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**The Impacts of Regular
Upward Bound: Results
from the Third Follow-Up
Data Collection**

April 2004

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CONTENTS

Chapter	Page
ACKNOWLEDGMENTS	iii
EXECUTIVE SUMMARY	xv
I INTRODUCTION	1
A. CONTEXT AND PURPOSE OF UPWARD BOUND	1
B. RESEARCH DESIGN	4
1. Selection of Upward Bound Projects and Random Assignment	4
2. Data Collection	6
3. Estimation of Program Effects	7
4. Context for Interpreting Program Effects	9
5. Subgroup Analysis	11
II UPDATE ON PROGRAM PARTICIPATION, UPWARD BOUND COURSE-TAKING AND EFFECTS ON HIGH SCHOOL OUTCOMES	15
A. EXPOSURE TO UPWARD BOUND	15
1. Participation	15
2. Duration	15
3. Receipt of Academic and Nonacademic Services	16
B. RECEIPT OF SUPPLEMENTAL SERVICES	21
C. THE EFFECT OF UPWARD BOUND ON HIGH SCHOOL CREDITS, GRADE POINT AVERAGE AND COMPLETION	24
1. The Effect of Upward Bound on High School Credits, Grade Point Average and Completion for All Students	24
2. The Effect of Upward Bound on High School Credits, Grade Point Average and Completion for Selected Subgroups	25

CONTENTS (continued)

	Page
III THE EFFECT OF UPWARD BOUND ON STUDENTS' POSTSECONDARY EDUCATION EXPERIENCES.....	31
A. THE EFFECT OF UPWARD BOUND ON POSTSECONDARY ENROLLMENT AND PERSISTENCE FOR ALL STUDENTS.....	32
1. The Effect of Upward Bound on Postsecondary Enrollment.....	34
2. The Effect of Upward Bound on Postsecondary Persistence.....	34
B. THE EFFECT OF UPWARD BOUND ON POSTSECONDARY ENROLLMENT AND PERSISTENCE FOR SELECTED SUBGROUPS	35
1. Subgroups Defined by Educational Expectations.....	35
2. Subgroups Defined by Academic Risk.....	40
3. Subgroups Defined by the Eligibility Criteria for Upward Bound	41
4. Subgroups Defined by Race and Ethnicity	42
5. Subgroups Defined by the Sex of the Student	50
6. Subgroups Defined by the Likelihood of Being Selected to Participate in Upward Bound.....	50
C. THE EFFECT OF UPWARD BOUND ON COLLEGE ENGAGEMENT.....	51
IV THE EFFECT OF LONGER UPWARD BOUND PARTICIPATION AND COMPLETION ON POSTSECONDARY ENROLLMENT AND PERSISTENCE.....	59
A. RESEARCH QUESTIONS	60
B. RESEARCH METHODS	61
C. THE EFFECT OF LONGER PARTICIPATION AND COMPLETION	64
1. The Effect of Longer Participation	65
2. The Effect of Program Completion.....	65
3. The Effect of Longer Participation and Program Completion on Enrollment at Four-Year Institutions	66
4. The Effect of Longer Participation and Program Completion for Subgroups Defined by Academic Risk.....	68
D. INTERPRETATION OF THE FINDINGS.....	69
REFERENCES	73

CONTENTS (*continued*)

	Page
APPENDIX A: SAMPLE DESIGN, UNIT NONRESPONSE AND WEIGHTS	A-1
APPENDIX B: BASELINE CHARACTERISTICS OF THE TREATMENT AND CONTROL GROUPS, THIRD FOLLOW-UP SURVEY RESPONDENTS	B-1
APPENDIX C: PROGRAM EFFECTS AND STANDARD ERRORS	C-1
APPENDIX D: THE EFFECT OF UPWARD BOUND ON HIGH SCHOOL OUTCOMES BY SELECTED SUBGROUPS	D-1
APPENDIX E: THE EFFECT OF UPWARD BOUND ON COLLEGE ENGAGEMENT BY SELECTED SUBGROUPS.....	E-1
APPENDIX F: METHODS USED TO ESTIMATE THE EFFECTS OF ADDITIONAL UPWARD BOUND PARTICIPATION	F-1
APPENDIX G: WEIGHTED STANDARD DEVIATIONS FOR ALL OUTCOME VARIABLES.....	G-1
APPENDIX H: DATA COLLECTION	H-1
APPENDIX I: SAMPLE SIZES AND STANDARD ERRORS FOR REPORTED IMPACT ESTIMATES.....	I-1

TABLES

Table	Page
I.1 RESPONSE RATES	7
II.1 DURATION AND SURVIVAL ESTIMATES	17
II.2 UPWARD BOUND ACADEMIC AND ACTIVITY SESSIONS: ALL PARTICIPANTS	18
II.3 UPWARD BOUND ACADEMIC AND ACTIVITY SESSIONS: PROGRAM COMPLETERS	22
II.4 RECEIPT OF SUPPLEMENTAL SERVICES.....	23
II.5 IMPACT OF UPWARD BOUND ON HIGH SCHOOL CREDITS, GRADES AND GRADUATION.....	26
II.6 IMPACT OF UPWARD BOUND ON HIGH SCHOOL CREDITS, GRADES AND GRADUATION FOR STUDENTS WITH HIGHER AND LOWER EDUCATIONAL EXPECTATIONS.....	27
II.7 IMPACT OF UPWARD BOUND ON HIGH SCHOOL CREDITS, GRADES AND GRADUATION BY STUDENTS' AT-RISK STATUS	29
III.1 IMPACT OF UPWARD BOUND ON POSTSECONDARY ENROLLMENT AND CREDITS, INCLUDES ALL SELF-REPORTED POSTSECONDARY ENROLLMENT.....	36
III.2 IMPACT OF UPWARD BOUND ON POSTSECONDARY ENROLLMENT AND CREDITS, EXCLUDES UNVERIFIED SELF-REPORTED ENROLLMENT	37
III.3 IMPACT OF UPWARD BOUND ON POSTSECONDARY ENROLLMENT AND CREDITS FOR STUDENTS WITH HIGHER AND LOWER EDUCATIONAL EXPECTATIONS, INCLUDES ALL SELF-REPORTED POSTSECONDARY ENROLLMENT.....	38
III.4 IMPACT OF UPWARD BOUND ON POSTSECONDARY ENROLLMENT AND CREDITS FOR STUDENTS WITH HIGHER AND LOWER EDUCATIONAL EXPECTATIONS, EXCLUDES UNVERIFIED SELF-REPORTED ENROLLMENT.....	39

TABLES (continued)

Table	Page
III.5 IMPACT OF UPWARD BOUND ON POSTSECONDARY ENROLLMENT AND CREDITS BY STUDENTS' AT-RISK STATUS, INCLUDES ALL SELF-REPORTED POSTSECONDARY ENROLLMENT	44
III.6 IMPACT OF UPWARD BOUND ON POSTSECONDARY ENROLLMENT AND CREDITS BY STUDENTS' AT-RISK STATUS, EXCLUDES UNVERIFIED SELF-REPORTED ENROLLMENT.....	45
III.7 IMPACT OF UPWARD BOUND ON POSTSECONDARY ENROLLMENT AND CREDITS BY STUDENTS' ELIGIBILITY STATUS, INCLUDES ALL SELF-REPORTED POSTSECONDARY ENROLLMENT	46
III.8 IMPACT OF UPWARD BOUND ON POSTSECONDARY ENROLLMENT AND CREDITS BY STUDENTS' ELIGIBILITY STATUS, EXCLUDES UNVERIFIED SELF-REPORTED ENROLLMENT.....	47
III.9 IMPACT OF UPWARD BOUND ON POSTSECONDARY ENROLLMENT AND CREDITS FOR AFRICAN AMERICAN, WHITE AND HISPANIC STUDENTS, INCLUDES ALL SELF-REPORTED POSTSECONDARY ENROLLMENT	48
III.10 IMPACT OF UPWARD BOUND ON POSTSECONDARY ENROLLMENT AND CREDITS FOR AFRICAN AMERICAN, WHITE AND HISPANIC STUDENTS, EXCLUDES UNVERIFIED SELF-REPORTED ENROLLMENT ...	49
III.11 IMPACT OF UPWARD BOUND ON POSTSECONDARY ENROLLMENT AND CREDITS FOR MALE AND FEMALE STUDENTS, INCLUDES ALL SELF-REPORTED POSTSECONDARY ENROLLMENT	52
III.12 IMPACT OF UPWARD BOUND ON POSTSECONDARY ENROLLMENT AND CREDITS FOR MALE AND FEMALE STUDENTS, EXCLUDES UNVERIFIED SELF-REPORTED ENROLLMENT.....	53
III.13 IMPACT OF UPWARD BOUND ON POSTSECONDARY ENROLLMENT AND CREDITS BY THE LIKELIHOOD OF ADMISSION TO UPWARD BOUND, INCLUDES ALL SELF-REPORTED POSTSECONDARY ENROLLMENT	54
III.14 IMPACT OF UPWARD BOUND ON POSTSECONDARY ENROLLMENT AND CREDITS BY THE LIKELIHOOD OF ADMISSION TO UPWARD BOUND, EXCLUDES UNVERIFIED SELF-REPORTED ENROLLMENT	55
III.15 IMPACT OF UPWARD BOUND ON COLLEGE ENGAGEMENT	57

TABLES (continued)

Table		Page
IV.1	DURATION OF UPWARD BOUND PARTICIPATION AND COMPLETION RATES, EXCLUDING NO-SHOWS	61
IV.2	CHARACTERISTICS OF UPWARD BOUND PARTICIPANTS WHO ENTERED IN NINTH OR TENTH GRADE BY PARTICIPATION DURATION AND COMPLETION STATUS.....	62
IV.3	IMPACT OF AN ADDITIONAL YEAR OF UPWARD BOUND PARTICIPATION ON POSTSECONDARY ENROLLMENT AND CREDITS.....	66
IV.4	IMPACT OF UPWARD BOUND COMPLETION ON POSTSECONDARY ENROLLMENT AND CREDITS.....	67
IV.5	IMPACT OF AN ADDITIONAL YEAR OF UPWARD BOUND PARTICIPATION ON POSTSECONDARY ENROLLMENT AND CREDITS BY STUDENTS' AT-RISK STATUS	68
IV.6	IMPACT OF UPWARD BOUND COMPLETION ON POSTSECONDARY ENROLLMENT AND CREDITS BY STUDENTS' AT-RISK STATUS.....	69

FIGURES

Figure		Page
1	IMPACT OF UPWARD BOUND ON POSTSECONDARY ENROLLMENT, BY LEVEL OF EDUCATIONAL EXPECTATIONS	xix
II.1	UPWARD BOUND ACADEMIC SESSIONS TAKEN BY PARTICIPANTS	19
II.2	UPWARD BOUND NONACADEMIC ACTIVITIES BY PARTICIPANTS.....	20

Executive Summary

Policymakers have long been concerned about the disparities in college attendance between more and less advantaged groups of students. Data from the 1990s indicate that students from high-income families were more than twice as likely to attend a four-year college or university as students from low-income families, and this difference is not surprising given disparities in college preparation between high- and low-income high school students. While the vast majority of high-income high school graduates are qualified to attend a four-year college—based on grades and test scores—only half of low-income students have adequate qualifications (Lutz and Carroll, 1998).

Upward Bound is one of the largest and longest running federal programs designed to help economically disadvantaged students prepare for, enter and succeed in college. Upward Bound is “designed to generate skills and motivation necessary for success in education beyond high school among young people from low-income backgrounds and inadequate secondary school preparation” (Public Law 90-222, Dec. 23, 1967). About 52,000 students now participate in 727 regular Upward Bound projects around the country. At least two-thirds of each project’s participants must be both low-income and potential first-generation college students. Students typically enter the regular Upward Bound program while in ninth or tenth grade. Although students may participate in Upward Bound through the summer following twelfth grade (for three to four years total), participants typically remain in Upward Bound for about 21 months. Projects provide students with a variety of services, including instruction, tutoring and counseling. In addition to regularly scheduled meetings throughout the school year, projects also offer an intensive instructional program that meets daily for about six weeks during the summer. The vast majority of projects are hosted by four-year colleges.

Since December 1991, Mathematica Policy Research, Inc., (MPR) has been conducting the national evaluation of Upward Bound for the U.S. Department of Education (ED). The evaluation has focused on program implementation issues and the effects of the program on student outcomes. The “impact study” is designed to measure the impacts or effects of regular Upward Bound on student outcomes, and it is based on a longitudinal evaluation in which eligible applicants from a nationally representative sample of projects were randomly assigned to Upward Bound or to a control group. Results from the implementation study were presented in Moore (1997a) and effects of Upward Bound on high school outcomes were presented in Myers and Schirm (1999). The results summarized here are based on the national evaluation’s third follow-up data collection, which was completed in 2000. Because the entire sample of students was beyond high school age by that time, the report includes updated findings on the effects of Upward Bound on high school outcomes. In addition, based on data covering the first few years after sample members left high school, the report addresses the following research questions:

- What effect does Upward Bound have on students’ postsecondary experiences?
- Who benefits most from Upward Bound?
- What is the association between staying in Upward Bound and student outcomes?

Because few other programs provide the same intensive experience as regular Upward Bound, the opportunity to participate in regular Upward Bound is an opportunity for students to get additional help in preparing for college. However, because more intensive programs are costlier than less intensive ones, regular Upward Bound is considerably more expensive than most other precollege programs. The evaluation was designed to test whether students in regular Upward Bound experienced better postsecondary outcomes than if they had participated in other available, but typically less intensive, precollege programs.

Methods and Data

Methods

The first two research questions were addressed by comparing the treatment group to the control group. Because eligible students were randomly assigned to these two groups, and because only treatment students were offered the opportunity to participate in Upward Bound, the differences between the two groups reveal the value-added of regular Upward Bound above and beyond the other programs and services that are available. Upward Bound operates in a service-rich environment, and students who are eligible for Upward Bound may participate in several precollege programs. Therefore, it is not surprising that many of the students assigned to both the treatment and control groups participate in precollege services other than regular Upward Bound. In fact, it is critical to the scientific validity of the study that students in the treatment and control groups have the same opportunities to pursue other services as the typical eligible applicant to regular Upward Bound. This report compares how eligible applicants fare when they are offered an opportunity to participate in the program to how they would fare without that opportunity.

The third research question cannot be addressed using random assignment. To assess the effect of staying in the program for longer periods, the national evaluation used statistical methods that attempted to approximate the rigor of random assignment and, in doing so, allowed us to examine the association between length of participation and student outcomes. Students who stayed in the program for shorter periods of time were statistically matched with similar students who remained in the program for longer periods. Similarly, students who did not complete Upward Bound (did not stay until the spring of their senior year of high school) were matched with similar students who completed the program. Because the matching procedure may not have adjusted for all relevant differences between students who participated for different lengths of time, the results must be interpreted with greater caution than used when assessing results based on random assignment.

Data Sources

Several data sources have informed this report. A nationally representative sample of 67 Upward Bound projects hosted by two- and four-year colleges was selected for the evaluation. In 1993, a survey of these projects was conducted. From 1992 to 1994, a baseline survey was conducted to obtain information on students that applied to these projects. During the same period, eligible applicants in each project were randomly assigned to either a treatment group or a control group. About 1,500 students were assigned to the treatment group, and about 1,300 were assigned to the control group. In 1994-1995, 1996-1997 and 1998-2000, follow-up surveys

were conducted. The response rates for these surveys were 97 percent, 86 percent and 81 percent, respectively. High school and postsecondary transcripts were also collected. Finally, Upward Bound project staff reported on the participation of students in the program.

When information was most recently collected on Upward Bound, the majority of students in the study had been out of high school for about two years. Because few students had an opportunity to complete college by that time, this report focuses on how Upward Bound affects preparation for college, college enrollment, the highest level of postsecondary education attended and initial progress in college.¹ Subsequent reports will examine college completion.

Overview of Major Findings

Findings in this report suggest that for the average student, Upward Bound (1) increased the number of high school math credits earned by participants, (2) did not affect other measures of high school academic preparation, (3) may have increased enrollment at four-year institutions and (4) did not affect enrollment at postsecondary institutions more generally when all types of postsecondary institutions are considered. Perhaps the most notable effect of Upward Bound was to increase the likelihood of attending four-year colleges and universities relative to other postsecondary institutions for students with lower educational expectations.² Finally, Upward Bound would have had larger effects if students remained in the program for longer periods of time. Below, we describe the findings in greater detail.

Effects on Postsecondary Outcomes

- *Upward Bound had no effect on overall enrollment or total credits earned at postsecondary institutions, but it may have increased enrollment in four-year postsecondary institutions.* Almost three-fourths of students in both the treatment group and the control group attended postsecondary institutions, broadly defined to include four-year institutions, two-year institutions, vocational schools and other postsecondary institutions. While the program may have increased the percent of students attending four-year colleges by about 6 percentage points, the evidence is not conclusive (see Chapter III).

¹ In this report, the highest level of postsecondary education is defined based on the types of postsecondary institutions that students attended. Students who had attended a four-year college or university were classified as having enrolled in a four-year institution. Students who had not attended a four-year college or university but had attended a two-year college were classified as having enrolled in a two-year institution. Students who had not attended either a four-year college or university or a two-year college but had attended a vocational school after high school were classified as having enrolled in a vocational postsecondary institution.

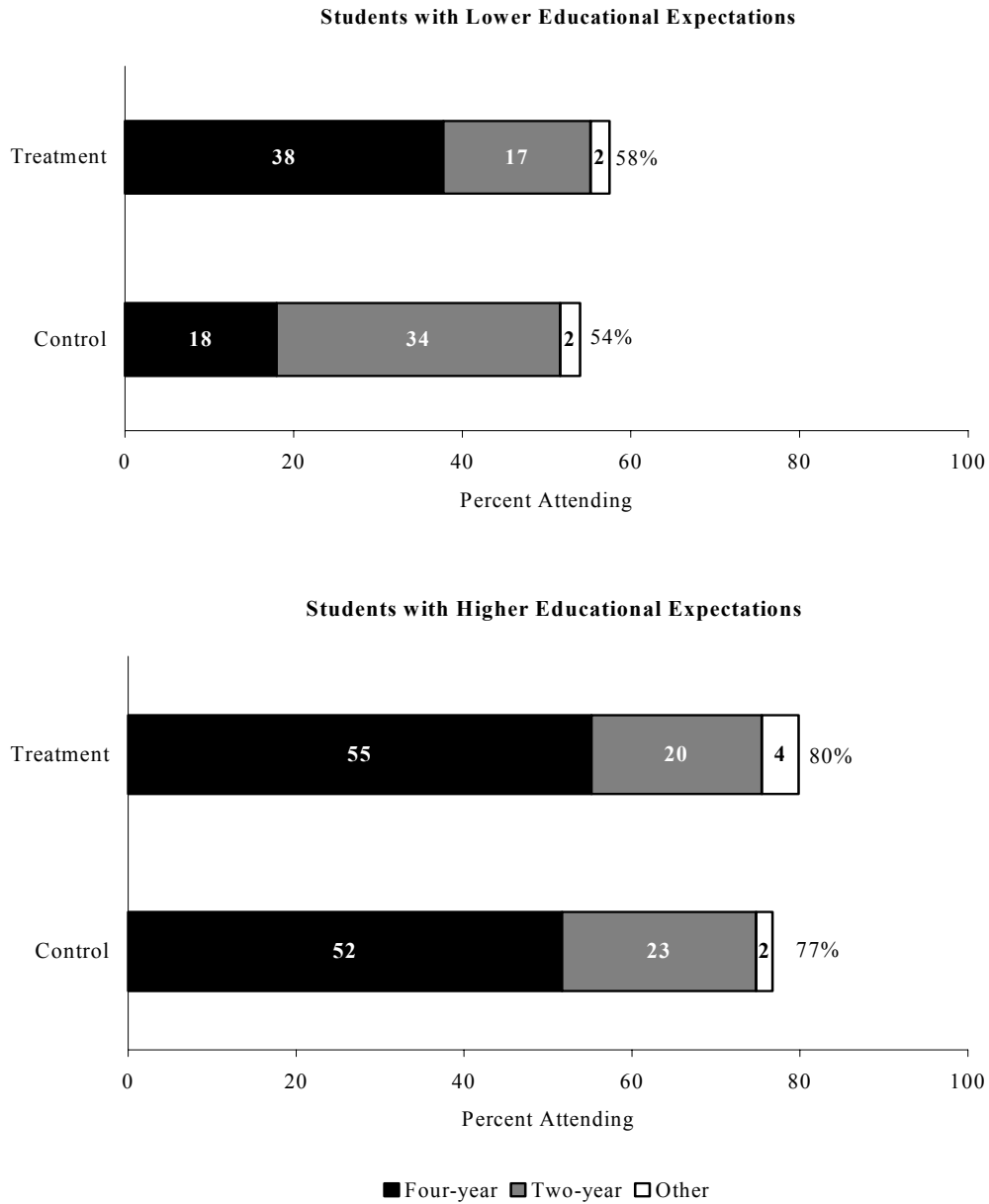
² Lower educational expectations were defined as expecting to complete less than a bachelor's degree and higher expectations included completing a bachelor's degree or higher. About 20 percent of the eligible program applicants had lower expectations.

- ***Upward Bound had a large effect on enrollment at four-year colleges for students who had lower educational expectations.*** For students who had lower educational expectations when they applied to the program, Upward Bound more than doubled the percent attending four-year colleges and universities from 18 percent to 38 percent (see Figure 1). For students with higher educational expectations, Upward Bound had no effect on enrollment at four-year colleges.
- ***Upward Bound had a large effect on credits earned at four-year colleges by students who had lower educational expectations.*** Upward Bound more than doubled the number of credits that students with lower educational expectations earned in four-year colleges from 11 credits to 22 credits. However, Upward Bound had no effect on credits earned at four-year colleges by those with higher expectations.
- ***Staying in Upward Bound for longer periods is associated with better student outcomes.*** Our findings suggest that Upward Bound participants would reap larger benefits from additional participation. Among students who applied for Upward Bound in ninth or tenth grade and left the program before the end of twelfth grade, program completion may increase the rate at which they attend postsecondary institutions by as many as 17 percentage points. For each of the same students, program completion may result in 16 additional postsecondary credits. Furthermore, for students who participated for two years or less, each additional year of Upward Bound may increase the rate at which participants attended postsecondary institutions by about 9 percentage points. Most of the increase in postsecondary attendance and credits earned is attributable to higher enrollment rates in four-year colleges and universities. However, these findings are based on nonexperimental methods and are therefore less reliable than other findings reported in this summary (see Chapter IV for more details).

Effects on High School Outcomes

- ***Upward Bound had limited or no effects on total high school credits or grades.*** Upward Bound had no effect on total credits and a small effect on credits earned in high school math. The program increased the number of math credits earned by 0.2 credits; that is, about one in five students completed an additional high school math course because of their exposure to Upward Bound. Upward Bound had no effect on credits earned in science, English, social studies or foreign language courses. Also, the program had no effect on honors and Advanced Placement credits, grades earned in high school or high school graduation.
- ***Upward Bound increased high school credits earned by students with lower educational expectations.*** For students with lower educational expectations, Upward Bound increased the number of credits earned in the five core academic subjects together by 2.0 credits, and it increased credits earned in two of those subjects individually—math and foreign languages—by 0.5 credits and 0.3 credits, respectively. Upward Bound also increased the number of credits earned in honors and Advanced Placement courses for students with lower expectations.

Figure 1
 Impact of Upward Bound on Postsecondary Enrollment,
 by Level of Educational Expectations



Upward Bound had a significantly larger effect on the likelihood of attending a four-year postsecondary institution for students who did not expect to complete a bachelor's degree when they entered Upward Bound than for students who expected to complete a bachelor's degree at that time.

Source: pst-hiexp.log and pst-loexp.log

I. Introduction

A. Context and Purpose of Upward Bound

Enrolling in college and completing a degree are important milestones for many young adults. Besides potential long-term benefits from college attendance and completion, such as increased wages, there are potential societal benefits that include reducing the burden on social service agencies and the criminal justice system, increasing local, state and federal tax revenues and, as some suggest, producing a more educated society that is better able to participate in a democratic form of government (see, for example, Decker et al. 1997; Oakes et al. 2000).

Although completion of a college education is important from both the perspective of the individual and society, many potential college students lack the skills or the resources needed to enter college or complete a college degree. Those who face some of the greatest barriers to pursuing a postsecondary education often include young adults from low-income families and families where neither parent has acquired a bachelor's degree; often, these same students are students of color (U.S. Department of Education 2001). Related to the low postsecondary enrollment rates for these students is the well-documented relationship between family socioeconomic status, race, ethnicity and high school academic preparation (see, for example, Coleman et al. 1966; Jencks et al. 1972; Mosteller and Moynihan 1972; Congressional Budget Office 1987; Jacobson et al. 2001). Although progress has been made to close the gap in achievement test scores between disadvantaged and more-advantaged students, large differences remain. For example, on achievement tests as reported by the National Assessment of Educational Progress, about 84 percent of African American students had scores that were lower than the typical white youth (Jencks and Phillips 1998). Furthermore, data from the National Education Longitudinal Study (1988-94) suggest that only half of low-income high school

graduates are academically prepared to attend four-year colleges or universities (Lutz and Carroll 1998).

Since the War on Poverty started in the 1960s, many federal, state, community and privately-funded initiatives have been undertaken to alleviate some of the barriers to attending college and completing a degree faced by low-income, first-generation college students and minority students (see, for example, Adelman 2000; Swail and Perna 2000; James, Jurich, and Estes 2001). Programs range from the Equity 2000, Advancement Via Individual Determination (AVID) and Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP), which are integrated with the regular high school or middle school experiences, to programs that more often supplement the high school experience, such as Upward Bound, Talent Search and I Have a Dream. A review of published reports of these programs suggests that few have been subjected to rigorous evaluation: the effectiveness of these approaches is generally unknown.³

In December 1991, the U.S. Department of Education initiated a rigorous, longitudinal evaluation conducted by Mathematica Policy Research (MPR) and its subcontractors, the Educational Testing Service, Westat, Decision Information Resources and Branch Associates, Inc., to determine whether the intensive strategy used by Upward Bound enables students to perform better in high school and subsequently to enter and complete college. This report summarizes the effect of the regular Upward Bound program on students' high school and early postsecondary experiences.⁴

³ An earlier study of Upward Bound by the Research Triangle Institute (Burkheimer et al. 1979) is one of the more rigorous evaluations; however, it relied on comparison group methods that may suffer from "selection bias" of the type described on page 6 of this report.

⁴ Within Upward Bound, three programs operate: regular Upward Bound, Veterans Upward Bound and Upward Bound Math and Science. In 2001, there were 727 regular Upward Bound projects serving 51,641 students, 47 Veterans Upward Bound projects serving 9,936 participants, and 121 Upward Bound Math and Science projects serving 6,003 students.

Upward Bound is designed to “generate skills and motivation necessary for success in education beyond high school among young people from low-income backgrounds and inadequate secondary school preparation” (Public Law 90-222, Dec. 23, 1967). In FY 2001, with federal funds of more than \$250 million, the regular Upward Bound program served about 51,600 students in 727 projects nationwide. The average cost per student served was about \$4,800 per year, and these expenditures provided a variety of services. Most Upward Bound projects emphasized academic preparation for attending and completing college and are best characterized along the following dimensions:

- ***Upward Bound offers a full range of precollege services.*** During the academic year participants engage in activities on a regular basis, often weekly; during the summer, they attend an intensive, full-day academic program that typically lasts for about six weeks.
- ***Upward Bound courses and activities emphasize academics.*** A key focus of program activities is to help students acquire academic proficiencies in challenging college-prep courses. Projects often require students to take Upward Bound courses during both the summer and school year. Also, almost all projects provide students with tutoring for high school course work and help to prepare them for college entrance exams.
- ***Upward Bound provides many activities in addition to academic course work.*** Projects complement academic offerings with a wide range of activities. Students attend plays, visit museums, tour college campuses and learn about and apply for financial aid.

Previous reports from this evaluation have documented the operations of Upward Bound projects (Moore 1997a), the characteristics of students served by Upward Bound projects (Myers and Schirm 1997) and the program’s short-term effects on students’ high school experiences (Myers and Schirm 1999). This report updates previous findings and provides a more complete picture of students’ early postsecondary experiences.

In the remainder of this chapter, we provide an overview of the evaluation design. Chapter II updates the findings described in Myers and Schirm (1999). Chapter III describes the

program's effect on postsecondary enrollment, postsecondary persistence and students' experiences in college. Chapter IV discusses the association of program completion and length of time students spend in Upward Bound with postsecondary outcomes. Finally, several appendices present details concerning the evaluation and the data analyses.

B. Research Design

1. Selection of Upward Bound Projects and Random Assignment

The national evaluation of Upward Bound is unique within education evaluation studies because of two important design elements: (1) a nationally representative sample of Upward Bound projects and (2) random assignment of eligible applicants to Upward Bound and a control group. These two design elements provide for both external validity and internal validity; that is, the ability to generalize the results to the population of regular Upward Bound projects and to make inferences about the causal effects of Upward Bound on student outcomes.

a. Selection of Upward Bound Projects

For the impact study, we randomly selected 70 Upward Bound projects. These projects are representative of all regular Upward Bound projects that were located in the 50 states and the District of Columbia, were hosted by a postsecondary institution, had operated for at least three years by October 1992 and were not dedicated to serving only students with physical disabilities.

Of the 70 projects we originally selected, 11 could not participate or had to be excluded for various reasons. For example, some did not plan to recruit new students for the 1992-1993 school year and some had too few applicants to accommodate random assignment. We replaced 8 of these 11 projects with similar, randomly selected projects and ended up with a sample of 67 projects. See Appendix A for a detailed description of the sample selection and weighting procedures.

b. Random Assignment of Eligible Applicants to Upward Bound and a Control Group

During the 1992-1993 and 1993-1994 school years, we randomly assigned eligible applicants from each project to either a treatment group, which was invited to participate in Upward Bound, or a control group, which was not invited to participate.⁵ Eligible applicants were defined as students whom the projects had recruited and who met the federal eligibility criteria (low-income or first-generation status) and project-specific criteria for participation. All of the projects had more applicants than openings, and all served the same number of students they would have normally served under their usual selection procedures.⁶ We implemented random assignment over 14 months so that projects could use their normal recruiting procedures and enroll students following their usual enrollment schedules. Nationwide, the random assignment process resulted in a treatment group of about 1,500 students and a control group of about 1,300 students. A detailed description of the random assignment procedures is presented in Myers et al. (1993).

⁵ After randomly assigning students to the treatment and control groups, we discovered that project directors at the 67 projects conducting random assignment had allowed 29 students in the control group, or about 2.2 percent of control students, to participate in Upward Bound. Although these students continued to receive Upward Bound services, we maintained their original status as members of the control group to preserve the comparability between the two groups due to random assignment. In the follow-up student surveys, an alternative source of information on Upward Bound participation, 43 control group members (3.3 percent) reported that they had participated at Upward Bound projects, including projects that were not conducting random assignment. Sensitivity tests reveal that if we count these 43 students as participants, reestimate the effects of Upward Bound, and round the estimates as done in the report, we obtain impact estimates that often match exactly the estimates presented in the report. Therefore, “crossover” had little effect on the estimates presented in this report. See Appendix C for more details.

⁶ To accommodate project wishes concerning the composition of the participants served by the program, such as sex, racial or ethnic group balance, we used stratified random sampling to select the treatment and control groups. Despite this, random assignment may have led some Upward Bound projects to select students they would not normally select. While we cannot determine whether this happened, we can assess whether the average effects of the program might be sensitive to such a change. Before random assignment, we asked project directors to rate each applicant as either most likely, somewhat likely or least likely to have been selected under normal selection procedures; in this report, we assessed whether the effects of Upward Bound vary across these three groups. Chapter III provides no evidence that the effects on college enrollment and highest level of postsecondary education varied across groups, but some evidence that the effects on postsecondary persistence were particularly large for students classified as least likely to attend (see Table III.13).

Random assignment allows us to compute estimates of program effects that should be free of selection biases. In observational studies, selection biases are often present and produce both measured and unmeasured differences between the group that receives the intervention and the comparison group. These differences become confounded with the program's true effect on student outcomes. However, because of random assignment, the only systematic difference between treatment and control groups in this evaluation is that the former was offered the opportunity to participate in Upward Bound; otherwise, the two groups are statistically equivalent (see Appendix B, Table B.1). On key demographic variables, there are no differences between treatment and control groups (for example, gender, race, ethnicity and low-income status). For some other background variables, small differences exist between the two groups (for example, how often parents checked on homework, number of times students missed a day of school and mothers' educational expectations). To adjust for possible differences in the treatment and control groups, we computed regression-adjusted estimates of program effects where we statistically controlled for some background characteristics, such as students' educational expectations—a strong correlate with parents' expectations and other parent inputs—grade at application, race, ethnicity and gender.

2. Data Collection

The analyses described in this report are based on information from students, their schools and the Upward Bound projects to which they applied. Almost all students in the sample completed a baseline questionnaire when they applied to Upward Bound (see Table I.1). For each of the follow-up surveys, high response rates were achieved. In the spring of 1994, we conducted the first follow-up survey of the students and achieved a 97 percent response rate. In 1996 and 1998, we conducted additional follow-up surveys with response rates of 86 percent and

Table I.1
Response Rates

Survey	Percent Responding
Baseline (1992 - 1993)	99
First Follow-up (1994 - 1995)	97
Second Follow-up (1996 - 1997)	86
Third Follow-up (1998 - 1999)	81

81 percent, respectively. Each time, we also collected transcripts from high schools and postsecondary education institutions attended by students in the evaluation sample. Appendix A describes the procedures used to adjust for survey nonresponse, and Appendix H describes the data collection procedures.

3. Estimation of Program Effects

In the next two chapters, we present estimates of two different types of program effects. The first type is the effect of being offered the opportunity to participate in Upward Bound, or the program’s effect on those students who applied and were eligible for Upward Bound. To estimate this effect, we computed the difference between the average for the *treatment group* (those offered the opportunity to participate in Upward Bound) and the average for the *control group* (those not offered the opportunity) on a given outcome, such as the proportion ever enrolled in a four-year college or university.⁷ The size of this effect depends on two things: (1) the rate at which students participate in or “show up” for Upward Bound services and (2) the

⁷ In practice, we estimated program impacts by estimating a linear regression model with the outcome of interest as the dependent variable. The independent variables included an indication of students’ random assignment status (treatment status), sex, race, ethnicity, educational expectations at baseline, grade at application, and low-income or first-generation status. Including additional control variables in the regression model allowed us to (1) increase the precision with which we estimated the impacts and (2) adjust for chance differences between the treatment and control groups on selected characteristics. More details about the computational procedures are presented in Appendix C. For selected outcomes, we replicated the analyses using a different technique, a logit model, and obtained similar results.

effect of the services on those who actually participate in Upward Bound. By focusing the analyses on the effect of students being given the opportunity to participate in Upward Bound, we define the treatment more broadly than simply what the Upward Bound program accomplishes once students participate in various Upward Bound activities and courses; it also includes the projects' efforts in getting students to participate in services.⁸

The second type of program effect is the effect of actual participation in Upward Bound; these estimates adjust for students who never showed up for services and indicate the effects for students who attended at least one session. To compute the effect of participating in Upward Bound, we used an instrumental variables estimator.^{9,10} To interpret the instrumental variables estimates as the true effect of Upward Bound on participants, some untestable assumptions had to be made.¹¹ Because of these assumptions, and because these estimates may only reflect part of the effect of offering Upward Bound services to eligible applicants, we focus our discussion on the first type of program effect. We present both types of program effects in the tables so that readers may compare findings for all students based on the first type of program effect and for students who participated based on the second type of effect. In general, the same conclusions

⁸ About 20 percent of the students who were determined to be eligible for the program never participated.

⁹ The instrumental variables regression model included the same independent variables as the regression model to estimate the effect of the opportunity to participate in Upward Bound. However, in the instrumental variables regression model, we specified the treatment indicator as an instrumental variable and assumed that the opportunity to participate in Upward Bound only affects the outcomes of interest through the probability of participating.

¹⁰ Angrist, Imbens and Rubin (1996) show that under simple conditions, the instrumental variables estimator is equivalent to the estimator proposed by Bloom (1989).

¹¹ When using this estimator to interpret the estimates as the impact for program participants, we had to make two assumptions. First, we assumed that the program had no impact on students who did not actually attend one or more sessions; that is, early exposure to Upward Bound after being selected for the program was assumed to have no impact on students' high school, postsecondary or related outcomes. This assumption would be violated, for example, when students who may have declined to participate received encouragement concerning their academic potential from projects and were motivated to perform at a higher level while in high school. Second, we assumed that the proportion of students in the Upward Bound group who did not actually receive services is the same proportion we would have observed among students in the control group if they had been given a chance to participate.

emerge from estimates of both types of effects. The effect on participants tends to be 20 to 25 percent larger than the effects on all students, and the difference is attributable to the treatment group members who did not participate in Upward Bound. For more details on the methods used to estimate program effects, see Appendix C.

It is possible for the estimated effect of Upward Bound to be positive or negative in circumstances where the true effect is zero. Because the evaluation is based on a sample of Upward Bound eligible applicants, the estimated program effects presented in this report contain what statisticians refer to as “sampling error.” To determine whether the estimated program effects can be attributed to the true effects of Upward Bound, we tested whether the estimates are “statistically significant”—significantly different from zero—at three levels that are commonly used in conducting such tests.¹² In the chapters that follow, we argue that Upward Bound had an effect if the estimated effect is statistically significant at any of these levels. If the estimated effect of Upward Bound on some outcome variable is statistically insignificant, one should not necessarily conclude that the true effect of Upward Bound was zero. However, the true effect was probably small if the estimated effect is statistically insignificant because the sample was designed to “detect” program effects of moderate size.

4. Context for Interpreting Program Effects

To properly interpret the estimated effects of Upward Bound that are presented in this report, it is important to understand that they (1) indicate the “value-added” of Upward Bound given the other programs in which students participate, (2) are based on students who

¹² More specifically, we conducted two-tailed tests of the null hypothesis that Upward Bound had no effect against the alternative that Upward Bound had an effect at the 0.10 level, the 0.05 level and the 0.01 level.

participated in Upward Bound in the mid-1990s and (3) are based on students who chose to participate in Upward Bound for various lengths of time.

a. Value-Added of Upward Bound

Upward Bound operates in a service-rich environment, and students who are eligible for Upward Bound may participate in several precollege programs. Therefore, it is not surprising that many of the students assigned to both the treatment and control groups participate in precollege services other than regular Upward Bound. In fact, it is critical to the scientific validity of the study that students in the treatment and control groups have the same opportunities to pursue other services as the typical eligible applicant to regular Upward Bound.

