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ABSTRACT

This report presents a quantitative analysis of the educational outcomes associated with a three-year pilot project at the City College of New York (CCNY) to change the focus of the college's writing program from remediation to enrichment. The project substituted a two-semester nontracked, college-level writing sequence for two remedial courses and one college-level course. Data were gathered from three student cohorts (total n=4,653) taking either the remedial, the college-level, or the pilot-course sequence. Findings indicated that for students with the lowest English placement test scores and for students from the English as a Second Language sequence, participation in the pilot project was associated with more rapid progress toward graduation in the form of credits and higher grade point averages. Outcomes were more mixed for students with somewhat higher placement scores (but still requiring remediation) and for students who participated in the project but placed in the standard college-level introductory writing course. Results generally support the project's effectiveness, especially for students at the lower levels. (DB)

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A STATISTICAL ANALYSIS OF STUDENT PROGRESS AND ACHIEVEMENT IN THE PILOT WRITING PROJECT AT CITY COLLEGE OF NEW YORK

Matthew Janger

May 1997

David Johnson -PO

Prepared for the
City College Writing Program:
an Enrichment Approach to Language and Literacy

a Pilot Project Supported by the
Fund for Improvement in Post Secondary Education

Project Directors
Barbara Gleason and Mary Soliday

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Statistical Analysis of Student Progress and Achievement in the Pilot Writing Project at City College of New York

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I. Purpose and Overview

Under a three year grant from the Fund for the Improvement of Post Secondary Education (FIPSE), Professors Barbara Gleason and Mary Soliday of the City College of New York (CCNY) undertook a pilot project designed to transform the focus of the college's writing program from remediation to enrichment. The pilot enrichment project substituted a two-semester, non-tracked, college-level writing sequence for the traditional system of two remedial courses and one college-level course. The purpose of this analytic study is to provide a quantitative analysis of the educational outcomes associated with project participation. This analysis is intended to complement the project's other qualitative evaluations.

The central questions to be addressed by this analysis are the following:

- What educational achievement and progress toward post secondary graduation are associated with pilot project participants both within the course and in the college as a whole (i.e., writing course completion, credits earned, grade point average (GPA), and selected course performance)?
- Are there differences in achievement and progress among pilot project participants? In particular, what if any differences emerge between students who would traditionally enroll in remedial versus college-level writing courses?
- How do educational progress and achievement of pilot project participants compare to that of participants in the traditional series of remedial and college-level writing courses?

In the new pilot course, English 111-112[1], students earned six college credits. This differed from the remedial courses, English 1 and English 2, for which students earned

[1] The pilot project was known as English 110.11 and English 110.12 in the Fall of 1993 and later was renumbered English 111 and English 112. For convenience they are referred to only as English 111, English 112, or English 111-112.

only partial college credit.[2] In addition, English 111-112 students were allowed to enroll in five required core courses without the usual prerequisites. Thus, concurrent with enrollment in English 111-112, students could enroll in World Humanities 101 and 102, World Civilizations 101 and 102, and Philosophy 101. Students in remedial writing, English 1 and 2, were barred from these courses. Instead, students following the traditional series of writing courses needed to simultaneously enroll in or have passed introductory college-level English, English 110. This meant that English 110 was at least co-requisite for those courses. Starting in the Fall semester of 1995, students were barred from these five core courses until they passed English 110. That is, English 110 was changed to a prerequisite.[3]

Given the existing budget constraints, we proposed to conduct the analysis of the first three years of the pilot enrichment project using CCNY's existing student records. We proposed to use this data to develop quantitative models to test the hypothesis that the FIPSE project's enrichment approach to teaching writing would lead to improved outcomes for all students in CCNY's open enrollment environment. The primary tools used were multivariate regression and log linear analysis.

The quantitative analysis was proposed only after the pilot project was well underway. As a result, problems in the quality of CCNY's data and the non-experimental design of the pilot project led to difficulties with the qualitative analysis. However, in spite of these difficulties, it was possible to draw a number of valuable lessons from the experience of the pilot project students.

