held beliefs and high school activities (Astin, 1993). These input variables from the SIF also include pretests for most of the dependent measures on the CSS. In examining writing, critical thinking and leadership ability, we chose to use self-perceived change during college as the dependent measure. Although there is no pretest that would allow us to assess actual change in writing, critical thinking, or leadership ability, we were able to control for self-rated writing ability and leadership ability at the time of college entry. Similarly, since "plan to engage in community service next year" does not have a pre-test on the SIF, we used the freshman response to "plan to engage in volunteer work" (in college) as a proxy.

Since we were interested in isolating the effect of service during college as distinct from antecedent factors that might predispose the student to engage in service, we also controlled for freshman self-selection factors that are known to predict subsequent participation in service (Astin & Sax, 1998; Sax, Astin & Astin, 1996). These eight variables include: sex (women are more likely than men to participate), doing volunteer work in high school, tutoring another student, attending religious services, being a guest in teacher's home, commitment to participating in a community action program,

endorsing "to make more money" as a reason for attending college (which is a *negative* predictor), and self-rated leadership ability. We also controlled for freshman student characteristics such as religious preference (4 dichotomous variables), parental education and income, and race (8 dichotomous variables), because some of the outcome measures may be affected by these characteristics (Astin, 1993).

In addition to entering student characteristics, activities and attitudes, we controlled for a set of college environmental variables, reflecting differences in college size, type and control. This was done in order to make sure that any observed effects of community service and service-learning are not confused with the environmental effect of attending a given kind of college. The nine institutional variables used in the regression are measures of institutional selectivity, size, and seven dichotomous variables reflecting type/control combinations (private university, public university, public college, non-sectarian college, Catholic college, Protestant college, and Historically Black College/University).

Data Analyses

The purpose of the study was to see if participating in service as part of an academic course has any effects on each of the 11 outcome measures beyond those of "generic" community service. A secondary objective of the study is to replicate previously reported effects of service participation using a new sample of students and several new outcome measures.

For these purposes we utilized a method of causal modeling which uses blocked, stepwise linear regression analysis to study the changes in partial regression coefficients for all variables at each step in the analysis (Astin, 1991). The advantage of this form of analysis is that it allows us to observe and understand the effects of multicollinearity—especially involving the variables representing community service and service-learning—in a complex longitudinal data set.

The approach we used enables us to view each step or block in a stepwise regression as a new model, different from the previous steps or blocks because of the newly added variable in the model. We can see how the new variable or block of variables affects the relationship of the dependent variable to every other variable, both in and out of the model. All such changes in relationships can be seen because SPSS has a feature that computes the "Beta in" for each such variable. "Beta in" shows what the standardized regression coefficient for a nonentered variable would be if it were the variable entered on the next step. By tracking step-by-step changes in Betas (for variables already in the model) and in "Beta-ins" (for variables not yet in the model), we can understand how multicollinearity is affecting the entire data set. Because community service and service-learning are treated as independent measures in this study, we are able to examine closely how their relationship with the dependent variable is affected by the entry of every other variable (including each other).

For each of the eleven stepwise regressions in this study, there are thus three blocks of variables in the regression equation: (1) entering freshman (input) variables; (2) variables for college size and type; and (3) variables representing participation in generic community service and in service-learning. By placing all the entering freshman variables in the first block, we controlled for pre-test differences on each outcome measure as well as for each individual's predisposition to engage in service—the self-selection bias.

We entered our primary independent variables in the third block: "generic" community service and service-learning. As already noted, the service-learning variable is a dichotomous measure of whether the student participated in service as part of a course, and the "generic" community service reflects any kind of community service experience, including service-learning.

A separate analysis was conducted for each dependent measure. All subjects who were missing data on either the dependent measure, the pre-test of the dependent measure, or the primary independent variables (community service and service-learning) were excluded from the analysis. The final sample sizes thus ranged from 19,268 to 20,254. Analyses used a very stringent confidence level ($p < .001$) to select input variables in each regression, except for the career choice regressions, for which we used subsamples. The confidence levels for all regressions are noted in the results tables.