This report provides estimates of the value-added of regular Upward Bound above and beyond other precollege programs and services that were available. Because eligible students were randomly assigned to the treatment and control groups, and because—with very few exceptions—only treatment students were offered the opportunity to participate in regular Upward Bound, the differences between the two groups provide valid estimates of the value of that opportunity given the opportunities that students have to participate in other programs.

b. Effects for Students Who Participated During the Mid-1990s

Since the students in the treatment and control groups applied to participate in regular Upward Bound during the mid-1990s, this report characterizes the effects of Upward Bound as it operated at that time. Like many educational interventions, Upward Bound is designed to affect students years after they finish participating in the program. Therefore, one cannot assess the effects of Upward Bound as it operates today because current participants have not had the opportunity to attend college or even complete high school. However, this report provides a fair assessment of Upward Bound today as long as the following two things have not changed much

since the mid-1990s: the types of services provided by regular Upward Bound and other precollege programs and the types students served by these programs.

c. Variation in Exposure to Upward Bound

In considering the effects of regular Upward Bound, it is important to recognize that students' Upward Bound experiences vary in the length of participation and, as a result, in the amount of services received. While the median duration of participation was 19 months, the duration of participation varied widely across students in the evaluation from a few months to a few years. Furthermore, the amount of services that students received is directly related to the length of time that students participated. In the evaluation, the average program completer participated for about 50-percent longer than the average participant and received about 50-percent more services. In Chapter II, we provide a more detailed picture of the services received by students in our sample and the amount of the Upward Bound services received by students in the treatment group.

5. Subgroup Analysis

The national evaluation of Upward Bound was primarily designed to ensure that we could “detect” (flag as statistically significant) average effects that were relatively small but large enough to be educationally important. However, the analysis of program effects has included a subgroup analysis based on six characteristics of students. These six characteristics and the subgroups defined based on them are listed below:

1. Educational expectations (less than a bachelor's degree; at least a bachelor's degree).
2. Academic risk (bottom 20 percent of ninth-grade academic achievement; top 80 percent).
3. Program eligibility (low-income and first-generation; first-generation only; low-income only).

4. Race and ethnicity (African American; white; Hispanic).
5. Sex (male; female).
6. Likelihood of admission to Upward Bound as rated by project directors (most likely; somewhat likely; least likely).

Some of the subgroup characteristics, such as race and ethnicity, are immutable characteristics of the student; others, such as educational expectations, can vary over time. In general, subgroups are based on characteristics of the students at the time they applied for Upward Bound.¹³

In the following chapters, we have given special attention to two particular pairs of subgroups: students with higher and lower educational expectations and students at higher and lower academic risk. In our baseline student survey prior to random assignment, students were asked if they expected to complete a graduate degree, complete a bachelor's degree, attend a four-year college but not complete a degree, attend a two-year college, graduate from high school or not complete a high school degree. For the evaluation, we classified students as having "lower educational expectations" if they did not expect to obtain at least a bachelor's degree when they applied for Upward Bound. The previous interim report found large effects for students with lower educational expectations (Myers and Schirm 1999).

However, when recruiting for Upward Bound, projects may find it difficult to target students based on their educational expectations. Therefore, we also examine whether high school transcripts can be used to identify students who are at risk of poor academic outcomes and who may benefit from Upward Bound services. The assessment of academic risk was based on ninth-grade academic achievement, as measured by grade point average and the number of credits earned in each of the five core subjects: math, science, English, foreign language and social

¹³ Academic risk subgroups were defined based on ninth-grade academic achievement. For students who applied for Upward Bound in eighth and ninth grades, our measure of academic risk could be affected by Upward Bound participation if Upward Bound raises high school achievement.

studies. These variables were weighted using a principal components analysis to create an academic risk index: higher values of the index indicate higher academic risk. Students were designated to be at higher academic risk if the value of the index belonged to the top 20 percent of the distribution for treatment and control students; other students were designated to be at lower academic risk.¹⁴

For small subgroups, we are likely to “detect” subgroup effects—find that the estimated program effects are statistically significant—only if the effects are relatively large. Therefore, when we report that the effect for a small subgroup is statistically insignificant, it simply means that the effect of Upward Bound was not large enough to be detected given the relatively small sample size; it does not mean that Upward Bound had no effect for this group.

¹⁴ A student’s risk designation—higher or lower—differs between this report and the previous report (Myers and Schirm 1999) for three reasons. First, data collected since the previous report was used to update the high school variables on which the risk index was based. Second, using the updated variables, we reestimated the principal components model and obtained different coefficients or weights from the estimation. These weights were then used to create an updated risk index. When assigning the top half of the distribution to the higher-risk group, we did not see the sharp distinction in impacts that was observed in the previous report. That fact, along with further reflection on the educational expectations results, led us to split students by their level of academic risk in a manner that would parallel the distribution of students in terms of educational expectations. Thus, the third change was to flag only the students in the top 20 percent of the risk index distribution as higher-risk students instead of the top 50 percent, as students with lower educational expectation constitute approximately 20 percent of eligible Upward Bound applicants. Given that this decision to stratify the data was not made a priori, we need to be careful in our interpretation of the results; however, the findings using this split of academic risk are suggestive for the particular subgroups we have created.

II. Update on Program Participation, Upward Bound Course-Taking and Effects on High School Outcomes

Myers and Schirm (1999) presented detailed findings on students' participation in Upward Bound, including the length of participation and participation in Upward Bound courses and activities, students' participation in supplemental services outside of Upward Bound and the effects of Upward Bound on high school outcomes, such as high school credits and high school graduation. Although most students had left Upward Bound and high school by the time the data were last collected, some students were still in high school. With the most recent round of data collection, we can now provide a more complete picture of students' participation and program effects on high school outcomes.

A. Exposure to Upward Bound

1. Participation

Upward Bound programs serve most of the students they admit to their programs. Approximately 80 percent of treatment group members received some Upward Bound services and can be classified as "participants." In other words, four out of five students who were offered a spot in the regular Upward Bound program to which they applied chose to participate in that program. Many of the students who chose not to participate indicated on our survey that transportation problems or the fact that they had taken a job prevented or discouraged them from participating. See Myers and Schirm (1999) for a more detailed assessment.

2. Duration

How long students participate in Upward Bound varies across participants. This section presents findings on the duration of program participation. These findings, based on

participation reports provided by Upward Bound projects, are similar to interim findings presented in Myers and Schirm (1999). Key findings include (see Table II.1):¹⁵

- The typical number of months participants remained in Upward Bound was 19 months.¹⁶
- About 40 percent of participants who applied for Upward Bound in the eighth grade or later were still in the program in the spring of their senior year of high school.
- Students who applied for Upward Bound in the summer after eighth grade typically spent more time in Upward Bound than other participants (42 months).
- Hispanic participants remained in Upward Bound less time than African American participants (15 versus 20 months, on average).
- Typically, students with lower educational expectations stayed in Upward Bound 15 months and those with higher expectations stayed 22 months.
- The most common reason for leaving Upward Bound was to take a job (see Myers and Schirm 1999).

3. Receipt of Academic and Nonacademic Services

With complete data on participants' activities in Upward Bound, we found that on average, Upward Bound participants attended about 265 academic Upward Bound sessions (see Table II.2); 174 of the sessions occurred during the summer program and 91 sessions occurred during the academic year. Sessions in English, math and science courses constituted the bulk of participants' Upward Bound academic course work (see Figure II.1). Although Upward Bound participants typically attended a substantial number of academic sessions, there was large

¹⁵ Results presented in this report concerning length of time spent in Upward Bound differ somewhat from those presented in the previous report (Myers and Schirm 1999). Myers and Schirm only included Upward Bound participants in the duration analysis who applied for Upward Bound after eighth grade. They used this definition so that most of the sample would have had a chance to complete the program by the time of the last data collection. Here, we have broadened the definition to include all participants who had applied for Upward Bound in the 67 sample projects during the period of late 1992 through early 1994. Some of the participants who were younger and not included in the previous analysis remained in Upward Bound for many months and as a result, for example, the median duration in Upward Bound presented in this report (19 months) is larger than the median duration presented in the previous report (18 months). In general, the differences are modest.

¹⁶ The median duration is used to describe the typical number of months that participants remained in Upward Bound.

Table II.1
Duration and Survival Estimates

Characteristics	Median Duration (months)	Mean Duration (months)	Months Participating (percent)				Completion Rate † (percent)
			12 or more	18 or more	24 or more	36 or more	
All Students	19	21	64	51	37	17	40
Gender							
Male	21	21	65	53	38	17	43
Female ^R	17	20	61	47	32	17	33
Race							
Asian	24	25	87	68	47	14	51
Native American	19	17	58	51	23	12	24
White	21	22	70	53	36	18	41
Hispanic	15	18 *	56	42	31	5	40
African American ^R	20	22	64	53	39	22	40
Entry into Upward Bound							
During 8th grade	20	26	67	62	43	41	38
Summer after 8th grade	42	33 *	78	71	63	55	35
During 9th grade ^R	11	18	49	41	36	19	26
Summer after 9th grade	24	22	68	56	49	17	36
During 10th grade	20	20	67	55	45	—	48
Summer after 10th grade	17	17	66	49	6	—	51
During 11th or 12th grade	17	14	59	42	0	—	54
Summer after 11th or 12th grade	13	10 **	52	—	—	—	59
Low-Income and First-Generation							
First-Generation and Low-Income ^R	19	21	62	52	36	16	41
Low-Income Only	22	25	78	64	45	24	43
First-Generation Only	14	21	55	45	38	19	33
Director Rating							
Most likely to be served ^R	15	20	66	42	28	12	43
Somewhat likely to be served	19	21	62	50	38	15	38
Least likely to be served	20	21	65	54	37	19	41
Does Student Have College Plan?							
Bachelor's degree or more ^R	22	22	65	55	39	18	43
Less than a Bachelor's degree	15	18 *	60	40	29	14	33

Source: f3_0818.log

Note: Hyphens indicate too few respondents to compute impact.

*/**/** Difference with modal category is statistically significant at the 0.10 / 0.05 / 0.01 level.

^R Shows the reference group (modal category) for the tests of statistical significance.

† The percent of participants who were still participating in Upward Bound during the spring of their senior year in high school.

Table II.2
Upward Bound Academic and Activity Sessions:
All Participants

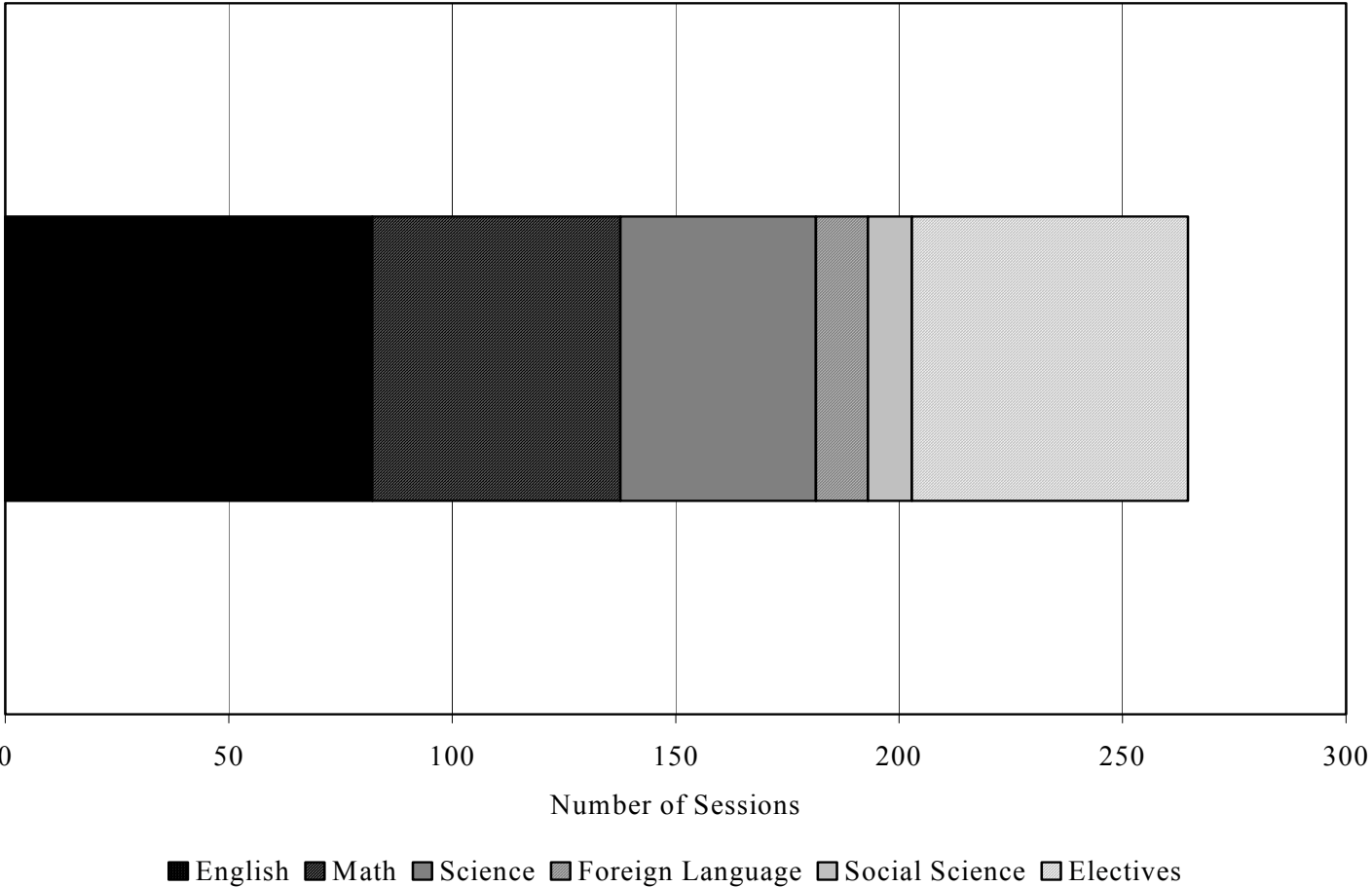
	Average		Total		
	Academic Year	Summers	Average	25th Percentile	75th Percentile
Courses					
English	32	50	82	24	121
English as a second language	0	0	0	0	0
Foreign language	2	9	12	0	19
Math	20	35	56	23	80
Computers	3	9	11	0	15
Science	16	28	44	11	69
Social science	3	7	10	0	12
Electives	14	34	48	7	75
Other academic sessions	0	2	2	0	0
Total academic sessions	91	174	265	104	405
Activities					
College preparedness	23	28	52	11	80
Career exploration	1	2	3	0	5
Self awareness	4	5	9	2	12
Field trips	6	7	13	3	17
Cultural awareness	3	4	7	1	10
Counseling sessions	38	28	66	14	84
Skill development	32	29	60	20	89
Other activities sessions	1	1	2	0	0
Total activities	108	105	212	74	293
Total	199	278	477	201	704

Source: f3_0925.log

variability in the number of sessions attended. For example, while one-quarter of participants attended 104 or fewer Upward Bound sessions, another quarter attended 405 or more sessions.

In addition to the academic course work completed through the Upward Bound program, participants engaged in a variety of nonacademic activities. The most common activities attended, as reported by Upward Bound projects, focused on counseling, followed by skills development and college preparation courses (see Figure II.2). On average, participants attended 212 activity sessions while in Upward Bound, with nonacademic activities split nearly equally

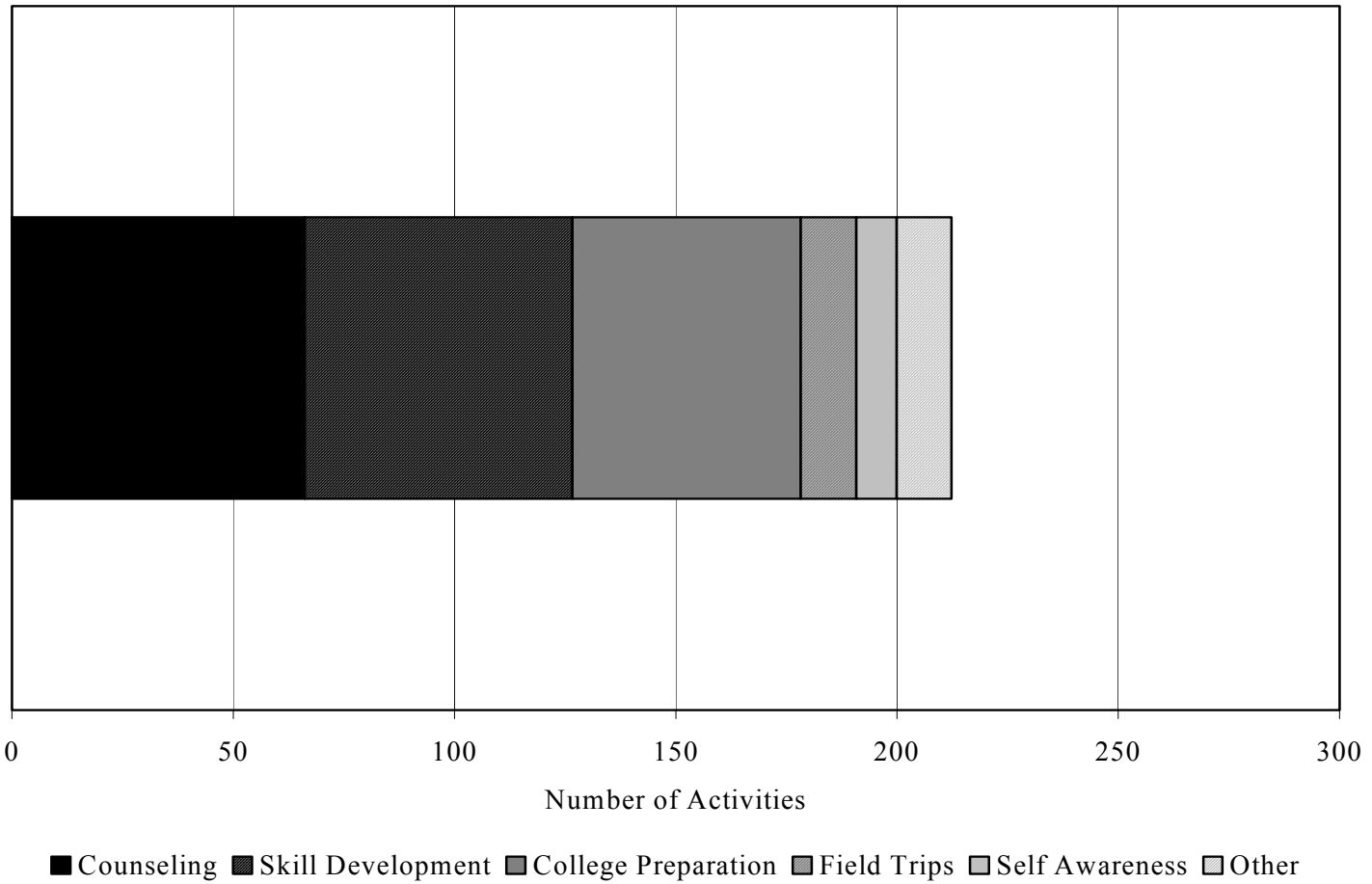
Figure II.1
Upward Bound Academic Sessions Taken by Participants



This figure shows that English, math and science accounted for most of the academic sessions taken by Upward Bound participants.

Source: pst-overall.log

Figure II.2
Upward Bound Nonacademic Activities by Participants



20

This figure shows that counseling, skill development and college preparation courses accounted for most of the activities provided by Upward Bound Projects.

Source: f3_0925.log

between the summer and the academic year (see Table II.2). Like the academic sessions, we found substantial variability in the number of activities attended by Upward Bound participants: about 25 percent of the participants attended 74 or fewer sessions and about 25 percent attended 293 or more nonacademic sessions.

Another perspective on the academic experiences of Upward Bound participants comes from focusing on “program completers,” defined as participants who were still in the program in the spring of their senior year in high school (see Table II.3). On average, program completers participated in Upward Bound for 50-percent longer than the average program participant (32 months versus 21 months) and participated in 50-percent more Upward Bound sessions—about 398 academic sessions and about 336 nonacademic sessions.

B. Receipt of Supplemental Services

The experiences of students in the control group show what eligible applicants to Upward Bound would do in the absence of Upward Bound. The results from the most recent data collection show that between the time students applied for Upward Bound and 1998-1999, more than half of the control group reported participating in some kind of supplemental services (see Table II.4). The most common type of supplemental service received by control group members focused on instruction and tutoring sessions (43 percent), followed closely by programs with a math or science emphasis (38 percent). We also found that 14 percent of the control group members reported participating in an Upward Bound Math and Science program and 12 percent reported participating in Talent Search. In the control group, 2 percent of students appear to have participated in regular Upward Bound.¹⁷ More of the students in the control group obtained supplemental services during the academic year than the summer (50 percent versus 22 percent).

¹⁷ About half of these students (16) participated in one of the programs in the national evaluation.

Table II.3
Upward Bound Academic and Activity Sessions:
Program Completers

	Average		Total		
	Academic Year	Summers	Average	25th Percentile	75th Percentile
Courses					
English	51	77	127	79	168
English as a second language	0	0	0	0	0
Foreign language	4	13	17	0	28
Math	33	49	81	53	109
Computers	3	12	15	0	25
Science	25	38	63	25	91
Social science	5	9	14	0	24
Electives	26	51	76	38	114
Other academic sessions	1	3	3	0	0
Total academic sessions	146	252	398	248	508
Activities					
College preparedness	41	40	81	39	111
Career exploration	2	3	6	1	6
Self awareness	6	7	13	5	16
Field trips	10	10	20	9	29
Cultural awareness	5	6	11	4	14
Counseling sessions	68	45	113	49	166
Skill development	50	42	92	47	128
Other activities sessions	1	1	2	0	0
Total activities	183	154	336	199	469
Total	329	406	734	482	902

Source: f3_0925.log

Although some students in the control group received services outside of Upward Bound, some students in the treatment group also received supplemental services outside of those offered by Upward Bound. According to the students in our evaluation, 31 percent attended instructional and tutoring sessions outside of Upward Bound; 25 percent participated in a math or science program; 14 percent participated in Upward Bound Math and Science; and 8 percent participated in Talent Search.

Table II.4
Receipt of Supplemental Services

	Treatment	Control	Difference
Participated in Upward Bound (%) †	80	0	80 ***
Supplemental Services - All (%)			
Participated in Talent Search	8	12	-4 ***
Participated in Upward Bound Math Science	14	14	0
Participated in other program that emphasized math or science	25	38	-13 ***
Attended instructional or tutoring sessions outside of Upward Bound	31	43	-12 ***
Participated in any supplemental services	42	54	-12 ***
Supplemental Services - Summer (%)			
Participated in Talent Search	2	4	-3 ***
Participated in Upward Bound Math Science	9	5	3 ***
Participated in other program that emphasized math or science	12	14	-2
Attended instructional or tutoring sessions outside of Upward Bound	10	14	-4 ***
Participated in any supplemental services	18	22	-4 **
Supplemental Services - Academic Year (%)			
Participated in Talent Search	7	10	-2 **
Participated in Upward Bound Math Science	12	12	0
Participated in other program that emphasized math or science	23	34	-11 ***
Attended instructional or tutoring sessions outside of Upward Bound	28	40	-11 ***
Participated in any supplemental services	42	50	-9 ***

Source: suppserv.log

*/**/** Difference between treatment and control is statistically significant at the 0.10 / 0.05 / 0.01 level.

† From project records, all other estimates of use of supplemental services based on student self-reports.

Due to participation in Upward Bound, students in the treatment group received substantially more precollege services than students in the control group. Approximately four out of five treatment students received services from Upward Bound, while only half of control students received precollege services from other programs. Not only are the students in the treatment group more likely to receive services, it appears that these services are much more intense. For example, Upward Bound spends more than \$4,000 per participant annually, while Talent Search, another large precollege program, spends about \$300 per participant annually.

C. The Effect of Upward Bound on High School Credits, Grade Point Average and Completion

The central goal of the Upward Bound program has been to increase the college enrollment and graduation rates of low-income students and students whose parents did not complete college. Furthermore, research has shown a strong link between high school academic preparation and college enrollment, particularly for minority students (see, for example, Adelman 1999; Jencks et al. 1972; Manski and Wise 1983). One way that Upward Bound projects attempt to raise the college enrollment and graduation rates of disadvantaged students is through improvements in high school achievement and preparation.

Myers and Schirm (1999) presented a detailed assessment of the effect of Upward Bound on students' high school outcomes. Information used in that report was based on the national evaluation's second follow-up survey and transcript data that capture the high school experiences of students in the treatment and control groups. The most recent data collection in 1998-2000 filled in the few remaining gaps for students who had not yet completed high school by 1996 and allow us to update the previous findings.

Next, we describe the highlights from our analysis of students' high school experiences based on the most recent round of data collection. We focus on the results for all students and then provide results for students with lower and higher educational expectations; program effects for other subgroups are presented in Appendix D.

1. The Effect of Upward Bound on High School Credits, Grade Point Average and Completion for All Students

For the average eligible applicant, Upward Bound had a statistically insignificant effect on most high school academic outcomes, including total credits earned in the five core subjects—math, science, English, social studies and foreign language—credits earned in honors and Advanced Placement courses, grade point average and high school completion. However,

Upward Bound had a statistically significant effect on the number of math credits earned in high school, raising the average from 3.0 credits to 3.2 credits (see Table II.5). The increase of about 0.2 credits suggests that about one out of five treatment group members completed an additional math course over and above what they would have completed in the absence of the program.

2. The Effect of Upward Bound on High School Credits, Grade Point Average and Completion for Selected Subgroups

a. Subgroups Defined by Educational Expectations

For students who expected to complete less than a bachelor's degree (about 20 percent of eligible applicants), we found that Upward Bound had statistically significant effects on credits earned in high school (see Table II.6). For these students, Upward Bound raised the average number of high school credits earned from 19 credits to 21 credits; that is, students in the treatment group who expected to complete less than a bachelor's degree completed about the equivalent of two more high school courses than they would have in the absence of the program. Much of the increase in high school credits came from additional credits in core academic subjects (math, science, English, foreign language and social studies); however, the effects were statistically significant only for credits earned in math and foreign language courses.

Upward Bound also increased the number of honors and Advanced Placement courses completed by lower-expectation students while in high school (see Table II.6). The increase of about 0.7 honors and Advanced Placement credits suggests that about 70 percent of the treatment group with lower educational expectations completed one more honors or Advanced Placement course than they would have without Upward Bound. For students with lower educational expectations, the effects of Upward Bound on high school graduation rates and grade point average were not statistically significant.

Table II.5
Impact of Upward Bound on High School Credits,
Grades and Graduation

	All Students		Participants
	Control Mean	Impact	Impact
Credits			
Total	21.2	0.1	0.2
Total Core	13.9	0.4	0.4
Math	3.0	0.2 **	0.2 **
Science	2.7	0.1	0.1
English	3.9	0.0	0.0
Social studies	2.8	0.1	0.1
Foreign language	1.5	0.1	0.1
Computer science	0.8	0.0	0.0
Vocational	1.5	-0.1	-0.1
Advanced Placement and Honors Credits			
Total	1.9	-0.1	-0.2
Total Core	1.9	-0.2	-0.2
Math	0.3	0.0	0.0
Science	0.4	0.0	0.0
English	0.7	-0.1	-0.1
Social studies	0.4	0.0	0.0
Foreign language	0.0	0.0	0.0
Overall Grade Point Average	2.3	0.0	0.0
High School Status (%)			
Graduated	90	-1	-1
Still in high school	0	0	0
Dropped out	7	0	0
General Educational Development (GED)	3	0	0

Source: hs-overall.log

Note: Hyphens indicate too few respondents to compute impact. Weighted values reported.

*/**/** Impact estimate is statistically significant at the 0.10 / 0.05 / 0.01 level.

Table II.6
Impact of Upward Bound on High School Credits, Grades and Graduation
for Students with Higher and Lower Educational Expectations

	All Students				Participants	
	Higher Expectations		Lower Expectations		Higher	Lower
	Control Mean	Impact	Control Mean	Impact	Impact	Impact
Credits						
Total	21.8	-0.3	18.5	2.0 *	-0.4	2.5 *
Total Core	14.4	0.0	11.7	1.8 **	0.0	2.2 **
Math	3.1	0.1	2.6	0.5 ** #	0.1	0.6 **
Science	2.9	0.0	2.1	0.3	0.0	0.4
English	4.0	-0.1	3.6	0.4	-0.1	0.5
Social studies	2.9	0.0	2.4	0.3	0.0	0.4
Foreign language	1.6	0.0	1.0	0.3 *	0.0	0.3
Computer science	0.8	0.0	0.6	0.2 * #	0.0	0.2 *
Vocational	1.5	-0.1	1.5	0.1	-0.2	0.1
Advanced Placement and Honors Credits						
Total	2.3	-0.3	0.5	0.7 * #	-0.4	0.9
Total Core	2.2	-0.3	0.5	0.7 * #	-0.4	0.9
Math	0.4	0.0	0.1	0.1 **	0.0	0.1 **
Science	0.5	-0.1	0.1	0.2 * #	-0.1	0.2 *
English	0.8	-0.1	0.2	0.2 #	-0.2	0.3
Social studies	0.5	-0.1	0.1	0.2 #	-0.1	0.3
Foreign language	0.1	0.0	0.0	0.0	0.0	0.0
Overall Grade Point Average	2.4	-0.1	1.9	0.1	-0.1	0.2
High School Status (%)						
Graduated	93	-1	75	2	-2	2
Still in high school	0	0	1	0	0	-1
Dropped out	4	3 *	17	-1	3 *	-1
General Educational Development (GED)	2	-1	7	-1	-1	-1

Source: hs-hiexp.log and hs-loexp.log

Note: Hyphens indicate too few respondents to compute impact. Weighted values reported.

//**** Impact estimate is statistically significant at the 0.10 / 0.05 / 0.01 level.

Indicates that for all students, the impacts are significantly different from the impacts for higher expectations students at the 0.10 level.

Among students who had higher educational expectations (about 80 percent of eligible applicants), the effects of Upward Bound on students' grade point average and the number of high school credits earned overall and in specific subject areas were statistically insignificant. However, Upward Bound increased the dropout rate for these students from 4 percent to 7 percent.

b. Subgroups Defined by Academic Risk

Upward Bound increased high school credits earned by students at higher academic risk (see Table II.7). Upward Bound increased the total number of credits earned in core subjects by higher-risk students—each student took approximately one additional course; however, it had a statistically insignificant effect on total core credits for lower-risk students. For both types of students, Upward Bound slightly increased the number of credits earned in certain core subjects—math, English and social studies for higher-risk students, and math, science and foreign language for lower-risk students.

Table II.7
Impact of Upward Bound on High School Credits, Grades and Graduation
by Students' At-Risk Status

	All Students				Participants	
	Higher Academic Risk		Lower Academic Risk		Higher	Lower
	Control Mean	Impact	Control Mean	Impact	Impact	Impact
Credits						
Total	14.8	1.3	23.0	0.1	1.7	0.1
Total Core	8.9	1.1 **	15.3	0.3	1.5 **	0.4
Math	2.0	0.3 **	3.2	0.1 ***	0.4 **	0.2 ***
Science	1.7	0.1	3.0	0.1 **	0.1	0.1 **
English	2.8	0.4 *	4.2	-0.1 #	0.5 *	-0.1
Social studies	1.9	0.3 **	3.1	0.0	0.3 *	0.0
Foreign language	0.6	0.1	1.7	0.1 **	0.1	0.1 **
Computer science	0.4	0.2	0.9	0.0	0.2	0.0
Vocational	1.4	-0.2	1.6	0.0	-0.3	0.0
Advanced Placement and Honors Credits						
Total	0.1	0.2	2.4	-0.2	0.3	-0.2
Total Core	0.1	0.2 *	2.3	-0.2	0.2 *	-0.2
Math	0.0	0.0 *	0.4	0.0	0.1 *	0.0
Science	0.0	0.0	0.5	0.0	0.0	0.0
English	0.1	0.0	0.8	-0.1	0.0	-0.1
Social studies	0.0	0.1 **	0.5	0.0 #	0.1 **	-0.1
Foreign language	0.0	0.0	0.1	0.0	0.0	0.0
Overall Grade Point Average	1.5	0.0	2.5	0.0	0.1	0.0
High School Status (%)						
Graduated	72	2	95	-2	3	-2
Still in high school	1	-1	0	0	-2	0
Dropped out	19	-1	3	1	-2	1
General Educational Development (GED)	8	0	2	1	0	1

Source: hs-ar20hi.log and hs-ar20lo.log

Note: Hyphens indicate too few respondents to compute impact. Weighted values reported.

*/**/*** Impact estimate is statistically significant at the 0.10 / 0.05 / 0.01 level.

Indicates that for all students, the impacts are significantly different from the impacts for higher academic risk students at the 0.10 level.

III. The Effect of Upward Bound on Students' Postsecondary Education Experiences

The ultimate goal of the Upward Bound program is to increase the chances that high school students from low-income families or families in which neither parent has completed a bachelor's degree will attend and graduate from institutions of higher education. With information collected in 1999-2000 from the third follow-up survey of students and from college transcripts, we have compared the postsecondary experiences of students in the Upward Bound group (the treatment group) with the experiences of students in the control group approximately three years after they would have graduated from high school.

This chapter contains estimates of the effect of Upward Bound on: (1) enrollment at any type of postsecondary institution, including four-year colleges and universities, two-year colleges and vocational institutions; (2) the highest level of postsecondary education attended, defined as "four-year" for students who attended a public or private nonprofit four-year college or university, "two-year" for students who attended a public or private nonprofit two-year college and "vocational" for students who attended a for-profit institution but no two- or four-year institution; (3) credits earned of different kinds (remedial, nonremedial and other) and at different types of postsecondary institutions; and (4) several measures of college engagement. This chapter focuses on the effects of Upward Bound on postsecondary enrollment and credits earned at all postsecondary institutions and at four-year colleges and universities. The next evaluation report will be based on survey interviews conducted in 2002 and postsecondary transcripts collected in the same year, and information from these sources will allow us to assess how Upward Bound affects college completion.

A. The Effect of Upward Bound on Postsecondary Enrollment and Persistence for All Students

In this section, we present estimates of the effects of regular Upward Bound on postsecondary attendance, the highest level of postsecondary education attended, and the number of credits earned at different levels of postsecondary education. In the third follow-up survey, we asked treatment and control students whether they had attended a college or other school since leaving high school. If they answered affirmatively, we asked them to provide the names of the colleges and schools that they had attended. These schools were matched to the 1997-98 Integrated Postsecondary Education Data System (IPEDS) maintained by the National Center for Education Statistics (NCES) to determine whether they met NCES's definition of a postsecondary institution. If so, the information in IPEDS was used to classify the institution as four-year (public or private, nonprofit), two-year (public or private, nonprofit) or vocational (for-profit). To assess student progress toward completing postsecondary degrees, MPR requested transcripts from these institutions for the students who reported having attended them.

This data collection process relies on the treatment and control students to accurately report the schools they have attended since high school. However, it is likely that some of them reported attending postsecondary institutions that they never actually attended. For example, some may have reported schools that they planned to attend but never attended, and others may have reported schools where they participated in a program (such as Upward Bound) but were not enrolled as students at the institution. Therefore, it would be desirable to have verification that students actually attended the schools they reported.

While the process of collecting transcripts was not designed to verify attendance, it effectively provided such verification in many instances. If a school provided a transcript that we requested for a student in our sample, then the student clearly attended that school. Furthermore, some of the reasons given by school staff members for not providing transcripts

can be treated as verification of attendance.¹⁸ However, in many instances, the reason given for not providing transcripts does not clearly indicate whether the student attended the school.¹⁹ Therefore, the information obtained while collecting transcripts is useful in verifying attendance in some but not all cases.

In designing the analysis, we faced the following question: if a student reported attending a postsecondary institution, should we accept that the student had actually enrolled there? If so, we would almost surely be crediting some sample members with attending colleges and universities that they never attended. Alternatively, we could require verification that sample members actually attended the postsecondary institutions that they reported. Under this approach, we would exclude some schools that students reported but had not attended, but we would also exclude some schools that our sample members had attended but for whom we did not receive verification of attendance.

Because both approaches have their merits and drawbacks, we took both approaches and compared the results. Findings based on the first approach, which does not require verification of attendance, are reported in the odd-numbered tables; findings based on the second approach, which requires verification of attendance, are reported in the even-numbered tables. In describing the results, we tend to focus on the findings based on the first approach to avoid cluttering the analysis with multiple estimates that tell the same story. However, when the statistical significance of a key impact estimate depends on whether we attempt to verify attendance, we present both estimates and indicate that the evidence is not conclusive.

¹⁸ For example, in some cases, the college indicated that it could not provide a transcript for the student because he or she owed money to the school.

¹⁹ For example, some schools required written consent from the students themselves even though the law does not require it, and MPR typically obtained only verbal consent (see Appendix H); these schools may not have even checked whether the student attended the school before indicating that they could not provide us with transcripts.

1. The Effect of Upward Bound on Postsecondary Enrollment

Upward Bound did not have a statistically significant effect on whether students enrolled in any postsecondary institution. About 74 percent of students in the treatment group and 71 percent of students in the control group attended some type of postsecondary institution, and the difference is not statistically significant (see Table III.1).

It is not clear whether Upward Bound increased enrollment in four-year colleges and universities. When we include all postsecondary enrollment reported by sample members, as described earlier, the estimated effect on four-year college enrollment is positive, 6 percentage points, and statistically significant (see Table III.1).²⁰ However, when we exclude unverified postsecondary enrollment, the effect falls to 5 percentage points and is statistically insignificant (see Table III.2). These two estimates are very similar to each other. However, in this evaluation like many others, we have treated statistical significance at the 0.10 level as the threshold between strong and weak evidence that the program had an effect (see Chapter I). Based on this threshold, the estimated effect of 6 percentage points presented in Table III.1 provides strong evidence, and the estimated effect of 5 percentage points presented in Table III.2 provides weak evidence. We believe that both of these estimates are credible and thus the evidence does not paint a clear picture of whether Upward Bound raised enrollment in four-year colleges. In future reports, we will reexamine the evidence based on more recent data.

2. The Effect of Upward Bound on Postsecondary Persistence

Upward Bound did not have a statistically significant effect on the total number of credits earned at postsecondary institutions (Table III.1). On average, treatment students and control

²⁰ This is consistent with the estimated effect of Upward Bound on educational expectations: Upward Bound increased the percent of students that expected to obtain at least a four-year degree (Myers and Schirm, 1999, Figure III.2).

students had earned about 37 credits and 36 credits, respectively, from postsecondary institutions, and the difference is statistically insignificant.²¹ The estimated effects on credits earned at two- and four-year colleges are also statistically insignificant.

B. The Effect of Upward Bound on Postsecondary Enrollment and Persistence for Selected Subgroups

1. Subgroups Defined by Educational Expectations

For students with lower educational expectations—students who did not expect to complete a bachelor’s degree when they applied to Upward Bound—about half of control group members attended college and less than one out of five attended a four-year college or university (see Table III.3). Therefore, the odds of completing a bachelor’s degree are low for students who had lower educational expectations and did not participate in Upward Bound. However, Upward Bound more than doubles the likelihood that students with lower educational expectations attend a four-year college or university, raising the enrollment rate from 18 percent to 38 percent.