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[2] At the beginning of the project students in the remedial courses, both in English and in mathematics, earned only partial credits for these courses. That is, these courses were apportioned fewer college credits than their hour totals. For example, four hours of English 2 would only be counted as two credits. In addition, students could count no more than 8 credits earned in remedial courses toward the 128 needed for graduation. Also, some CCNY programs, such as nursing, engineering, and architecture, do not accept credits from remedial courses. Beginning in the Spring semester of 1996, students could no longer earn any college credit for the remedial courses at CCNY.

[3] Students in English 111-112 still needed to pass the CUNY Reading Assessment Test as a requirement for enrollment in the five core courses, World Humanities 101 and 102, World Civilizations 101 and 102, and Philosophy 101. At the beginning of the project period, students who were enrolled in or had passed English 110 were eligible to enroll in these five core courses. Beginning in the Fall semester of 1995 the rule was changed so that students needed to pass English 110 before enrolling in these five courses. However, a waiver allowing engineering students to enroll in the five courses with English 110 as a co-requisite remained in place until the Spring of 1997, after the pilot project had ended.

II. Case Selection - One-Year, Two-Year, and Three-Year Analyses

Because data was collected over three years starting in the Fall of 1993, we have data for three student cohorts with outcome data for one, two, and three years of enrollment. In general, the analyses were conducted for outcomes as of the end of Summer of each academic year, 1994, 1995, and 1996. As a result, there are three cohorts and three possible analyses, leading to a total of six versions of the outcome data (Exhibit 1). The students selected for the study consist of those students enrolled in English 1, English 2, English 110, or in the pilot writing course (English 111) in the Fall of 1993 (Cohort 1), Fall of 1994 (Cohort 2), and Fall of 1995 (Cohort 3). We collected records on student outcomes until the end of the Summer of 1996. Thus, we have three years of data on Cohort 1, two years of data on Cohort 2, and one year of data on Cohort 3 At the same time, we are able to analyze one-year outcomes on all three cohorts and two-year outcomes for Cohorts 1 and 2.

The analysis examined the enrollment in four introductory writing courses: the two traditional one-semester remedial writing courses, English 1 and English 2; the one-semester introductory college-level course, English 110; and the pilot two-semester writing course, English 111-112. We were particularly interested in the different outcomes associated with participation in English 111-112 as compared to participation in courses in the regular writing course sequence. How, for example, did the performance of regular English 1 students compare to students in English 111-112 who would otherwise have been in English 1? As a result, English 111-112 students were further divided into three groups by their original placement status. That is, they were analyzed as English 111-112 students with English 1 placement status; English 111-112 students with English 2 placement status; and English 111-112 students with English 110 placement status.

Students were placed into introductory writing courses based on two criteria, their scores on the twelve point City University of New York (CUNY) Writing Assessment Test (WAT) and the previous writing courses they have passed. Students with scores below 5 on the WAT are placed in English 1, those with scores of 6 are placed in English 2, those with scores of 8 to 10 are placed in English 110. and those who score 11 or 12 can place out of English 110 altogether.[4] After taking the WAT, students can then place into higher

[4] No students receive WAT scores of 7, so students with English 2 placement all had scores of 6. The WAT is scored by two readers, and their scores are combined to produce the final score. Any test receiving a combined score of 7 is scored by a third reader and assigned a score of either 6 or 8.

Exhibit 1
Enrollment Years and Cohorts by Years Elapsed and Ending Semester

Cohort	Years of Enrollment		
	One-Year	Two-Years	Three-Years
Fall 93, Cohort 1	Summer 94	Summer 95	Summer 96
Fall 94, Cohort 2	Summer 95	Summer 96	
Fall 95, Cohort 3	Summer 96		

Read as: For students who enrolled in introductory writing in the Fall 1993 semester, Cohort 1, one-year analysis was conducted on their status as of the end of the Summer 1994 semester.