Results and Discussion

Of the 22,236 students in our study, 29.9% indicated that they had participated in course-based community service (service-learning), an additional 46.5% reported participation in some other form of community service (the sum of these two define "generic" community service participation), and 23.6% said they did not participate in any community service during college. Service-learning participants were more likely to say they performed volunteer work *frequently* (28.5%) compared to those who participated in non-course-based community service (22.7%).

Confirming earlier research (Astin & Sax, 1998), we found that there were certain characteristics that pre-dispose students to participation in community service. Among the strongest predictors of participation in community service are volunteering in high

school, being a woman, tutoring other students in high school, expressing a commitment to participate in community action programs, attending religious services, and not placing a high priority on making money.

In addition to confirming earlier research on the predictors of service, this study affirms some earlier findings about the *effects* of service participation. All eleven student outcomes are positively affected both by community service and by taking service-learning courses, even after "inputs" and "environments" (entering characteristics and institutional type) are controlled. We will briefly discuss these overall findings, and then address affective, academic, leadership and future plans outcomes in more detail.

In some cases—most notably with certain affective outcomes—community service appears to have a stronger effect than does service-learning.[2] Moreover, while both of these participation measures show significant partial correlations with the affective outcomes after inputs and college-type variables are controlled, for the self-efficacy and leadership outcomes the partial regression coefficient for service-learning shrinks to nonsignificance when generic service is entered into the equation. In other words, for these outcomes, the effect of service-learning is accounted for by the fact that students who engage in service-learning are also participating in generic community service.

In such comparisons between the effects of community service and service-learning, it is important to keep in mind a couple of considerations. First, service-learning is still an emerging form of pedagogy for faculty. Some faculty may not conduct service-learning well, or service placements might not work out for some students; we have not attempted to assess the quality of the service experience in these analyses. Given the range of such experiences that students might have, the possible effect of participating in a service-learning course may not be as strong as it might be if only "excellent" service-learning courses were analyzed.

Second, elements that make course-based service a potentially powerful pedagogy can also be found in some "generic" community service. For instance, co-curricular leadership development programs that require service might also have a strong reflection component (such as structured discussions with a student affairs professional). In such cases, one might expect the outcomes of such an experience to resemble outcomes that would be expected in service-learning courses, especially for the affective outcomes. These kinds of issues are important when comparing the effects of service-learning with those of community service.

Despite these considerations, there are a few outcomes for which service-learning is a stronger predictor than is community service. Further, for all academic outcomes as well as for some affective ones, participating in service as part of a course has a positive effect over and above the effect of generic community service. Service-learning participation is also a clearly superior predictor of choosing a service-related career, exhibiting a stronger effect than generic community service in almost all career-choice analyses. We now discuss each group of outcomes in more detail.

Values and Beliefs

We have intentionally chosen affective measures that reflect social concern and interest in civic engagement. In this way, our research directly addresses the extent to which community service and service-learning are tools that higher education can use to strengthen democracy by fostering a sense of civic responsibility and community participation in students.

Two of the three measures of values—"commit-

TABLE 2
Affective Outcomes: Community Service (c/s) and Service-Learning (s/l) Beta Values

	Simple r		Beta after Controlling for					
			Inputs		Institutional Environment		Service (Final step)	
Outcome	c/s	s/l	c/s	s/l	c/s	s/l	c/s	s/l
Commitment to Activism N=19,789	.28	.11	19	07	19	07	18	03
Promoting Racial Understanding N=19,439	.19	.10	12	06	12	06	11	04
Self-efficacy N=19,268	.15	.07	09	03	09	03	09	01*

Note: Unless indicated, all coefficients are significant at the $p < .001$ level of confidence. Decimals omitted from Beta coefficients. *$p < .05$

ment to promoting racial understanding" and "commitment to activism"—are significantly affected by participation in course-based service over generic community service. A third outcome—the belief that an individual can effect change in our society—is impacted by service, but service-learning shows a significant effect only until generic service is controlled. In other words, service-learning does strengthen a student's sense of social self-efficacy, but only because it provides an opportunity to do community service. In this connection, it is important to realize that service-learning *would* have shown a significant direct effect on this belief if generic community service had not been included in the analysis.[3] Table 2 shows the Beta values at the end of each regression block for the outcome measures.