Upward Bound increased the number of postsecondary credits earned at four-year colleges and universities by students with lower educational expectations.²² More specifically, Upward Bound raised the average number of credits earned at four-year colleges and universities by these students from 11 credits to 22 credits, almost a one-semester difference. Among students with higher educational expectations—students who expected to complete a bachelor’s degree or more before entering the program—the effects of Upward Bound on enrollment and credits were

²¹ Combined with the postsecondary enrollment rates presented in Section A.1, these estimates suggest that in both the treatment group and the control group, students who had attended at least one postsecondary institution earned an average of about 50 postsecondary credits.

²² While the estimated effect on total credits earned at all postsecondary institutions is statistically insignificant for students with lower educational expectations, it becomes larger and statistically significant when we use the procedures described earlier to verify postsecondary attendance (see Table III.4).

Table III.1
Impact of Upward Bound on Postsecondary Enrollment and Credits,
Includes All Self-Reported Postsecondary Enrollment

	All Students		Participants
	Control Mean	Impact	Impact
Postsecondary School Status (%)			
Any postsecondary school	71	3	3
Four-year college	44	6 **	7 **
Two-year college	24	-5	-6
Vocational school	2	2	2
Credits Earned			
All postsecondary schools	35.8	1.4	1.7
Nonremedial	33.8	0.8	0.9
Remedial	1.5	-0.2	-0.2
Other	0.5	0.8	0.9
Four-year colleges	25.1	3.2	3.6
Nonremedial	24.1	2.3	2.7
Remedial	0.6	0.1	0.1
Other	0.5	0.7	0.9
Two-year colleges	9.6	-1.3	-1.5
Nonremedial	8.6	-1.0	-1.2
Remedial	0.9	-0.3	-0.3
Other	0.0	0.0	0.0
Vocational schools	1.1	-0.4	-0.5
Nonremedial	1.1	-0.5	-0.6
Remedial	0.0	0.0	0.0
Other	0.0	0.1	0.1

Source: pst-overall.log

Note: Weighted values reported.

*/**/** Impact estimate is statistically significant at the 0.10 / 0.05 / 0.01 level.

Table III.2
Impact of Upward Bound on Postsecondary Enrollment and Credits,
Excludes Unverified Self-Reported Enrollment

	All Students		Participants
	Control Mean	Impact	Impact
Postsecondary School Status (%)			
Any postsecondary school	62	3	4
Four-year college	38	5	5
Two-year college	22	-3	-3
Vocational school	2	1	2
Credits Earned			
All postsecondary schools	31.3	0.7	0.8
Nonremedial	29.6	0.2	0.2
Remedial	1.3	-0.1	-0.1
Other	0.4	0.6	0.8
Four-year colleges	21.8	2.2	2.6
Nonremedial	20.8	1.7	2.0
Remedial	0.6	0.0	0.0
Other	0.4	0.6	0.6
Two-year colleges	8.5	-1.4	-1.7
Nonremedial	7.8	-1.3	-1.6
Remedial	0.7	-0.1	-0.1
Other	0.0	0.0	0.0
Vocational schools	0.9	-0.1	-0.1
Nonremedial	0.9	-0.2	-0.2
Remedial	0.0	0.0	0.0
Other	0.0	0.1	0.1

Source: pst-overall.log

Note: Weighted values reported.

*/**/** Impact estimate is statistically significant at the 0.10 / 0.05 / 0.01 level.

Table III.3

Impact of Upward Bound on Postsecondary Enrollment and Credits for Students with Higher and Lower Educational Expectations,
Includes All Self-Reported Postsecondary Enrollment

	All Students				Participants	
	Higher Expectations		Lower Expectations		Higher	Lower
	Control Mean	Impact	Control Mean	Impact	Impact	Impact
Postsecondary School Status (%)						
Any postsecondary school	77	3	54	4	4	4
Four-year college	52	4	18	20 ** #	4	24 **
Two-year college	23	-3	34	-16	-3	-19
Vocational school	2	3	2	0	3	0
Credits Earned						
All postsecondary schools	40.3	1.0	21.6	6.2	1.2	7.5
Nonremedial	37.9	1.4	20.4	0.1	1.6	0.2
Remedial	1.9	-0.2	0.5	-0.1	-0.3	-0.1
Other	0.5	-0.1	0.6	6.2	-0.1	7.4
Four-year colleges	29.0	2.2	11.0	10.9 *** #	2.5	13.0 ***
Nonremedial	27.8	2.2	10.3	4.5	2.6	5.5
Remedial	0.7	0.1	0.0	0.1	0.2	0.2
Other	0.5	-0.2	0.6	6.2	-0.2	7.4
Two-year colleges	10.5	-1.0	7.8	-2.5	-1.2	-3.0
Nonremedial	9.3	-0.6	7.3	-2.3	-0.7	-2.8
Remedial	1.1	-0.4	0.5	-0.2	-0.5	-0.2
Other	0.0	0.0	0.0	-	0.0	-
Vocational schools	0.8	-0.1	2.8	-2.1	-0.2	-2.5
Nonremedial	0.8	-0.2	2.7	-2.0	-0.3	-2.4
Remedial	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.0	0.1	0.0	0.0	0.1	0.0

Source: pst-hiexp.log and pst-loexp.log

Note: Hyphens indicate too few respondents to compute impact. Weighted values reported.

*/**/** Impact estimate is statistically significant at the 0.10 / 0.05 / 0.01 level.

Indicates that for all students, the impacts are significantly different from the impacts for higher expectations students at the 0.10 level.

Table III.4

Impact of Upward Bound on Postsecondary Enrollment and Credits for Students with Higher and Lower Educational Expectations,
Excludes Unverified Self-Reported Enrollment

	All Students				Participants	
	Higher Expectations		Lower Expectations		Higher	Lower
	Control Mean	Impact	Control Mean	Impact	Impact	Impact
Postsecondary School Status (%)						
Any postsecondary school	68	2	45	12	2	14
Four-year college	44	1	14	21 ** #	2	25 **
Two-year college	21	-1	29	-9	-1	-11
Vocational school	2	2	2	0	2	0
Credits Earned						
All postsecondary schools	36.1	-1.2	16.7	9.2 ** #	-1.5	11.0 **
Nonremedial	34.1	-0.9	15.7	4.6	-1.1	5.5
Remedial	1.6	-0.2	0.6	-0.1	-0.3	-0.1
Other	0.4	-0.1	0.4	4.7	-0.1	5.6
Four-year colleges	26.0	-0.2	7.1	13.0 *** #	-0.2	15.6 ***
Nonremedial	24.9	0.1	6.6	8.2 *** #	0.1	9.9 ***
Remedial	0.7	-0.1	0.1	0.1	-0.1	0.1
Other	0.4	-0.2	0.4	4.7	-0.2	5.6
Two-year colleges	9.3	-1.2	7.4	-2.5	-1.4	-3.0
Nonremedial	8.4	-1.0	7.0	-2.3	-1.2	-2.8
Remedial	0.8	-0.1	0.4	-0.1	-0.2	-0.2
Other	0.0	0.0	0.0	-	0.0	-
Vocational schools	0.7	0.1	2.1	-1.3	0.2	-1.6
Nonremedial	0.7	0.0	2.0	-1.3	0.0	-1.5
Remedial	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.0	0.1	0.0	0.0	0.1	0.0

Source: pst-hiexp.log and pst-loexp.log

Note: Hyphens indicate too few respondents to compute impact. Weighted values reported.

*/**/** Impact estimate is statistically significant at the 0.10 / 0.05 / 0.01 level.

Indicates that for all students, the impacts are significantly different from the impacts for higher expectations students at the 0.10 level.

statistically insignificant for four-year colleges and universities and all postsecondary institutions (see Table III.3).

The effect of Upward Bound on enrollment in four-year postsecondary institutions is larger for students with lower educational expectations than for students with higher educational expectations. This difference suggests that Upward Bound might have larger effects on enrollment in four-year postsecondary institutions if it served a larger proportion of students who did not expect to obtain a bachelor's degree when they applied for Upward Bound. Since it might be difficult for projects to target students based on their self-reported educational expectations, the next section addresses whether Upward Bound also has especially large effects on students whose ninth-grade transcripts suggest that they are at relatively high risk of academic failure.

2. Subgroups Defined by Academic Risk

Upward Bound had statistically insignificant effects on overall college enrollment for students at higher academic risk or for students at lower academic risk (see Table III.5). Upward Bound raised four-year college enrollment for students at lower academic risk; it may also have raised four-year college enrollment for students at higher academic risk, but the evidence is not conclusive. When we include all postsecondary enrollment reported by sample members, the estimated impacts on four-year college enrollment are positive and statistically significant for both groups—8 percentage points for students at higher academic risk and 7 percentage points for students at lower academic risk. However, when we exclude unverified postsecondary enrollment, the effect on higher-risk students becomes statistically insignificant (see Table III.6).

For students at lower academic risk, Upward Bound raised the average number of credits earned at four-year colleges from 30 credits to 36 credits (see Table III.5). Upward Bound did

not have statistically significant effects on total postsecondary credits earned at all types of institutions for either students at higher academic risk or students at lower academic risk.

Our findings suggest that it is difficult to use ninth-grade transcripts to identify students who benefit as much from Upward Bound as participants with lower educational expectations. In future research, we will make further attempts to use information from high school transcripts to identify students who would reap large benefits from Upward Bound.

3. Subgroups Defined by the Eligibility Criteria for Upward Bound

To be eligible to participate in Upward Bound, students had to be classified as “low-income” (family income below 150 percent of the poverty line) or “first-generation” (neither parent had earned a bachelor’s degree). For the largest group of students, those who met both eligibility criteria, Upward Bound did not have a statistically significant effect on overall postsecondary enrollment, but it increased enrollment at four-year colleges and universities from 43 percent to 50 percent (see Table III.7). For these students, the effects of Upward Bound on credits earned from postsecondary institutions are statistically insignificant.

Among students who only met the first-generation criterion, Upward Bound reduced overall postsecondary enrollment from 80 percent to 73 percent. Interestingly, Upward Bound increased enrollment at vocational institutions for these students. However, the drop in overall postsecondary enrollment indicates that the increase in enrollment in vocational institutions was more than offset by the decrease in enrollment at other types of institutions. For students who only met the first-generation eligibility criterion, it is not clear whether Upward Bound affected postsecondary persistence. When we include all postsecondary enrollment reported by sample members, the estimated impacts on credits earned at four-year and all postsecondary institutions are positive and statistically significant (see Table III.7). However, when we exclude unverified postsecondary enrollment, these effects become statistically insignificant (see Table III.8).

For the small number of students who only met the low-income eligibility criterion, the effects of Upward Bound on postsecondary enrollment and credits are statistically insignificant. Given the small sample size, the effects on this group would have to be very large to expect significant impact estimates. Therefore, it is difficult to determine the effects of Upward Bound for this small subgroup.

4. Subgroups Defined by Race and Ethnicity

For white students, Upward Bound increased overall postsecondary enrollment from 58 percent to 69 percent (see Table III.9). It may also have increased four-year college enrollment for white students, but the evidence is inconclusive. When we include all postsecondary enrollment reported by sample members, the estimated effect on four-year college enrollment is statistically insignificant. However, when we exclude unverified postsecondary enrollment, the effect becomes positive and statistically significant (see Table III.10).

For Hispanic students, Upward Bound increased enrollment at four-year postsecondary institutions from 38 percent to 50 percent (see Table III.9). It may also have increased overall postsecondary enrollment for Hispanic students, but the evidence is inconclusive. When we include all postsecondary enrollment reported by sample members, the estimated impact on overall postsecondary enrollment is statistically insignificant (see Table III.9). However, when we exclude unverified postsecondary enrollment, this effect becomes positive and statistically significant (see Table III.10).

Upward Bound did not have statistically significant effects on postsecondary enrollment or enrollment in four-year colleges and universities for African American students. While Upward Bound may have raised enrollment in vocational institutions and reduced enrollment in two-year colleges for these students, the evidence is not conclusive. When we include all postsecondary enrollment reported by sample members, the estimated effects on these two outcomes are

statistically significant (see Table III.9). However, when we exclude unverified postsecondary enrollment, the effects become statistically insignificant (see Table III.10).

Our findings suggest that the effects of Upward Bound on persistence at postsecondary institutions may be especially large for Hispanic students. For these students, Upward Bound raised the average number of credits earned at four-year colleges and universities from 13 credits to 28 credits (see Table III.9). For these students, Upward Bound also raised the average number of credits earned at all postsecondary institutions from 30 credits to 38 credits. For African American students and white students, there is no conclusive evidence that Upward Bound affected the number of postsecondary credits earned at any type of postsecondary institution.²³

²³ While Upward Bound may have increased the number of credits earned at two-year colleges for whites, the evidence is not conclusive. When we include all postsecondary enrollment reported by sample members, the estimated effect is statistically insignificant (see Table III.9). However, when we exclude unverified postsecondary enrollment, the effect becomes statistically significant (see Table III.10).

Table III.5

Impact of Upward Bound on Postsecondary Enrollment and Credits by Students' At-Risk Status,
Includes All Self-Reported Postsecondary Enrollment

	All Students				Participants	
	Higher Academic Risk		Lower Academic Risk		Higher	Lower
	Control Mean	Impact	Control Mean	Impact	Impact	Impact
Postsecondary School Status (%)						
Any postsecondary school	51	-6	76	4 #	-8	5
Four-year college	19	8 **	52	7 ***	11 **	8 ***
Two-year college	31	-15 **	23	-4	-20 **	-4
Vocational school	1	1	2	2	2	2
Credits Earned						
All postsecondary schools	11.8	0.9	42.1	4.0	1.2	4.5
Nonremedial	11.5	-0.3	39.7	3.3	-0.3	3.7
Remedial	0.3	1.2 **	1.8	-0.5 #	1.5 **	-0.6
Other	0.0	-	0.6	1.2	-	1.4
Four-year colleges	6.7	1.4	29.8	6.6 **	1.8	7.4 **
Nonremedial	6.6	1.0	28.7	5.4 *	1.3	6.1 *
Remedial	0.1	0.4 *	0.6	0.1	0.5 *	0.1
Other	0.0	-	0.5	1.1	-	1.3
Two-year colleges	4.0	0.7	11.2	-2.4	0.9	-2.7
Nonremedial	3.8	-0.1	10.0	-1.8	-0.1	-2.0
Remedial	0.2	0.8 **	1.2	-0.6 #	1.0 **	-0.7
Other	0.0	-	0.0	0.0	-	0.0
Vocational schools	1.1	-1.2	1.1	-0.2	-1.5	-0.2
Nonremedial	1.1	-1.2	1.0	-0.3	-1.5	-0.3
Remedial	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.0	-	0.0	0.1	-	0.1

Source: pst-ar20hi.log and pst-ar20lo.log

Note: Hyphens indicate too few respondents to compute impact. Weighted values reported.

*/**/** Impact estimate is statistically significant at the 0.10 / 0.05 / 0.01 level.

Indicates that for all students, the impacts are significantly different from the impacts for higher academic risk students at the 0.10 level.

Table III.6

Impact of Upward Bound on Postsecondary Enrollment and Credits by Students' At-Risk Status,
Excludes Unverified Self-Reported Enrollment

	All Students				Participants	
	Higher Academic Risk		Lower Academic Risk		Higher	Lower
	Control Mean	Impact	Control Mean	Impact	Impact	Impact
Postsecondary School Status (%)						
Any postsecondary school	42	-5	69	6	-7	6
Four-year college	16	4	45	6 **	6	7 **
Two-year college	25	-9	22	-2	-12	-2
Vocational school	1	-1	2	2	-1	2
Credits Earned						
All postsecondary schools	11.0	-1.7	37.2	3.2	-2.2	3.6
Nonremedial	10.3	-1.9	35.3	2.4	-2.5	2.7
Remedial	0.8	0.2	1.4	-0.2	0.3	-0.2
Other	0.0	-	0.5	1.0	-	1.1
Four-year colleges	5.2	0.8	26.4	4.9 *	1.0	5.4 *
Nonremedial	4.8	0.9	25.4	4.0	1.1	4.5
Remedial	0.4	-0.1	0.6	0.1	-0.1	0.1
Other	0.0	-	0.4	0.8	-	0.9
Two-year colleges	5.0	-1.6	9.8	-1.8	-2.1	-2.0
Nonremedial	4.6	-1.8	8.9	-1.6	-2.4	-1.8
Remedial	0.4	0.3	0.8	-0.2	0.3	-0.2
Other	0.0	-	0.0	0.0	-	0.0
Vocational schools	0.9	-0.9	0.9	0.1	-1.2	0.2
Nonremedial	0.9	-0.9	0.9	0.0	-1.2	0.0
Remedial	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.0	-	0.0	0.1	-	0.1

Source: pst-ar20hi.log and pst-ar20lo.log

Note: Hyphens indicate too few respondents to compute impact. Weighted values reported.

*/**/** Impact estimate is statistically significant at the 0.10 / 0.05 / 0.01 level.

Indicates that for all students, the impacts are significantly different from the impacts for higher academic risk students at the 0.10 level.

Table III.7
Impact of Upward Bound on Postsecondary Enrollment and Credits by Students' Eligibility Status,
Includes All Self-Reported Postsecondary Enrollment

	All Students						Participants			
	Low-Income & First-Gen.		First-Generation Only		Low-Income Only		LI & FG	FG Only	LI Only	
	Control Mean	Impact	Control Mean	Impact	Control Mean	Impact	Impact	Impact	Impact	
Postsecondary School Status (%)										
Any postsecondary school	68	5	80	-7 ** #	84	-5	5	-9 **	-5	
Four-year college	43	7 **	49	0	44	10	9 **	0	10	
Two-year college	22	-5	30	-9	36	-12	-5	-11	-13	
Vocational school	2	2	0	4 **	4	-3	2	5 **	-3	
Credits Earned										
All postsecondary schools	36.7	0.2	32.5	13.0 **	33.5	7.3	0.2	14.8 **	7.9	
Nonremedial	34.7	-0.9	30.5	14.9 ** #	31.1	9.8	-1.0	17.0 **	10.6	
Remedial	1.6	0.1	1.2	-1.0	1.0	-0.2	0.1	-1.1	-0.2	
Other	0.4	1.0	0.8	-0.9 #	1.4	-2.3	1.1	-1.1	-2.5	
Four-year colleges	26.4	1.1	20.3	13.9 **	22.5	7.4	1.3	15.8 **	8.0	
Nonremedial	25.5	0.0	18.8	15.6 *** #	20.4	10.1	0.0	17.8 ***	10.9	
Remedial	0.5	0.3	0.7	-0.7	0.6	-0.4	0.3	-0.8	-0.4	
Other	0.3	0.9	0.8	-1.0 #	1.4	-2.3	1.0	-1.2	-2.5	
Two-year colleges	8.9	-0.4	12.1	-1.3	10.1	1.1	-0.5	-1.5	1.2	
Nonremedial	7.8	-0.2	11.6	-1.2	9.8	1.0	-0.2	-1.3	1.0	
Remedial	1.1	-0.2	0.5	-0.2	0.3	0.2	-0.2	-0.3	0.2	
Other	0.0	0.0	0.0	0.1	0.0	-	0.0	0.1	-	
Vocational schools	1.3	-0.6	0.1	0.5	1.0	-1.3	-0.6	0.5	-1.4	
Nonremedial	1.3	-0.7	0.1	0.5	1.0	-1.3	-0.8	0.5	-1.4	
Remedial	0.0	0.0	0.0	-	0.0	-	0.0	-	-	
Other	0.0	0.1	0.0	-	0.0	-	0.1	-	-	

Source: pst-lifg.log, pst-low_only.log, and pst-fgenonly.log

Note: Hyphens indicate too few respondents to compute impact. Weighted values reported.

*/**/** Impact estimate is statistically significant at the 0.10 / 0.05 / 0.01 level.

Indicates that for all students, the impacts are significantly different from the impacts for low-income and first-generation students at the 0.10 level.

Table III.8
Impact of Upward Bound on Postsecondary Enrollment and Credits by Students' Eligibility Status,
Excludes Unverified Self-Reported Enrollment

	All Students						Participants			
	Low-Income & First-Gen.		First-Generation Only		Low-Income Only		LI & FG	FG Only	LI Only	
	Control Mean	Impact	Control Mean	Impact	Control Mean	Impact	Impact	Impact	Impact	
Postsecondary School Status (%)										
Any postsecondary school	58	6	78	-15 ** #	68	8	7	-18 **	8	
Four-year college	37	7 **	47	-9 #	30	18	9 **	-11	19 *	
Two-year college	20	-1	30	-9	33	-8	-2	-10	-8	
Vocational school	2	0	0	5 *	4	-3	0	6 *	-3	
Credits Earned										
All postsecondary schools	30.5	0.0	33.9	3.3	35.9	13.5	0.0	4.0	14.3	
Nonremedial	28.9	-0.8	31.6	5.1	34.0	14.3	-0.9	6.1	15.2	
Remedial	1.3	0.0	1.5	-1.1 *	0.8	0.7	0.0	-1.3 *	0.8	
Other	0.3	0.8 *	0.8	-0.7 #	1.1	-1.6	0.9 *	-0.9	-1.7	
Four-year colleges	21.2	1.5	23.4	4.2	25.3	11.8	1.8	5.1	12.6	
Nonremedial	20.5	0.8	21.5	6.0	23.7	12.8	0.9	7.2	13.6	
Remedial	0.5	0.1	1.1	-0.9 *	0.5	0.6	0.1	-1.1 *	0.6	
Other	0.3	0.7 *	0.8	-0.8 #	1.1	-1.6	0.8 *	-1.0	-1.7	
Two-year colleges	8.1	-1.2	10.4	-1.6	9.7	2.5	-1.4	-2.0	2.7	
Nonremedial	7.3	-1.1	10.0	-1.6	9.4	2.3	-1.3	-1.9	2.5	
Remedial	0.8	-0.1	0.4	-0.1	0.3	0.2	-0.1	-0.1	0.2	
Other	0.0	0.0	0.0	0.1	0.0	-	0.0	0.1	-	
Vocational schools	1.1	-0.3	0.1	0.7 **	0.9	-0.9	-0.4	0.9 **	-0.9	
Nonremedial	1.1	-0.4	0.1	0.7 ** #	0.9	-0.9	-0.5	0.9 **	-0.9	
Remedial	0.0	0.0	0.0	-	0.0	-	0.0	-	-	
Other	0.0	0.1	0.0	-	0.0	-	0.1	-	-	

Source: pst-lifg.log, pst-low_only.log, and pst-fgenonly.log

Note: Hyphens indicate too few respondents to compute impact. Weighted values reported.

//*** Impact estimate is statistically significant at the 0.10 / 0.05 / 0.01 level.

Indicates that for all students, the impacts are significantly different from the impacts for low-income and first-generation students at the 0.10 level.

Table III.9

Impact of Upward Bound on Postsecondary Enrollment and Credits for African American, White and Hispanic Students,
Includes All Self-Reported Postsecondary Enrollment

	All Students						Participants			
	African American		White		Hispanic		Afr Amer	White	Hispanic	
	Control Mean	Impact	Control Mean	Impact	Control Mean	Impact	Impact	Impact	Impact	
Postsecondary School Status (%)										
Any postsecondary school	77	-2	58	11 *** #	65	8	-3	14 ***	9	
Four-year college	50	4	35	8	38	12 **	5	10	14 **	
Two-year college	25	-10 **	21	5 #	25	-4	-12 **	6	-5	
Vocational school	1	4 **	2	-1 * #	2	0	4 **	-1	0	
Credits Earned										
All postsecondary schools	38.6	-1.9	32.6	4.6	30.0	7.9 *	-2.2	5.5	9.0 *	
Nonremedial	36.6	-2.9	31.5	4.6	27.6	8.4 *	-3.3	5.4	9.6 **	
Remedial	1.6	0.1	0.9	0.1	2.1	-0.5	0.1	0.1	-0.5	
Other	0.5	0.9	0.2	0.0	0.2	-0.1	1.0	0.0	-0.1	
Four-year colleges	31.1	-1.8	20.6	2.1	13.1	15.3 *** #	-2.0	2.5	17.4 ***	
Nonremedial	30.0	-2.7	20.0	2.0	12.7	15.2 *** #	-3.1	2.4	17.3 ***	
Remedial	0.7	0.2	0.4	0.1	0.3	0.0	0.2	0.1	0.0	
Other	0.4	0.7	0.2	0.0	0.1	0.1	0.8	0.0	0.1	
Two-year colleges	6.6	-0.3	11.1	2.9	14.9	-5.2	-0.4	3.4	-5.9	
Nonremedial	5.7	-0.2	10.6	2.9	13.0	-4.7	-0.2	3.4	-5.4	
Remedial	0.8	-0.1	0.5	0.0	1.9	-0.5	-0.2	0.0	-0.5	
Other	0.1	0.0	0.0	0.0	0.0	-	0.0	0.0	-	
Vocational schools	1.0	0.2	0.8	-0.2	1.9	-2.5	0.2	-0.3	-2.8	
Nonremedial	0.9	0.0	0.8	-0.2	1.8	-2.3	0.0	-0.3	-2.6	
Remedial	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	
Other	0.0	0.2	0.0	-	0.1	-0.2	0.2	-	-0.2	

Source: pst-black.log, pst-white.log, and pst-hisp.log

Note: Hyphens indicate too few respondents to compute impact. Weighted values reported.

*/**/** Impact estimate is statistically significant at the 0.10 / 0.05 / 0.01 level.

Indicates that for all students, the impacts are significantly different from the impacts for African American students at the 0.10 level.

Table III.10

Impact of Upward Bound on Postsecondary Enrollment and Credits for African American, White, and Hispanic Students,
Excludes Unverified Self-Reported Enrollment

	All Students						Participants			
	African American		White		Hispanic		Afr Amer	White	Hispanic	
	Control Mean	Impact	Control Mean	Impact	Control Mean	Impact	Impact	Impact	Impact	
Postsecondary School Status (%)										
Any postsecondary school	68	-7	52	15 *** #	56	16 *** #	-8	18 ***	18 ***	
Four-year college	44	-1	30	10 **	31	14 *** #	-1	11 **	16 ***	
Two-year college	22	-7	19	8 ** #	23	-2	-8	9 **	-2	
Vocational school	1	1	2	-1 ** #	2	3	1	-2 **	3	
Credits Earned										
All postsecondary schools	33.6	-3.7	30.1	4.8	25.1	7.8 *	-4.4	5.7 *	8.7 *	
Nonremedial	31.8	-4.3	29.2	4.8 *	23.4	7.5 *	-5.2	5.7 *	8.4 *	
Remedial	1.5	-0.2	0.7	0.0	1.4	0.3	-0.2	0.0	0.4	
Other	0.3	0.9 *	0.2	0.0	0.2	0.0	1.0 *	0.0	0.0	
Four-year colleges	26.4	-2.0	19.4	1.6	12.2	12.1 *** #	-2.4	1.9	13.5 ***	
Nonremedial	25.3	-2.7	18.8	1.7	11.7	11.9 *** #	-3.2	2.0	13.3 ***	
Remedial	0.8	0.0	0.4	-0.1	0.3	0.0	0.0	-0.1	0.0	
Other	0.3	0.7	0.2	0.0	0.2	0.1	0.8	0.0	0.1	
Two-year colleges	6.3	-1.8	10.0	3.6 * #	11.5	-3.6	-2.2	4.4 *	-4.0	
Nonremedial	5.6	-1.6	9.6	3.6 * #	10.3	-3.8	-1.9	4.3 *	-4.3	
Remedial	0.7	-0.2	0.3	0.1	1.1	0.3	-0.3	0.1	0.3	
Other	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	-	
Vocational schools	0.9	0.1	0.6	-0.3	1.4	-0.9	0.2	-0.4	-1.0	
Nonremedial	0.9	-0.1	0.6	-0.3	1.3	-0.8	-0.1	-0.4	-0.9	
Remedial	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	
Other	0.0	0.2	0.0	-	0.1	-0.1	0.2	-	-0.1	

Source: pst-black.log, pst-white.log, and pst-hisp.log

Note: Hyphens indicate too few respondents to compute impact. Weighted values reported.

*/**/*** Impact estimate is statistically significant at the 0.10 / 0.05 / 0.01 level.

Indicates that for all students, the impacts are significantly different from the impacts for African American students at the 0.10 level.

5. Subgroups Defined by the Sex of the Student

Upward Bound may have raised the enrollment rate of young men and young women in four-year institutions, but the evidence is not conclusive. When we include all postsecondary enrollment reported by sample members, the estimated effect on four-year college enrollment is 7 percentage points and statistically significant for both groups (see Table III.11). However, when we exclude unverified postsecondary enrollment, the effect becomes smaller and statistically insignificant for both groups (see Table III.12).

The impacts of Upward Bound on postsecondary credits are positive for men. For young men, Upward Bound increased the total number of postsecondary credits from 19 credits to 27 credits (see Table III.11). For young women, the estimated effect is statistically insignificant.

6. Subgroups Defined by the Likelihood of Being Selected to Participate in Upward Bound

Before students were randomly assigned to the treatment group or control group, we asked project directors to rate students they had determined eligible for their program according to the likelihood that they would have been selected to participate in Upward Bound in the absence of the experiment. We used these ratings to assess whether the program's effects would change if project directors dipped further into the pool of eligible applicants to select different types of students.

Upward Bound raised four-year college enrollment by students who were most likely to be selected for Upward Bound (see Table III.13).²⁴ For these students, Upward Bound raised four-year college enrollment 10 percentage points to 52 percent; this represents a 24 percent increase over the enrollment rate for similar students in the control group (42 percent). For students who

²⁴ In general, when we tested whether differences in impacts existed among these three groups, we found no statistically significant differences. This suggests that our evaluation did not distort the group of students served.

were somewhat likely to be selected, the estimated effects of Upward Bound on postsecondary enrollment are statistically insignificant. For students who were least likely to be selected, Upward Bound may raise four-year college enrollment but the evidence is inconclusive. When we include all postsecondary enrollment reported by sample members, the estimated effect on four-year college enrollment is statistically insignificant for these students (see Table III.13). However, when we exclude unverified postsecondary enrollment, the estimated effect becomes larger and statistically significant (see Table III.14).

The effect of Upward Bound on postsecondary persistence appears to be largest for the students that projects are least likely to serve. For students who were least likely to be selected for the program, Upward Bound increased the number of credits earned at four-year institutions from 9 to 33 credits—large impacts for a small subgroup of treatment students (see Table III.13). For these students, Upward Bound may have also increased the number of credits earned at all postsecondary institutions (see Table III.13), but the estimated impact becomes statistically insignificant when we exclude unverified postsecondary enrollment (see Table III.14). For students who were somewhat likely to be selected, the effects of Upward Bound on the total number of credits earned at all postsecondary institutions and the number of credits earned at four-year institutions were statistically insignificant. For students who were most likely to be selected, Upward Bound may have raised the average number of credits earned at four-year colleges and universities (see Table III.13), but the estimated impact becomes statistically insignificant when we exclude unverified postsecondary enrollment (see Table III.14).

C. The Effect of Upward Bound on College Engagement

Besides assessing the effects of Upward Bound on postsecondary enrollment and credits, we examined the effects of the program on a set of related outcomes that describe students’

Table III.11

Impact of Upward Bound on Postsecondary Enrollment and Credits for Male and Female Students,
Includes All Self-Reported Postsecondary Enrollment

	All Students				Participants	
	Male		Female		Male	Female
	Control Mean	Impact	Control Mean	Impact	Impact	Impact
Postsecondary School Status (%)						
Any postsecondary school	59	4	75	3	5	3
Four-year college	33	7 *	49	7 *	8 *	8 *
Two-year college	24	-3	24	-6	-3	-7
Vocational school	1	0	2	3	0	3
Credits Earned						
All postsecondary schools	18.5	8.9 **	42.1	-1.3 #	10.2 **	-1.5
Nonremedial	17.0	8.5 **	39.9	-1.9 #	9.8 **	-2.2
Remedial	1.1	-0.1	1.7	-0.1	-0.1	-0.2
Other	0.4	0.5	0.6	0.7	0.5	0.8
Four-year colleges	12.5	7.0 **	29.7	1.7	8.0 **	2.0
Nonremedial	11.5	6.9 **	28.7	0.8	7.9 **	0.9
Remedial	0.5	-0.1	0.6	0.2	-0.1	0.2
Other	0.4	0.2	0.5	0.8	0.2	0.9
Two-year colleges	5.8	1.2	10.9	-2.1	1.4	-2.5
Nonremedial	5.3	1.3	9.8	-1.8	1.5	-2.1
Remedial	0.5	0.0	1.1	-0.4	-0.1	-0.4
Other	0.0	0.0	0.0	0.0	0.0	0.0
Vocational schools	0.2	0.6	1.4	-0.9	0.7	-1.1
Nonremedial	0.2	0.3	1.4	-0.9	0.4	-1.0
Remedial	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.0	0.3	0.0	0.0	0.3	-0.1

Source: pst-male.log and pst-female.log

Note: Hyphens indicate too few respondents to compute impact. Weighted values reported.

*/**/** Impact estimate is statistically significant at the 0.10 / 0.05 / 0.01 level.

Indicates that for all students, the impacts are significantly different from the impacts for male students at the 0.10 level.

Table III.12

Impact of Upward Bound on Postsecondary Enrollment and Credits for Male and Female Students,
Excludes Unverified Self-Reported Enrollment

	All Students				Participants	
	Male		Female		Male	Female
	Control Mean	Impact	Control Mean	Impact	Impact	Impact
Postsecondary School Status (%)						
Any postsecondary school	50	9 *	67	2	10 *	2
Four-year college	26	6	43	4	7	5
Two-year college	23	-1	21	-3	-1	-3
Vocational school	1	4 *	2	0	4 *	1
Credits Earned						
All postsecondary schools	17.9	6.6 *	36.5	-1.6	7.6 *	-1.9
Nonremedial	16.7	6.1 *	34.6	-2.1	7.0 *	-2.5
Remedial	1.0	-0.2	1.4	-0.1	-0.2	-0.1
Other	0.2	0.7	0.5	0.5	0.7	0.6
Four-year colleges	12.4	4.6	25.5	1.2	5.3	1.4
Nonremedial	11.7	4.3	24.4	0.6	4.9	0.7
Remedial	0.5	0.0	0.6	0.0	0.0	0.0
Other	0.2	0.4	0.4	0.5	0.4	0.6
Two-year colleges	5.4	0.2	9.8	-2.0	0.2	-2.4
Nonremedial	4.9	0.3	9.0	-1.9	0.4	-2.3
Remedial	0.5	-0.1	0.8	-0.1	-0.2	-0.1
Other	0.0	0.0	0.0	0.0	0.0	0.0
Vocational schools	0.2	1.7 **	1.2	-0.8	#	2.0 **
Nonremedial	0.2	1.5 **	1.2	-0.8	#	1.7 **
Remedial	0.0	0.0	0.0	0.0		0.0
Other	0.0	0.3	0.0	0.0		0.0

Source: pst-male.log and pst-female.log

Note: Hyphens indicate too few respondents to compute impact. Weighted values reported.

*/**/** Impact estimate is statistically significant at the 0.10 / 0.05 / 0.01 level.

Indicates that for all students, the impacts are significantly different from the impacts for male students at the 0.10 level.

Table III.13

Impact of Upward Bound on Postsecondary Enrollment and Credits by the Likelihood of Admission to Upward Bound,
Includes All Self-Reported Postsecondary Enrollment

	All Students						Participants			
	Least Likely		Somewhat Likely		Most Likely		Least	Somewhat	Most	
	Control Mean	Impact	Control Mean	Impact	Control Mean	Impact	Impact	Impact	Impact	
Postsecondary School Status (%)										
Any postsecondary school	65	9	74	2	68	4	10	2	5	
Four-year college	30	15	50	1	42	10 ***	17	1	12 ***	
Two-year college	34	-7	23	-4	23	-6	-7	-5	-6	
Vocational school	0	0	1	5 *	2	0	0	5 *	0	
Credits Earned										
All postsecondary schools	28.5	17.3 **	40.0	-4.9 #	33.3	4.3	19.6 **	-5.7	5.0	
Nonremedial	27.0	17.9 ***	38.2	-4.8 #	30.9	3.0 #	20.3 ***	-5.5	3.5	
Remedial	1.2	-0.5	1.3	0.4	1.8	-0.5	-0.5	0.5	-0.6	
Other	0.3	-0.1	0.5	-0.5	0.6	1.9 *	-0.2	-0.6	2.2 *	
Four-year colleges	8.8	24.4 ***	31.6	-4.4 #	22.0	4.9 * #	27.7 ***	-5.1	5.7 *	
Nonremedial	8.1	24.7 ***	30.5	-4.0 #	21.1	3.1 #	28.0 ***	-4.6	3.6	
Remedial	0.3	-0.1	0.8	0.0	0.4	0.2	-0.2	0.0	0.2	
Other	0.3	-0.1	0.4	-0.4	0.6	1.6	-0.2	-0.5	1.9	
Two-year colleges	17.3	-4.1	7.6	-0.2	10.0	-0.7	-4.7	-0.2	-0.8	
Nonremedial	16.4	-3.8	7.0	-0.5	8.6	0.0	-4.3	-0.6	0.0	
Remedial	0.9	-0.3	0.5	0.4 **	1.4	-0.8 *	-0.4	0.4 **	-0.9 *	
Other	0.0	-	0.1	0.0	0.0	0.1	-	0.0	0.1	
Vocational schools	2.4	-3.0	0.8	-0.4	1.1	0.1	-3.4	-0.4	0.1	
Nonremedial	2.4	-3.0	0.7	-0.3	1.1	-0.2	-3.4	-0.3	-0.2	
Remedial	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	
Other	0.0	-	0.1	-0.1	0.0	0.2	-	-0.1	0.2	

Source: pst-rating_h.log, pst-rating_m.log, and pst-rating_l.log

Note: Hyphens indicate too few respondents to compute impact. Weighted values reported.

*/**/** Impact estimate is statistically significant at the 0.10 / 0.05 / 0.01 level.

Indicates that for all students, the impacts are significantly different from the impacts for least likely students at the 0.10 level.