Exhibit 1
Enrollment Years and Cohorts by Years Elapsed and Ending Semester

Cohort	Years of Enrollment		
	One-Year	Two-Years	Three-Years
Fall 93, Cohort 1	Summer 94	Summer 95	Summer 96
Fall 94, Cohort 2	Summer 95	Summer 96	
Fall 95, Cohort 3	Summer 96		

Read as: For students who enrolled in introductory writing in the Fall 1993 semester, Cohort 1, one-year analysis was conducted on their status as of the end of the Summer 1994 semester.

writing courses by passing the previous course in the sequence. Thus, students can place into English 2 by passing English 1 and into English 110 by passing English 2. This placement information was used to divide students in the pilot writing course by their placement groups.

In addition, students can become eligible for English 110 by completing the last class in the English as a Second Language (ESL) sequence, ESL 30. The pilot writing project directors believed that the experience of these ESL student in English 110 and English 111-112 might be different from the experience of other students. As a result, the analysis groups were further sub-divided based on their placement from the ESL program. English 110 students were divided into those with and without placement from ESL, and English 111-112 students with English 110 placement were divided in the same way.

Lastly, for a few students enrolled in English 111-112, the CCNY records show no record of a WAT score or of passing a previous introductory writing course. For these students there was no way to tell where they would have been placed had they not participated in the pilot project. For this reason the analyses include an extra category for English 111-112 students without placement information. For example, in the Fall of 1993, no prior placement information was available for 26 students in English 111-112 (Exhibit 2). Thus, for this analysis, students enrolled in introductory writing courses were divided into nine groups:

- English 1 students
- English 111-112 students with English 1 placement status
- English 2 students
- English 111-112 students with English 2 placement status
- English 110 students who are NOT placed from ESL 30
- English 110 student who ARE placed from ESL 30
- English 111-112 students with English 110 placement status who are NOT placed from ESL 30
- English 111-112 students with English 110 placement status who ARE placed from ESL 30
- English 111-112 students with no placement information

The titles for these categories are abbreviated somewhat in the attached exhibits (See Exhibit 2).

Exhibit 2
Introductory Writing Enrollment by Course and Placement Category
for Fall 1993, Fall 1994, and Fall 1995 Cohorts
Total Enrollment

Original Fall Enrollment	Introductory Writing Enrollment			
	Cohort 1 Fall 93	Cohort 2 Fall 94	Cohort 3 Fall 95	Total
Eng. 1	67	101	0	168
Eng. 111 w/ Eng. 1 Placement	56	53	43	152
Eng. 2	176	184	86	446
Eng. 111 w/ Eng. 2 Placement	137	186	160	483
Eng. 110 NOT ESL Students	945	783	748	2476
Eng. 110 AND ESL Students	190	170	148	508
Eng. 111 w/ Eng. 110 Placement NOT ESL	99	73	123	295
Eng. 111 w/ Eng. 110 Placement AND ESL	13	38	19	70
Eng. 111 w/ NO Placement Information	26	10	19	55
Sub-total Eng. 110	1135	953	896	2984
Sub-total Eng. 111 w/ Eng. 110 Plcmnt	112	111	142	365
Sub-total Eng. 111	331	360	364	1055
All Introductory Writing Courses	1709	1598	1346	4653

Read as: Sixty-seven students enrolled in English 1 in the Fall 1993 semester (Cohort 1), 101 enrolled in English 1 in Fall 1994 (Cohort 2), and none enrolled in English 1 in the Fall 1995 semester (Cohort 3). In the Fall 1993 semester (Cohort 1), 57 students enrolled in English 111 who would normally have been placed in English 1.

In all, there are 4,363 students in our three year sample. Because the traditional writing courses are a sequence, and because students can enroll in the pilot writing course at any stage in the sequence, students could potentially be counted in more than one cohort. For example, a student enrolled in English 1 in the Fall of 1993 could enroll in English 2 in the Fall of 1994. This student would be included in the English 1 group in Cohort 1 and in the English 2 group in Cohort 2. As a result, of the 4,363 students in our sample, 1,709 were enrolled in introductory writing courses in Fall 1993; 1,598 were enrolled in introductory writing courses in Fall 1994; and 1,346 were enrolled in Fall 1995 (Exhibit 2). This sums to 4,653, 290 more than the number of students in our sample. For the sake of the one-year and two-year analyses, this double counting seemed appropriate, since this represented the normal experience of students in the traditional writing sequence. At any given time the enrollment in English 110, for example, represents a mixture of students who have placed into the course through their reading scores, by passing English 2, or by passing out of the ESL sequence. To exclude students who were in English 2 in the previous Fall would distort the sample for English 110 students. This has an advantage since it provides additional observations for the shorter term analyses, where the actual differences are likely to be smaller.