That service-learning has an independent effect both on a student's commitment to promoting racial understanding and activism is noteworthy. This suggests that service-learning provides a concrete means by which institutions of higher education can educate students to become concerned and involved citizens. (Recall that our measure of activism includes such things as helping others who are in difficulty, influencing the political structure, influencing social values and participating in community action programs.) In short, while participating in community service positively affects these values, participating in course-based service can strengthen them even more.

Academic Outcomes

One of the most interesting findings of our study is the positive effect that participating in service has on all the academic outcomes: growth in critical thinking and in writing skills and college GPA (grade-point average). Table 3 shows the Beta values for community service and service-learning at the end of each of the three blocks of these regression analyses.

For all three academic outcomes, both community service and service-learning have a significant effect after controlling for "inputs" (including entering characteristics such as high school GPA) and institutional type. In other words, both kinds of service are associated with greater self-reported gains both in critical thinking and in writing skills, and higher college GPAs.

Of particular significance is the finding that service-learning has an effect on all these cognitive outcomes that is independent of the effect of community service. This is different from what we found with the affective outcomes just discussed, where the impact of service-learning is largely due to the fact that it provides an opportunity to engage in community service. In fact, for both writing skills and college GPA, the effect of service-learning is *stronger* than that of generic community service. Since these outcomes are academic in nature, one might expect that course-based service would provide benefits beyond those of generic community service. Though the differences are modest, it is important to keep in mind that we have not limited our analysis to what might be considered "ideal" service-learning courses (where academic learning and the service are both meaningful and connected in clear ways).

The reason that students who participate in service-learning courses exhibit higher GPAs is not entirely clear. Could it be that service-learning courses tend to be "easy" courses, that is, graded on a more lenient basis than other courses? While it may seem far-fetched to argue that a course or two will significantly improve a student's overall GPA, could it be that students who take service-learning courses tend to enroll in other courses that are "easy" as well?[4] Another explanation, of course, is that participating in service-learning helps to get students more engaged in the overall academic experience, thereby enhancing their overall academic performance. Clearly, these alternative interpretations need to be tested in further research.

TABLE 3
Academic Outcomes: Community Service (c/s) and Service-Learning (s/l) Beta Values

	Simple r		Beta after Controlling for					
			Inputs		Institutional Environment		Service (Final step)	
Outcome	c/s	s/l	c/s	s/l	c/s	s/l	c/s	s/l
Critical Thinking Skills N=20,129	.09	.07	07	06	06	04	06	03
Writing Skills N=19,974	.06	.07	04	06	03	04	02*	04
College GPA N=19,972	.08	.10	04	07	03	04	02	04

Note: Unless indicated, all coefficients are significant at the $p < .001$ level of confidence. Decimals omitted from Beta coefficients. *$p < .01$

TABLE 4
Leadership Measures: Community Service (c/s) and Service-Learning (s/l) Beta Values

	Simple r		Beta after Controlling for					
			Inputs		Institutional Environment		Service (Final step)	
	c/s	s/l	c/s	s/l	c/s	s/l	c/s	s/l
Outcome								
Leadership Ability N=20,254	.21	.09	18	07	17	05	17	02[a]
Leadership Activities N=20,046	.25	.10	18	06	17	05	17	02[b]
Interpersonal Skills N=20,124	.14	.07	11	05	10	03	10	01[c]

Note: Unless otherwise indicated, all coefficients are statistically significant at the $p < .001$ level of confidence. Decimals omitted from Beta coefficients.
[a] $.01 < p < .05$ [b] $.001 < p < .01$ [c] $p > .05$

Taken together, these findings present powerful evidence to suggest that *connecting service with academic course material does indeed enhance the development of cognitive skills.* In other words, even if the only goal of coursework is to strengthen students' cognitive development, this study suggests that service-learning has a place in the curriculum, and should not be relegated solely to co-curricular efforts.

Leadership Outcomes

The leadership measures we examined—growth in leadership *ability*, involvement in leadership *activities* (being elected to student government office, participating in student office or participating in leadership training) and self-perceived growth in interpersonal skills—do not appear to benefit more from a service-learning experience than from involvement in generic community service. Service-learning does not retain its significance once generic service enters the regression, primarily because the effect of generic service is so strong. (The final coefficients for service-learning reach the .01 level of confidence for leadership ability and leadership activities, but not the .001 level.) See Table 4 for the Beta values of the leadership measures at key points in the regression analysis.