Table III.14

Impact of Upward Bound on Postsecondary Enrollment and Credits by the Likelihood of Admission to Upward Bound,
Excludes Unverified Self-Reported Enrollment

	All Students						Participants				
	Least Likely		Somewhat Likely		Most Likely		Least	Somewhat	Most		
	Control Mean	Impact	Control Mean	Impact	Control Mean	Impact	Impact	Impact	Impact		
Postsecondary School Status (%)											
Any postsecondary school	57	11	65	0	60	5	13	0	6		
Four-year college	24	18 **	42	-2	37	9 ***	21 *	-2	10 ***		
Two-year college	32	-7	21	-1	21	-3	-7	-1	-3		
Vocational school	1	0	2	3	2	0	0	4	0		
Credits Earned											
All postsecondary schools	28.1	10.4	32.5	-3.4	30.6	1.4	11.7	-4.0	1.7		
Nonremedial	26.8	10.9	31.0	-3.2	28.7	0.3	12.2	-3.8	0.3		
Remedial	0.9	-0.1	1.2	0.1	1.5	-0.4	-0.1	0.1	-0.4		
Other	0.4	-0.3	0.4	-0.3	0.5	1.5 *	-0.4	-0.4	1.8 *		
Four-year colleges	12.7	16.8 ***	25.1	-3.2	#	20.2	3.1	#	18.9 ***	-3.8	3.6
Nonremedial	12.0	17.1 ***	24.1	-2.8	#	19.3	1.7	#	19.2 ***	-3.3	2.0
Remedial	0.3	0.1	0.8	-0.2		0.5	0.1		0.1	-0.2	0.1
Other	0.4	-0.3	0.3	-0.3		0.5	1.3		-0.4	-0.3	1.5
Two-year colleges	13.6	-4.2	6.6	-0.2		9.5	-1.8		-4.8	-0.2	-2.1
Nonremedial	12.9	-4.0	6.1	-0.5		8.5	-1.3		-4.6	-0.6	-1.6
Remedial	0.7	-0.2	0.4	0.3		1.0	-0.4 *		-0.2	0.4	-0.5 *
Other	0.0	-	0.1	0.0		0.0	0.0		-	0.0	0.0
Vocational schools	1.8	-2.1	0.8	0.0		0.9	0.1		-2.4	0.0	0.2
Nonremedial	1.8	-2.1	0.8	0.0		0.8	0.0		-2.4	0.1	0.0
Remedial	0.0	-	0.0	0.0		0.0	0.0		-	0.0	0.0
Other	0.0	-	0.0	0.0		0.0	0.2		-	0.0	0.2

Source: pst-rating_h.log, pst-rating_m.log, and pst-rating_l.log

Note: Hyphens indicate too few respondents to compute impact. Weighted values reported.

*/**/** Impact estimate is statistically significant at the 0.10 / 0.05 / 0.01 level.

Indicates that for all students, the impacts are significantly different from the impacts for least likely students at the 0.10 level.

experiences while attending postsecondary institutions. Previous research has shown, for example, that postsecondary students who are more engaged in school are more likely to persist and graduate (Braxton 2000). For the national evaluation of Upward Bound, we measured students' engagement by asking them to report on the frequency with which they used academic counseling services, obtained personal counseling, received help from a learning skills center, received tutoring services, engaged in services offered by a minority student center or obtained services from a health center during their first year of college. We also measured students' use of services provided by Student Support Services,²⁵ receipt of financial aid and whether students had met with faculty or an advisor about academic issues, participated in study groups outside of class, worked for pay while in college or participated in activities outside of class such as intramural sports and school clubs.

For most of the college engagement outcomes that we examined, the estimated effects of Upward Bound are statistically insignificant (see Table III.15). For example, Upward Bound did not have a statistically significant effect on the rate at which students received financial aid in college. However, Upward Bound slightly increased the receipt of personal counseling, the use of learning skills centers and the use of tutoring services during students' first year in college (see Table III.15). Upward Bound also increased the employment rate and hours worked by students in college. For college sophomores, Upward Bound raised the employment rate from 37 percent to 47 percent and the average number of hours worked per week from 10 to 12 hours per week. The effects of Upward Bound on college engagement outcomes for different subgroups do not suggest any notable findings (see Appendix E).

²⁵ Student Support Services is a federal program designed to provide low-income and first-generation college students with opportunities for academic development, assist them in meeting basic college requirements and motivate them toward completing their degrees.

Table III.15
Impact of Upward Bound on College Engagement

	All Students		Participants
	Control Mean	Impact	Impact
Residence in focused housing (%)	1	0	0
Days per year of parent or student contact with school	72.2	2.0	2.4
How often during first year in postsecondary school student used the following supplemental services			
Academic counseling	1.4	0.2	0.2
Personal counseling	0.4	0.2 **	0.3 **
Learning skills center services	0.8	0.2 *	0.3 *
Tutoring services	1.0	0.3 ***	0.4 ***
Minority student services	0.4	0.1	0.1
Health services	0.6	0.0	0.1
Other	0.0	0.0	0.0
Participation in federally supported programs while in postsecondary school (%)			
Student Support Services	5	1	1
McNair Post-Baccalaureate Achievement Program	1	0	0
Student received financial aid (%)	55	-1	-2
How often during first year of postsecondary school student:			
Talked with faculty in office about academic matters	2.1	0.1	0.1
Met with advisor concerning academic plans	1.7	0.1	0.1
Had informal contact with advisor or other faculty	1.6	0.2 **	0.3 **
Participated in study groups outside of class	2.4	-0.1	-0.1
Went to events with friends from school	3.1	0.1	0.1
Participated in school clubs	1.3	0.1	0.1
Attended career-related lectures, conventions, or field trips with friends	1.4	0.0	0.0
Participated in intramural or intercollegiate sports, music, drama, etc.	1.2	0.0	0.0
Cut classes	1.5	0.0	0.0
While in college or other school, student worked for pay (%)			
Freshman year	45	1	1
Sophomore year	37	10 ***	11 ***
Approximate hours worked per week during:			
Freshman year	12.9	-1.4	-1.7
Sophomore year	10.0	2.0 ***	2.4 ***

Source: pss-overall.log

Note: Weighted values reported.

*/**/** Impact estimate is statistically significant at the 0.10 / 0.05 / 0.01 level.

IV. The Effect of Longer Upward Bound Participation and Completion on Postsecondary Enrollment and Persistence

It is possible that students would reap larger benefits from Upward Bound if they spent more time in the program. The typical participant remains in Upward Bound for a little more than a year and a half, and most participants do not complete the program (see Chapter II). In this chapter, we describe the relationships between two postsecondary outcomes—postsecondary enrollment and credits—and two measures of the extent to which students participated in Upward Bound—the duration of program participation and program completion. In measuring these relationships, we attempt to estimate the effects of additional participation on postsecondary enrollment and credits.

As we describe later, the estimated effects of additional participation may overstate the true effects due to selection bias. With this caution in mind, our findings suggest that keeping students in Upward Bound for longer periods may substantially improve their postsecondary outcomes. Although these findings may appear at odds with the findings described in Chapter III on the effect of Upward Bound on postsecondary outcomes, our analysis suggests that the findings in Chapters III and IV are not inconsistent with each other (see Section D).

Findings reported in this chapter suggest that the effects of Upward Bound on postsecondary enrollment and persistence would increase if Upward Bound projects implemented retention programs that raised the average length of program participation. However, the findings do not suggest that the effects of Upward Bound would increase if projects focused their recruiting on the types of students who tend to have long spells of participation. For example, students with higher educational expectations tend to have long spells of participation (see Chapter II, Table

II.1). However, these students tend to reap smaller benefits from Upward Bound than students with lower educational expectations (see Chapter III, Table III.2).

A. Research Questions

To assess the potential for keeping students in Upward Bound for longer periods of time, we classified participants as “low-duration participants” (1 to 12 months of participation), “medium-duration participants” (13 to 24 months of participation) or “high-duration participants” (25 or more months of participation), and also as program “completers” (still participating in the spring of senior year) or “noncompleters.” Among Upward Bound participants, 35 percent participate for 1 to 12 months, 28 percent participate for 13 to 24 months and 36 percent participate for 25 or more months; 40 percent complete the program, that is, participate in Upward Bound through high school graduation (see Table IV.1).²⁶ These findings suggest that there is considerable opportunity to increase the completion rate and the length of time that participants remain in the program.

To better understand the potential effects of Upward Bound retention on postsecondary enrollment and credits, we address two research questions:

1. For low- and medium-duration participants, hereafter referred to as “lower-duration participants,” how much higher would their postsecondary enrollment rate and persistence be if they participated for an additional year?
2. For noncompleting participants, how much higher would their postsecondary enrollment rate and persistence be if they completed Upward Bound?

²⁶ Students who complete Upward Bound participate for different lengths of time depending on whether they enter the program in eighth grade, ninth grade, tenth grade or eleventh grade.

Table IV.1
Duration of Upward Bound Participation and Completion Rates,
Excluding No-Shows

	Mean Duration	Distribution of Duration			Completion Rates
		1-12 months	13-24 months	25+ months	
All Cohorts of Participants	21	35	28	36	40
8th Grade Cohort	31	24	17	60	35
9th Grade Cohort	21	38	18	44	33
10th Grade Cohort	18	35	41	24	48
11th Grade Cohort	12	43	57	—	57

Source: char1.log

B. Research Methods

To answer these questions, we compared the outcomes for students with relatively low levels of participation to those for students with relatively high levels of participation. A simple comparison of students with different levels of Upward Bound participation, however, may fail to reveal the effects of additional participation. While random assignment ensures that there will be no systematic differences between treatment and control students, it does not ensure there will be no systematic differences between completers and noncompleters or among students who choose to participate in Upward Bound for different lengths of time. The characteristics of students may influence how long they choose to participate in Upward Bound and whether they complete Upward Bound. If so, the average characteristics of students will vary with the level of Upward Bound participation. For example, we found that students who participate in Upward Bound for longer periods of time are more likely to be female and have higher grade point averages in ninth grade than students who participate for shorter periods (see Table IV.2); we find similar differences between completers and noncompleters. Therefore, we cannot infer the effects of additional Upward Bound participation simply from differences in average outcomes between lower- and higher-duration students and between completers and noncompleters.

Table IV.2
 Characteristics of Upward Bound Participants Who Entered in Ninth or Tenth Grade
 by Participation Duration and Completion Status

Characteristics	Participation Duration (Months)			Completion Status	
	1-12	13-24	25+	No	Yes
Sex (%)					
Male	41	36	24	39	25
Female	60	64	76	61	75
Race (%)					
African American	44	42	44	41	47
White	19	31	23	25	21
Hispanic	29	16	26	24	25
Other Race	8	11	8	10	7
Low-Income and First-Generation (%)					
Low-Income and First-Generation	74	84	81	77	83
First-Generation Only	22	10	15	19	12
Low-Income Only	4	6	5	5	5
Educational Expectations (%)					
High School or Less	4	3	4	6	1
Some College	17	20	17	19	16
Finish Four-year College	43	37	37	36	43
More Than a Four-year Degree	28	27	33	29	30
Academic Achievement - Ninth Grade					
Total Credits	5.7	6.1	6.1	5.8	6.2
Advanced Placement and Honors Credits	0.6	0.3	0.5	0.4	0.5
Overall Grade Point Average	2.1	2.4	2.5	2.1	2.5
Homework (%)					
Less than 1 Hour / Week	11	8	3	11	2
1-10 Hours / Week	68	66	76	70	71
More than 10 Hours / Week	21	26	20	19	26
Extracurricular Activities (%)					
Less than 1 Hour / Week	41	38	34	40	34
1-10 Hours / Week	46	49	55	47	54
11-15 Hours / Week	5	7	8	6	7
More than 15 Hours / Week	5	4	3	4	4
Disciplinary Problems (%)					
Disobeying Rules	46	42	42	46	39
In-school Suspension	24	11	14	20	12
Out-of-school Suspension	14	12	10	14	9
Graduation probability (self-assessed, %)					
Very Sure	84	90	87	84	92
Less Sure	16	10	13	16	8

Source: char2.log

Because students with different levels of Upward Bound participation have different characteristics, we used statistical matching to select samples of lower- and higher-duration students with similar observed characteristics and samples of noncompleters and completers with similar characteristics.²⁷ To measure the potential effects of participating in Upward Bound for an additional year, we matched low-duration participants to similar medium-duration participants, and we matched medium-duration participants to similar high-duration participants.²⁸ Likewise, to measure the potential effects of program completion on noncompleters, we matched noncompleters to similar completers. The matching process ensured that matched samples contained participants with similar demographic characteristics, educational aspirations and ninth-grade academic performance.²⁹

In this analysis, we restricted our sample to students who entered Upward Bound in ninth or tenth grade. We excluded students who applied for Upward Bound in the eighth grade because they had not yet entered high school and therefore we could not obtain information on their previous academic performance from high school transcripts. Because postsecondary enrollment and credits were the key outcomes for this analysis, and because academic performance before college influences these outcomes, it was important to match students with similar academic performance before they entered Upward Bound. We also excluded students who applied for Upward Bound after tenth grade. Their window of opportunity to participate in Upward Bound

²⁷ Unlike random assignment, which ensures two statistically equivalent groups that are similar in terms of observed and unobserved characteristics, the matching procedures can only create groups that are similar in terms of observed characteristics.

²⁸ These matches allow us to simulate what the outcomes of low-duration participants would have been had they instead been medium-duration participants and what the outcomes of medium-duration participants would have been had they instead been high-duration participants.

²⁹ We used propensity score matching to select the matched samples. See Appendix F for additional details.

was relatively short—two years—so the potential for increasing the length of their participation in Upward Bound was limited.

Once matching was completed, we estimated program effects using the same methods employed throughout this report. For example, consider the comparison of noncompleters to similar completers. We treated completers as the “treatment group”—the group that received additional Upward Bound services—and noncompleters as the “control group.” The treatment-control difference in mean outcomes provides an estimate of the potential benefit of additional Upward Bound participation.³⁰

Although the matched samples have similar demographic characteristics, educational expectations and ninth-grade academic performance, they may differ in ways not revealed by the data collected for the evaluation. For example, our matched samples of completers and noncompleters may differ in their motivation to attend college. Unobserved differences between matched samples may bias the estimates presented in the next section. Therefore, we must interpret these estimates cautiously (see Section D).

C. The Effect of Longer Participation and Completion

Though subject to the caveats described earlier and presented in more detail at the end of this chapter, findings from this analysis suggest:

- ***Longer participation may yield larger effects.*** For students who participated in Upward Bound for less than two years, an additional year of Upward Bound participation may raise the postsecondary enrollment rate by as much as 9 percentage points and the average number of postsecondary credits earned by as many as nine credits.

³⁰ Mean outcomes were regression-adjusted with the same linear model used throughout the report to compute the impacts of the opportunity to participate in Upward Bound (see Chapter I, footnote 6), with additional covariates on ninth-grade academic performance and Upward Bound cohort.

- ***Program completion may yield larger effects.*** For Upward Bound participants who did not complete the program, program completion may raise postsecondary enrollment by as much as 17 percentage points and the average number of postsecondary credits by as much as 16 credits.
- ***The effect of additional participation operates through greater enrollment at four-year institutions.*** Additional Upward Bound participation seems to raise enrollment at four-year institutions and, as a consequence, raises overall postsecondary enrollment.
- ***The effect of additional participation on postsecondary enrollment and credits is similar for students with higher and lower ninth-grade academic performance.*** For none of the relevant outcomes is there a statistically significant difference in the effects of additional participation between higher- and lower-risk students; almost all of the estimated effects are similar for the two groups.

1. The Effect of Longer Participation

Our findings suggest that Upward Bound would have a much larger effects on lower-duration participants—students who participated for no more than 24 months—if it could keep them in the program longer (see Table IV.3). About 69 percent of lower-duration participants had attended a postsecondary institution between high school and the third follow-up survey. Our results suggest that if these participants had stayed in Upward Bound an additional year, 78 percent would have attended a postsecondary institution, and the average number of postsecondary credits earned would have risen from 30 to 40.

2. The Effect of Program Completion

Our findings also suggest that Upward Bound might have a larger effect on noncompleters if it retained them through high school graduation (see Table IV.4). If noncompleters remained in Upward Bound through program completion, we estimate that they would on average participate for an additional 22 months—almost two years.³¹ Therefore, one might expect the effects of

³¹ For students who entered Upward Bound in ninth or tenth grade, the average duration for noncompleters was just over nine months. For completers from this same group, the average duration in the program was more than 31 months.

Table IV.3
Impact of an Additional Year of Upward Bound Participation on
Postsecondary Enrollment and Credits

	Lower-Duration Participants	Impact of an Additional Year
Postsecondary School Status (%)		
Any postsecondary school †	69	9 ***
Four-year college	46	13 ***
Two-year college	21	-4 *
Vocational school	2	1
Credits Earned (mean)		
All postsecondary schools †	30.4	9.4 ***
Four-year colleges	22.6	6.8 ***
Two-year colleges	6.9	2.5
Vocational schools	0.9	0.2

Source: means.log and out_imp.log

*/**/** Impact estimate is statistically significant at the 0.10 / 0.05 / 0.01 level.

† Includes four-year, two-year, vocational, and other postsecondary schools that could not be classified.

program completion to be approximately twice that of an additional year of participation, and our analysis confirms that expectation. For noncompleters, our estimates suggest program completion would raise postsecondary enrollment rates from 74 percent to 91 percent.³² Additional estimates suggest that completing Upward Bound would raise the average number of postsecondary credits earned by noncompleters from 37 to 53.

3. The Effect of Longer Participation and Program Completion on Enrollment at Four-Year Institutions

Just as Upward Bound participation raises enrollment rates at four-year colleges and universities (see Chapter III, Table III.1), additional Upward Bound participation also seems to raise enrollment rates at these institutions. For lower-duration participants, our estimates suggest

³² For comparison, 87 percent of Upward Bound completers attended a postsecondary institution.

Table IV.4
Impact of Upward Bound Completion on
Postsecondary Enrollment and Credits

	Noncompleters	Impact of Program Completion
Postsecondary School Status (%)		
Any postsecondary school †	74	17 ***
Four-year college	52	23 ***
Two-year college	18	-8 **
Vocational school	3	3
Credits Earned (mean)		
All postsecondary schools †	37.1	15.8 ***
Four-year colleges	27.7	12.3 ***
Two-year colleges	8.5	3.9 *
Vocational schools	0.8	-0.3

Source: means.log and out_imp.log

*/**/** Impact estimate is statistically significant at the 0.10 / 0.05 / 0.01 level.

† Includes four-year, two-year, vocational, and other postsecondary schools that could not be classified.

that an additional year of participation would raise enrollment rates at four-year colleges and universities from 46 percent to 59 percent (see Table IV.3). For noncompleters, our estimates suggest that program completion would raise enrollment rates at four-year institutions from 52 percent to 75 percent (see Table IV.4).

Furthermore, the effect of additional participation on four-year college enrollment appears to generate a positive effect on overall postsecondary enrollment. The estimated effect of an additional year of participation on overall postsecondary enrollment—9 percentage points—can be attributed to the 13 percentage point increase in enrollment at four-year colleges and universities (see Table IV.3). Similarly, the estimated effect of program completion on overall postsecondary enrollment—17 percentage points—can be attributed to the 23 percentage point increase in enrollment at four-year colleges and universities (see Table IV.4). Therefore, additional Upward Bound participation seems to raise enrollment at four-year institutions and, as a consequence, raises overall postsecondary enrollment.

Table IV.5
Impact of an Additional Year of Upward Bound Participation on
Postsecondary Enrollment and Credits by Students' At-Risk Status

	Higher Risk		Lower Risk	
	Lower-Duration Participants	Impact of an Additional Year	Lower-Duration Participants	Impact of an Additional Year
Postsecondary School Status (%)				
Any postsecondary school †	47	7 *	76	8 ***
Four-year college	31	12 ***	51	13 ***
Two-year college	15	-4	23	-6 **
Vocational school	1	-1	2	0
Credits Earned (mean)				
All postsecondary schools †	12.2	6.7 **	37.2	12.1 ***
Four-year colleges	7.5	6.6 **	28.2	10.4 ***
Two-year colleges	3.9	0.4	7.9	1.7
Vocational schools	0.7	-0.3	0.9	0.1

Source: means.log and out_imp.log

*/**/** Impact estimate is statistically significant at the 0.10 / 0.05 / 0.01 level.

The impacts for higher risk and lower risk students are not significantly different from each other at the 0.10 level.

† Includes four-year, two-year, vocational, and other postsecondary schools that could not be classified.

4. The Effect of Longer Participation and Completion for Subgroups Defined by Academic Risk

For lower-duration students, our findings suggest that an additional year of Upward Bound would raise enrollment at four-year colleges and overall postsecondary enrollment for both students at higher risk of academic failure and students at lower risk of academic failure (see Table IV.5). The estimated effect of an additional year of Upward Bound participation on four-year college enrollment is 12 percentage points for higher-risk students and 13 percentage points for lower-risk students. As a result, Upward Bound raised overall postsecondary enrollment for both groups, by 7 percentage points for higher-risk students and by 8 percentage points for lower-risk students. For both higher-risk and lower-risk students, an additional year of Upward

Table IV.6
Impact of Upward Bound Completion on
Postsecondary Enrollment and Credits by Students' At-Risk Status

	Higher Risk		Lower Risk	
	Noncompleters	Impact of Program Completion	Noncompleters	Impact of Program Completion
Postsecondary School Status (%)				
Any postsecondary school †	52	18 *	80	16 ***
Four-year college	37	29 ***	57	22 ***
Two-year college	14	-13	19	-9 ***
Vocational school	1	2	4	3
Credits Earned (mean)				
All postsecondary schools †	18.7	24.1 ***	43.6	19.1 ***
Four-year colleges	11.9	14.4	33.3	17.4 ***
Two-year colleges	6.3	8.6 *	9.3	2.3
Vocational schools	0.5	1.1	1.0	-0.6

Source: means.log and out_imp.log

*/**/** Impact estimate is statistically significant at the 0.10 / 0.05 / 0.01 level.

The impacts for higher risk and lower risk students are not significantly different from each other at the 0.10 level.

† Includes four-year, two-year, vocational, and other postsecondary schools that could not be classified.

Bound also seems to raise the number of postsecondary credits earned in four-year colleges and overall.

For noncompleters, our findings suggest that Upward Bound completion would raise postsecondary enrollment and credits earned for both students at higher risk of academic failure and students at lower risk of academic failure (see Table IV.6). For example, the estimated effects on overall postsecondary enrollment are 18 percentage points for higher-risk students and 16 percentage points for lower-risk students; the estimated effects on total postsecondary credits are approximately 24 credits for higher-risk students and 19 credits for lower-risk students.

D. Interpretation of the Findings

Our findings suggest that the potential effects of retaining Upward Bound participants who would otherwise leave the program early may be large. They suggest that an additional year of

participation would raise the postsecondary enrollment rate for lower-duration participants by about 9 percentage points, and that program completion would raise the postsecondary enrollment rate for noncompleters by about 20 percentage points.

However, we suspect the true effects of additional participation are probably smaller than the estimates presented in this chapter. Although we used rigorous statistical methods in our analysis, we could not randomly assign students to different levels of Upward Bound participation. Therefore, it is likely that unobserved differences between the matched samples have generated selection bias in the estimates reported in this chapter. Because participants decide how long to participate and whether to complete the program (unless they are expelled), the groups may differ along many dimensions, including unmeasured characteristics like the motivation to attend college. If so, the estimated effects of additional participation, based on comparisons between these groups, may be partly attributable to differences in motivation that predated the Upward Bound participation of these students.

While the selection bias could be positive or negative, we suspect that selection bias leads us to overestimate the effects of additional participation. It seems likely that more motivated students participate longer in Upward Bound and complete Upward Bound at higher rates than less motivated students. If so, higher-duration participants would tend to be more motivated than lower-duration participants, and completers would tend to be more motivated than noncompleters. Furthermore, it seems likely that more motivated students enroll in college at higher rates than less motivated students. If so, higher-duration students should have higher college enrollment rates than lower-duration students because higher-duration students tend to be more motivated, and completers should have higher college enrollment rates than noncompleters because completers tend to be more motivated. While matching may reduce the motivational

differences between the samples, we expect that these differences partially explain the large positive effects of additional participation reported in this chapter.³³

Given the nature of selection bias, it is impossible to know for certain whether it exists and, if so, how large it is. But we should not assume that the estimates reported in this chapter greatly overstate the effects of additional Upward Bound participation. An exercise we conducted suggests that the magnitudes of the estimates reported in this chapter are credible. The estimated effects of an additional year of Upward Bound on college enrollment, which are presented in this chapter, are roughly consistent with the estimated effects of actual participation presented in Chapter III when you account for the average length of participation and the characteristics of lower-duration participants.³⁴ Therefore, the estimated effects of additional Upward Bound participation are consistent with the possibility that for lower-duration students who applied for Upward Bound in ninth or tenth grade, Upward Bound raises the likelihood of college attendance by about 9 percentage points per year of participation.

³³ If unobserved factors have led to selection bias, the bias was probably not reduced much by matching because the characteristics used in matching were weak predictors of how long students participated in Upward Bound and whether they completed the program. For example, only 6 out of the 19 variables used in matching lower-risk completers and noncompleters were significantly related to program completion at the 10 percent level; for higher-risk completers and noncompleters, 9 out of the 19 variables were used in matching were significantly related to program completion at the 10 percent level.

³⁴ In Chapter III, we estimated that Upward Bound raised enrollment at four-year colleges for participants by 7 percentage points (see “Participants” column in Table III.1). However, this estimate is a function of the types of students served by the program and the duration of their participation in Upward Bound. The estimated impacts reported in Chapter III were based on all participants, while the estimated impacts reported in this chapter were based on a subgroup of participants that included students who entered Upward Bound in ninth or tenth grade (see Appendix F). These participants had somewhat lower than average educational expectations when they entered the program, and Chapter III found larger impacts for lower-expectation students. For students who entered Upward Bound in ninth or tenth grade, the estimated impacts of Upward Bound participation on enrollment at four-year colleges were 26 percentage points for lower-expectation students and 6 percentage points for higher-expectation students. These impacts correspond to annual impacts of 17 percentage points and 5 percentage points, respectively, for lower- and higher-expectation students. Weighting these estimates by the proportion of lower- and higher-expectation students among lower-duration students who entered Upward Bound in ninth or tenth grade yields an estimate of the annual impact of Upward Bound participation on four-year college enrollment (8 percentage points) that is to the same order of magnitude as the estimated impact of an additional year of Upward Bound on four-year college enrollment (13 percentage points, see Table IV.3). We find a similar degree of consistency between the annual impacts of Upward Bound participation and the impact of an additional year of participation on enrollment at two-year colleges.

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APPENDIX A

SAMPLE DESIGN, UNIT NONRESPONSE AND WEIGHTS

In this appendix, we describe how the treatment and control samples were selected for the Upward Bound evaluation. We also describe how weights were assigned to members of both samples to account for the sample design and missing data due to unit nonresponse.

A. Sample Design

For the impact study, we selected a nationally representative sample of eligible Upward Bound applicants in two stages. First, a nationally representative sample of Upward Bound projects was selected to serve as “primary sampling units” (PSUs). Second, eligible applicants in the projects were randomly assigned to treatment and control groups.

1. First-Stage Sampling: Selection of Projects

The “universe” of projects for the impact study—the collection of projects whose students are eligible to be selected for the study sample—consists of active regular Upward Bound projects that (1) are located in the 50 states and the District of Columbia, (2) are hosted by postsecondary educational institutions, (3) had operated for at least three years by October 1992 and (4) were not serving only students with physical disabilities. Veterans projects and math and science projects are not considered regular projects. During the period when the impact study sample of students was being selected (roughly May 1992 through March 1994), there were 395 Upward Bound projects that met the definition of the universe.³⁵

From the universe of 395 projects, we selected a sample of 70 projects using stratified random sampling: each project in the universe was assigned to a group of projects (a stratum), and a sample was drawn from each stratum. Sampling rates varied across strata, so some

³⁵ Some projects funded in the 1989-1992 grant cycle were defunded in the 1992-1995 grant cycle and therefore eliminated from the universe. Projects newly funded in the 1992-1995 and later grant cycles were also excluded from the universe.

projects had a greater chance of being selected than other projects. Stratification with disproportionate sampling (unequal sampling rates) was used to ensure that enough projects—and therefore enough students—were selected to support precise estimates for relatively small but important analytic subgroups, such as students in large projects or students in projects hosted by two-year postsecondary institutions.

Table A.1 displays the 46 strata used to select projects in the first-stage sampling for the impact study. The table also shows, for each stratum, the number of projects in the universe, the number of projects selected for the sample and the number of projects in which random assignment of students was carried out. Within each stratum, projects were selected using simple random sampling without replacement. Thus, although selection probabilities varied across strata, each project in a given stratum had the same chance of being selected. That chance equals the number of projects selected divided by the number of projects in the universe in that stratum.³⁶

Strata are defined, in part, by cross-tabulating three stratifying variables: (1) location of the host institution, (2) type and control of the host institution and (3) project size. Type and control was ascertained from the 1990-1991 Integrated Postsecondary Education Data System (IPEDS) Institutional Characteristics file. The project size variable has three categories: (1) small (60 or fewer students), (2) medium (61 to 99 students) and (3) large (100 or more students). Enrollment figures were obtained from the 1990-1991 Upward Bound performance reports.

³⁶ Three of the projects in the sample are backups selected randomly from the same strata as three originally selected projects for which it was determined that random assignment would be inappropriate. Two of the three originally selected projects were operating under special administrative provisions, and the third project had, for several years, been unable to fill all available openings. These three projects that were replaced by backups are included in the universe counts in Table A.1.

Table A.1
Selection of Upward Bound Projects for the Impact Study

Stratum	Number of Projects		
	Universe	Sample	
		Selected	Respondents ^a
Urban: Four-year, Public			
Small:			
African American ^b	14	2	2
Latino	4	1	1
Other	7	1	1
Medium:			
Asian	5	2	2
Native American	2	1	1
Latino	9	2	2
Other	56	1	1
Large:			
African American	25	3	3
Latino	6	3	3
White	2	1	1
Other	6	1	1
Urban: Four-year, Private			
Small:			
African American	8	1	1
Other	5	1	1
Medium:			
Asian	4	1	1
African American	38	3	3
Latino	3	2	2
Other	5	1	1
Large:			
Asian	2	1	1
African American	22	5	3
Other	3	1	1
Urban: Two-year			
Small:			
Native American	1	1	1
African American	9	3	3
Latino	3	1	1
Other	5	1	1
Medium:			
Asian	2	1	1
African American	10	3	3
Other	4	1	1
Large	3	1	1

TABLE A.1 (continued)

Stratum	Number of Projects		
	Universe	Sample	
		Selected	Respondents ^a
Rural: Four-year, Public			
Small:			
White	6	1	1
Other	6	1	1
Medium:			
Native American	7	3	2
Latino	4	1	1
Other	30	1	1
Large:			
African American	5	1	1
Other	10	2	2
Rural: Four-year, Private			
Small	7	1	1
Medium	14	2	2
Large	4	1	1
Rural: Two-year			
Small:			
African American	4	2	2
White	5	1	1
Other	6	1	1
Medium:			
African American	5	1	1
White	8	2	2
Other	5	1	1
Large:			
White	3	1	1
Other	3	1	1
Total	395	70	67

^a Respondents are projects in which random assignment was carried out.

^b At least 50 percent of the students served by "African American projects" are classified as African American according to the 1990-91 Upward Bound performance reports. Native American, Latino, and white projects are similarly defined. (Native American includes Alaskan Native.) For Asian projects, at least 25 percent of the students served are classified as Asian or Pacific Islander.

Although some strata are defined entirely in terms of the location, type and size variables, many strata are defined by also taking into account projects' racial and ethnic compositions. At least 25 percent of the students served by "Asian projects" are classified as Asian or Pacific Islander. For a Native American (including Alaskan Native), African American, Latino or white project, at least 50 percent of the students served are classified as members of the specified racial or ethnic group. Data on race and ethnicity were obtained from Upward Bound performance reports.

When possible, projects were sampled proportionately by racial and ethnic composition within classifications based on the other three stratifying variables. Thus, differences by racial and ethnic composition in the overall rates at which projects were sampled are due largely to disproportionate sampling by size and type and control. Small projects, large projects and projects hosted by two-year postsecondary institutions were oversampled to provide adequate sample sizes for subgroup analyses.

2. Second-Stage Sampling: Selection of Students

For each of the 67 projects selected in the first stage, we identified its main recruiting period(s)—typically spring 1993, fall 1993 or both—that fell during the student sample intake period for the impact study (roughly October 1992 to March 1994). With few exceptions, eligible students applying to Upward Bound during a project's main recruiting period(s) were selected with certainty for the baseline impact study sample and subject to random assignment to treatment (Upward Bound) and control groups. The exceptions were students designated as "exempt" from random assignment and students randomly chosen as "givebacks." We discuss these exceptions after describing how random assignment was conducted.

a. Random Assignment

When a project had completed recruiting for a given recruiting period, we selected eligible applicants at random to fill all available program openings. Eligible applicants not selected for Upward Bound and assigned to the treatment group were assigned to the control group or, more accurately, to a waiting list that could be used to fill certain future program openings. The waiting list and students selected from it, so-called “post-initial treatments” (PITs), are discussed in the next section.³⁷

At least one round of random assignment was conducted in each of 67 projects.³⁸ In 17 projects with more than one recruiting period, there were two or more rounds of random assignment. We conducted a total of 87 rounds of random assignment.

Many Upward Bound project directors were concerned that the element of chance introduced by random assignment could severely unbalance the student composition of their programs. For example, it would be possible for all students in a cohort to be from just one target school or to be female. The former outcome could have seriously damaged relationships with target schools whose students were not selected, while the latter might have hampered program operations if there were not enough dormitory rooms available for females during the summer session. Therefore, project directors were allowed to specify random assignment strata and, subject to the existence of enough eligible applicants, to allocate available program

³⁷ As we discuss later, students designated as post-initial treatments will not necessarily be members of the treatment group for baseline or follow-up analyses.

³⁸ As indicated in Table A.1, random assignment was not carried out in 3 of the 70 projects selected for the sample. The stated policy of one of those three projects was to serve all eligible applicants. Although not policy, the practice of another project was also to serve all eligible applicants because there were just enough students to fill program openings, leaving none to form a control group. The third project had its funding cut and had no openings for new students. These three projects could not be replaced by backups even though, as noted earlier, three other projects in which random assignment could not be carried out had been replaced. Backups could not be selected because random assignment was determined to be infeasible only after it had been announced that no additional projects would be selected for the impact study. Failure to carry out random assignment in originally selected projects may introduce bias of unknown direction and magnitude into sample estimates.

openings across the strata to obtain the desired mix of students.³⁹ In all, there were 339 random assignment strata. Within a given stratum, random assignment was conducted as described earlier. The eligible applicants in the stratum were chosen at random to fill the available openings in the stratum. Students not picked for Upward Bound were assigned to the waiting list.

b. Exemptions, Givebacks and PITs

Exemptions. At the request of Upward Bound project directors, a very small number of students applying to Upward Bound were exempt from random assignment because it was determined that allowing the assignment of such students to be subject to the vagaries of chance could be unusually or permanently disruptive to normal program operations. For example, if a project and a local child protective services agency had a prior agreement that all eligible students referred by the agency would be accepted into Upward Bound, that agreement was not violated for the evaluation, and students referred during the sample intake period were exempt from random assignment. Strict policies of accepting all siblings into the program or accepting none of them were honored, and they accounted for a few exemptions. For instance, one of a pair of twins applying to a project with such a policy was exempt from random assignment, while the other twin was subject to random assignment. The exempt twin would be allowed to participate in Upward Bound only if the nonexempt twin were randomly assigned to the treatment group. All exempt students were designated as nonresearch cases and were excluded from all analyses.

³⁹ Stratification was also needed in some instances to ensure that a project did not violate the federal requirement that two-thirds of the project's students be both low-income and potential first-generation college. For projects with multiple rounds of random assignment, each round had its own set of strata.

Givebacks. Some projects recruited many more eligible applicants than were needed to fill available program openings and form a control group of adequate size. In such instances, we randomly selected students from the control group and “gave them back” to the projects immediately after random assignment. These givebacks could be selected by the projects to fill program openings when the impact study student intake period had ended. Although subject to random assignment, givebacks are not part of the baseline or follow-up samples. All 97 givebacks (distributed across 11 projects) are nonresearch cases.

PITs. After being selected for Upward Bound, some students never enter the program. Other students enter but leave before completing the program. Therefore, Upward Bound projects typically maintain waiting lists of students so that program openings can be filled without having to either mount a full-scale recruiting effort or wait until the next recruiting period.

During the sample intake period for the evaluation, projects were not allowed to have their own waiting lists: all nonexempt applicants were subject to random assignment.⁴⁰ To enable projects to maintain full enrollment under such conditions, we assigned students not selected for Upward Bound to an evaluation waiting list, rather than a strict control group. Students could be randomly selected from the evaluation waiting list to fill program openings, although such use of the waiting list was subject to time and size restrictions. Specifically, students could not be selected off the waiting list after a certain date—typically, the start of the next recruiting period. Also, for a given random assignment stratum, a student could not be selected from the waiting list if the selection of a student reduced the number of students remaining on the waiting list to

⁴⁰ Even students who applied to Upward Bound and were placed on a project’s waiting list prior to the sample intake period for the study were generally subject to random assignment. The only exceptions were students who had previously been promised admission when openings became available. Such students were among the small number of exemptions.

less than about two-thirds the number of students originally assigned to the treatment group. Students randomly selected from the evaluation waiting list are designated as PITs. The next section discusses how PITs are used in baseline and third follow-up analyses.

B. Weighting

Students were assigned weights that we have used in estimating impacts. Weighting has three purposes. First, it ensures that the sample “weights up” to the universe, producing correct totals (subject to sampling variability).⁴¹ Second, for purposes of estimation, weighting “undoes” the effects of disproportionate sampling so that two strata with the same number of students in the universe are counted equally, even if they have different numbers of students in the sample. Third, weighting adjusts for nonresponse.

In the following sections, we describe how we assigned baseline and third follow-up weights. We constructed separate third follow-up weights for analyzing data from the survey, high school transcripts, postsecondary transcripts and participation reports from the 67 evaluation projects. To exclude exemptions and givebacks from all analyses, we assigned them zero baseline and third follow-up weights. In contrast, all PITs were included in baseline analyses and received nonzero baseline weights. As we will discuss later, whether a PIT received a nonzero third follow-up weight depended on when that student was selected from the evaluation waiting list.

⁴¹ For example, without weighting, a total estimated from a simple one-in-two random sample would, on average, fall short of the true (population) total by 50 percent.

1. Baseline Weights

We assigned nonzero baseline weights to 3,028 students—all nonexempt students except givebacks.⁴² A student’s baseline weight is:

$$w = \frac{1}{\text{project selection probability}} \times \frac{(\text{number of applicants})_s}{(\text{number of applicants} - \text{number of givebacks})_s},$$

where s indexes the student’s random assignment stratum. This baseline weight is the inverse of the student’s probability of being selected for the baseline sample. That selection probability is:

$$p = \text{project selection probability} \times \frac{(\text{number of applicants} - \text{number of givebacks})_s}{(\text{number of applicants})_s}.$$

The first term is project selection probability in the first stage of sampling, that is, the probability that the project to which the student applied was selected. The second term is the student selection probability in the second stage of sampling, that is, the probability that the student was selected *conditional* on the selection of the student’s project. Put differently, this term equals the probability that the student was retained in the experimental sample after being randomly assigned, which equals the probability of not being selected as a “giveback.” The product for the first and second terms gives the student’s overall (unconditional) probability of selection for the evaluation. The first- and second-stage selection probabilities are easy to calculate. The first-stage probability equals the proportion of all projects in the stratum that conducted random

⁴² For the baseline sample, students were designated as treatments or controls based on their initial random assignment status. Students initially selected for Upward Bound are treatments, while students initially placed on the evaluation waiting list, including students who later became PITs, are controls.

assignment for the evaluation (see Table A.1). The second-stage probability equals the proportion of all nonexempt students who were not “givebacks.”