The analyses in this report were first tested on the one-year outcomes for the Fall 1993 Cohort, before being tested on the other cohorts and outcomes. This provided an opportunity to make adjustments in the analysis based on the first year data and to test them on another sample, ensuring that the conclusions did not simply capitalize on random relationships in the data. Thus analyses were run on each cohort separately for the available one-year, two-year, and three-year data, after the original model was developed. A preliminary review of the data did not reveal striking differences in performance between the different cohorts. As a result, it was appropriate to combine the cohorts for the final analysis and reporting. Thus, the one-year analysis reported here includes the students from all three cohorts, while the two-year analysis includes the students from the Fall 1993 Cohort and the Fall 1994 Cohort. As three-year data is only available for the Fall 1993 Cohort, the three-year analysis is only for this cohort. (The analyses by cohort are included in a technical appendix, which is available by request from the project directors.)

While the repeated writing course enrollment of students in the sample is appropriate for students enrolled in the traditional writing sequence, it does present a problem for interpreting the effects of students enrolling in the pilot writing course. It was possible for students in English 1, 2, or 110 to enroll in the pilot project in an earlier or later year. This

meant that for a number of analyses students could be counted in the English 1, 2, or 110 "control" groups who participated in the pilot project either before the time being examined or during the second or third years of two-year and three-year analyses. This represented a kind of "treatment leakage." Unfortunately, the students receiving this "treatment leakage" include only those English 1, 2, or 110 students who were attending CCNY in prior or later semesters. Thus, these are a group of students in the control group who remained enrolled, who would therefore earn more credits or hours, and who could well be expected to be among those earning higher grades or passing rates. By leaving these students in the analyses we may artificially lower the effects we see from the pilot project, since members of the control group will also be participating in the treatment. However, if we remove these students from the analyses we may artificially inflate the positive effects of the pilot project, since we are removing a group of successful students from the control group.

As a result, all of the analyses were run both with and without the relevant students. Happily, the results remained very consistent in both versions. The discussion below reports the analyses for the samples without the "treatment leakage" students, but the report's conclusions would be essentially the same were these students included. (The analyses with treatment leakage are included in a technical appendix, which is available by request from the project directors.) The analysis of outcomes after one year excludes students who had taken English 111-112 in previous years (Exhibit 3). The analysis of outcomes after two years excludes students who took English 111-112 in previous years or during the second year of analysis. That is, students in the Fall 1994 Cohort could have taken English 111-112 in the 1993-1994 school year or the 1995-1996 school year. In either of these cases, the students would be omitted (Exhibit 4). Lastly, for the three-year analysis on Cohort 1, students who took English 111-112 in either the 1994-1995 or 1995-1996 school year were excluded (Exhibit 5). Thus, Exhibits 3, 4, and 5 provide the numbers of students eligible to be included in the one-year, two-year, and three-year analyses.

Exhibit 3
For One-Year Analysis
Introductory Writing Enrollment by Course and Placement Category
for Fall 1993, Fall 1994, and Fall 1995 Cohorts
Without Students Taking English 111-112 in Previous Years

Original Fall Enrollment	Introductory Writing Enrollment			
	Cohort 1 Fall 93	Cohort 2 Fall 94	Cohort 3 Fall 95	Total
Eng. 1	67	101	0	168
Eng. 111 w/ Eng. 1 Placement	56	50	38	144
Eng. 2	176	183	83	442
Eng. 111 w/ Eng. 2 Placement	137	179	149	465
Eng. 110 NOT ESL Students	945	769	729	2443
Eng. 110 AND ESL Students	190	170	147	507
Eng. 111 w/ Eng. 110 Placement NOT ESL	99	71	118	288
Eng. 111 w/ Eng. 110 Placement AND ESL	13	38	19	70
Eng. 111 w/ NO Placement Information	26	9	19	54
Sub-total Eng. 110	1135	939	876	2950
Sub-total Eng. 111 w/ Eng. 110 Plcmnt	112	109	137	358
Sub-total Eng. 111	331	347	343	1021
All Introductory Writing Courses	1709	1570	1302	4581