One possible explanation of these results is that academic courses incorporating service-learning focus more on cognitive skill development (critical thinking, writing, etc.) than on the development of leadership and interpersonal skills. Another possible explanation is that co-curricular leadership development programs (in contrast to service-learning courses) may in many cases be designed and operated by the students themselves, thereby affording them an opportunity to develop leadership skills not present in most service-learning courses. Or, co-curricular service programs designed to enhance leadership development may be designed more like service-learning courses, thereby producing the same effects in students.

Career Outcomes and Plans for Future Service

Choosing a service-related career is more strongly affected by participating in community service and by service-learning than most other student outcomes. For the preliminary descriptive analyses, freshman career choices were grouped into two kinds of service-related careers:

- medical careers (clinical psychologist, dentist, nurse, optometrist, physician and therapist),
- non-medical service careers (elementary, secondary or college teacher, clergy, forester/conservationist, foreign service, law enforcement, school counselor, and principal).

Table 5 shows that students who participate in community service—regardless of freshman year career choice—are more likely than their nonparticipant classmates to say they plan to pursue a service-related career on the post-test. Moreover, those students who complete their service as part of a course exhibit the most dramatic shifts in career choice. For example, among those 3,942 students who indicated on the Freshman Survey that they were interested in pursuing a medical career, 71.3% of those who participated in service-learning confirmed their commitment to a service related career on the follow-up survey; of those who were engaged in generic community service, 64.4% maintained their initial commitment, while among other students only 54.7% maintained their freshman commitment to a service-related career. The differences among the 2,635 freshman "unde-

TABLE 5
Effects of Service Participation on Choosing a Service Career

Freshman Career Choice	Percent Choosing Service Career Four Years Later Among: Service-Learning Participants	Volunteers	Other Students
Medical	71.3	64.4	54.7
n=3942	(n=987)	(n=1226)	(n=357)
Non-Medical Service	78.7	68.2	60.6
N=3177	(n=1022)	(n=901)	(n=337)
Non-service	19.1	13.1	10.3
N=7604	(n=380)	(n=488)	(n=223)
"other"	43.5	28.6	24.4
N=1374	(n=176)	(n=178)	(n=85)
undecided	41.3	27.8	18.5
N=2635	(n=318)	(n=345)	(n=116)
All Freshmen	29.8	47.0	23.2
N=18,732	N=5,585	N=8,806	N=4,341

Note: N's in parentheses do not sum to row or column totals because of missing data. Decimals omitted from Beta coefficients.

cided" students are particularly remarkable: 41.3% of those who engaged in service-learning during college planned to pursue a service-related career on the follow-up, compared to only 18.5 of undecided students who didn't participate in service.

The regression results for "plans to participate in community service" mirror those for the values and beliefs we examined, in that generic community service is the stronger predictor. However, in this case, service-learning maintains a unique (though slight) direct affect on the outcome measure. Not surprisingly, participation in (any kind of) service during college is a powerful predictor of plans to do so in the future.

Career choice regression analyses are limited to the sub-group of students for whom we had post-test career choice information. Since the dependent measure is necessarily dichotomous (chose a service career or a non-service career), we made a decision to eliminate the cases who marked "other" or "undecided" on the follow-up survey.

Because the various career-choice groups looked so different in our preliminary descriptive analyses, we chose to run four separate regressions, one each for:

1. the entering group that planned to pursue service-related careers (medical and non-medical were combined),
2. the group planning non-service-related careers as freshmen,
3. the group who chose "other" on the freshman survey and
4. those who marked "undecided" on the freshman survey.

Table 6 shows the regression results for these four career-choice groups.

Service-learning appears to impact these career outcomes in two different ways. First, it affects students' career choices indirectly by providing an opportunity to participate in generic community service. This indirect effect is evidenced by the decrease in the Beta value for service-learning that occurs when community service enters the regression. For example, in the regression for undecided students, the coefficient for service-learning after controlling for inputs and institutional characteristics is .17, but drops to .13 when community service enters the regression. So service-learning has a unique ("direct") effect on initially undecided students, but also a weaker ("indirect") effect that is shared with community service. This same shared effect is evidenced in the case of generic community service, where the Betas show a decrease from .19 to .16 when service-learning enters the equation. However, the fact that the Betas for service-learning in all four groups retain most of their size even after community service is controlled suggests that service-learning's primary effect on career choice is a direct one.