Two simple examples illustrate how we calculated baseline weights. For an applicant to a large, rural project hosted by a private, four-year university, the project selection probability is 1/4: according to Table A.1, random assignment was carried out in one of the four large, rural projects hosted by private, four-year universities. If there were seven other applicants (for a total of eight) and no givebacks in the student’s random assignment stratum, the second-stage selection probability equals one and the overall selection probability equals $1/4 \times 1 = 1/4$. Therefore, the student’s baseline weight is four (the inverse of 1/4), implying that the student represents herself or himself and three other students who applied to projects but were not selected for the first-stage sample. Alternatively, if there were four givebacks instead of none, the second-stage selection probability equals 4/8, and the overall selection probability equals $1/4 \times 4/8 = 1/8$. Then, the student’s baseline weight is eight, implying that the student represents himself or herself, one giveback and six other students (two applicants to each of three projects not selected for the evaluation).

2. Third Follow-Up Survey Weights

As discussed in the previous section, 3,028 students received nonzero baseline weights. For the third follow-up survey, we set aside the 184 students classified as nonresearch cases (see the next section) and focused on the other 2,844 students. Our goal was to complete interviews with all 2,844 students; we succeeded in interviewing 2,292 students, which corresponds to an 81 percent response rate.⁴³ Next, we discuss how we weighted students for the analyses of the third

⁴³ Item nonresponse (failure to answer individual questions) created little missing data beyond that created by unit nonresponse (failure to answer any questions).

follow-up survey data to account for sampling and unit nonresponse. These weights are designed to allow the treatment students who responded the survey to represent the population of Upward Bound eligible applicants nationwide and the control students who responded to the survey to represent the same population. We begin by describing how we designated students as treatments, controls or nonresearch cases.

a. Designating Students as Treatment, Control or Nonresearch

Of the 3,028 students who received nonzero baseline weights, 1,524 were designated as treatments, 1,320 as controls and 184 as nonresearch cases for the third follow-up analysis. All 1,479 students assigned to the treatment group at initial random assignment are designated as treatments for this analysis. Similarly, all 1,320 students assigned to the evaluation waiting list at initial random assignment and not randomly selected from it as PITs are controls.

Of the 229 PITs, 45 are designed as treatments for the third follow-up analyses; the rest are designated as nonresearch cases. A PIT was designated as a treatment if two conditions were satisfied. First, the PIT had the opportunity to begin participating in Upward Bound at essentially the same time (often the same day) as the original treatments in the PIT's random assignment stratum. Second, the PIT did not replace a treatment who dropped out of Upward Bound (or never showed up). PITs satisfying these two conditions were designated as treatments because it is assumed that they would have been original treatments had the Upward Bound project director not underestimated the number of open slots that were available at the initial random assignment.⁴⁴ As noted before, all other PITs were designated as nonresearch cases.

⁴⁴ Project directors often do not regard a slot as open until there is strong evidence that a previously enrolled student has dropped out. Therefore, rather than delaying student selection until the "last minute," some slots that were later confirmed as open were not filled in the initial random assignment.

b. Survey Weights

Survey weights were developed to account for the probability of being assigned to the treatment group for treatment students, the probability of being assigned to the control group for control students and the probability of responding to the survey. The following steps were taken to compute survey weights:

1. ***Calculate control totals.*** We summed the baseline weights of all students (treatment, control and nonresearch) in each weighting class to obtain 297 control totals.⁴⁵
2. ***Estimate propensity scores.*** For each treatment and control group member, we estimated the probability that the student responded to the survey, conditional on a set of baseline characteristics.⁴⁶
3. ***Compute preliminary survey weights.*** We multiplied each student's baseline weight by the inverse of his or her propensity score to compute a preliminary survey weight.
4. ***Post-stratify the sample to compute final survey weights.*** To compute final survey weights, the preliminary weights were ratio-adjusted to ensure that the final weights for treatments and controls separately summed to the control totals within each weighting class. Final weights for all nonrespondents and nonresearch cases were set to zero.

3. Third Follow-Up High School Transcript Weights

To construct nonresponse-adjusted weights for the third follow-up analyses of high school transcript data, we followed similar procedures used to construct weights for third follow-up

⁴⁵ In 42 of the original 339 random assignment strata, the response rate for either the treatment group or the control group was zero. These 42 strata were combined with other strata based on propensity scores, whose estimation is described later in the text. We combined an empty stratum with a nonempty stratum based on the similarity of students' propensity scores, as measured by the difference in the average propensity scores between students in a given empty stratum and students in a nonempty stratum with which the empty stratum might be combined. The nonempty stratum with the smallest difference was judged the most similar to the empty stratum. We did not combine strata across projects. Propensity scores were used to combine strata into weighting classes because these scores reflect a broad range of characteristics related to nonresponse and to the outcomes that are examined in the impact analysis.

⁴⁶ The probability was obtained for all 2,844 treatment and control students from two logistic regression models, one for the treatment group and the other for the control group. These models predict response to the third follow-up survey as a function of the control variables from the regression model used to estimate impacts: sex, race, educational aspirations, grade level at program application, and eligibility status—first-generation, low-income or both. Estimation of these propensity score models revealed that sex, race, educational expectations and eligibility status were significant predictors of response to the third-followup survey for at least one of the two groups.

survey data. We attempted to collect high school transcript data for the subgroup of the 2,844 treatment and control students who had not yet completed high school by the previous round of transcript data collection. After the round of transcript data collection that followed the fielding of the third follow-up survey, we had collected at least some high school transcripts for 95 percent of all treatment and control students. Because some sample members did not respond to the survey and therefore did not provide us with a current list of all high schools they had attended, we cannot distinguish between survey nonrespondents with partial transcript information and survey nonrespondents with complete transcript information. Thus, we chose to treat the 95 percent of treatment and control students for whom we had any transcript data as respondents when developing high school transcript weights. The high school transcript weights are designed to allow the treatment students for whom we had received transcripts to represent the population of Upward Bound eligible applicants nationwide, and to allow the control students for whom we had received transcripts to represent the same population.

In computing high school transcript weights, we used the same four steps taken to compute survey weights, including the same propensity score model—inserting an indicator for transcript response as the dependent variable—and the same weighting classes for post-stratification.

4. Third Follow-Up Postsecondary Transcript Weights

In the third follow-up survey, 1,737 students reported that they had attended some type of postsecondary institution. Some students reported institutions that were not really postsecondary institutions (for example, the Job Corps), and others reported schools that were not in IPEDS and were not institutions that maintain transcripts. We classify as “postsecondary institutions” all schools that can be found in IPEDS or could otherwise be located and determined to be a transcript-providing institution. We classify as “postsecondary students” all 1,524 treatments and controls who responded to the third follow-up survey and reported having attended one or

more “postsecondary institutions.” We requested transcripts from each of the postsecondary institutions attended by the 1,524 postsecondary students unless the students refused to give consent for the release of their transcripts.

Of the 1,524 postsecondary students, we received transcripts from all the postsecondary institutions they attended for 1,375 of them, a response rate of 90 percent. To develop postsecondary transcript weights that adjust the survey weights to account for variability in likelihood of receiving complete postsecondary transcript data for postsecondary students, we took the following four steps:

1. ***Calculate control totals for postsecondary students, separately for treatment and control students.*** For the treatment and control groups separately, we summed the third follow-up survey weights of postsecondary students in each random assignment stratum to obtain 224 control totals.
2. ***Calculate control totals for postsecondary students, separately for treatment and control students.*** For the treatment and control groups separately, we summed the third follow-up survey weights of postsecondary students in each random assignment stratum to obtain 224 control totals.
3. ***Calculate control totals for postsecondary students, separately for treatment and control students.*** For the treatment and control groups separately, we summed the third follow-up survey weights of postsecondary students in each random assignment stratum to obtain 224 control totals.⁴⁷
4. ***Estimate propensity scores.*** Among postsecondary students, we estimated the probability that we received complete postsecondary transcript data for the student.⁴⁸

⁴⁷ In 73 of the 297 weighting classes used to develop the survey weights, the response rate for either the treatment group or the control group was zero. These 73 cells were combined with other cells based on propensity scores, whose estimation is described later. These cells were combined for the same reason and in the same manner that the original 339 random assignment strata were combined to form 297 weighting classes for developing the survey weights.

⁴⁸ This estimate was computed by multiplying together two estimated probabilities: the probability that the student gave consent for us to obtain his or her transcripts, and the probability that we were able to obtain those records if consent was given. For the treatment and control groups separately, we estimated two logit models—one to predict consent, the other to predict receipt of complete transcript data conditional on consent. The first model predicts consent as a function of some of the control variables from the regression model used to estimate impacts, sex, race, and educational aspirations, along with counts of the number of four-year, two-year, and other colleges that the student attended. The second model predicts receipt of all transcripts requested as a function of sex, the school counts for four-year, two-year, and other colleges, and current college status (current college attendance and college completion).

5. ***Compute preliminary postsecondary transcript weights.*** After computing the control totals, we multiplied each student's baseline weight by the inverse of his or her propensity score.
6. ***Post-stratify the sample to compute final postsecondary transcript weights.*** The preliminary weight was then ratio-adjusted to ensure that the final postsecondary transcript weights for treatments and controls sum to their respective control totals within each of the 224 weighting classes. For all nonrespondents, nonresearch cases and third follow-up survey nonrespondents, the final postsecondary transcript weight equals zero; for survey respondents who were not classified as postsecondary students, the final postsecondary transcript weight equals the third follow-up survey weight.

The postsecondary transcript weights are designed to make two samples representative of the population of Upward Bound eligible applicants nationwide: treatment students who responded to the third follow-up survey and for whom we had transcripts from every postsecondary institution attended, and control students who met the same two criteria.

5. Third Follow-Up Upward Bound Participation Weights

One goal of the evaluation is to describe the patterns of program participation among applicants who are accepted into the program. Therefore, we examined the participation behavior of the 1,524 students assigned to the treatment group (the group offered the chance to participate in Upward Bound); we weight them to represent all eligible applicants.

However, we have incomplete participation data for 17 Upward Bound participants from the treatment group. For these participants, we received participation reports in previous rounds of data collection, did not receive a participation report in the latest round of data collection and were unable to compensate using self-reported survey data. To develop participation weights that adjust the survey weights to account for the probability of receiving complete participation data for treatment students, we took the following three steps:

1. ***Calculate control totals for postsecondary students, separately for treatment and control groups.*** For each group, we summed the baseline weights of all 3,028

treatment, control and nonresearch cases in each random assignment stratum to obtain 339 control totals.

2. ***Compute baseline treatment weights.*** The probability of assignment to the treatment group varied across random assignment strata. Therefore, for each stratum, a baseline treatment weight was computed by dividing the baseline weight by the proportion of students randomly assigned to the treatment group.
3. ***Post-stratify the sample to compute participation weights.*** The treatment group was post-stratified into three weighting classes: one class of students who had completed their Upward Bound participation before the previous round of data collection and two classes of students who had not completed their participation before the previous round of data collection—those with baseline treatment weights greater than 20 and those with smaller weights. For the first weighting class, our participation information is complete: the participation weight was set to the baseline treatment weight. For the second and third weighting classes separately, the participation weight is computed as the baseline treatment weight times the inverse of the weighted “response” rate for the weighting class, that is, the weighted proportion of students with complete participation information. For all nonparticipants and the 17 students with incomplete participation information, the participation weight was set to zero.

APPENDIX B

**BASELINE CHARACTERISTICS OF THE TREATMENT AND CONTROL GROUPS,
THIRD FOLLOW-UP SURVEY RESPONDENTS**

Table B.1
 Baseline Characteristics of the Treatment and Control Groups,
 Third Follow-up Survey Respondents

Baseline Characteristics	Treatment	Control	Difference
Educational expectations¹			
Student	16.5	17.1	-0.6
Father	16.6	16.8	-0.2
Mother	16.7	17.1	-0.4 *
How often talked with parents about²			
Courses	1.9	2.0	-0.1
School activities	2.0	2.1	-0.1
Studies	1.9	2.0	-0.2 ***
Grades	2.4	2.5	-0.1 *
Transferring to another school	0.7	0.7	-0.1
Taking ACT or SAT exam	1.0	1.1	-0.1 *
College plans	2.2	2.4	-0.2 *
How often parent²			
Checked on homework	2.1	2.2	-0.1 **
Helped with homework	1.6	1.8	-0.2
Gave special privileges	1.9	1.9	0.0
Limited privileges	1.7	1.7	0.0
Required chores	2.6	2.6	0.0
Limited TV and video time	1.5	1.4	0.1
Limited time with friends	2.1	2.0	0.0
Times			
Late for school	2.7	2.8	-0.1
Skipped classes	0.9	0.7	0.3
Missed a day of school	3.8	3.5	0.3 **
In trouble for not following school rules	1.1	1.1	-0.1
Put on in-school suspension	0.4	0.3	0.1
Suspended	0.2	0.2	0.0
Transferred for disciplinary reasons	0.0	0.0	0.0
Arrested	0.0	0.0	0.0
Spent time in juvenile home	0.0	0.0	0.0 *
Parent (%)			
Attended school meeting	63	67	-4 **
Spoke with teachers	70	74	-4
Visited classes	48	49	-1
Attended school event	63	66	-3
Hours spent			
On homework ³	7.0	7.6	-0.7 *
On school-sponsored activities ³	4.5	5.2	-0.7
Playing video games (weekdays) ⁴	1.0	0.8	0.1 **
Playing video games (weekends) ⁴	1.4	1.3	0.1 **
Grade at application	9.4	9.4	0.0

TABLE B.1 (continued)

Baseline Characteristics	Treatment	Control	Difference
Low-Income and First-Generation (%)			
Low-Income and First-Generation	79	79	0
Low-Income Only	4	4	0
First-Generation Only	16	17	0
Race (%)			
Hispanic	22	22	0
White	22	20	2
African-American	49	52	-4
Other Race	7	6	1
Gender (%)			
Male	29	28	0
Female	71	72	0
Sample Size	1,265	1,027	

Source: f3_0142.log

Note: The numbers in the "Difference" column may not exactly equal the difference between the numbers in the "Treatment" and "Control" columns due to rounding; weights used to account for survey nonresponse.

*/**/** Impact estimate is statistically significant at the 0.10 / 0.05 / 0.01 level.

¹ Expected years of schooling.

² Coding: 0=never, 1=rarely, 2=sometimes, 3=often.

³ Hours per week.

APPENDIX C

PROGRAM IMPACTS AND STANDARD ERRORS

This appendix describes how we estimated the effects (impacts) of Upward Bound—both the opportunity to participate and actual participation—and how we estimated the standard errors of the estimates.

A. Computing Program Impacts

Some policymakers and program operators may be most interested in learning about the effects of offering Upward Bound services to eligible applicants. Others may be more interested in learning about the effects of actually participating in Upward Bound. The evaluation literature refers to the first impact as the “intended to treat effect” (ITT) and the second impact as the “complier average causal effect” (CACE). Our estimates of the ITT are based on a comparison of students randomly assigned to the treatment group with students randomly assigned to the control group. Our estimates of the CACE are based on a comparison of Upward Bound participants to nonparticipants, using the outcome of random assignment, treatment or control status, as an instrumental variable to predict program participation.

1. Impacts of the Opportunity to Participate in Upward Bound (ITT)

In order to compute the average impact of the opportunity to participate in Upward Bound, we estimate a statistical model that predicts the outcome of interest as a function of treatment status and background characteristics, such as educational expectations, sex, race, ethnicity and grade level at application. We include baseline characteristics in the model to increase the precision with which we estimate program impacts and to capture chance differences in baseline characteristics that remained after students were randomly assigned to the treatment and control groups. The basic form of the model is:

$$y_i = \beta_0 + \beta_1 T_i + \beta_2 X_i + \varepsilon_{li} \tag{C.1}$$

where y_i is the outcome of interest; T_i equals 1 if the student was randomly assigned to the treatment group and equals 0 otherwise; X_i is a vector that includes baseline characteristics of the student; ε_{yi} is a random error term that captures the effects of unobserved factors that influence the outcome; and β_0 , β_1 and β_2 are parameters or vectors of parameters to be estimated. The parameter of most interest is β_1 because it shows the impact of being offered the opportunity to participate in Upward Bound on student outcomes. We estimate the parameters in equation C.1 using ordinary least squares for both categorical and continuous outcomes. All regression models are weighted to account for the sampling design and unit nonresponse (see Appendix A).

2. Impacts of Participation in Upward Bound (CACE)

To compute the CACE estimator for the impact of participating in Upward Bound, we estimate the relationship between the opportunity to participate and participation and the relationship between participation and student outcomes. These relationships can be expressed as:

$$\begin{aligned} P_i &= \alpha_0 + \alpha_1 T_i + \alpha_2 X_i + \varepsilon_{pi} \\ y_i &= \beta_0 + \beta_1 P_i + \beta_2 X_i + \varepsilon_{yi} \end{aligned} \tag{C.2}$$

where y_i is the outcome of interest; T_i equals 1 for students who were randomly assigned to the treatment group and equals 0 for other students; X_i is a vector that includes background variables; P_i equals 1 for students who were randomly assigned to the treatment group and participated in Upward Bound and equals 0 for other students; ε_{pi} and ε_{yi} are random error terms that capture the effects of unobserved factors that influence both participation and the outcome; and α_0 , α_1 , α_2 , β_0 , β_1 and β_2 are parameters or vectors of parameters to be estimated. The parameter of greatest interest is β_1 because it shows the impact of participating in Upward Bound on the outcome.

We estimate the parameters in equation C.2 using the instrumental variables estimator. This technique allows us to compute asymptotically unbiased and efficient estimates of the parameters. The parameter β_1 can be interpreted as the causal impact for “compliers,” that is, students who were induced to participate in Upward Bound by the randomly assigned offer.⁴⁹ To implement the instrumental variables estimator, we use the two-stage least squares procedure when either continuous or categorical outcomes are analyzed.

The CACE estimator used throughout the report does not account for the fact that some Upward Bound control group members were offered the chance to participate in regular Upward Bound and subsequently participated in the program. (See footnote 5 in Chapter V.) However, results from a sensitivity test suggest that accounting for “crossover,” as it is commonly called, would have very little effect on the estimated impacts of participating in Upward Bound as presented in this report. Table C.1 provides the impact estimates from Table III.1 using methods that account for crossover. A comparison of Tables III.1 and C.1 indicate that accounting for crossover has a negligible effect on the estimated impacts of participating in regular Upward Bound.

B. Calculating Standard Errors

To determine whether impact estimates are statistically significant, we computed standard errors that account for the sample design of the study, which is described in Appendix A. The first stage of sampling in the evaluation involved selecting a stratified random sample of Upward Bound projects. The second stage of the sampling process involved taking a random sample of eligible students and assigning them to the treatment group; the remaining students were

⁴⁹ See Angrist, Imbens, and Rubin (1996).

Table C.1
 Impact of Upward Bound on Postsecondary Enrollment and Credits,
 Accounting for the 43 Control Group Members Who Reported Participating in Regular Upward Bound

	All Students		Participants
	Control Mean	Impact	Impact
Postsecondary School Status (%)			
Any postsecondary school	71	3	3
Four-year college	44	6 **	8 **
Two-year college	24	-5	-6
Vocational school	2	2	2
Credits Earned			
All postsecondary schools	35.8	1.4	1.7
Nonremedial	33.8	0.8	1.0
Remedial	1.5	-0.2	-0.2
Other	0.5	0.8	1.0
Four-year colleges	25.1	3.2	3.8
Nonremedial	24.1	2.3	2.8
Remedial	0.6	0.1	0.1
Other	0.5	0.7	0.9
Two-year colleges	9.6	-1.3	-1.6
Nonremedial	8.6	-1.0	-1.2
Remedial	0.9	-0.3	-0.4
Other	0.0	0.0	0.0
Vocational schools	1.1	-0.4	-0.5
Nonremedial	1.1	-0.5	-0.6
Remedial	0.0	0.0	0.0
Other	0.0	0.1	0.1

Source: pst-overall.log

Note: Weighted values reported.

*/**/** Impact estimate is statistically significant at the 0.10 / 0.05 / 0.01 level.

assigned to the control group. Given that projects were first sampled and then students were sampled, we have a cluster sample of students and not a simple random sample of students.

To accommodate the complex sample design, we use bootstrapping techniques to compute estimates of the standard errors of the impact estimates and other statistical parameters used in the evaluation. Bootstrap samples of projects were selected from the 67 evaluation projects, impacts were computed for each bootstrap sample, and standard errors were computed by measuring the variability in impact estimates across bootstrap samples. Bootstrapping allows us to compute a direct estimate of the variability without making assumptions about the independence of students within projects.

APPENDIX D

**THE EFFECT OF UPWARD BOUND ON HIGH SCHOOL OUTCOMES
BY SELECTED SUBGROUPS**

Table D.1
Impact of Upward Bound on High School Credits, Grades and Graduation
by Students' Eligibility Status

	All Students						Participants			
	Low-Inc. and First-Gen.		First-Generation Only		Low-Income Only		LI and FG	FG Only	LI Only	
	Control Mean	Impact	Control Mean	Impact	Control Mean	Impact	Impact	Impact	Impact	
Credits										
Total	21.1	0.4	21.7	-0.8	20.7	0.5	0.4	-1.1	0.5	
Total Core	13.8	0.5	14.4	-0.4	13.6	1.2	0.6	-0.6	1.2	
Math	2.9	0.2 *	3.1	0.0	2.9	0.2	0.2 *	0.0	0.3	
Science	2.7	0.1	2.8	-0.3	2.8	0.3	0.1	-0.4	0.3	
English	3.9	0.0	3.9	0.1	3.8	0.0	0.0	0.1	0.0	
Social Studies	2.8	0.1	3.0	-0.3 * #	2.9	0.1	0.2	-0.4	0.1	
Foreign Language	1.4	0.1	1.6	0.1	1.3	0.5 *	0.1	0.1	0.5 *	
Computer Science	0.8	0.0	0.9	-0.2	0.4	0.2	0.0	-0.3	0.3	
Vocational	1.5	-0.1	1.4	-0.1	1.4	-0.2	-0.1	-0.2	-0.2	
Advanced Placement and Honors Credits										
Total	2.0	-0.4	2.0	0.2	0.8	1.7 ** #	-0.4	0.2	1.8 **	
Total Core	1.9	-0.4	1.9	0.1	0.8	1.7 ** #	-0.4	0.1	1.7 **	
Math	0.3	0.0	0.4	-0.1 **	0.1	0.3 ** #	0.0	-0.2 **	0.3 **	
Science	0.4	-0.1	0.4	0.0	0.1	0.4 ** #	-0.1	0.0	0.4 **	
English	0.7	-0.2	0.6	0.2	0.4	0.5 * #	-0.2	0.2	0.5 *	
Social Studies	0.4	-0.1	0.5	0.1	0.1	0.4 *** #	-0.1	0.1	0.4 ***	
Foreign Language	0.0	0.0	0.0	0.0	0.0	0.1 *	0.0	0.0	0.1 *	
Overall Grade Point Average	2.3	0.0	2.3	-0.1	2.1	0.4 *** #	0.0	-0.2	0.4 ***	
High School Status (%)										
Graduated	89	0	93	-3	94	5	0	-4	5	
Still in high school	0	0	0	0	0	-	0	0	-	
Dropped out	8	-1	5	5	1	-1	-1	6	-1	
General Educational Development (GED)	3	1	2	-1	5	-4	1	-2	-5	

Source: hs-lifg.log, hs-low_only.log, and hs-fgenonly.log

Note: Hyphens indicate too few respondents to compute impact. Weighted values reported.

*/**/** Impact estimate is statistically significant at the 0.10 / 0.05 / 0.01 level.

Indicates that for all students, the impacts are significantly different from the impacts for low-income and first-generation students at the 0.10 level.

Table D.2
 Impact of Upward Bound on High School Credits, Grades and Graduation
 for African American, White, and Hispanic Students

	All Students						Participants			
	African American		White		Hispanic		Afr. Amer.	White	Hispanic	
	Control Mean	Impact	Control Mean	Impact	Control Mean	Impact	Impact	Impact	Impact	
Credits										
Total	21.4	-0.8	20.4	0.9 ** #	21.5	1.4 ** #	-1.0	1.1 **	1.6 *	
Total Core	14.0	-0.2	13.3	0.9 ** #	14.1	1.0 *	-0.3	1.1 **	1.2 *	
Math	3.0	0.0	2.8	0.3 **	3.0	0.4 *** #	0.0	0.3 **	0.5 ***	
Science	2.9	-0.1	2.6	0.2 ***	2.5	0.3 *	-0.2	0.3 ***	0.3 *	
English	3.9	-0.1	3.7	0.2 * #	4.1	0.1	-0.1	0.2 *	0.1	
Social Studies	2.9	0.0	2.8	0.2 *	2.8	0.1	0.0	0.2 *	0.1	
Foreign Language	1.5	0.1	1.3	0.1	1.7	0.1	0.1	0.1	0.1	
Computer Science	0.8	0.0	0.7	0.0	0.9	0.1	0.0	0.0	0.1	
Vocational	1.5	-0.3	1.5	0.0	1.5	0.0	-0.3	0.0	0.1	
Advanced Placement and Honors Credits										
Total	2.0	0.1	1.0	-0.1	2.8	-0.8	0.2	-0.1	-0.9	
Total Core	1.9	0.1	0.9	-0.1	2.7	-0.9	0.2	-0.1	-1.0	
Math	0.3	0.0	0.2	0.0	0.5	-0.2	0.0	0.0	-0.2	
Science	0.4	0.0	0.1	0.0	0.6	-0.2	0.0	0.1	-0.2	
English	0.7	0.0	0.4	-0.1	0.9	-0.2	0.0	-0.1	-0.2	
Social Studies	0.4	0.1 *	0.2	0.0	0.7	-0.3	0.1 *	0.0	-0.3	
Foreign Language	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	
Overall Grade Point Average	2.2	-0.1	2.4	0.1	2.3	0.0	-0.1	0.1	0.0	
High School Status (%)										
Graduated	94	-2	82	5 ** #	88	1	-3	7 **	1	
Still in high school	1	-1	0	0	0	2	-1	0	2	
Dropped out	5	0	10	1	8	-1	-1	2	-1	
General Educational Development (GED)	1	4 **	8	-7 ** #	4	-2	4 **	-8 **	-2	

Source: hs-black.log, hs-white.log, and hs-hisp.log

Note: Hyphens indicate too few respondents to compute impact. Weighted values reported.

*/**/** Impact estimate is statistically significant at the 0.10 / 0.05 / 0.01 level.

Indicates that for all students, the impacts are significantly different from the impacts for African American students at the 0.10 level.

Table D.3
Impact of Upward Bound on High School Credits, Grades and Graduation
for Male and Female Students

	All Students				Participants	
	Male		Female		Male	Female
	Control Mean	Impact	Control Mean	Impact	Impact	Impact
Credits						
Total	19.4	0.5	21.9	0.1	0.5	0.1
Total Core	12.6	0.5	14.4	0.3	0.6	0.4
Math	2.7	0.2	3.1	0.1	0.2	0.2 *
Science	2.5	0.0	2.8	0.1	0.0	0.1
English	3.6	0.1	4.0	0.0	0.1	0.0
Social Studies	2.6	0.1	2.9	0.1	0.1	0.1
Foreign Language	1.1	0.1	1.6	0.1	0.1	0.1
Computer Science	0.6	0.1	0.8	0.0	0.1	0.0
Vocational	1.4	0.0	1.6	-0.1	-0.1	-0.1
Advanced Placement and Honors Credits						
Total	1.0	0.1	2.3	-0.3	0.1	-0.3
Total Core	0.9	0.2	2.3	-0.3	0.2	-0.4
Math	0.2	0.0	0.4	0.0	0.0	0.0
Science	0.2	0.0	0.5	-0.1	0.0	-0.1
English	0.4	0.0	0.8	-0.1	0.0	-0.1
Social Studies	0.2	0.1	0.5	-0.1	#	-0.1
Foreign Language	0.0	0.0 **	0.1	0.0	#	0.0 **
Overall Grade Point Average	2.0	0.1	2.4	-0.1	0.1	-0.1
High School Status (%)						
Graduated	85	2	92	-1	3	-1
Still in high school	0	1	0	0	1	0
Dropped out	8	-2	6	1	-3	1
General Educational Development (GED)	6	-1	2	1	-1	1

Source: hs-male.log and hs-female.log

Note: Hyphens indicate too few respondents to compute impact. Weighted values reported.

//** Impact estimate is statistically significant at the 0.10 / 0.05 / 0.01 level.

Indicates that for all students, the impacts are significantly different from the impacts for male students at the 0.10 level.

Table D.4
Impact of Upward Bound on High School Credits, Grades and Graduation
by the Likelihood of Admission to Upward Bound

	All Students						Participants		
	Least Likely		Somewhat Likely		Most Likely		Least	Somewhat	Most
	Control Mean	Impact	Control Mean	Impact	Control Mean	Impact	Impact	Impact	Impact
Credits									
Total	19.9	0.9	21.6	0.0	21.0	0.2	1.0	-0.1	0.3
Total Core	12.8	1.1	14.3	0.1	13.6	0.4	1.2	0.2	0.5
Math	2.7	0.4 **	3.1	0.1	2.9	0.2 *	0.5 **	0.1	0.2 *
Science	2.6	0.0	2.8	0.0	2.7	0.1	0.0	0.0	0.1
English	3.6	0.3	4.0	0.0	3.8	0.0	0.3	0.0	0.0
Social Studies	2.6	0.2	2.9	0.0	2.8	0.1	0.2	-0.1	0.2
Foreign Language	1.2	0.2	1.5	0.1	1.5	0.0	0.3	0.1	0.0
Computer Science	0.9	-0.2	0.8	0.0	0.7	0.0	-0.2	0.0	0.1
Vocational	1.8	-0.2	1.5	-0.2	1.5	0.0	-0.3	-0.3	0.1
Advanced Placement and Honors Credits									
Total	0.8	0.1	2.7	-0.1	1.4	-0.1	0.1	-0.1	-0.1
Total Core	0.8	0.1	2.6	-0.1	1.4	-0.1	0.1	-0.1	-0.1
Math	0.1	0.1	0.5	-0.1	0.2	0.0	0.1	-0.1	0.0
Science	0.2	0.0	0.5	0.0	0.3	0.0	0.0	0.0	0.0
English	0.3	0.1	0.9	0.0	0.5	-0.1	0.1	0.0	-0.1
Social Studies	0.2	0.0	0.6	0.0	0.3	0.0	0.0	0.0	0.0
Foreign Language	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Overall Grade Point Average	2.1	0.0	2.4	-0.1	2.3	0.1	0.0	-0.2	0.1
High School Status (%)									
Graduated	78	2	92	0	90	-1	2	0	-2
Still in high school	0	-	0	0	0	0	-	0	0
Dropped out	13	5	5	1	8	-2	6	1	-2
General Educational Development (GED)	9	-7 *	3	0	2	3 #	-8 *	0	3

Source: hs-rating_h.log, hs-rating_m.log, and hs-rating_l.log

Note: Hyphens indicate too few respondents to compute impact. Weighted values reported.

*/**/** Impact estimate is statistically significant at the 0.10 / 0.05 / 0.01 level.

Indicates that for all students, the impacts are significantly different from the impacts for least likely students at the 0.10 level.

APPENDIX E

**THE EFFECT OF UPWARD BOUND ON COLLEGE ENGAGEMENT
BY SELECTED SUBGROUPS**

Table E.1
 Impact of Upward Bound on College Engagement
 For Higher and Lower Educational Expectations Students

	All Students				Participants	
	Higher Expectations		Lower Expectations		Higher	Lower
	Control Mean	Impact	Control Mean	Impact	Impact	Impact
Residence in focused housing (%)	1	1	1	0	1	0
Days per year of parent or student contact with school	77.3	1.4	54.0	6.4	1.7	7.7
How often during first year in postsecondary school student used the following supplemental services						
Academic counseling	1.6	0.0	0.7	0.4	0.1	0.5
Personal counseling	0.4	0.3 ***	0.3	0.1	0.3 ***	0.1
Learning skills center services	0.9	0.2 *	0.4	0.1	0.2	0.1
Tutoring services	1.2	0.2 **	0.5	0.5 *	0.3 **	0.5 *
Minority student services	0.5	0.0	0.2	0.1	0.0	0.1
Health services	0.7	0.0	0.2	0.0	0.0	0.0
Other	0.0	0.0	0.1	0.0	0.0	-0.1
Participation in federally supported programs while in postsecondary school (%)						
Student Support Services	5	2	4	-3 #	2	-3
McNair Post-Baccalaureate Achievement Program	1	0	1	-1	0	-2
Student received financial aid (%)	61	-1	40	-2	-1	-3
How often during first year of postsecondary school student:						
Talked with faculty in office about academic matters	2.4	-0.2	1.1	0.4	-0.2	0.5
Met with advisor concerning academic plans	2.0	0.0	0.9	0.5 *	0.0	0.6 *
Had informal contact with advisor or other faculty	1.9	0.1	0.8	0.6 *	0.1	0.8 *
Participated in study groups outside of class	2.7	-0.3	1.3	0.4	-0.4	0.4
Went to events with friends from school	3.5	0.0	2.0	0.3	0.0	0.4
Participated in school clubs	1.4	0.0	0.9	0.3	0.0	0.3
Attended career-related lectures, conventions, or field trips with friends	1.6	-0.2	0.8	0.2	-0.2	0.2
Participated in intramural or intercollegiate sports, music, drama, etc.	1.4	-0.1	0.7	0.2	-0.2	0.2
Cut classes	1.7	-0.1	1.0	0.1	-0.1	0.2

Source: pss-hiexp.log and pss-loexp.log

Note: Hyphens indicate too few respondents to compute impact. Weighted values reported.

*** Impact estimate is statistically significant at the 0.10 / 0.05 / 0.01 level.

Indicates that for all students, the impacts are significantly different from the impacts for higher expectations students at the 0.10 level.

Table E.2
Impact of Upward Bound on College Engagement
by Students' At-Risk Status

	All Students				Participants	
	Higher Academic Risk		Lower Academic Risk		Higher	Lower
	Control Mean	Impact	Control Mean	Impact	Impact	Impact
Residence in focused housing (%)	1	-1	1	1	-1	1
Days per year of parent or student contact with school	55.3	-0.7	77.2	2.9	-1.0	3.2
How often during first year in postsecondary school student used the following supplemental services						
Academic counseling	0.7	0.1	1.6	0.3 **	0.1	0.3 *
Personal counseling	0.2	0.4 **	0.4	0.2 *	0.5 **	0.2 *
Learning skills center services	0.6	-0.1	0.8	0.4 ** #	-0.2	0.4 **
Tutoring services	0.5	0.1	1.2	0.4 ***	0.1	0.5 ***
Minority student services	0.0	0.2 ***	0.5	0.1	0.2 ***	0.1
Health services	0.2	0.0	0.7	0.1	0.0	0.1
Other	0.0	0.0	0.0	0.0	0.0	0.0
Participation in federally supported programs while in postsecondary school (%)						
Student Support Services	6	-3	5	2	-4	2
McNair Post-Baccalaureate Achievement Program	0	0	1	0	0	0
Student received financial aid (%)	35	-13	61	2	-17	2
How often during first year of postsecondary school student:						
Talked with faculty in office about academic matters	1.3	-0.3	2.3	0.2	-0.4	0.2
Met with advisor concerning academic plans	1.1	-0.1	1.9	0.2 *	-0.1	0.2 *
Had informal contact with advisor or other faculty	0.9	0.0	1.8	0.4 ***	0.0	0.4 ***
Participated in study groups outside of class	1.2	0.0	2.7	-0.1	-0.1	-0.1
Went to events with friends from school	1.7	0.1	3.5	0.1	0.2	0.1
Participated in school clubs	0.5	-0.1	1.5	0.2 *	-0.1	0.2 *
Attended career-related lectures, conventions, or field trips with friends	0.9	-0.3 **	1.5	0.1 #	-0.4 **	0.1
Participated in intramural or intercollegiate sports, music, drama, etc.	0.5	0.0	1.3	0.0	0.0	0.0
Cut classes	1.1	-0.5	1.7	0.1	-0.7	0.1

Source: pss-ar20hi.log and pss-ar20lo.log

Note: Hyphens indicate too few respondents to compute impact. Weighted values reported.

*/**/** Impact estimate is statistically significant at the 0.10 / 0.05 / 0.01 level.

Indicates that for all students, the impacts are significantly different from the impacts for higher academic risk students at the 0.10 level.

Table E.3
Impact of Upward Bound on College Engagement
by Students' Eligibility Status

	All Students						Participants		
	Low-Inc. and First-Gen.		First-Generation Only		Low-Income Only		LI and FG	FG Only	LI Only
	Control Mean	Impact	Control Mean	Impact	Control Mean	Impact	Impact	Impact	Impact
Residence in focused housing (%)	1	1	2	-1	3	-4	1	-2	-5
Days per year of parent or student contact with school	70.5	5.6	81.5	-15.5 * #	67.9	8.1	6.6	-18.6 *	8.6
How often during first year in postsecondary school student used the following supplemental services									
Academic counseling	1.4	0.2	1.5	0.0	1.4	0.6 *	0.2	0.0	0.6 *
Personal counseling	0.3	0.2 *	0.4	0.3 **	0.4	0.3	0.2 *	0.4 **	0.3
Learning skills center services	0.7	0.2 *	0.9	0.0	0.9	0.0	0.3 *	0.0	0.0
Tutoring services	1.0	0.3 **	1.5	0.0	0.7	1.2 ***	0.3 **	0.0	1.2 ***
Minority student services	0.4	0.1	0.3	0.1	0.3	0.1	0.1	0.1	0.1
Health services	0.5	0.0	0.6	0.0	0.5	0.5	0.0	0.0	0.5
Other	0.0	0.0	0.1	-0.2	0.0	0.1 *	0.0	-0.2	0.1 *
Participation in federally supported programs while in postsecondary school (%)									
Student Support Services	5	1	4	1	6	0	1	2	-1
McNair Post-Baccalaureate Achievement Program	1	0	1	0	0	-	0	0	-
Student received financial aid (%)	54	0	59	-12 **	56	5	-1	-14 **	5
How often during first year of postsecondary school student:									
Talked with faculty in office about academic matters	2.0	0.2	2.5	-0.8 * #	2.1	0.8	0.2	-0.9 *	0.8
Met with advisor concerning academic plans	1.6	0.3 **	2.0	-0.5 ** #	2.5	-0.5	0.3 **	-0.6 **	-0.5
Had informal contact with advisor or other faculty	1.5	0.3 **	1.8	-0.2	1.9	-0.5	0.4 **	-0.2	-0.5
Participated in study groups outside of class	2.3	0.1	2.9	-1.5 ** #	2.2	1.3 *** #	0.1	-1.8 **	1.4 ***
Went to events with friends from school	3.0	0.1	3.6	-0.4	3.6	0.9 *	0.1	-0.5	0.9 *
Participated in school clubs	1.2	0.0	1.6	-0.3	0.9	1.2 ** #	0.1	-0.4	1.3 **
Attended career-related lectures, conventions, or field trips with friends	1.4	0.0	1.5	-0.2	1.3	1.1 * #	0.0	-0.3	1.1 *
Participated in intramural or intercollegiate sports, music, drama, etc.	1.2		1.0	0.0	1.2	0.7	-0.2	0.0	0.8
Cut classes	1.4	0.0	2.1	-0.7	1.4	1.5 *** #	0.0	-0.8	1.6 ***

Source: pss-lifg.log, pss-low_only.log, and pss-fgenonly.log

Note: Hyphens indicate too few respondents to compute impact. Weighted values reported.