Read as: There were 67 students enrolled in English 1 in the Fall of 1993 (Cohort 1) who had not previously enrolled in English 111-112. There were 101 students enrolled in English 1 in the Fall of 1994 (Cohort 2) who had not previously enrolled in English 111-112. And, there were no students enrolled in English 1 in the Fall of 1995 (Cohort 3) who had not previously enrolled in English 111-112. Thus, there were a total of 168 student in our three cohorts who enrolled in English 1 during our study period and had not previously enrolled in English 111-112. These students were eligible to be included in the one-year analysis.

Exhibit 4
For Two-Year Analysis
Introductory Writing Enrollment by Course and Placement Category
for Fall 1993 and Fall 1994 Cohorts
Without Students Taking English 111-112 in Previous Years or Year Two

Original Fall Enrollment	Introductory Writing Enrollment		
	Cohort 1 Fall 93	Cohort 2 Fall 94	Total
Eng. 1	52	90	142
Eng. 111 w/ Eng. 1 Placement	52	46	98
Eng. 2	171	175	346
Eng. 111 w/ Eng. 2 Placement	131	168	299
Eng. 110 NOT ESL Students	944	766	1710
Eng. 110 AND ESL Students	189	170	359
Eng. 111 w/ Eng. 110 Placement NOT ESL	98	70	168
Eng. 111 w/ Eng. 110 Placement AND ESL	13	36	49
Eng. 111 w/ NO Placement Information	24	9	33
Sub-total Eng. 110	1133	936	2069
Sub-total Eng. 111 w/ Eng. 110 Plcmnt	111	106	217
Sub-total Eng. 111	318	329	647
All Introductory Writing Courses	1674	1530	3204

Read as: In the Fall 1993 semester (Cohort 1), 52 Students enrolled in English 1 who did not take English 111-112 in the 1994-1995 school year (Year Two). In the Fall of 1994 semester (Cohort 2), 90 student enrolled in English 1 who had not taken English 111-112 in previous years, and did not take English 111 in the 1995-1996 school year. Thus, there were a total of 142 students who enrolled in English 1 in Cohorts 1 and 2 who neither enrolled in English 111-112 in prior years nor in Year Two. These students were eligible to be included in the two-year analysis.

Exhibit 5
For Three-Year Analysis
Introductory Writing Enrollment by Course and Placement Category
for Fall 1993 and Fall 1994 Cohorts
Without Students Taking English 111-112 in Year Two or Year Three

	Introductory Writing Enrollment Cohort 1 Fall 93
Eng. 1	52
Eng. 111 w/ Eng. 1 Placement	52
Eng. 2	171
Eng. 111 w/ Eng. 2 Placement	131
Eng. 110 NOT ESL Students	944
Eng. 110 AND ESL Students	189
Eng. 111 w/ Eng. 110 Placement NOT ESL	98
Eng. 111 w/ Eng. 110 Placement AND ESL	13
Eng. 111 w/ NO Placement Information	24
Sub-total Eng. 110	1133
Sub-total Eng. 111 w/ Eng. 110 Plcmnt	111
Sub-total Eng. 111	318
All Introductory Writing Courses	1674

Read as: In the Fall 1993 semester (Cohort 1), 52 Students enrolled in English 1 who did not take English 111 in the 1994-1995 school year (Year Two) or the 1995-1996 school year (Year Three). These students were eligible to be included in the three-year analysis.