Given that one's career choice often represents a lifelong commitment that consumes a large part of one's waking hours, there is perhaps no stronger expression of commitment to service than to choose a career that is service-based. Thus, the positive effects of service-learning on the student's career choice may well represent the most significant finding to emerge from this inquiry.

Limitations and Future Research

Perhaps the greatest limitation of this study is that

TABLE 6
Service & Career Plans: Community Service (c/s) and Service-Learning (s/l) Beta Values

	Simple r		Beta After Controlling for					
			Inputs		Institutional Environment		Service (Final step)	
	c/s	s/l	c/s	s/l	c/s	s/l	c/s	s/l
Outcome								
Service plans next yr. N=20,254; $p < .001$	.31	.09	28	06	26	07	16	02
service career SIF* service N=5,671; $p < .005$	.12	.13	12	09	12	09	11	07
service career SIF* non-service N=6,068; $p < .005$	.12	.14	12	09	11	08	09	05
service career SIF* "other" N=814; $p < .01$	.19	.18	13	15	13	15	10	15
service career SIF* "undecided" N=1,662; p < .01	.23	.20	19	17	19	17	16	13

* SIF = freshman survey. *Note:* Decimals omitted from Beta coefficients.

the quality of the community service and classroom experiences are not measured, and as Eyler and Giles' (1999) research suggests, "the quality of the service-learning makes a difference" (p. 187). Echoing other researchers and practitioners (Mabry, 1998; Zlotkowski, 1996), we suggest that future research focus on the specifics of the service experience.[5] For instance, how do factors such as training, type of experience, and length of experience affect student development?

Second, this study examines outcomes from the perspective of the student (self-reported measures). Research that provides different perspectives—faculty assessment of learning or standardized assessments—will also benefit our understanding of how learning takes place. The self-efficacy measures in this study are not intended to substitute for independently assessed skills, though one would expect the two to be related (e.g., one who believes he/she has good leadership skills is likely to become more effective than one who doesn't). Research examining the validity of self-reported growth in cognitive learning in general suggests that self-reported growth is related to cognitive constructs (Anaya, 1999). A more detailed study of critical thinking in particular offers support for the use of self-reports to measure this construct (Tsui, 1999).

The analyses conducted on the academic outcomes in this study only begin to enhance our understanding of how students participating in service learning can benefit from the experience. There is still a need to understand how the learning of various disciplines might be enhanced by service-learning. This concern is being addressed directly by the American Association for Higher Education (AAHE) Series on Service-Learning in the Disciplines. There is also a need to better understand how different kinds of students might benefit (e.g. does race or gender matter?), and the benefits of placing a service-learning experience at different points in a student's college experience (e.g. first-year experience, in the major, or throughout the college years).

Conclusion

The results of this study add weight to the belief that course-based service has benefits over and above those of "generic" community service. Because it is a longitudinal study, we have been able to control for many student and institutional characteristics which predispose students to participate in service, and which may shape the service-learning experience. Even when such student and institutional characteristics were controlled, service-learning has a significant effect on all eleven outcomes examined.

Notes

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[1] For this study, we define service-learning as service done as part of a course or class.

[2] In most cases this difference may be attributed simply to the greater variance in generic community service.

[3] Here we have a clear demonstration of the "multicollinearity problem:" Our conclusion about whether a particular variable (i.e., course-based service-learning) "affects" any given outcome may depend on what *other* variables (i.e., generic service) are included in the analysis of that outcome.

[4] Further analyses of these data suggest that college major does not play a significant mediating role between service-learning and college GPA (Astin, Vogelgesang, Ikeda, and Yee., 2000).

[5] For a discussion of the effects of reflection on this particular set of students, see Astin, Vogelgesang, Ikeda & Yee (2000).

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Authors

LORI J. VOGELGESANG is director of the Center for Service Learning Research and Dissemination at the Higher Education Research Institute (HERI), University of California, Los Angeles. She has conducted research and evaluation of service learning programs for HERI and for RAND.

ALEXANDER W. ASTIN is Allan M. Cartter Professor of Higher Education and Director of the Higher Education Research Institute at the University of California, Los Angeles.