*/**/** Impact estimate is statistically significant at the 0.10 / 0.05 / 0.01 level.

Indicates that for all students, the impacts are significantly different from the impacts for lower-income and first-generation students at the 0.10 level.

Table E.4
Impact of Upward Bound on College Engagement
for African American, White and Hispanic Students

	All Students						Participants		
	African American		White		Hispanic		Afr. Amer.	White	Hispanic
	Control Mean	Impact	Control Mean	Impact	Control Mean	Impact	Impact	Impact	Impact
Residence in focused housing (%)	2	1	0	0	0	1	1	0	2
Days per year of parent or student contact with school	74.1	-0.2	54.5	13.2 **	85.9	5.4	-0.2	15.8 **	6.0
How often during first year in postsecondary school student used the following supplemental services									
Academic counseling	1.4	0.2	1.1	0.4 **	1.5	0.3 *	0.2	0.5 **	0.3 *
Personal counseling	0.4	0.3 ***	0.3	0.1	0.3	0.2	0.3 ***	0.1	0.2
Learning skills center services	0.9	0.2	0.5	0.3	0.6	0.3	0.2	0.4	0.4
Tutoring services	1.2	0.3 *	0.5	0.3	0.8	0.6 *	0.3 *	0.3	0.6 *
Minority student services	0.5	0.2	0.0	0.1	0.4	-0.1	0.2	0.1	-0.1
Health services	0.6	0.1	0.5	0.1	0.5	-0.1	0.1	0.2	-0.1
Other	0.0	0.0	0.0	0.0	0.1	-0.1	0.0	0.0	-0.1
Participation in federally supported programs while in postsecondary school (%)									
Student Support Services	6	1	2	4 **	4	0	1	5 **	0
McNair Post-Baccalaureate Achievement Program	2	-1	0	0	0	0	-1	0	0
Student received financial aid (%)	60	-5	46	7 **	51	-2	-6	9 **	-2
How often during first year of postsecondary school student:									
Talked with faculty in office about academic matters	2.3	-0.3	1.8	0.6 ** #	1.8	0.5 #	-0.4	0.7 **	0.6 *
Met with advisor concerning academic plans	2.0	0.0	1.4	0.2	1.4	0.3	0.0	0.2	0.3
Had informal contact with advisor or other faculty	1.8	0.1	1.3	0.5 **	1.3	0.1	0.1	0.6 **	0.1
Participated in study groups outside of class	2.5	-0.2	1.9	0.5 *	2.4	-0.4	-0.3	0.6 *	-0.4
Went to events with friends from school	3.2	0.0	2.7	0.4 ***	3.2	0.0	0.1	0.5 ***	0.0
Participated in school clubs	1.4	0.0	1.0	0.3 **	1.2	-0.2	0.0	0.4 **	-0.3
Attended career-related lectures, conventions, or field trips with friends	1.7	-0.2	0.9	0.2	1.2	0.2	-0.3	0.2	0.2
Participated in intramural or intercollegiate sports, music, drama, etc.	1.5	-0.2	0.8	0.0	0.7	0.3	-0.3	0.0	0.3
Cut classes	1.6	-0.2	1.6	0.2	1.2	0.2	-0.2	0.2	0.3

Source: pss-black.log, pss-white.log, and pss-hisp.log

Note: Hyphens indicate too few respondents to compute impact. Weighted values reported.

*/**/*** Impact estimate is statistically significant at the 0.10 / 0.05 / 0.01 level.

Indicates that for all students, the impacts are significantly different from the impacts for African American students at the 0.10 level.

Table E.5
Impact of Upward Bound on College Engagement
for Male and Female Students

	All Students				Participants	
	Male		Female		Male	Female
	Control Mean	Impact	Control Mean	Impact	Impact	Impact
Residence in focused housing (%)	2	-1	1	1	-1	1
Days per year of parent or student contact with school	54.8	5.3	79.1	1.2	6.0	1.4
How often during first year in postsecondary school student used the following supplemental services						
Academic counseling	1.2	0.2	1.4	0.2	0.2	0.2
Personal counseling	0.4	0.5 ***	0.4	0.1 #	0.6 ***	0.1
Learning skills center services	0.7	0.4	0.8	0.2	0.4	0.2
Tutoring services	0.8	0.5 *	1.1	0.2 **	0.6 *	0.3 **
Minority student services	0.2	0.4 ***	0.5	0.0 #	0.4 ***	-0.1
Health services	0.3	0.2 **	0.6	0.0	0.2 **	0.0
Other	0.0	0.0	0.0	0.0	0.0	0.0
Participation in federally supported programs while in postsecondary school (%)						
Student Support Services	5	1	5	1	1	1
McNair Post-Baccalaureate Achievement Program	1	-1	1	0	-1	0
Student received financial aid (%)	43	3	60	-3	4	-3
How often during first year of postsecondary school student:						
Talked with faculty in office about academic matters	1.7	0.1	2.2	0.1	0.2	0.1
Met with advisor concerning academic plans	1.5	0.0	1.8	0.2	0.1	0.2
Had informal contact with advisor or other faculty	1.2	0.4 *	1.7	0.2 *	0.4 *	0.2 *
Participated in study groups outside of class	2.1	-0.2	2.5	-0.1	-0.2	-0.1
Went to events with friends from school	2.8	0.1	3.2	0.1	0.2	0.1
Participated in school clubs	1.0	0.2	1.4	0.0	0.2	0.0
Attended career-related lectures, conventions, or field trips with friends	1.0	0.1	1.5	-0.1	0.2	-0.1
Participated in intramural or intercollegiate sports, music, drama, etc.	1.7	0.0	1.0	-0.1	0.1	-0.1
Cut classes	1.2	0.2	1.6	-0.1	0.3	-0.2

Source: pss-male.log and pss-female.log

Note: Hyphens indicate too few respondents to compute impact. Weighted values reported.

*** Impact estimate is statistically significant at the 0.10 / 0.05 / 0.01 level.

Indicates that for all students, the impacts are significantly different from the impacts for male students at the 0.10 level.

Table E.6
Impact of Upward Bound on College Engagement
by the Likelihood of Admission to Upward Bound

	All Students						Participants		
	Least Likely		Somewhat Likely		Most Likely		Least	Somewhat	Most
	Control Mean	Impact	Control Mean	Impact	Control Mean	Impact	Impact	Impact	Impact
Residence in focused housing (%)	1	1	0	1	2	0	1	1	0
Days per year of parent or student contact with school	63.2	4.7	75.4	8.1 *	70.7	-1.7	5.3	9.6 *	-2.0
How often during first year in postsecondary school student used the following supplemental services									
Academic counseling	1.4	0.7 *	1.4	0.0	1.4	0.3	0.8	0.0	0.3
Personal counseling	0.5	0.3	0.3	0.2	0.3	0.2 **	0.4	0.2	0.2 **
Learning skills center services	0.7	0.3	0.8	0.3 **	0.8	0.2	0.4	0.4 **	0.2
Tutoring services	1.2	-0.1	1.1	0.5 ***	0.9	0.3	-0.1	0.6 ***	0.3
Minority student services	0.5	0.2	0.5	0.0	0.3	0.1	0.2	0.0	0.1
Health services	0.5	0.5	0.7	0.0	0.5	0.0	0.6	0.0	0.0
Other	0.1	-0.1	0.0	0.0	0.0	0.0	-0.1	0.0	0.0
Participation in federally supported programs while in postsecondary school (%)									
Student Support Services	3	0	4	1	6	1	0	1	2
McNair Post-Baccalaureate Achievement Program	0	0	0	1	2	-1 * #	0	1	-2 *
Student received financial aid (%)	41	5	56	-1	56	-2	6	-1	-3
How often during first year of postsecondary school student:									
Talked with faculty in office about academic matters	1.8	0.7	2.3	0.0	1.9	0.1	0.8	0.0	0.1
Met with advisor concerning academic plans	1.7	0.6	1.7	0.0	1.7	0.1	0.7	0.0	0.1
Had informal contact with advisor or other faculty	1.2	0.3	1.7	0.1	1.6	0.4 **	0.3	0.2	0.4 **
Participated in study groups outside of class	2.0	0.5	2.6	-0.6	2.2	0.1	0.6	-0.7	0.1
Went to events with friends from school	2.7	0.6	3.3	-0.4	3.0	0.4 *	0.7	-0.5	0.5 *
Participated in school clubs	0.8	0.5 *	1.6	-0.4	1.1	0.4 ***	0.6 *	-0.5	0.5 ***
Attended career-related lectures, conventions, or field trips with friends	1.0	0.5	1.5	-0.2 #	1.4	0.1	0.6	-0.3	0.1
Participated in intramural or intercollegiate sports, music, drama, etc.	0.9	0.9 *	1.1	-0.1	1.3	-0.2 #	1.1 *	-0.1	-0.2
Cut classes	1.6	0.1	1.6	-0.3	1.4	0.1	0.1	-0.3	0.2

Source: pss-rating_h.log, pss-rating_m.log, and pss-rating_l.log

Note: Hyphens indicate too few respondents to compute impact. Weighted values reported.

*/**/** Impact estimate is statistically significant at the 0.10 / 0.05 / 0.01 level.

Indicates that for all students, the impacts are significantly different from the impacts for least likely students at the 0.10 level.

APPENDIX F

METHODS USED TO ESTIMATE THE EFFECTS OF ADDITIONAL UPWARD BOUND PARTICIPATION

The duration and completion analyses presented in Chapter IV are designed to measure the potential benefits of additional Upward Bound participation, defined as longer Upward Bound participation for students who participate for a relatively short period of time and Upward Bound completion for noncompleting participants. The two “target” populations for this analysis—students who could be targeted for program retention efforts—are students who participated in Upward Bound for less than two years and noncompleting participants. To estimate the effects of additional Upward Bound participation on the target populations, we matched samples from the target populations to appropriate comparison samples. While we had no firm rule for how comparable the two weighted samples must be, two samples were considered comparable if the weighted means of baseline variables were similar between the two samples, that is, if the two samples appear to represent the same population. The remainder of this appendix describes the target and comparison samples, details the rules used in matching and assesses the comparability of the matched target and comparison samples.

A. Selecting Target and Comparison Samples to be Matched

To measure the impacts of an additional year of Upward Bound participation, we defined the target population to be all Upward Bound participants who participated for no more than two years. This population consists of low-duration participants, who participated for 1 to 12 months, and medium-duration participants, who participated for 13 to 24 months. For each of these two subgroups of the target population, we selected a comparison population of students who participated in Upward Bound for roughly one more year than students in the target population—medium-duration participants for targeted low-duration participants, and high-duration participants (who participated for more than 24 months) for targeted medium-duration participants. To measure the impacts of program completion on noncompleters, we defined the

target population to be all participants who do not complete Upward Bound (noncompleters) and the comparison population to be all participants who do complete the program (completers).

The treatment group provides samples of students from the target and comparison populations that can be used to measure the potential impacts of additional Upward Bound participation. We restricted our sample to students who (1) applied for Upward Bound in ninth or tenth grade at one of the 67 evaluation projects, (2) were assigned to the treatment group and (3) ultimately participated in Upward Bound. We excluded students who applied for Upward Bound in eighth grade. We excluded students who applied for Upward Bound in eighth grade because high school transcripts were unavailable for them—they had not yet attended high school—and thus we had no information on their academic achievement prior to program entry. Because the key outcomes of this analysis are college enrollment and persistence, and because academic achievement prior to college influences these outcomes, it was important to match students with similar achievement prior to entering Upward Bound. We also excluded students who applied for Upward Bound after tenth grade because their window of opportunity to participate in Upward Bound was relatively short: their maximum spell of participation was no more than two years. Therefore, the potential for increasing the length of participation for these students is fairly limited. The sample is restricted to Upward Bound participants so that we can measure the impacts of longer spells of participation relative to shorter spells and the impact of program completion relative to participation without completion.

Because of missing data due to survey nonresponse and “transcript” nonresponse (see Appendix H), we needed to impose two further restrictions. Because it was important to match students with similar achievement prior to entering Upward Bound, we dropped students for whom we lacked ninth-grade transcripts. Furthermore, because the third follow-up survey was used to collect information on the postsecondary institutions that sample members had attended,

we dropped students who did not complete a third follow-up interview. These restrictions generated a sample of 762 target and comparison sample members from the 1,523 students assigned to the treatment group. These participants were divided into target and comparison samples, and matching algorithms were applied to select matched target and comparison samples.

Postsecondary transcripts provided information on postsecondary credits earned, but we were unable to collect a complete set of postsecondary transcripts for 28 percent of all postsecondary students in our treatment and control samples. While transcript weights were developed to account for incomplete transcript data in the *experimental* samples, for the analyses in Chapter IV, we needed to account for incomplete transcript data in our nonexperimental comparison samples. Instead of developing weights for the comparison samples, we selected additional matched samples for the subgroup of 717 students for whom we have a complete set of postsecondary transcripts.

B. Selecting Matched Target and Comparison Samples

For each matching exercise, the target and comparison samples were split into two subgroups: (1) students whose ninth-grade transcripts suggest that they were at relatively high risk of academic failure (higher-risk students) and (2) students whose ninth-grade transcripts suggest that they were at relatively low risk of academic failure (lower-risk students). This split was motivated by the need to compute impacts separately for these two subgroups.

Within each of the two subgroups, we estimated propensity scores on which the two samples were matched (Rosenbaum and Rubin 1983; Rosenbaum and Rubin 1985). An unweighted logit model was estimated to distinguish between members of the two samples; the dependent variable was coded as 1 for target sample members and 0 for comparison sample members. The

explanatory variables contain information about gender, race, educational aspirations, time spent on homework, ninth-grade academic achievement and Upward Bound cohort.⁵⁰ Furthermore, the baseline weight, which reflects the probability that the student’s project was selected into the evaluation, was included as an explanatory variable.⁵¹ The model was used to estimate the log odds of being in the target sample conditional on the explanatory variables for each target and comparison sample member.⁵²

Separately for higher- and lower-risk students, we matched target sample members to “comparable” comparison sample members. Two students were deemed comparable when their log odds were sufficiently close. We matched each target sample member to *all* comparison sample members who were deemed comparable.⁵³ Target sample members for whom we were unable to find a comparable comparison sample member were excluded from the matched target sample because no comparison student could provide credible information about the outcomes we would have observed with additional Upward Bound participation. All comparison sample members who were matched to one or more target sample members were included in the matched comparison sample.

The matched comparison sample was weighted to represent the same segment of the Upward Bound population that is represented by the matched target sample. For each comparison student, *c*, who was matched to a single target student, *t*, we assigned a weight of

⁵⁰ See the first column of Table F.1 for a complete list of variables.

⁵¹ While we had experimented with weighting the propensity score model, we were generally able to obtain more comparable matched target and comparison samples when we included the baseline weight as an explanatory variable in the propensity score model.

⁵² The log odds of being in the target sample equals the natural log of $P(1) / P(0)$, where $P(1)$ equals the probability of being in the target sample and $P(0)$ equals the probability of being in the comparison sample. These probabilities were predicted using the estimated coefficients from the logit model.

⁵³ Therefore, we matched target sample members to comparison sample members “with replacement.”

$w_c = w_t/n_t$, where w_t equals the weight of the target student, and n_t equals the number of comparison students who were matched to the target student. That is, the weight of target student t was distributed equally to all comparison students to whom t was matched. However, most comparison students were matched to multiple target students. Therefore, for each matched comparison student, we assigned a weight of $w_c = \sum_{t \in M_c} w_t/n_t$, where M_c is the set of target students who were matched to the comparison student.

The most challenging task in selecting an algorithm for choosing the matched target and comparison samples was selecting “caliper ranges” that define how close the log odds of matched target and comparison sample members must be. Narrow caliper ranges can leave many target sample members unmatched when similar students could be found in the comparison sample; wide caliper ranges generate matches between students who are not really comparable. We tested several different caliper ranges in matching the target samples to the comparison samples. One caliper range that we tested corresponds to the smallest possible range under which all target sample members match at least one comparison sample member. Other caliper ranges that we tested correspond to the smallest possible ranges under which fixed proportions of the target sample—less than 100 percent—match at least one comparison sample member. Each caliper range generated different matched target and comparison samples; therefore, selecting a caliper range was equivalent to selecting a pair of matched target and comparison samples. Ultimately, we selected the widest caliper range that led to matched target and comparison samples with a small number of significant differences in variables that describe baseline characteristics and ninth-grade academic achievement.

The resulting matched samples were used to measure the impacts of additional Upward Bound participation in Chapter IV. To measure the impacts of an additional year of Upward Bound, the matched target sample consisted of the following groups:

- Higher-risk low-duration students who were matched to one or more higher-risk medium-duration students.
- Lower-risk low-duration students who were matched to one or more lower-risk medium-duration students.
- Higher-risk medium-duration students who were matched to one or more higher-risk high-duration students.
- Lower-risk medium-duration students who were matched to one or more lower-risk high-duration students.

To measure the impacts of completing Upward Bound for noncompleters, the matched target sample consisted of the following groups:

- Higher-risk noncompleters who were matched to one or more higher-risk completers.
- Lower-risk noncompleters who were matched to one or more lower-risk completers.

The matched comparison sample consisted of all the comparison sample members to whom target sample members were matched.

C. Describing and Assessing the Matched Samples

Through the process described in Section B, we were able to select comparable matched target and comparison samples for answering the questions posed in Chapter IV. Included in this appendix are four tables that can be used to assess the matched samples, along with two tables that compare the average characteristics of the matched and unmatched target sample members. Tables F.1 and F.2 describe the full and matched samples of lower-duration and higher-duration students by level of academic risk and overall; Table F.3 presents the mean characteristics of the lower-duration target sample separately for both matched and unmatched students and overall.

Tables F.4 and F.5 describe the full and matched samples of noncompleters and completers by level of academic risk and overall; Table F.6 presents the mean characteristics of the target sample of noncompleters separately for both matched and unmatched students and overall.

Each table shows that while the unmatched target and comparison samples differ from each other, the matched target and comparison samples are more comparable to each other. For each group, the first set of columns, titled “Full Samples,” provides mean values for the baseline characteristics of the target and comparison samples, along with an indicator for the level at which the difference in means is statistically significant. The second set of columns, titled “Matched Samples,” provides mean values for the baseline characteristics of the matched target and comparison samples, also followed by an indicator of the level of statistical significance for the difference. The means for the full samples—both the target sample and the comparison sample—and means for the matched target sample are weighted to account for unequal sampling, survey nonresponse and, where appropriate (Tables F.2 and F.5), the absence of complete postsecondary transcript data. In contrast, the matched comparison sample means are weighted to account for the results from matching, as described in Section B.

An assessment from each table suggests that matching was successful in producing samples that are comparable in the characteristics that we examined based on data collected for the evaluation. To assess the performance of matching in balancing the two samples, we compare the number of statistically significant baseline differences between the *full target and comparison samples* to the number of statistically significant baseline differences between the *matched target and comparison samples*.⁵⁴ Typically, the target and comparison samples are

⁵⁴ Our tests for significant differences account for heteroscedasticity due to unequal weighting but do not account for the correlation between the means of the two samples due to matching. Mean differences are flagged as statistically significant at the 10 percent (*), 5 percent (**), and 1 percent (***) levels.

significantly different on several baseline characteristics, and the matched target and comparison samples are significantly different on fewer baseline characteristics. The matching algorithm generated matched samples that appear to differ primarily in the extent of their participation.

The remainder of this appendix shows that the matched target and comparison samples are comparable. Table F.1 illustrates the comparability of the matched samples of lower- and higher-duration participants. For the overall target and comparison samples, combining higher- and lower-risk students together, higher-duration participants were significantly more likely to be female, to have higher ninth-grade GPAs and credits and to spend more time on homework each week than lower-duration participants. Our preferred caliper range selects a matched target sample consisting of 90 percent of the 463 lower-duration target sample members. The matched comparison sample is significantly different from the matched target sample on only 2 of the 17 baseline characteristics—whether the student applied for Upward Bound before 1994 and whether the student spent 1 to 10 hours per week on homework. For students with complete postsecondary transcript data, the matched comparison sample only differs from the matched target sample with respect to the year of Upward Bound application (Table F.2). For the higher-risk group, there are five significant differences between the matched samples (see Tables F.1 and F.2); for the lower-risk group, there is one significant difference between them.

Table F.4 illustrates the comparability of the matched samples of noncompleters and completers. For the overall target and comparison samples, completers were significantly more likely to be female, to have higher ninth-grade GPAs and to spend more time on homework each week than noncompleters. Our preferred caliper range selects a matched target sample consisting of 90 percent of the 412 noncompleters. As shown in Table F.4, the matched comparison sample is significantly different from the matched target sample only in ninth-grade GPA. For students with complete postsecondary transcript data, the matched comparison sample

also differs from the matched target sample in the percentage of students who only met the first-generation eligibility criterion (see Table F.5). For the higher-risk group, there are two significant differences between the matched samples for both survey respondents (see Table F.4) and those with complete postsecondary transcripts (see Table F.5); for the lower-risk group, there is one significant difference for survey respondents, and there are three significant differences for those with complete postsecondary transcripts.

We believe that the matched target and comparison samples provide credible estimates of the potential impacts of additional Upward Bound participation. Each matched comparison sample is roughly as similar to its corresponding matched target sample in the number of significant baseline differences as we would expect under random assignment.⁵⁵ Furthermore, the baseline variables we used to assess the comparability of matched samples provide information on demographic characteristics, prior academic achievement and other factors that may influence postsecondary enrollment and persistence. Thus, the findings in Chapter IV should have strong internal validity relative to many other nonexperimental analyses. Additionally, 90 percent of students in the target sample were matched and included in the analysis. Therefore, the findings in Chapter IV probably also have strong external validity.

⁵⁵ The notable exception occurred in matching lower-duration target sample members and higher-duration comparison sample members. In this case, the limited number of students in comparison sample pool resulted in more significant differences between the matched target and comparison samples than would have been expected from random assignment.

Table F.1
 Matching Lower-Duration Target Sample Members (T) and Higher-Duration Comparison Sample Members (C),
 Survey Respondents

	Higher Academic Risk						Lower Academic Risk						Overall					
	Full Samples			Matched Samples			Full Samples			Matched Samples			Full Samples			Matched Samples		
	T	C	SD	T	C	SD	T	C	SD	T	C	SD	T	C	SD	T	C	SD
Male (%)	39	23		38	37		31	26	**	29	33		34	25	***	31	34	
Race (%)																		
White	19	11		19	19		25	29		28	27		23	25		26	25	
Hispanic	9	23	*	10	20	**	30	25		21	24		25	24		19	23	
Other Race	10	5		13	7		7	9		9	13		8	8		10	12	
Low-Income and First-Generation (%)																		
First-Generation Only	11	4	**	13	7		21	14		13	14		18	12		13	12	
Low-Income Only	0	3		0	3	**	4	6		5	6		3	5	**	4	5	
Educational Expectations (%)																		
Some College	30	29		41	25	*	9	17	*	12	21		15	20		19	22	
Finish Four-year College	37	31		29	37		46	38		41	33		44	37	*	38	34	
Master's Degree or Equivalent	5	8		6	15	*	9	11		11	14		8	11	**	10	14	
PhD, MD, or Professional Degree	14	8		8	9		24	20		25	24		21	18		20	20	
Academic Achievement - Ninth Grade																		
Total Credits	4.3	5.0	**	4.9	4.9		6.7	6.5	**	6.6	6.5		6.0	6.2	**	6.2	6.1	
Advanced Placement and Honors Credits	0.0	0.3	*	0.1	0.1		0.7	0.5		0.7	0.2		0.5	0.5		0.6	0.2	
Overall Grade Point Average	1.4	1.6	***	1.6	1.8		2.5	2.6		2.6	2.7		2.2	2.4	*	2.3	2.4	
Higher Academic Risk (%)	100	100		100	100		0	0		0	0		27	21		26	26	
Homework (%)																		
1-10 Hours / Week	45	63	***	56	78	**	70	74		65	73		63	72	***	63	74	**
More than 10 Hours / Week	24	21		17	16		25	23		31	24		25	22		27	22	
Upward Bound Cohort																		
Grade at UB Application	9.4	9.3		9.5	9.4		9.5	9.5	**	9.6	9.6		9.5	9.4	**	9.5	9.5	
Applied for UB Before 1994 (%)	66	78		67	61		65	66		72	51	**	65	69		70	54	**
Students	116	95		105	94		347	458		313	396		463	553		418	490	

Source: balance.log

Note: The matched samples represent those in the target sample (T) of lower-duration participants who were matched using the caliper range which yields a 90 percent match rate for the comparison group (C) of higher-duration participants.

*/**/*** Difference between T and C is statistically significant at the 0.10 / 0.05 / 0.01 level, indicated in the SD columns.

Table F.2

Matching Lower-Duration Target Sample Members (T) and Higher-Duration Comparison Sample Members (C),
Survey Respondents with Complete Postsecondary Transcripts

	Higher Academic Risk						Lower Academic Risk						Overall						
	Full Samples			Matched Samples			Full Samples			Matched Samples			Full Samples			Matched Samples			
	T	C	SD	T	C	SD	T	C	SD	T	C	SD	T	C	SD	T	C	SD	
Male (%)	40	18	**	33	44		36	30	**	32	39		37	27	***	32	40		
Race (%)																			
White	18	9		18	20		24	32	*	28	32		23	26		25	28		
Hispanic	9	19	**	9	21	**	30	23		24	27		24	22		19	26		
Other Race	10	4		12	7		8	10		9	9		8	9		10	9		
Low-Income and First-Generation (%)																			
First-Generation Only	10	4	**	11	5		27	19		20	14		22	15		18	11		
Low-Income Only	0	2		0	3	*	5	6		7	4		4	5		5	4		
Educational Expectations (%)																			
Some College	35	29		42	25	**	10	20		13	17		17	22		21	19		
Finish Four-year College	31	40		22	38		48	34		38	34		43	35		33	35		
Master's Degree or Equivalent	3	5		4	12	**	9	11		11	13		7	10		9	13		
PhD, MD, or Professional Degree	16	7		20	10		21	21		26	28		20	17		24	23		
Academic Achievement - Ninth Grade																			
Total Credits	4.3	4.9	**	4.9	4.8		6.7	6.4	***	6.5	6.6		6.0	6.1		6.1	6.1		
Advanced Placement and Honors Credits	0.1	0.6	**	0.1	0.1		0.9	0.4		0.8	0.3		0.6	0.5		0.6	0.3		
Overall Grade Point Average	1.4	1.5	***	1.6	1.9	***	2.6	2.6		2.5	2.6		2.2	2.4		2.3	2.4		
Higher Academic Risk (%)	100	100		100	100		0	0		0	0		27	26		29	29		
Homework (%)																			
1-10 Hours / Week	44	51	**	48	83	***	71	75		67	61		64	69	*	61	67		
More than 10 Hours / Week	22	33		26	11	***	25	20		30	33		24	24		29	27		
Upward Bound Cohort																			
Grade at UB Application	9.4	9.2	*	9.4	9.4		9.5	9.4		9.5	9.5		9.4	9.4		9.5	9.5		
Applied for UB Before 1994 (%)	65	81	*	59	49		61	63		73	45	***	62	68		69	46	***	
Students	97	80		88	84		274	359		249	321		371	439		337	405		

Source: balance.log

Note: The matched samples represent those in the target sample (T) of lower-duration participants who were matched using the caliper range which yields a 90 percent match rate for the comparison group (C) of higher-duration participants.

*/**/** Difference between T and C is statistically significant at the 0.10 / 0.05 / 0.01 level, indicated in the SD columns.

Table F.3
Comparison of Unmatched, Matched and All Participants,
Duration Analysis, Survey Respondents

	Weighted			Unweighted		
	Unmatched	Matched	All	Unmatched	Matched	All
Male (%)	40	31	34	53	34	36
Race (%)						
White	15	26	23	24	28	28
Hispanic	43	19	25	29	20	21
Other Race	2	10	8	11	12	12
Low-Income and First-Generation (%)						
First-Generation Only	34	13	18	27	11	13
Low-Income Only	1	4	3	2	5	5
Educational Expectations (%)						
Some College	2	19	15	9	17	16
Finish Four-year College	61	38	44	40	38	38
Master's Degree or Equivalent	1	10	8	7	12	11
PhD, MD, or Professional Degree	23	20	21	22	23	23
Academic Achievement - Ninth Grade						
Total Credits	5.6	6.2	6.0	6.0	6.0	6.0
Advanced Placement and Honors Credits	0.5	0.6	0.5	0.1	0.3	0.3
Overall Grade Point Average	2.0	2.3	2.2	2.1	2.4	2.4
Higher Academic Risk (%)	30	26	27	24	25	25
Homework (%)						
1-10 Hours / Week	66	63	63	73	70	70
More than 10 Hours / Week	16	27	25	22	24	24
Upward Bound Cohort						
Grade at UB Application	9.4	9.5	9.5	9.6	9.6	9.6
Applied for UB Before 1994 (%)	49	70	65	62	54	55
Students	45	418	463	45	418	463

Source: unmatched.log

Note: An unmatched participant is one who is unable to be matched with a comparison group member within the caliper range.

Table F.4
 Matching Noncompleting Target Sample Members (T) and Completing Comparison Sample Members (C),
 Survey Respondents

	Higher Academic Risk						Lower Academic Risk						Overall					
	Full Samples			Matched Samples			Full Samples			Matched Samples			Full Samples			Matched Samples		
	T	C	SD	T	C	SD	T	C	SD	T	C	SD	T	C	SD	T	C	SD
Male (%)	34	31		28	32		33	21	***	25	29		33	22	**	26	30	
Race (%)																		
White	17	12		22	21		29	22		23	35		25	20		23	31	
Hispanic	16	13		20	27		29	30		28	14		25	27		26	18	
Other Race	9	2		12	10		8	7		9	15		9	6		10	14	
Low-Income and First-Generation (%)																		
First-Generation Only	10	2	*	11	11		26	13		23	15		21	11	*	20	14	
Low-Income Only	1	3		1	3		4	5		4	5		3	5		3	5	
Educational Expectations (%)																		
Some College	25	21		33	23		12	16		11	12		16	16		18	15	
Finish Four-year College	33	46		25	36		41	40		42	34		39	41		37	35	
Master's Degree or Equivalent	4	15		5	9		10	12		11	15		8	12		9	13	
PhD, MD, or Professional Degree	14	9		8	16		25	20		28	31		21	18		22	26	
Academic Achievement - Ninth Grade																		
Total Credits	4.3	5.0	***	4.9	5.0		6.7	6.5		6.5	6.4		5.9	6.3		6.1	6.0	
Advanced Placement and Honors Credits	0.0	0.6		0.0	0.1		0.7	0.6		0.8	0.3		0.5	0.6	*	0.6	0.2	
Overall Grade Point Average	1.3	1.7	***	1.5	1.8	**	2.5	2.7		2.6	2.7	*	2.2	2.5	***	2.3	2.5	**
Higher Academic Risk (%)	100	100		100	100		0	0		0	0		31	15	***	29	29	
Homework (%)																		
1-10 Hours / Week	48	63		60	84	***	74	74		74	66		66	73	**	70	71	
More than 10 Hours / Week	23	35		18	13		20	23		23	28		21	25		22	23	
Upward Bound Cohort																		
Grade at UB Application	9.3	9.4		9.4	9.4		9.4	9.5	***	9.4	9.4		9.4	9.5	***	9.4	9.4	
Applied for UB Before 1994 (%)	70	76		74	68		59	65		59	55		62	66		64	59	
Students	108	51		98	51		304	299		274	262		412	350		372	313	

Source: balance.log

Note: The matched samples represent those in the target sample (T) of noncompleting participants who were matched using the caliper range which yields a 90 percent match rate for the comparison group (C) of completing participants.

*/**/** Difference between T and C is statistically significant at the 0.10 / 0.05 / 0.01 level, indicated in the SD columns.

Table F.5

Matching Noncompleting Target Sample Members (T) and Completing Comparison Sample Members (C),
Survey Respondents with Complete Postsecondary Transcripts

	Higher Academic Risk						Lower Academic Risk						Overall						
	Full Samples			Matched Samples			Full Samples			Matched Samples			Full Samples			Matched Samples			
	T	C	SD	T	C	SD	T	C	SD	T	C	SD	T	C	SD	T	C	SD	
Male (%)	36	19	*	29	31		33	27		23	37		33	25		25	35		
Race (%)																			
White	17	8		21	22		26	24		22	39	*	24	21		22	34		
Hispanic	16	10		20	20		30	28		28	15		26	24		26	17		
Other Race	9	2		12	12		8	9		9	12		8	7		10	12		
Low-Income and First-Generation (%)																			
First-Generation Only	9	2		9	6		30	19		27	12		24	15	**	22	11	*	
Low-Income Only	0	3		0	3		4	6		5	4		3	5		4	4		
Educational Expectations (%)																			
Some College	29	16		38	22		11	19		10	15		17	18		18	17		
Finish Four-year College	28	62		19	31		48	34		46	36		43	40		39	35		
Master's Degree or Equivalent	3	8		4	8		10	12		11	16		8	11		9	14		
PhD, MD, or Professional Degree	15	7		9	23		20	22		23	25		18	18		19	24		
Academic Achievement - Ninth Grade																			
Total Credits	4.4	4.8	**	5.0	4.9		6.7	6.4	***	6.5	6.4	*	6.0	6.0		6.1	6.0		
Advanced Placement and Honors Credits	0.0	1.1	*	0.1	0.1		0.9	0.6	***	1.1	0.2		0.6	0.7		0.8	0.2		
Overall Grade Point Average	1.3	1.6	***	1.5	1.8	**	2.5	2.7		2.6	2.8	**	2.2	2.4		2.3	2.5	**	
Higher Academic Risk (%)	100	100		100	100		0	0		0	0		29	22		27	27		
Homework (%)																			
1-10 Hours / Week	47	43		60	84	***	73	77		73	71		65	69		70	75		
More than 10 Hours / Week	20	56		14	10		22	20		25	25		21	28		22	21		
Upward Bound Cohort																			
Grade at UB Application	9.3	9.3		9.3	9.4		9.3	9.5	***	9.4	9.4		9.3	9.4	***	9.4	9.4		
Applied for UB Before 1994 (%)	68	83	*	72	64		58	61		60	54		61	66		63	57		
Students	87	46		78	47		254	225		229	194		341	271		307	241		

Source: balance.log

Note: The matched samples represent those in the target sample (T) of noncompleting participants who were matched using the caliper range which yields a 90 percent match rate for the comparison group (C) of completing participants.

*/**/** Difference between T and C is statistically significant at the 0.10 / 0.05 / 0.01 level, indicated in the SD columns.

Table F.6
Comparison of Unmatched, Matched and All Participants,
Completion Analysis, Survey Respondents

	Weighted			Unweighted		
	Unmatched	Matched	All	Unmatched	Matched	All
Male (%)	70	26	33	65	32	35
Race (%)						
White	38	23	25	55	30	32
Hispanic	21	26	25	23	20	20
Other Race	2	10	9	8	13	13
Low-Income and First-Generation (%)						
First-Generation Only	25	20	21	30	14	16
Low-Income Only	0	3	3	0	5	4
Educational Expectations (%)						
Some College	8	18	16	10	17	17
Finish Four-year College	46	37	39	33	36	35
Master's Degree or Equivalent	3	9	8	13	13	13
PhD, MD, or Professional Degree	18	22	21	18	23	23
Academic Achievement - Ninth Grade						
Total Credits	5.3	6.1	5.9	6.0	6.0	6.0
Advanced Placement and Honors Credits	0.0	0.6	0.5	0.0	0.2	0.2
Overall Grade Point Average	1.5	2.3	2.2	1.6	2.4	2.4
Higher Academic Risk (%)	42	29	31	25	26	26
Homework (%)						
1-10 Hours / Week	44	70	66	60	71	70
More than 10 Hours / Week	18	22	21	18	23	23
Upward Bound Cohort						
Grade at UB Application	9.0	9.4	9.4	9.1	9.4	9.4
Applied for UB Before 1994 (%)	56	64	62	38	54	52
Students	40	372	412	40	372	412

Source: unmatched.log

Note: An unmatched participant is one who is unable to be matched with a comparison group member within the caliper range.