III. Non-Experiment - Selection Bias and Measurement Error

While the pilot writing project at CCNY sought to test a new model for teaching introductory writing at the college, it was not experimental in nature. Much of the effort and interest in the program was aimed at implementation issues such as refining the project design, serving student needs, and recruiting student participants. Notably, students were provided the opportunity to choose between traditional courses and the pilot course. They were not assigned on a random or controlled basis. The project directors report that student choice was necessary given the goals and constraints of the project, but this creates a problem of selection bias for this analysis. The problem of selection bias is a recurrent issue throughout this analysis. In spite of this, the outcomes associated with project participants, coupled with efforts to control for bias, revealed interesting patterns.

Interviews with students and project staff indicated that while the process by which students came to the pilot course was often confusing, it was not random. Various sorts of counseling and recruiting affected students' enrollment decisions. An informal survey of students in one English 2 course, one English 110 course, and two English 111 courses in the Fall of 1995 revealed that nearly all the students were aware of the type of writing course in which they were enrolled. Their reasons for this choice included the influence of advisors, characteristics of the courses, and their personal preferences. Students selected themselves for participation in English 111-112 by personal criteria that are likely to correlate with student progress and achievement. Thus, for example, students in English 111-112 with English 1 placement may not be representative of English 1 students as a whole. The same is true for each placement group in English 111-112.

Thus differences in outcomes for the pilot project participants as compared to regular students in their same placement group may represent differences in those students choosing to take the pilot project as much as effects of the pilot project. In order to control for some of this selection bias, the regression analyses include measures of student quality that correlate with student participation in the pilot writing course. These are SEEK status and high school average. The SEEK program offers financial and academic assistance to students who do not meet CCNY's admissions standards, but who come from high-poverty designated neighborhoods. High school average is measured on a 0-100 scale, and scores in our sample range from 11 to 97 with a mean of 78.43 and a standard deviation of 13.7. These measures, combined with controls for prior credits and prior GPA help to control statistically for some of the selection bias in the sample. This helps the

results to give a picture that is closer to describing the effects of pilot course participation on students by placement group. Nonetheless, it is generally appropriate to assess the results of these analyses as representing differences in outcomes rather than the direct effects of participation in the pilot writing course.

This analysis is still extremely valuable because it provides a more objective understanding of outcomes for students in the regular and pilot writing programs. Combined with the experience of the project, it provides clear information on the experiences of the project participants and gives a much clearer sense of what outcomes could be expected in a more carefully controlled experiment.

In some cases selection was part of the treatment. For example, students participating in the pilot writing course were granted the option of participating in five required core courses, World Humanities 101 and 102, World Civilizations 101 and 102, and Philosophy 101. In assessing the results of that option, students' judgment in deciding whether or not to enroll is an important part of their experience. In this case, the outcomes for pilot project students represent a direct measure of the success of this option. For this reason, the analysis of the passing rates in World Humanities 101 and 102 is based on the actual rates, without statistical controls.

An additional source of possible error in this analysis is the quality of the database. The CCNY records are not always reliable. For example, eight students enrolled in English 111 in the Fall of 1993 had grades of Y. This grade should have been changed to their final grade for English 111-112 in the Spring of 1994. Many errors and omissions of this sort exist in the records, and, given our limited budget and the size of the sample, not all have necessarily been removed. Student enrollment patterns at CCNY also appear to be full of exceptions. As a result, many anomalies appeared in the data. For example, there are students enrolled in introductory writing courses in spite of WAT scores or previous writing course enrollment below the required level. This may be because they successfully challenged their placement or because a writing teacher recommended that a student advance ahead in the writing sequence. Other students were shown as re-enrolling in the same class even after passing. Where these anomalies appeared likely to skew the results, and where possible, they were corrected or eliminated. In most cases, they were included as representative of the student experience at CCNY. However, to some extent, these problems introduce measurement error into the analysis. In general, the effect of this error is not to bias the results, but to make it more difficult to identify true differences. Given

better data, one would not be likely to come to different conclusions, but the conclusions could be stated with more certainty.[5]

In addition, some variables could not be used because of incomplete data. For example, data on student first language and place of birth were incomplete. Information on First Language was missing for 1,123 students, and for Place of Birth information was missing for 2,393 students. Thus, while ESL status appeared to be an important factor in understanding the outcomes for pilot course participants, language status could not be included as an additional variable.