APPENDIX G

WEIGHTED STANDARD DEVIATIONS FOR ALL OUTCOME VARIABLES

Table G.1
Weighted Standard Deviations for High School Outcome Variables

High School Outcomes	Standard Deviation
Credits	
Total	6.6
Total Core	4.9
Math	1.2
Science	1.3
English	1.5
Social Studies	1.2
Foreign Language	1.1
Computer Science	0.8
Vocational	1.5
Advanced Placement and Honors Credits	
Total	3.5
Total Core	3.3
Math	0.8
Science	0.9
English	1.2
Social Studies	0.8
Foreign Language	0.3
Grade Point Average	
Overall	0.8
Math	0.9
Science	0.9
English	0.9
Social Studies	1.0
Foreign Language	1.1
High School Status (%)	
Graduated	31
Still in high school	6
Dropped out	26
General Educational Development (GED)	17

Source: hs-overall.log

Table G.2
 Weighted Standard Deviations for Postsecondary Outcome Variables,
 Transcript Information

Postsecondary Outcomes	Standard Deviation
Postsecondary School Status (%)	
Any postsecondary school	45
Four-year college	50
Two-year college	41
Vocational school	16
Credits Earned	
All postsecondary schools	44.8
Nonremedial	43.2
Remedial	4.1
Other	9.8
Four-year colleges	41.5
Nonremedial	39.8
Remedial	3.1
Other	9.6
Two-year colleges	20.8
Nonremedial	20.0
Remedial	2.8
Other	1.0
Vocational schools	7.7
Nonremedial	7.2
Remedial	0.3
Other	1.6

Source: pst-overall.log

Table G.3
 Weighted Standard Deviations for Postsecondary Outcome Variables,
 Survey Information

Postsecondary Outcomes	Standard Deviation
Residence in focused housing (%)	11
Frequency of parent or student contact with school (days/year)	63.5
How often during first year in postsecondary school student used the following supplemental services	
Academic counseling	2.0
Personal counseling	1.3
Learning skills center services	1.8
Tutoring services	2.2
Minority student services	1.4
Health services	1.4
Other	0.2
Participation in federally supported programs while in postsecondary school (%)	
Student Support Services	22
McNair Post-Baccalaureate Achievement Program	10
Student received financial aid (%)	50
How often during first year of postsecondary school student:	
Talked with faculty in office about academic matters	2.4
Met with advisor concerning academic plans	2.0
Had informal contact with advisor or other faculty	2.3
Participated in study groups outside of class	2.7
Went to events with friends from school	3.1
Participated in school clubs	2.4
Attended career-related lectures, conventions, or field trips with friends	2.0
Participated in intramural or intercollegiate sports, music, drama, etc.	2.3
Cut classes	2.2
While in college or other school, student worked for pay during (%):	
Freshman year	50
Sophomore year	49
Approximate hours worked per week during:	
Freshman year	15.8
Sophomore year	14.8

Source: pss-overall.log

APPENDIX H
DATA COLLECTION

This appendix describes and assesses the procedures for collecting the data that contributed to this report. These data come from three different sources:

1. The third follow-up survey of students.
2. Secondary and postsecondary transcripts.
3. Administrative records from Upward Bound programs.

The collection of administrative records from Upward Bound programs was straightforward. Therefore, this appendix focuses on procedures for obtaining completed interviews in the third follow-up survey and for collecting academic transcripts.

A. Third Follow-Up Survey of Students

The third follow-up survey was conducted between October 1998 and December 1999. This survey was the third conducted after students were randomly assigned to Upward Bound and a control group, and it was designed to collect information on secondary and postsecondary outcomes approximately six years after random assignment.

1. Data Collection Modes

One week before we began interviewing, we sent a letter to all study participants. The letter indicated that we would call them to complete an interview for an important study, and it encouraged them to participate. In addition, the letter indicated that we would pay them \$10 for completing the interview.

Most interviews were administered using computer-assisted telephone interviewing (CATI). CATI interviews took about 20 minutes to complete. When a CATI interview was not possible, we attempted to interview the sample member in person or obtain a completed questionnaire through the mail. In February 1999, questionnaires were mailed to study participants that could not be reached by telephone. Five additional follow up mailings were conducted after the first

mailing, with the last set of questionnaires being sent out in November 1999. In addition, field staff located some sample members and asked them to complete the self-administered questionnaire.

2. Locating

Throughout the data collection period, locating staff used services such as Deltech and Choicepoint to obtain updated addresses and phone numbers for study participants that were difficult to reach. In addition, student financial aid files were also used to search for updated addresses.

3. Methods Used to Obtain a High Response Rate

Financial incentives and field locating were used to obtain a high response rate for the survey.

a. Incentives

We conducted an experiment to measure the benefits of incentives in obtaining a high response rate for this sample. After we had interviewed 64 percent of the sample, the remaining 36 percent of the sample was divided into three groups: the first group received a \$10 check, the second group received a letter promising a \$10 payment for completing the survey, and the third group received only a letter encouraging them to complete and return the survey. The response rates after three weeks indicated that sample members responded differently to the different incentive schemes. The response rates after three weeks were 16 percent for the first group, 7 percent for second group and 3 percent for the third group. Based on these results, an incentive check was enclosed for everyone in subsequent mailings.

For the final mailing in November 1999, the incentive amount was increased to \$25. This mailing sought to increase the response rate among control participants, which was lower than

that for the treatment group. (In October 1999, the response rate for the control group was 76 percent versus 84 percent for the treatment group.) After obtaining updated address information on some participants from student financial aid files, we sent questionnaires to the control nonrespondents and to a select group of treatment nonrespondents. Through this effort, the difference in response rates between treatment and control participants was reduced to 5 percentage points.

b. Field Locating

To reduce the gap in response rates among the treatment and control groups and to increase the overall response rate, field locating was added to the data collection methods for one month near the end of the data collection period. Field staff were hired and trained in cities with high nonresponse rates to locate students that had not been reached by phone or by mail.⁵⁶

4. Response Rates

Of the 3,006 eligible sample members from the treatment, control and nonresearch groups, 2,448 completed a third follow-up interview.⁵⁷ Therefore, the response rate for the full sample was 81 percent. The response rates for the control group, the treatment group and the non-research group were 79 percent, 83 percent and 85 percent, respectively. Table H.1 displays the number of completed interviews, the number of eligible nonrespondents, the number ineligible because they had deceased and the number ineligible for other reasons for the control group, the treatment group and the non-research group respectively.

⁵⁶ Field staff obtained seven completed interviews by locating sample members, giving them copies of the questionnaire, waiting while the questionnaires were completed, and sending the completed questionnaires back to MPR. Field staff obtained some additional completed interviews by asking sample members to complete the questionnaires and send them to MPR, and by giving sample members the toll-free number necessary to complete a telephone interview.

⁵⁷ See Appendix A for a description of how students were assigned to the three groups.

Table H.1
Response Rates for the Third Follow-up Survey of Students

	Control Group	Treatment Group	Non-research Group	Full Sample
Completed Interview	1,027	1,265	156	2,448
Eligible Nonrespondent	281	250	27	558
Ineligible - Deceased	4	2	1	7
Ineligible - Other	2	0	0	2
Total	1,314	1,517	184	3,015

B. Transcript Data Collection

For the third follow-up analysis of Upward Bound, secondary and postsecondary transcripts were collected between May 1999 and May 2000. Academic transcripts provided the primary source of information on postsecondary achievement. Transcript requests were made from institutions that were reported by sample members in the third follow-up survey of students and in earlier surveys.

1. Preparation for Requesting Transcripts

Information about students' secondary and postsecondary enrollment was primarily obtained from follow-up interviews. Students reported the secondary and postsecondary institutions that they had attended. We were also able to obtain information about postsecondary enrollment of some nonrespondents using financial aid files from the Department of Education.⁵⁸

To obtain mailing addresses for the schools that were attended by sample members, we matched schools that were reported by survey respondents to directories of secondary and postsecondary schools maintained by the U.S. Department of Education. Secondary schools

⁵⁸ The financial aid files also enabled us to get updated addresses of participants that we had not been able to locate previously. Mail surveys were sent to these participants, and new school information provided on returned surveys was entered into the database for future transcript requests.

were matched to the Common Core of Data (CCD); postsecondary schools were matched to the Integrated Postsecondary Education Data System (IPEDS).⁵⁹

2. Procedures for Requesting Transcripts

Each school was sent a transcript request packet that included:

- A letter, printed on Department of Education letterhead, that explained the purpose of the study and the reason we were requesting transcripts.
- A statement of Authorization and Confidentiality, which cited the Family Educational Rights and Privacy Act and included questions and answers regarding consent and confidentiality.
- A transcript checklist of all the materials that we requested from the school, including student transcripts, a course catalog, grade descriptions and a transcript reimbursement form, which would indicate the reimbursement that the school required for providing the requested transcripts.
- A postage-paid business reply envelope for sending the transcripts.
- A disclosure notice to be placed in each student's file, indicating that a copy of his or her transcript was released to Mathematica Policy Research as an agent to the U.S. Department of Education.

3. Follow-Up Procedures

For schools that did not respond to our initial request for transcripts, we mailed another request for student transcripts. These mailings were done periodically as we tracked the schools that had not yet sent the requested transcripts and corrected requests that contained errors.

As the targeted end date for collecting transcripts approached, interviewers started calling schools directly to inquire about the status of our requests. Many schools responded to these calls by faxing us the requested transcripts. When the school indicated that they could not

⁵⁹ Students were asked to provide the name and state of each secondary and postsecondary school they attended, but sometimes misspellings or incomplete information resulted in some invalid requests for student transcripts as schools were matched with an incorrect address and transcripts were requested from the wrong school. When a school indicated that they could not fill a request because they had no record of the student whose transcript we requested, it was sometimes due to such mismatches. In these cases, we attempted to learn the correct name and address of the school where the student was enrolled and make a new transcript request.

provide one or more of the requested transcripts, the interviewer completed a problem sheet indicating the reason. The reason generally fell into one of the following categories:

- ***The student was never enrolled at the school according to the school's records.*** When this occurred, our first response was to call the school and provide more information on the student (e.g., provide or verify date of birth and dates of attendance) to see if a transcript could be located with additional information. In many cases, the school was able to locate and provide transcripts once additional information was provided. In other cases, the school provided some information that helped us determine where we might obtain the needed transcripts.⁶⁰ When all other attempts to locate the student's transcript failed, we tried to contact the student directly to verify his or her enrollment at the school. If we were unable to reach the student and the school had no record of the student having ever attended, we finally marked the case as an invalid request. When we did reach the student and the student confirmed the information in the database, we would call the school again to ask them to check their records, providing any additional information that might help them locate the transcript. Typically, after we called the school again and confirmed the student's attendance dates, the transcript was located and sent.
- ***Transcripts were held by the school district.*** Some schools only held the transcripts of currently enrolled students and all other transcripts were sent to the school district. In this situation, the school would sometimes forward the request packet to the district. Other times, the school returned the materials to us, and we sent them to the school district.
- ***The student transferred to another school.*** When the student had transferred to another school, a transcript was requested from the school to which the student had transferred. In some cases, the registrar or school secretary forwarded the request materials to the transfer school. In other cases, the request materials were sent back to us and we sent a new request to the transfer school.

⁶⁰ For example, some school principals and registrars indicated that their school was often confused with another school having the same or a similar name and suggested that we direct our request to the other school. In this case, we would call the alternate school to find out if the student was ever enrolled there. If so, we made a correction to the database and sent a request to the newly identified school.

- ***The school would not release any transcript without student's written consent.*** Many schools returned the transcript request materials with no transcripts, indicating that they required written consent from each student whose transcript we were requesting. A problem sheet was completed for these cases, and they were forwarded to the survey manager for follow-up. As a first step, the survey manager called the school to explain that, as an agent of the Department of Education, Mathematica Policy Research was authorized to collect student transcripts for the purposes of this study and that, according to the laws of FERPA, schools are permitted to release student transcripts to the Department of Education without the written consent of students participating in the study. It was also explained that students had given verbal consent over the telephone or written consent when they completed the mail survey, and that we did not request transcripts for any students who refused consent. Some schools agreed to send the requested transcripts upon hearing this explanation. Others reiterated that signed consent was required by school policy. In this case, we sent written consent forms to the students for them to sign and return to Mathematica so that we could obtain their student transcript for the impact study. A \$10 check and a postage-paid return envelope were included with the form as an incentive to complete and return it. Several students did sign and return the consent form, but many of the letters came back unopened because we no longer had a valid address for the student.
- ***The school would not release transcripts without advance payment.*** In these cases, we sent a check to cover the cost of each transcript, along with a list of the students whose transcripts we were requesting.
- ***The school would not release a transcript until the student paid an outstanding debt.*** In some cases we were eventually able to obtain these transcripts as students paid whatever bills they owed the school. When the debt remained unpaid, however, there was no way we could get the transcript. These cases were marked as unfilled requests.

4. Reimbursements

When reimbursement forms were returned to us with student transcripts, we sent checks to the schools requesting reimbursement and a list of the students whose transcripts we received. Not all schools requested reimbursement for the transcripts. In all, 741 checks were issued totaling \$5,397.

5. Response Rates

Of the approximately 7,000 transcripts that we requested, we received approximately 5,700 of them (see Table H.2). We received 82 percent of the transcripts requested from secondary schools and 80 percent of the transcripts requested from postsecondary institutions.

Table H.2
Response Rates to Requests for Transcripts

	Number Requested	Number Received	Percent Received
Secondary	2,997	2,444	82
Postsecondary	4,028	3,211	80
Total	7,025	5,655	80

APPENDIX I

**SAMPLE SIZES AND STANDARD ERRORS FOR
REPORTED IMPACT ESTIMATES**

Table 1.1
Sample Sizes and Standard Errors for Reported Impact Estimates: Table II.5

	All Students		Participants
	Sample Size	Standard Error †	Standard Error ‡
Credits			
Total	2,687	0.55	0.65
Total Core	2,687	0.41	0.49
Math	2,687	0.08	0.09
Science	2,687	0.10	0.11
English	2,687	0.12	0.15
Social Studies	2,687	0.08	0.10
Foreign Language	2,687	0.07	0.08
Computer Science	2,687	0.03	0.04
Vocational	2,687	0.09	0.11
Advanced Placement and Honors Credits			
Total	2,687	0.25	0.30
Total Core	2,687	0.26	0.32
Math	2,687	0.06	0.07
Science	2,687	0.07	0.09
English	2,687	0.08	0.10
Social Studies	2,687	0.05	0.06
Foreign Language	2,687	0.01	0.01
Overall Grade Point Average	2,673	0.09	0.10
High School Status (%)			
Graduated	2,291	3.57	4.18
Still in high school	2,291	0.38	0.44
Dropped out	2,291	1.96	2.29
General Educational Development (GED)	2,291	1.75	2.05

Source: hs-overall.log

† The standard error of the estimated impact of being offered the opportunity to participate in Upward Bound (see Chapter I, Section B, Subsection 3).

‡ The standard error of the estimated impact of actually participating in Upward Bound (see Chapter I, Section B, Subsection 3).

Table I.2
Sample Sizes and Standard Errors for Reported Impact Estimates: Table II.6

	All Students				Participants	
	Higher Expectations		Lower Expectations		Higher	Lower
	Sample Size	Std Error †	Sample Size	Std Error †	Std Error ‡	Std Error ‡
Credits						
Total	1,994	0.86	467	1.22	1.05	1.51
Total Core	1,994	0.60	467	0.90	0.72	1.11
Math	1,994	0.10	467	0.21	0.12	0.26
Science	1,994	0.16	467	0.19	0.20	0.24
English	1,994	0.14	467	0.28	0.18	0.33
Social Studies	1,994	0.10	467	0.22	0.12	0.27
Foreign Language	1,994	0.11	467	0.17	0.13	0.22
Computer Science	1,994	0.06	467	0.11	0.07	0.14
Vocational	1,994	0.12	467	0.30	0.16	0.37
Advanced Placement and Honors Credits						
Total	1,994	0.39	467	0.43	0.48	0.57
Total Core	1,994	0.39	467	0.41	0.49	0.54
Math	1,994	0.05	467	0.03	0.07	0.04
Science	1,994	0.11	467	0.10	0.13	0.13
English	1,994	0.13	467	0.14	0.17	0.18
Social Studies	1,994	0.09	467	0.17	0.12	0.22
Foreign Language	1,994	0.01	467	0.02	0.02	0.02
Overall Grade Point Average	1,982	-0.09	465	0.14	-0.11	0.17
High School Status (%)						
Graduated	1,700	1.91	403	14.82	2.28	17.76
Still in high school	1,700	0.20	403	1.12	0.24	1.33
Dropped out	1,700	1.43	403	10.60	1.73	12.71
General Educational Development (GED)	1,700	1.01	403	4.67	1.19	5.61

Source: hs-hiexp.log and hs-loexp.log

† The standard error of the estimated impact of being offered the opportunity to participate in Upward Bound (see Chapter I, Section B, Subsection 3).

‡ The standard error of the estimated impact of actually participating in Upward Bound (see Chapter I, Section B, Subsection 3).

Table I.3

Sample Sizes and Standard Errors for Reported Impact Estimates: Table II.7

	All Students				Participants	
	Higher Academic Risk		Lower Academic Risk		Higher	Lower
	Sample Size	Std Error †	Sample Size	Std Error †	Std Error ‡	Std Error ‡
Credits						
Total	528	0.79	2,114	0.29	1.06	0.34
Total Core	528	0.54	2,114	0.24	0.72	0.28
Math	528	0.12	2,114	0.05	0.16	0.06
Science	528	0.10	2,114	0.05	0.13	0.06
English	528	0.22	2,114	0.13	0.30	0.15
Social Studies	528	0.13	2,114	0.05	0.18	0.06
Foreign Language	528	0.08	2,114	0.04	0.10	0.05
Computer Science	528	0.14	2,114	0.04	0.19	0.05
Vocational	528	0.18	2,114	0.06	0.23	0.07
Advanced Placement and Honors Credits						
Total	528	0.12	2,114	0.25	0.16	0.29
Total Core	528	0.10	2,114	0.25	0.14	0.30
Math	528	0.02	2,114	0.06	0.03	0.07
Science	528	0.03	2,114	0.07	0.03	0.08
English	528	0.03	2,114	0.07	0.04	0.08
Social Studies	528	0.05	2,114	0.05	0.06	0.06
Foreign Language	528	0.01	2,114	0.01	0.01	0.02
Overall Grade Point Average	528	0.04	2,114	0.01	0.05	0.01
High School Status (%)						
Graduated	411	6.01	1,768	3.16	7.75	3.53
Still in high school	411	1.05	1,768	0.38	1.34	0.43
Dropped out	411	5.27	1,768	1.57	6.83	1.77
General Educational Development (GED)	411	2.60	1,768	1.79	3.32	1.99

Source: hs-ar20hi.log and hs-ar20lo.log

† The standard error of the estimated impact of being offered the opportunity to participate in Upward Bound (see Chapter I, Section B, Subsection 3).

‡ The standard error of the estimated impact of actually participating in Upward Bound (see Chapter I, Section B, Subsection 3).

Table I.4
Sample Sizes and Standard Errors for Reported Impact Estimates: Table D.1

	All Students						Participants		
	Low-Inc. and First-Gen.		First-Generation Only		Low-Income Only		LI and FG	FG Only	LI Only
	Sample Size	Std Error †	Sample Size	Std Error †	Sample Size	Std Error †	Std Error ‡	Std Error ‡	Std Error ‡
Credits									
Total	2,133	0.56	411	1.01	143	1.34	0.66	1.42	1.41
Total Core	2,133	0.46	411	0.53	143	1.00	0.55	0.73	1.04
Math	2,133	0.10	411	0.13	143	0.24	0.12	0.17	0.25
Science	2,133	0.09	411	0.22	143	0.26	0.11	0.32	0.27
English	2,133	0.13	411	0.14	143	0.32	0.15	0.18	0.33
Social Studies	2,133	0.09	411	0.16	143	0.26	0.10	0.24	0.27
Foreign Language	2,133	0.10	411	0.17	143	0.29	0.12	0.23	0.30
Computer Science	2,133	0.05	411	0.17	143	0.16	0.06	0.26	0.17
Vocational	2,133	0.09	411	0.34	143	0.30	0.10	0.48	0.31
Advanced Placement and Honors Credits									
Total	2,133	0.35	411	0.38	143	0.66	0.42	0.54	0.70
Total Core	2,133	0.35	411	0.32	143	0.65	0.42	0.43	0.68
Math	2,133	0.07	411	0.05	143	0.14	0.08	0.07	0.14
Science	2,133	0.09	411	0.07	143	0.17	0.10	0.09	0.18
English	2,133	0.11	411	0.14	143	0.26	0.14	0.20	0.28
Social Studies	2,133	0.07	411	0.10	143	0.12	0.09	0.15	0.12
Foreign Language	2,133	0.01	411	0.02	143	0.08	0.02	0.03	0.08
Overall Grade Point Average	2,122	-0.03	408	-0.12	143	0.40	0.11	0.13	0.14
High School Status (%)									
Graduated	1,801	3.73	362	3.61	128	3.68	4.38	4.37	3.91
Still in high school	1,801	0.46	362	0.19	128	0.00	0.54	0.23	0.00
Dropped out	1,801	2.01	362	2.95	128	1.88	2.37	3.60	1.99
General Educational Development (GED)	1,801	1.91	362	1.31	128	3.26	2.24	1.56	3.48

Source: hs-lifg.log, hs-low_only.log, and hs-fgenonly.log

† The standard error of the estimated impact of being offered the opportunity to participate in Upward Bound (see Chapter I, Section B, Subsection 3).

‡ The standard error of the estimated impact of actually participating in Upward Bound (see Chapter I, Section B, Subsection 3).

Table I.5

Sample Sizes and Standard Errors for Reported Impact Estimates: Table D.2

	All Students						Participants		
	African American		White		Hispanic		Afr. Amer.	White	Hispanic
	Sample Size	Std Error †	Sample Size	Std Error †	Sample Size	Std Error †	Std Error ‡	Std Error ‡	Std Error ‡
Credits									
Total	1,143	0.68	761	0.38	503	0.71	0.89	0.46	0.80
Total Core	1,143	0.44	761	0.37	503	0.53	0.55	0.45	0.61
Math	1,143	0.07	761	0.11	503	0.15	0.09	0.14	0.17
Science	1,143	0.19	761	0.07	503	0.15	0.25	0.09	0.16
English	1,143	0.10	761	0.10	503	0.19	0.13	0.13	0.22
Social Studies	1,143	0.05	761	0.10	503	0.16	0.07	0.12	0.18
Foreign Language	1,143	0.09	761	0.07	503	0.11	0.11	0.09	0.12
Computer Science	1,143	0.06	761	0.05	503	0.08	0.08	0.06	0.09
Vocational	1,143	0.20	761	0.16	503	0.16	0.26	0.19	0.18
Advanced Placement and Honors Credits									
Total	1,143	0.16	761	0.14	503	0.86	0.19	0.17	0.94
Total Core	1,143	0.16	761	0.14	503	0.86	0.19	0.16	0.94
Math	1,143	0.05	761	0.04	503	0.19	0.06	0.05	0.20
Science	1,143	0.05	761	0.04	503	0.19	0.06	0.04	0.21
English	1,143	0.08	761	0.06	503	0.21	0.10	0.07	0.23
Social Studies	1,143	0.05	761	0.03	503	0.26	0.07	0.04	0.29
Foreign Language	1,143	0.01	761	0.02	503	0.04	0.02	0.02	0.04
Overall Grade Point Average	1,139	-0.09	758	0.08	500	-0.01	0.11	0.06	0.20
High School Status (%)									
Graduated	962	2.94	672	2.67	415	5.55	3.50	3.28	6.32
Still in high school	962	0.48	672	0.23	415	1.90	0.56	0.27	2.18
Dropped out	962	1.72	672	2.53	415	3.19	2.01	3.02	3.63
General Educational Development (GED)	962	1.47	672	3.05	415	2.74	1.81	3.66	3.16

Source: hs-black.log, hs-white.log, and hs-hisp.log

† The standard error of the estimated impact of being offered the opportunity to participate in Upward Bound (see Chapter I, Section B, Subsection 3).

‡ The standard error of the estimated impact of actually participating in Upward Bound (see Chapter I, Section B, Subsection 3).

Table I.6
Sample Sizes and Standard Errors for Reported Impact Estimates: Table D.3

	All Students				Participants	
	Males		Females		Males	Females
	Sample Size	Std Error †	Sample Size	Std Error †	Std Error ‡	Std Error ‡
Credits						
Total	864	0.91	1,823	0.48	1.06	0.58
Total Core	864	0.58	1,823	0.41	0.67	0.49
Math	864	0.13	1,823	0.09	0.16	0.10
Science	864	0.11	1,823	0.10	0.13	0.13
English	864	0.20	1,823	0.09	0.23	0.11
Social Studies	864	0.13	1,823	0.08	0.15	0.10
Foreign Language	864	0.08	1,823	0.08	0.10	0.10
Computer Science	864	0.07	1,823	0.03	0.08	0.04
Vocational	864	0.15	1,823	0.11	0.18	0.14
Advanced Placement and Honors Credits						
Total	864	0.18	1,823	0.26	0.20	0.32
Total Core	864	0.15	1,823	0.28	0.17	0.36
Math	864	0.06	1,823	0.05	0.08	0.07
Science	864	0.05	1,823	0.08	0.05	0.10
English	864	0.06	1,823	0.08	0.07	0.10
Social Studies	864	0.05	1,823	0.07	0.06	0.09
Foreign Language	864	0.01	1,823	0.02	0.01	0.02
Overall Grade Point Average	864	0.06	1,809	-0.05	0.07	-0.07
High School Status (%)						
Graduated	699	5.67	1,592	3.67	6.52	4.35
Still in high school	699	1.06	1,592	0.33	1.21	0.39
Dropped out	699	2.45	1,592	2.26	2.82	2.68
General Educational Development (GED)	699	3.80	1,592	1.54	4.38	1.83

Source: hs-male.log and hs-female.log

† The standard error of the estimated impact of being offered the opportunity to participate in Upward Bound (see Chapter I, Section B, Subsection 3).

‡ The standard error of the estimated impact of actually participating in Upward Bound (see Chapter I, Section B, Subsection 3).

Table I.7
Sample Sizes and Standard Errors for Reported Impact Estimates: Table D.4

	All Students						Participants		
	Least Likely		Somewhat Likely		Most Likely		Least	Somewhat	Most
	Sample Size	Std Error †	Sample Size	Std Error †	Sample Size	Std Error †	Std Error ‡	Std Error ‡	Std Error ‡
Credits									
Total	264	1.02	1,011	0.58	1,403	0.53	1.21	0.70	0.62
Total Core	264	0.73	1,011	0.49	1,403	0.39	0.87	0.59	0.46
Math	264	0.17	1,011	0.10	1,403	0.08	0.19	0.12	0.10
Science	264	0.18	1,011	0.15	1,403	0.08	0.21	0.19	0.09
English	264	0.21	1,011	0.15	1,403	0.12	0.25	0.18	0.14
Social Studies	264	0.31	1,011	0.08	1,403	0.09	0.37	0.10	0.11
Foreign Language	264	0.15	1,011	0.09	1,403	0.08	0.18	0.11	0.10
Computer Science	264	0.25	1,011	0.05	1,403	0.05	0.28	0.06	0.06
Vocational	264	0.20	1,011	0.16	1,403	0.09	0.25	0.21	0.10
Advanced Placement and Honors Credits									
Total	264	0.42	1,011	0.20	1,403	0.21	0.50	0.24	0.25
Total Core	264	0.42	1,011	0.23	1,403	0.21	0.50	0.28	0.24
Math	264	0.09	1,011	0.07	1,403	0.04	0.10	0.09	0.04
Science	264	0.13	1,011	0.06	1,403	0.06	0.16	0.07	0.07
English	264	0.11	1,011	0.08	1,403	0.07	0.14	0.10	0.08
Social Studies	264	0.13	1,011	0.03	1,403	0.05	0.16	0.04	0.06
Foreign Language	264	0.04	1,011	0.02	1,403	0.01	0.04	0.02	0.02
Overall Grade Point Average	263	0.02	1,009	-0.12	1,392	0.05	0.13	0.18	0.07
High School Status (%)									
Graduated	232	10.47	873	1.90	1,179	4.88	12.11	2.24	5.71
Still in high school	232	0.00	873	0.46	1,179	0.66	0.00	0.54	0.76
Dropped out	232	8.20	873	1.31	1,179	2.50	9.44	1.54	2.92
General Educational Development (GED)	232	4.08	873	1.11	1,179	2.80	4.60	1.31	3.28

Source: hs-rating_h.log, hs-rating_m.log, and hs-rating_l.log

† The standard error of the estimated impact of being offered the opportunity to participate in Upward Bound (see Chapter I, Section B, Subsection 3).

‡ The standard error of the estimated impact of actually participating in Upward Bound (see Chapter I, Section B, Subsection 3).

Table I.8
Sample Sizes and Standard Errors for Reported Impact Estimates: Table III.1

	All Students		Participants
	Sample Size	Standard Error †	Standard Error ‡
Postsecondary School Status (%)			
Any postsecondary school	2,292	3.91	4.58
Four-year college	2,292	2.67	3.13
Two-year college	2,292	3.43	4.02
Vocational school	2,292	1.38	1.62
Credits Earned			
All postsecondary schools	1,842	3.05	3.53
Nonremedial	1,842	3.34	3.87
Remedial	1,842	0.25	0.29
Other	1,842	0.62	0.71
Four-year colleges	1,842	2.16	2.50
Nonremedial	1,842	2.41	2.79
Remedial	1,842	0.17	0.19
Other	1,842	0.61	0.70
Two-year colleges	1,842	2.06	2.37
Nonremedial	1,842	1.87	2.15
Remedial	1,842	0.25	0.28
Other	1,842	0.03	0.04
Vocational schools	1,842	0.56	0.65
Nonremedial	1,842	0.51	0.59
Remedial	1,842	0.01	0.02
Other	1,842	0.10	0.12

Source: pst-overall.log

† The standard error of the estimated impact of being offered the opportunity to participate in Upward Bound (see Chapter I, Section B, Subsection 3).

‡ The standard error of the estimated impact of actually participating in Upward Bound (see Chapter I, Section B, Subsection 3).

Table I.9
Sample Sizes and Standard Errors for Reported Impact Estimates: Table III.2

	All Students		Participants
	Sample Size	Standard Error †	Standard Error ‡
Postsecondary School Status (%)			
Any postsecondary school	2,292	4.93	5.78
Four-year college	2,292	3.39	3.97
Two-year college	2,292	3.22	3.77
Vocational school	2,292	1.09	1.28
Credits Earned			
All postsecondary schools	2,292	2.96	3.46
Nonremedial	2,292	3.14	3.68
Remedial	2,292	0.20	0.24
Other	2,292	0.47	0.55
Four-year colleges	2,292	2.20	2.56
Nonremedial	2,292	2.37	2.76
Remedial	2,292	0.15	0.17
Other	2,292	0.46	0.53
Two-year colleges	2,292	1.66	1.95
Nonremedial	2,292	1.54	1.81
Remedial	2,292	0.15	0.18
Other	2,292	0.03	0.03
Vocational schools	2,292	0.43	0.50
Nonremedial	2,292	0.39	0.45
Remedial	2,292	0.01	0.01
Other	2,292	0.09	0.11

Source: pst2-overall.log

† The standard error of the estimated impact of being offered the opportunity to participate in Upward Bound (see Chapter I, Section B, Subsection 3).

‡ The standard error of the estimated impact of actually participating in Upward Bound (see Chapter I, Section B, Subsection 3).

Table I.10

Sample Sizes and Standard Errors for Reported Impact Estimates: Table III.3

	All Students				Participants	
	Higher Expectations		Lower Expectations		Higher	Lower
	Sample Size	Std Error †	Sample Size	Std Error †	Std Error ‡	Std Error ‡
Postsecondary School Status (%)						
Any postsecondary school	1,701	2.71	403	11.67	3.15	13.99
Four-year college	1,701	3.31	403	8.92	3.84	10.66
Two-year college	1,701	2.43	403	12.07	2.90	14.56
Vocational school	1,701	2.22	403	1.33	2.67	1.59
Credits Earned						
All postsecondary schools	1,331	3.73	344	4.02	4.33	4.84
Nonremedial	1,331	3.73	344	6.35	4.33	7.78
Remedial	1,331	0.27	344	0.25	0.31	0.30
Other	1,331	0.34	344	4.97	0.39	6.14
Four-year colleges	1,331	2.70	344	3.51	3.12	4.23
Nonremedial	1,331	2.85	344	4.28	3.29	5.19
Remedial	1,331	0.26	344	0.08	0.30	0.10
Other	1,331	0.32	344	4.97	0.37	6.14
Two-year colleges	1,331	2.18	344	2.60	2.53	3.18
Nonremedial	1,331	1.95	344	2.61	2.26	3.20
Remedial	1,331	0.29	344	0.25	0.33	0.30
Other	1,331	0.04	344	0.00	0.05	0.00
Vocational schools	1,331	0.49	344	1.81	0.57	2.20
Nonremedial	1,331	0.43	344	1.80	0.50	2.19
Remedial	1,331	0.02	344	0.03	0.02	0.03
Other	1,331	0.12	344	0.02	0.14	0.03

Source: pst-hiexp.log and pst-loexp.log

† The standard error of the estimated impact of being offered the opportunity to participate in Upward Bound (see Chapter I, Section B, Subsection 3).

‡ The standard error of the estimated impact of actually participating in Upward Bound (see Chapter I, Section B, Subsection 3).

Table I.11

Sample Sizes and Standard Errors for Reported Impact Estimates: Table III.4

	All Students				Participants	
	Higher Expectations		Lower Expectations		Higher	Lower
	Sample Size	Std Error †	Sample Size	Std Error †	Std Error ‡	Std Error ‡
Postsecondary School Status (%)						
Any postsecondary school	1,701	4.57	403	10.36	5.38	12.38
Four-year college	1,701	4.60	403	8.43	5.41	10.10
Two-year college	1,701	2.51	403	10.12	2.96	12.16
Vocational school	1,701	1.48	403	1.21	1.77	1.45
Credits Earned						
All postsecondary schools	1,701	3.61	403	4.59	4.27	5.53
Nonremedial	1,701	3.56	403	3.71	4.20	4.45
Remedial	1,701	0.24	403	0.21	0.28	0.25
Other	1,701	0.26	403	3.44	0.30	4.15
Four-year colleges	1,701	2.82	403	4.29	3.32	5.19
Nonremedial	1,701	2.83	403	2.22	3.33	2.64
Remedial	1,701	0.19	403	0.11	0.22	0.13
Other	1,701	0.23	403	3.44	0.27	4.15
Two-year colleges	1,701	1.79	403	2.37	2.13	2.83
Nonremedial	1,701	1.67	403	2.36	1.98	2.82
Remedial	1,701	0.16	403	0.18	0.19	0.22
Other	1,701	0.04	403	0.00	0.04	0.00
Vocational schools	1,701	0.45	403	1.21	0.53	1.44
Nonremedial	1,701	0.40	403	1.20	0.48	1.43
Remedial	1,701	0.01	403	0.03	0.01	0.03
Other	1,701	0.11	403	0.02	0.13	0.02

Source: pst2-hiexp.log and pst2-loexp.log

† The standard error of the estimated impact of being offered the opportunity to participate in Upward Bound (see Chapter I, Section B, Subsection 3).

‡ The standard error of the estimated impact of actually participating in Upward Bound (see Chapter I, Section B, Subsection 3).

Table I.12

Sample Sizes and Standard Errors for Reported Impact Estimates: Table III.5

	All Students				Participants	
	Higher Academic Risk		Lower Academic Risk		Higher	Lower
	Sample Size	Std Error †	Sample Size	Std Error †	Std Error ‡	Std Error ‡
Postsecondary School Status (%)						
Any postsecondary school	411	4.48	1,769	3.45	5.81	3.93
Four-year college	411	3.44	1,769	2.51	4.73	2.82
Two-year college	411	6.48	1,769	3.61	8.96	4.00
Vocational school	411	1.85	1,769	0.95	2.43	1.05
Credits Earned						
All postsecondary schools	340	3.04	1,413	2.63	3.77	2.99
Nonremedial	340	2.86	1,413	2.82	3.53	3.21
Remedial	340	0.47	1,413	0.42	0.59	0.47
Other	340	0.00	1,413	0.83	0.00	0.92
Four-year colleges	340	2.51	1,413	3.09	3.11	3.42
Nonremedial	340	2.41	1,413	2.88	2.98	3.20
Remedial	340	0.21	1,413	0.19	0.25	0.22
Other	340	0.00	1,413	0.80	0.00	0.89
Two-year colleges	340	1.74	1,413	2.80	2.14	3.11
Nonremedial	340	1.67	1,413	2.45	2.05	2.73
Remedial	340	0.36	1,413	0.40	0.46	0.45
Other	340	0.00	1,413	0.05	0.00	0.05
Vocational schools	340	1.21	1,413	0.66	1.51	0.74
Nonremedial	340	1.20	1,413	0.57	1.51	0.64
Remedial	340	0.01	1,413	0.01	0.02	0.01
Other	340	0.00	1,413	0.14	0.00	0.16

Source: pst-ar20hi.log and pst-ar20lo.log

† The standard error of the estimated impact of being offered the opportunity to participate in Upward Bound (see Chapter I, Section B, Subsection 3).

‡ The standard error of the estimated impact of actually participating in Upward Bound (see Chapter I, Section B, Subsection 3).

Table I.13

Sample Sizes and Standard Errors for Reported Impact Estimates: Table III.6

	All Students				Participants	
	Higher Academic Risk		Lower Academic Risk		Higher	Lower
	Sample Size	Std Error †	Sample Size	Std Error †	Std Error ‡	Std Error ‡
Postsecondary School Status (%)						
Any postsecondary school	411	6.90	1,769	3.45	9.09	3.95
Four-year college	411	3.16	1,769	3.04	4.17	3.46
Two-year college	411	7.26	1,769	3.02	9.75	3.38
Vocational school	411	0.79	1,769	1.53	1.00	1.70
Credits Earned						
All postsecondary schools	411	2.73	1,769	2.28	3.49	2.57
Nonremedial	411	2.63	1,769	2.46	3.38	2.77
Remedial	411	0.27	1,769	0.26	0.34	0.29
Other	411	0.00	1,769	0.62	0.00	0.68
Four-year colleges	411	1.65	1,769	2.56	2.10	2.84
Nonremedial	411	1.50	1,769	2.44	1.92	2.73
Remedial	411	0.23	1,769	0.18	0.29	0.21
Other	411	0.00	1,769	0.59	0.00	0.66
Two-year colleges	411	1.99	1,769	2.02	2.53	2.25
Nonremedial	411	1.95	1,769	1.85	2.50	2.06
Remedial	411	0.27	1,769	0.21	0.35	0.24
Other	411	0.00	1,769	0.04	0.00	0.04
Vocational schools	411	0.84	1,769	0.56	1.10	0.64
Nonremedial	411	0.84	1,769	0.49	1.10	0.55
Remedial	411	0.01	1,769	0.01	0.01	0.01
Other	411	0.00	1,769	0.13	0.00	0.15

Source: pst2-ar20hi.log and pst2-ar20lo.log

† The standard error of the estimated impact of being offered the opportunity to participate in Upward Bound (see Chapter I, Section B, Subsection 3).

‡ The standard error of the estimated impact of actually participating in Upward Bound (see Chapter I, Section B, Subsection 3).

Table I.14
Sample Sizes and Standard Errors for Reported Impact Estimates: Table III.7

	All Students						Participants		
	Low-Inc. and First Gen.		First-Generation Only		Low-Income Only		LI and FG	FG Only	LI Only
	Sample Size	Std Error †	Sample Size	Std Error †	Sample Size	Std Error †	Std Error ‡	Std Error ‡	Std Error ‡
Postsecondary School Status (%)									
Any postsecondary school	1,802	4.69	362	3.67	128	8.01	5.50	4.43	8.76
Four-year college	1,802	3.19	362	6.30	128	10.73	3.75	7.78	11.39
Two-year college	1,802	3.89	362	7.77	128	8.81	4.59	9.44	9.46
Vocational school	1,802	1.21	362	1.83	128	3.46	1.43	2.26	3.68
Credits Earned									
All postsecondary schools	1,453	2.93	292	5.94	97	12.85	3.42	7.22	14.05
Nonremedial	1,453	3.11	292	5.95	97	12.42	3.63	7.28	13.48
Remedial	1,453	0.24	292	0.67	97	0.57	0.29	0.78	0.63
Other	1,453	0.59	292	0.75	97	1.96	0.68	0.86	2.14
Four-year colleges	1,453	2.72	292	5.92	97	12.54	3.18	6.82	13.67
Nonremedial	1,453	2.89	292	5.99	97	12.19	3.37	6.89	13.17
Remedial	1,453	0.23	292	0.55	97	0.58	0.27	0.63	0.65
Other	1,453	0.56	292	0.75	97	1.96	0.66	0.86	2.14
Two-year colleges	1,453	1.34	292	4.50	97	4.74	1.57	5.28	5.21
Nonremedial	1,453	1.21	292	4.36	97	4.74	1.42	5.13	5.21
Remedial	1,453	0.21	292	0.34	97	0.28	0.25	0.40	0.30
Other	1,453	0.04	292	0.08	97	0.00	0.05	0.09	0.00
Vocational schools	1,453	0.71	292	0.39	97	1.51	0.83	0.46	1.65
Nonremedial	1,453	0.65	292	0.39	97	1.51	0.76	0.46	1.65
Remedial	1,453	0.02	292	0.00	97	0.00	0.02	0.00	0.00
Other	1,453	0.13	292	0.00	97	0.00	0.15	0.00	0.00

Source: pst-lifg.log, pst-low_only.log, and pst-fgenonly.log

† The standard error of the estimated impact of being offered the opportunity to participate in Upward Bound (see Chapter I, Section B, Subsection 3).

‡ The standard error of the estimated impact of actually participating in Upward Bound (see Chapter I, Section B, Subsection 3).

Table I.15

Sample Sizes and Standard Errors for Reported Impact Estimates: Table III.8

	All Students						Participants		
	Low-Inc. and First Gen.		First-Generation Only		Low-Income Only		LI and FG	FG Only	LI Only
	Sample Size	Std Error †	Sample Size	Std Error †	Sample Size	Std Error †	Std Error ‡	Std Error ‡	Std Error ‡
Postsecondary School Status (%)									
Any postsecondary school	1,802	5.25	362	6.04	128	10.05	6.16	7.49	10.72
Four-year college	1,802	2.98	362	6.71	128	11.09	3.51	8.47	11.60
Two-year college	1,802	3.44	362	7.88	128	8.56	4.05	9.58	9.20
Vocational school	1,802	0.52	362	2.73	128	3.46	0.61	3.34	3.68
Credits Earned									
All postsecondary schools	1,802	2.78	362	6.16	128	9.33	3.27	7.37	9.81
Nonremedial	1,802	2.88	362	6.11	128	8.92	3.39	7.29	9.36
Remedial	1,802	0.19	362	0.61	128	1.05	0.22	0.74	1.10
Other	1,802	0.41	362	0.59	128	1.47	0.49	0.72	1.57
Four-year colleges	1,802	2.12	362	5.40	128	8.85	2.49	6.41	9.32
Nonremedial	1,802	2.19	362	5.32	128	8.41	2.57	6.28	8.84
Remedial	1,802	0.15	362	0.56	128	1.09	0.17	0.68	1.14
Other	1,802	0.39	362	0.59	128	1.47	0.46	0.72	1.57
Two-year colleges	1,802	1.45	362	3.75	128	3.18	1.70	4.57	3.42
Nonremedial	1,802	1.35	362	3.67	128	3.15	1.59	4.48	3.39
Remedial	1,802	0.15	362	0.24	128	0.25	0.18	0.29	0.27
Other	1,802	0.03	362	0.06	128	0.00	0.04	0.07	0.00
Vocational schools	1,802	0.50	362	0.37	128	1.02	0.58	0.44	1.09
Nonremedial	1,802	0.44	362	0.37	128	1.02	0.51	0.44	1.09
Remedial	1,802	0.01	362	0.00	128	0.00	0.01	0.00	0.00
Other	1,802	0.11	362	0.00	128	0.00	0.14	0.00	0.00

Source: pst2-lifg.log, pst2-low_only.log, and pst2-fgenonly.log

† The standard error of the estimated impact of being offered the opportunity to participate in Upward Bound (see Chapter I, Section B, Subsection 3).

‡ The standard error of the estimated impact of actually participating in Upward Bound (see Chapter I, Section B, Subsection 3).

Table I.16
Sample Sizes and Standard Errors for Reported Impact Estimates: Table III.9

	All Students						Participants		
	African American		White		Hispanic		Afr. Amer.	White	Hispanic
	Sample Size	Std Error †	Sample Size	Std Error †	Sample Size	Std Error †	Std Error ‡	Std Error ‡	Std Error ‡
Postsecondary School Status (%)									
Any postsecondary school	962	3.85	673	3.70	415	6.16	4.63	4.64	7.10
Four-year college	962	3.11	673	4.95	415	5.12	3.64	5.92	5.86
Two-year college	962	4.17	673	4.66	415	5.05	5.15	5.62	5.70
Vocational school	962	1.82	673	0.64	415	1.57	2.25	0.79	1.79
Credits Earned									
All postsecondary schools	742	4.23	560	3.69	344	4.53	4.80	4.38	5.06
Nonremedial	742	4.50	560	3.51	344	4.41	5.09	4.16	4.89
Remedial	742	0.26	560	0.54	344	0.70	0.30	0.63	0.78
Other	742	0.70	560	0.19	344	0.49	0.79	0.22	0.55
Four-year colleges	742	4.10	560	3.13	344	5.30	4.67	3.67	5.64
Nonremedial	742	4.36	560	3.09	344	5.34	4.95	3.62	5.67
Remedial	742	0.30	560	0.41	344	0.57	0.34	0.48	0.65
Other	742	0.68	560	0.19	344	0.38	0.78	0.22	0.42
Two-year colleges	742	1.17	560	2.48	344	4.04	1.33	3.13	4.49
Nonremedial	742	1.09	560	2.38	344	3.83	1.23	3.01	4.27
Remedial	742	0.20	560	0.31	344	0.31	0.22	0.37	0.34
Other	742	0.06	560	0.01	344	0.00	0.07	0.01	0.00
Vocational schools	742	0.89	560	0.48	344	1.58	1.02	0.57	1.82
Nonremedial	742	0.80	560	0.48	344	1.57	0.91	0.57	1.80
Remedial	742	0.03	560	0.00	344	0.02	0.03	0.00	0.02
Other	742	0.18	560	0.00	344	0.18	0.20	0.00	0.20

Source: pst-black.log, pst-white.log, and pst-hisp.log

† The standard error of the estimated impact of being offered the opportunity to participate in Upward Bound (see Chapter I, Section B, Subsection 3).

‡ The standard error of the estimated impact of actually participating in Upward Bound (see Chapter I, Section B, Subsection 3).

Table I.17
Sample Sizes and Standard Errors for Reported Impact Estimates: Table III.10

	All Students						Participants		
	African American		White		Hispanic		Afr. Amer.	White	Hispanic
	Sample Size	Std Error †	Sample Size	Std Error †	Sample Size	Std Error †	Std Error ‡	Std Error ‡	Std Error ‡
Postsecondary School Status (%)									
Any postsecondary school	962	8.64	673	4.13	415	5.50	10.43	5.13	6.08
Four-year college	962	5.48	673	4.44	415	4.44	6.53	5.30	4.90
Two-year college	962	4.49	673	3.51	415	4.47	5.46	4.27	5.08
Vocational school	962	0.70	673	0.70	415	2.92	0.83	0.85	3.28
Credits Earned									
All postsecondary schools	962	5.99	673	2.98	415	4.32	7.20	3.38	4.82
Nonremedial	962	6.04	673	2.87	415	4.25	7.27	3.25	4.73
Remedial	962	0.24	673	0.38	415	0.55	0.29	0.45	0.62
Other	962	0.52	673	0.13	415	0.40	0.62	0.15	0.45
Four-year colleges	962	4.99	673	3.43	415	3.80	5.97	4.10	4.07
Nonremedial	962	5.11	673	3.35	415	3.78	6.12	4.01	4.04
Remedial	962	0.23	673	0.33	415	0.48	0.27	0.39	0.55
Other	962	0.50	673	0.12	415	0.36	0.59	0.15	0.40
Two-year colleges	962	1.56	673	2.00	415	2.75	1.90	2.50	3.09
Nonremedial	962	1.40	673	1.94	415	2.69	1.70	2.43	3.02
Remedial	962	0.21	673	0.18	415	0.34	0.25	0.21	0.39
Other	962	0.05	673	0.01	415	0.00	0.06	0.01	0.00
Vocational schools	962	0.65	673	0.29	415	1.26	0.77	0.35	1.44
Nonremedial	962	0.57	673	0.29	415	1.24	0.67	0.35	1.42
Remedial	962	0.02	673	0.00	415	0.01	0.02	0.00	0.01
Other	962	0.16	673	0.00	415	0.07	0.20	0.00	0.08

Source: pst2-black.log, pst2-white.log, and pst2-hisp.log

† The standard error of the estimated impact of being offered the opportunity to participate in Upward Bound (see Chapter I, Section B, Subsection 3).

‡ The standard error of the estimated impact of actually participating in Upward Bound (see Chapter I, Section B, Subsection 3).

Table I.18
Sample Sizes and Standard Errors for Reported Impact Estimates: Table III.11

	All Students				Participants	
	Males		Females		Males	Females
	Sample Size	Std Error †	Sample Size	Std Error †	Std Error ‡	Std Error ‡
Postsecondary School Status (%)						
Any postsecondary school	699	4.04	1,593	4.94	4.63	5.83
Four-year college	699	3.48	1,593	3.40	3.98	4.02
Two-year college	699	2.91	1,593	4.31	3.35	5.16
Vocational school	699	1.11	1,593	1.81	1.27	2.16
Credits Earned						
All postsecondary schools	563	3.78	1,279	4.22	4.34	4.89
Nonremedial	563	3.69	1,279	4.51	4.23	5.23
Remedial	563	0.35	1,279	0.29	0.40	0.33
Other	563	0.75	1,279	0.74	0.86	0.86
Four-year colleges	563	3.23	1,279	3.07	3.70	3.58
Nonremedial	563	3.28	1,279	3.28	3.75	3.82
Remedial	563	0.28	1,279	0.21	0.32	0.25
Other	563	0.69	1,279	0.73	0.79	0.84
Two-year colleges	563	1.94	1,279	2.84	2.23	3.28
Nonremedial	563	1.93	1,279	2.66	2.22	3.08
Remedial	563	0.21	1,279	0.25	0.24	0.29
Other	563	0.02	1,279	0.05	0.02	0.06
Vocational schools	563	0.57	1,279	0.77	0.66	0.90
Nonremedial	563	0.36	1,279	0.76	0.41	0.89
Remedial	563	0.02	1,279	0.02	0.03	0.02
Other	563	0.29	1,279	0.04	0.33	0.04

Source: pst-male.log and pst-female.log

† The standard error of the estimated impact of being offered the opportunity to participate in Upward Bound (see Chapter I, Section B, Subsection 3).

‡ The standard error of the estimated impact of actually participating in Upward Bound (see Chapter I, Section B, Subsection 3).

Table I.19

Sample Sizes and Standard Errors for Reported Impact Estimates: Table III.12

	All Students				Participants	
	Males		Females		Males	Females
	Sample Size	Std Error †	Sample Size	Std Error †	Std Error ‡	Std Error ‡
Postsecondary School Status (%)						
Any postsecondary school	699	4.90	1,593	5.45	5.63	6.44
Four-year college	699	3.91	1,593	3.68	4.50	4.35
Two-year college	699	3.73	1,593	3.74	4.27	4.45
Vocational school	699	2.16	1,593	1.01	2.47	1.20
Credits Earned						
All postsecondary schools	699	3.75	1,593	4.09	4.29	4.86
Nonremedial	699	3.63	1,593	4.32	4.14	5.13
Remedial	699	0.33	1,593	0.23	0.37	0.27
Other	699	0.54	1,593	0.59	0.62	0.69
Four-year colleges	699	3.56	1,593	3.03	4.07	3.58
Nonremedial	699	3.53	1,593	3.22	4.04	3.80
Remedial	699	0.26	1,593	0.18	0.29	0.22
Other	699	0.45	1,593	0.57	0.52	0.68
Two-year colleges	699	1.55	1,593	2.26	1.79	2.69
Nonremedial	699	1.52	1,593	2.15	1.75	2.55
Remedial	699	0.18	1,593	0.17	0.21	0.20
Other	699	0.01	1,593	0.04	0.02	0.05
Vocational schools	699	0.76	1,593	0.56	0.86	0.66
Nonremedial	699	0.59	1,593	0.55	0.67	0.65
Remedial	699	0.02	1,593	0.01	0.02	0.01
Other	699	0.28	1,593	0.02	0.32	0.02

Source: pst2-male.log and pst2-female.log

† The standard error of the estimated impact of being offered the opportunity to participate in Upward Bound (see Chapter I, Section B, Subsection 3).

‡ The standard error of the estimated impact of actually participating in Upward Bound (see Chapter I, Section B, Subsection 3).

Table I.20

Sample Sizes and Standard Errors for Reported Impact Estimates: Table III.13

	All Students						Participants		
	Least Likely		Somewhat Likely		Most Likely		Least	Somewhat	Most
	Sample Size	Std Error †	Sample Size	Std Error †	Sample Size	Std Error †	Std Error ‡	Std Error ‡	Std Error ‡
Postsecondary School Status (%)									
Any postsecondary school	232	11.20	873	2.72	1,180	4.82	13.04	3.20	5.60
Four-year college	232	9.29	873	4.12	1,180	3.35	10.90	4.85	3.87
Two-year college	232	6.68	873	3.18	1,180	4.25	7.68	3.75	4.98
Vocational school	232	0.75	873	2.62	1,180	0.79	0.88	3.09	0.92
Credits Earned									
All postsecondary schools	185	6.81	691	5.83	960	2.86	8.05	6.64	3.30
Nonremedial	185	6.66	691	6.03	960	2.93	7.84	6.87	3.38
Remedial	185	0.43	691	0.37	960	0.45	0.50	0.42	0.52
Other	185	0.37	691	0.36	960	1.06	0.43	0.42	1.22
Four-year colleges	185	8.68	691	5.40	960	2.54	9.77	6.17	2.91
Nonremedial	185	8.59	691	5.53	960	2.71	9.64	6.31	3.12
Remedial	185	0.25	691	0.33	960	0.20	0.30	0.38	0.23
Other	185	0.37	691	0.32	960	1.03	0.43	0.37	1.18
Two-year colleges	185	5.43	691	1.84	960	1.50	6.36	2.11	1.74
Nonremedial	185	5.21	691	1.87	960	1.28	6.12	2.13	1.48
Remedial	185	0.36	691	0.19	960	0.42	0.41	0.21	0.49
Other	185	0.00	691	0.07	960	0.04	0.00	0.08	0.05
Vocational schools	185	2.55	691	0.76	960	0.61	3.02	0.88	0.70
Nonremedial	185	2.55	691	0.75	960	0.48	3.02	0.87	0.55
Remedial	185	0.00	691	0.02	960	0.03	0.00	0.02	0.03
Other	185	0.00	691	0.08	960	0.20	0.00	0.09	0.23

Source: pst-rating_h.log, pst-rating_m.log, and pst-rating_l.log

† The standard error of the estimated impact of being offered the opportunity to participate in Upward Bound (see Chapter I, Section B, Subsection 3).

‡ The standard error of the estimated impact of actually participating in Upward Bound (see Chapter I, Section B, Subsection 3).

Table I.21

Sample Sizes and Standard Errors for Reported Impact Estimates: Table III.14

	All Students						Participants		
	Least Likely		Somewhat Likely		Most Likely		Least	Somewhat	Most
	Sample Size	Std Error †	Sample Size	Std Error †	Sample Size	Std Error †	Std Error ‡	Std Error ‡	Std Error ‡
Postsecondary School Status (%)									
Any postsecondary school	232	12.01	873	4.53	1,180	4.52	14.06	5.33	5.26
Four-year college	232	8.89	873	5.49	1,180	3.26	10.52	6.47	3.77
Two-year college	232	6.76	873	3.20	1,180	3.60	7.79	3.77	4.21
Vocational school	232	1.54	873	2.37	1,180	0.52	1.76	2.79	0.60
Credits Earned									
All postsecondary schools	232	7.44	873	4.58	1,180	3.38	8.76	5.41	3.93
Nonremedial	232	7.22	873	4.55	1,180	3.59	8.52	5.36	4.19
Remedial	232	0.39	873	0.31	1,180	0.29	0.45	0.37	0.34
Other	232	0.40	873	0.23	1,180	0.87	0.46	0.27	1.02
Four-year colleges	232	6.08	873	4.37	1,180	2.55	7.07	5.16	2.96
Nonremedial	232	5.92	873	4.30	1,180	2.70	6.89	5.08	3.13
Remedial	232	0.30	873	0.26	1,180	0.20	0.34	0.31	0.23
Other	232	0.40	873	0.19	1,180	0.84	0.46	0.23	0.98
Two-year colleges	232	3.78	873	1.60	1,180	1.93	4.29	1.88	2.26
Nonremedial	232	3.58	873	1.56	1,180	1.72	4.07	1.83	2.02
Remedial	232	0.31	873	0.19	1,180	0.24	0.35	0.23	0.28
Other	232	0.00	873	0.06	1,180	0.03	0.00	0.07	0.03
Vocational schools	232	1.78	873	0.58	1,180	0.47	2.04	0.68	0.55
Nonremedial	232	1.78	873	0.57	1,180	0.36	2.04	0.68	0.42
Remedial	232	0.00	873	0.01	1,180	0.02	0.00	0.02	0.02
Other	232	0.00	873	0.03	1,180	0.17	0.00	0.03	0.20

Source: pst2-rating_h.log, pst2-rating_m.log, and pst2-rating_l.log

† The standard error of the estimated impact of being offered the opportunity to participate in Upward Bound (see Chapter I, Section B, Subsection 3).

‡ The standard error of the estimated impact of actually participating in Upward Bound (see Chapter I, Section B, Subsection 3).

Table I.22

Sample Sizes and Standard Errors for Reported Impact Estimates: Table III.15

	All Students		Participants
	Sample Size	Standard Error †	Standard Error ‡
Residence in focused housing (%)	2,292	0.66	0.77
Days per year of parent or student contact with school	2,292	4.05	4.74
How often during first year in postsecondary school student used the following supplemental services			
Academic counseling	2,292	0.17	0.20
Personal counseling	2,292	0.09	0.11
Learning skills center services	2,292	0.13	0.15
Tutoring services	2,292	0.12	0.14
Minority student services	2,292	0.12	0.14
Health services	2,292	0.10	0.12
Other	2,292	0.02	0.03
Participation in federally supported programs while in postsecondary school (%)			
Student Support Services	2,292	1.03	1.19
McNair Post-Baccalaureate Achievement Program	2,292	0.46	0.54
Student received financial aid (%)	2,292	5.39	6.32
How often during first year of postsecondary school student:			
Talked with faculty in office about academic matters	2,292	0.18	0.21
Met with advisor concerning academic plans	2,292	0.11	0.13
Had informal contact with advisor or other faculty	2,292	0.11	0.13
Participated in study groups outside of class	2,292	0.26	0.30
Went to events with friends from school	2,292	0.21	0.25
Participated in school clubs	2,292	0.16	0.19
Attended career-related lectures, conventions, or field trips with friends	2,292	0.09	0.10
Participated in intramural or intercollegiate sports, music, drama, etc.	2,292	0.12	0.14
Cut classes	2,292	0.19	0.22
Worked for pay in college (%)			
Freshman year	2,292	2.83	3.31
Sophomore year	2,292	2.34	2.78
Hours worked per week in college			
Freshman year	2,292	1.04	1.21
Sophomore year	2,292	0.77	0.91

Source: pss-overall.log

† The standard error of the estimated impact of being offered the opportunity to participate in Upward Bound (see Chapter I, Section B, Subsection 3).

‡ The standard error of the estimated impact of actually participating in Upward Bound (see Chapter I, Section B, Subsection 3).

Table I.23

Sample Sizes and Standard Errors for Reported Impact Estimates: Table E.1

	All Students				Participants	
	Higher Expectations		Lower Expectations		Higher	Lower
	Sample Size	Std Error †	Sample Size	Std Error †	Std Error ‡	Std Error ‡
Residence in focused housing (%)	1,701	0.85	403	0.79	0.99	0.95
Days per year of parent or student contact with school	1,701	3.23	403	19.67	3.80	23.56
How often during first year in postsecondary school student used the following supplemental services						
Academic counseling	1,701	0.26	403	0.33	0.31	0.40
Personal counseling	1,701	0.09	403	0.17	0.11	0.20
Learning skills center services	1,701	0.13	403	0.22	0.15	0.26
Tutoring services	1,701	0.11	403	0.24	0.13	0.29
Minority student services	1,701	0.17	403	0.18	0.20	0.22
Health services	1,701	0.13	403	0.11	0.16	0.13
Other	1,701	0.01	403	0.04	0.02	0.05
Participation in federally supported programs while in postsecondary school (%)						
Student Support Services	1,701	1.48	403	2.09	1.71	2.49
McNair Post-Baccalaureate Achievement Program	1,701	0.71	403	1.44	0.85	1.74
Student received financial aid (%)	1,701	4.06	403	11.86	4.81	14.23
How often during first year of postsecondary school student:						
Talked with faculty in office about academic matters	1,701	0.23	403	0.41	0.28	0.49
Met with advisor concerning academic plans	1,701	0.15	403	0.29	0.17	0.35
Had informal contact with advisor or other faculty	1,701	0.19	403	0.36	0.23	0.43
Participated in study groups outside of class	1,701	0.30	403	0.31	0.36	0.37
Went to events with friends from school	1,701	0.28	403	0.34	0.33	0.41
Participated in school clubs	1,701	0.29	403	0.31	0.35	0.37
Attended career-related lectures, conventions, or field trips with friends	1,701	0.22	403	0.30	0.27	0.36
Participated in intramural or intercollegiate sports, music, drama, etc.	1,701	0.22	403	0.22	0.26	0.26
Cut classes	1,701	0.16	403	0.43	0.19	0.51

Source: pss-hiexp.log and pss-loexp.log

† The standard error of the estimated impact of being offered the opportunity to participate in Upward Bound (see Chapter I, Section B, Subsection 3).

‡ The standard error of the estimated impact of actually participating in Upward Bound (see Chapter I, Section B, Subsection 3).

Table I.24

Sample Sizes and Standard Errors for Reported Impact Estimates: Table E.2

	All Students				Participants	
	Higher Academic Risk		Lower Academic Risk		Higher	Lower
	Sample Size	Std Error †	Sample Size	Std Error †	Std Error ‡	Std Error ‡
Residence in focused housing (%)	411	0.81	1,769	0.86	1.02	0.97
Days per year of parent or student contact with school	411	8.28	1,769	4.61	10.57	5.22
How often during first year in postsecondary school student used the following supplemental services						
Academic counseling	411	0.22	1,769	0.13	0.27	0.15
Personal counseling	411	0.17	1,769	0.10	0.23	0.11
Learning skills center services	411	0.19	1,769	0.16	0.24	0.18
Tutoring services	411	0.17	1,769	0.16	0.22	0.17
Minority student services	411	0.05	1,769	0.13	0.06	0.15
Health services	411	0.09	1,769	0.11	0.11	0.13
Other	411	0.02	1,769	0.03	0.03	0.03
Participation in federally supported programs while in postsecondary school (%)						
Student Support Services	411	3.11	1,769	1.23	3.95	1.39
McNair Post-Baccalaureate Achievement Program	411	0.53	1,769	0.53	0.65	0.60
Student received financial aid (%)	411	9.76	1,769	3.02	13.07	3.43
How often during first year of postsecondary school student:						
Talked with faculty in office about academic matters	411	0.40	1,769	0.18	0.52	0.20
Met with advisor concerning academic plans	411	0.19	1,769	0.12	0.24	0.13
Had informal contact with advisor or other faculty	411	0.23	1,769	0.13	0.30	0.14
Participated in study groups outside of class	411	0.23	1,769	0.24	0.30	0.27
Went to events with friends from school	411	0.25	1,769	0.14	0.32	0.16
Participated in school clubs	411	0.23	1,769	0.12	0.29	0.13
Attended career-related lectures, conventions, or field trips with friends	411	0.17	1,769	0.10	0.22	0.11
Participated in intramural or intercollegiate sports, music, drama, etc.	411	0.15	1,769	0.10	0.20	0.12
Cut classes	411	0.33	1,769	0.15	0.44	0.16

Source: pss-ar20hi.log and pss-ar20lo.log

† The standard error of the estimated impact of being offered the opportunity to participate in Upward Bound (see Chapter I, Section B, Subsection 3).

‡ The standard error of the estimated impact of actually participating in Upward Bound (see Chapter I, Section B, Subsection 3).

Table I.25

Sample Sizes and Standard Errors for Reported Impact Estimates: Table E.3

	All Students						Participants		
	Low-Inc. and First-Gen.		First-Generation Only		Low-Income Only		LI & FG	FG Only	LI Only
	Sample Size	Std Error †	Sample Size	Std Error †	Sample Size	Std Error †	Std Error ‡	Std Error ‡	Std Error ‡
Residence in focused housing (%)	1,802	0.64	362	2.15	128	3.79	0.75	2.60	4.04
Days per year of parent or student contact with school	1,802	3.74	362	8.52	128	12.39	4.38	10.37	13.31
How often during first year in postsecondary school student used the following supplemental services									
Academic counseling	1,802	0.17	362	0.34	128	0.33	0.20	0.41	0.36
Personal counseling	1,802	0.09	362	0.17	128	0.36	0.10	0.21	0.39
Learning skills center services	1,802	0.13	362	0.24	128	0.40	0.15	0.28	0.43
Tutoring services	1,802	0.12	362	0.26	128	0.45	0.14	0.32	0.48
Minority student services	1,802	0.10	362	0.38	128	0.46	0.12	0.46	0.50
Health services	1,802	0.09	362	0.21	128	0.46	0.10	0.25	0.50
Other	1,802	0.01	362	0.13	128	0.05	0.01	0.16	0.05
Participation in federally supported programs while in postsecondary school (%)									
Student Support Services	1,802	1.00	362	3.90	128	5.08	1.16	4.68	5.47
McNair Post-Baccalaureate Achievement Program	1,802	0.55	362	1.68	128	0.00	0.64	2.01	0.00
Student received financial aid (%)	1,802	5.78	362	5.62	128	9.89	6.79	6.88	10.64
How often during first year of postsecondary school student:									
Talked with faculty in office about academic matters	1,802	0.19	362	0.42	128	0.51	0.22	0.53	0.54
Met with advisor concerning academic plans	1,802	0.13	362	0.25	128	0.47	0.15	0.31	0.50
Had informal contact with advisor or other faculty	1,802	0.14	362	0.24	128	0.42	0.16	0.29	0.46
Participated in study groups outside of class	1,802	0.22	362	0.60	128	0.42	0.25	0.75	0.44
Went to events with friends from school	1,802	0.27	362	0.38	128	0.52	0.32	0.46	0.56
Participated in school clubs	1,802	0.16	362	0.45	128	0.51	0.19	0.54	0.57
Attended career-related lectures, conventions, or field trips with friends	1,802	0.11	362	0.25	128	0.55	0.12	0.30	0.62
Participated in intramural or intercollegiate sports, music, drama, etc.	1,802	0.17	362	0.28	128	0.59	0.20	0.34	0.65
Cut classes	1,802	0.17	362	0.57	128	0.55	0.19	0.71	0.59

Source: pss-lifg.log, pss-low_only.log, and pss-fgenonly.log

† The standard error of the estimated impact of being offered the opportunity to participate in Upward Bound (see Chapter I, Section B, Subsection 3).

‡ The standard error of the estimated impact of actually participating in Upward Bound (see Chapter I, Section B, Subsection 3).

Table I.26

Sample Sizes and Standard Errors for Reported Impact Estimates: Table E.4

	All Students						Participants		
	African American		White		Hispanic		Afr Amer	White	Hispanic
	Sample Size	Std Error †	Sample Size	Std Error †	Sample Size	Std Error †	Std Error ‡	Std Error ‡	Std Error ‡
Residence in focused housing (%)	962	1.33	673	0.50	415	1.13	1.56	0.62	1.32
Days per year of parent or student contact with school	962	4.49	673	6.34	415	7.12	5.32	7.88	8.05
How often during first year in postsecondary school student used the following supplemental services									
Academic counseling	962	0.22	673	0.21	415	0.15	0.26	0.25	0.17
Personal counseling	962	0.09	673	0.16	415	0.17	0.11	0.19	0.19
Learning skills center services	962	0.14	673	0.23	415	0.22	0.17	0.28	0.25
Tutoring services	962	0.15	673	0.25	415	0.34	0.17	0.29	0.37
Minority student services	962	0.14	673	0.06	415	0.21	0.16	0.07	0.24
Health services	962	0.16	673	0.15	415	0.13	0.19	0.18	0.15
Other	962	0.01	673	0.03	415	0.06	0.02	0.03	0.07
Participation in federally supported programs while in postsecondary school (%)									
Student Support Services	962	1.81	673	1.79	415	1.82	2.10	2.04	2.10
McNair Post-Baccalaureate Achievement Program	962	0.89	673	0.35	415	0.60	1.06	0.42	0.68
Student received financial aid (%)	962	5.75	673	3.15	415	10.36	6.99	4.04	11.82
How often during first year of postsecondary school student:									
Talked with faculty in office about academic matters	962	0.23	673	0.30	415	0.32	0.28	0.36	0.35
Met with advisor concerning academic plans	962	0.16	673	0.19	415	0.24	0.19	0.23	0.27
Had informal contact with advisor or other faculty	962	0.16	673	0.24	415	0.21	0.19	0.30	0.24
Participated in study groups outside of class	962	0.30	673	0.26	415	0.32	0.36	0.30	0.36
Went to events with friends from school	962	0.25	673	0.16	415	0.41	0.30	0.19	0.47
Participated in school clubs	962	0.26	673	0.13	415	0.23	0.31	0.17	0.26
Attended career-related lectures, conventions, or field trips with friends	962	0.21	673	0.14	415	0.31	0.26	0.17	0.34
Participated in intramural or intercollegiate sports, music, drama, etc.	962	0.20	673	0.13	415	0.22	0.24	0.15	0.25
Cut classes	962	0.22	673	0.27	415	0.34	0.26	0.32	0.39

Source: pss-black.log, pss-white.log, and pss-hisp.log

† The standard error of the estimated impact of being offered the opportunity to participate in Upward Bound (see Chapter I, Section B, Subsection 3).

‡ The standard error of the estimated impact of actually participating in Upward Bound (see Chapter I, Section B, Subsection 3).

Table I.27

Sample Sizes and Standard Errors for Reported Impact Estimates: Table E.5

	All Students				Participants	
	Males		Females		Males	Females
	Sample Size	Std Error †	Sample Size	Std Error †	Std Error ‡	Std Error ‡
Residence in focused housing (%)	699	1.14	1,593	0.81	1.34	0.94
Days per year of parent or student contact with school	699	6.60	1,593	5.29	7.57	6.25
How often during first year in postsecondary school student used the following supplemental services						
Academic counseling	699	0.26	1,593	0.23	0.29	0.27
Personal counseling	699	0.17	1,593	0.09	0.20	0.10
Learning skills center services	699	0.25	1,593	0.13	0.28	0.16
Tutoring services	699	0.29	1,593	0.12	0.33	0.14
Minority student services	699	0.12	1,593	0.18	0.14	0.21
Health services	699	0.09	1,593	0.13	0.10	0.15
Other	699	0.01	1,593	0.03	0.01	0.04
Participation in federally supported programs while in postsecondary school (%)						
Student Support Services	699	1.95	1,593	1.36	2.24	1.58
McNair Post-Baccalaureate Achievement Program	699	0.68	1,593	0.55	0.79	0.65
Student received financial aid (%)	699	4.08	1,593	6.68	4.69	7.94
How often during first year of postsecondary school student:						
Talked with faculty in office about academic matters	699	0.25	1,593	0.19	0.29	0.23
Met with advisor concerning academic plans	699	0.18	1,593	0.13	0.20	0.15
Had informal contact with advisor or other faculty	699	0.21	1,593	0.11	0.24	0.13
Participated in study groups outside of class	699	0.30	1,593	0.29	0.34	0.35
Went to events with friends from school	699	0.24	1,593	0.26	0.27	0.30
Participated in school clubs	699	0.19	1,593	0.20	0.21	0.24
Attended career-related lectures, conventions, or field trips with friends	699	0.15	1,593	0.11	0.18	0.13
Participated in intramural or intercollegiate sports, music, drama, etc.	699	0.23	1,593	0.14	0.27	0.16
Cut classes	699	0.20	1,593	0.27	0.23	0.32

Source: pss-male.log and pss-female.log

† The standard error of the estimated impact of being offered the opportunity to participate in Upward Bound (see Chapter I, Section B, Subsection 3).

‡ The standard error of the estimated impact of actually participating in Upward Bound (see Chapter I, Section B, Subsection 3).

Table I.28

Sample Sizes and Standard Errors for Reported Impact Estimates: Table E.6

	All Students						Participants		
	Least Likely		Somewhat Likely		Most Likely		Least	Somewhat	Most
	Sample Size	Std Error †	Sample Size	Std Error †	Sample Size	Std Error †	Std Error ‡	Std Error ‡	Std Error ‡
Residence in focused housing (%)	232	2.09	873	0.79	1,180	0.97	2.42	0.91	1.14
Days per year of parent or student contact with school	232	13.13	873	4.18	1,180	5.57	15.29	4.92	6.51
How often during first year in postsecondary school student used the following supplemental services									
Academic counseling	232	0.41	873	0.23	1,180	0.19	0.47	0.27	0.22
Personal counseling	232	0.32	873	0.14	1,180	0.09	0.37	0.17	0.10
Learning skills center services	232	0.43	873	0.13	1,180	0.15	0.50	0.15	0.18
Tutoring services	232	0.40	873	0.17	1,180	0.17	0.46	0.21	0.20
Minority student services	232	0.44	873	0.14	1,180	0.09	0.51	0.16	0.10
Health services	232	0.36	873	0.15	1,180	0.07	0.42	0.17	0.08
Other	232	0.08	873	0.03	1,180	0.01	0.09	0.03	0.02
Participation in federally supported programs while in postsecondary school (%)									
Student Support Services	232	2.34	873	1.46	1,180	1.69	2.70	1.72	1.96
McNair Post-Baccalaureate Achievement Program	232	0.28	873	0.63	1,180	0.78	0.31	0.75	0.92
Student received financial aid (%)	232	10.37	873	4.04	1,180	6.53	12.26	4.75	7.63
How often during first year of postsecondary school student:									
Talked with faculty in office about academic matters	232	0.50	873	0.18	1,180	0.24	0.58	0.21	0.28
Met with advisor concerning academic plans	232	0.44	873	0.15	1,180	0.16	0.49	0.18	0.19
Had informal contact with advisor or other faculty	232	0.26	873	0.16	1,180	0.19	0.31	0.18	0.22
Participated in study groups outside of class	232	0.51	873	0.50	1,180	0.24	0.59	0.58	0.28
Went to events with friends from school	232	0.44	873	0.35	1,180	0.23	0.52	0.42	0.26
Participated in school clubs	232	0.31	873	0.38	1,180	0.16	0.35	0.44	0.18
Attended career-related lectures, conventions, or field trips with friends	232	0.33	873	0.16	1,180	0.15	0.37	0.19	0.17
Participated in intramural or intercollegiate sports, music, drama, etc.	232	0.48	873	0.17	1,180	0.26	0.55	0.20	0.30
Cut classes	232	0.34	873	0.28	1,180	0.18	0.39	0.33	0.20

Source: pss-rating_h.log, pss-rating_m.log, and pss-rating_l.log

† The standard error of the estimated impact of being offered the opportunity to participate in Upward Bound (see Chapter I, Section B, Subsection 3).

‡ The standard error of the estimated impact of actually participating in Upward Bound (see Chapter I, Section B, Subsection 3).

Table I.29

Sample Sizes and Standard Errors for Reported Impact Estimates: Table IV.3

	Sample Size	Standard Error †
Postsecondary School Status (%)		
Any postsecondary school	463	2.26
Four-year college	463	3.36
Two-year college	463	2.22
Vocational school	463	1.72
Credits Earned (mean)		
All postsecondary schools	373	2.08
Four-year colleges	373	2.55
Two-year colleges	373	1.64
Vocational schools	373	0.48

Source: means.log and out_imp.log

† The standard error of the estimated impact of being offered the opportunity to participate in Upward Bound (see Chapter I, Section B, Subsection 3).

Table I.30
Sample Sizes and Standard Errors for Reported Impact Estimates: Table IV.4

	Sample Size	Standard Error †
Postsecondary School Status (%)		
Any postsecondary school	762	3.95
Four-year college	762	5.47
Two-year college	762	3.33
Vocational school	762	3.85
Credits Earned (mean)		
All postsecondary schools	615	3.20
Four-year colleges	615	3.39
Two-year colleges	615	2.16
Vocational schools	615	0.61

Source: means.log and out_imp.log

† The standard error of the estimated impact of being offered the opportunity to participate in Upward Bound (see Chapter I, Section B, Subsection 3).

Table I.31

Sample Sizes and Standard Errors for Reported Impact Estimates: Table IV.5

	Higher Risk		Lower Risk	
	Sample Size	Std Error †	Sample Size	Std Error †
Postsecondary School Status (%)				
Any postsecondary school	116	4.08	347	2.83
Four-year college	116	4.15	347	4.09
Two-year college	116	4.54	347	2.29
Vocational school	116	0.76	347	1.83
Credits Earned (mean)				
All postsecondary schools	97	3.15	276	2.37
Four-year colleges	97	3.11	276	2.44
Two-year colleges	97	1.57	276	1.77
Vocational schools	97	0.40	276	0.56

Source: means.log and out_imp.log

† The standard error of the estimated impact of being offered the opportunity to participate in Upward Bound (see Chapter I, Section B, Subsection 3).

Table I.32

Sample Sizes and Standard Errors for Reported Impact Estimates: Table IV.6

	Higher Risk		Lower Risk	
	Sample Size	Std Error †	Sample Size	Std Error †
Postsecondary School Status (%)				
Any postsecondary school	159	9.27	603	4.26
Four-year college	159	10.19	603	6.58
Two-year college	159	12.75	603	3.27
Vocational school	159	3.34	603	4.60
Credits Earned (mean)				
All postsecondary schools	133	8.78	482	3.95
Four-year colleges	133	9.45	482	4.22
Two-year colleges	133	4.60	482	2.68
Vocational schools	133	1.50	482	0.78

Source: means.log and out_imp.log

† The standard error of the estimated impact of being offered the opportunity to participate in Upward Bound (see Chapter I, Section B, Subsection 3).