IV. Analyses

As discussed above each analysis was conducted on six versions of the outcome data and for groups both including and excluding the "treatment leakage" students. In addition, the hypotheses were first tested on the Cohort 1, one-year data and finalized before being tested against the other two cohorts or the two-year and three-year outcomes.

Since the conclusions drawn from the analyses of the different cohorts were very similar, the discussion below covers the combined data for outcomes after one, two, and three years. The analyses address introductory writing course completion, cumulative course credits, GPA, and pass rates in World Humanities 101 and 102. For all of these analyses, where differences are described as "significant", this means that they were statistically significant at the 95 percent level That is, the probability that the difference observed is due only to chance is five percent or less.

[5] As this report was going to press the project directors discovered that there was one section of 110.11-110.12 in the Fall of 1993 that was not part of the pilot project. This section of 22 students with English 2 placement was included in the analysis as English 111-112 students with English 2 placement. This is likely to introduce bias into the results for this group of students. The other sub-groups should be unaffected.

V. Introductory Writing Course Completion

The first and most basic measure of student outcomes in the introductory writing courses is the rate at which students pass these courses (Exhibit 6). In this analysis of pass rates, selection bias is not statistically controlled. This discussion deals with the actual rates at which the students passed each course. This seemed appropriate here, because the pass rates are included to describe students' actual experience in the pilot course rather than to assess the pilot course's effects.

Comparing these pass rates between the pilot writing course and the traditional writing sequence is complicated somewhat by the fact that English 111-112 was a two-semester course while English 1, English 2, and English 110 were all one semester courses. In order to pass the pilot writing course, students needed to successfully complete both semesters. Of the 1,021 students who enrolled in English 111-112 in our three cohorts, 66 percent (676 students) passed the two-semester course. This is significantly less than the average pass rate of 76 percent. However, if one treats the rate of 76 percent as a consistent pass rate for only one semester, the equivalent rate over two semesters would be 76 percent squared, or 58 percent, significantly less than the rate for English 111-112. In both cases these differences are statistically significant, that is they are not likely to be due to chance.

The pass rates indicate that students with English 1 placement were far more likely to pass English 1 than English 111-112. While 88 percent of students passed English 1 in the sample, only 56 percent of students with English 1 placement passed English 111-112. Even continued over two semesters, the equivalent pass rate for English 1 students would be 77 percent, still significantly higher than that of their counterparts in English 111-112.

The experience for students with English 2 placement is less clear. The pass rate of 75 percent for students in English 2 is significantly higher than that of 64 percent for students in English 111-112 with English 2 placement. However, the two semester equivalent for English 2 students is 56 percent, significantly lower than that for their counterparts in English 111-112. Thus, while students in English 2 may be more likely to pass their one-semester writing course, the equivalent passing rate per semester would actually be higher in English 111-112.

Exhibit 6
Introductory Writing Students Passing Introductory Writing
by Course and Placement Category
for Combined Fall 1993, 1994, and 1995 Cohorts
Without Students Taking English 111-112 in Previous Years

Original Fall Enrollment	Introductory Writing Falls 93-95		
	Total Enrollment	Number Passing	Percent Passing
Eng. 1	168	147	88%
Eng. 111 w/ Eng. 1 Placement	144	81	56%
Eng. 2	442	333	75%
Eng. 111 w/ Eng. 2 Placement	465	299	64%
Eng. 110 NOT ESL Students	2443	1951	80%
Eng. 110 AND ESL Students	507	382	75%
Eng. 111 w/ Eng. 110 Placement NOT ESL	288	200	69%
Eng. 111 w/ Eng. 110 Placement AND ESL	70	60	86%
Eng. 111 w/ NO Placement Information	54	36	67%
Sub-total Eng. 110	2950	2333	79%
Sub-total Eng. 111 w/ Eng. 110 Plcmnt	412	296	72%
Sub-total Eng. 111	1021	676	66%
All Introductory Writing Courses	4581	3489	76%

Read as: Of the 168 students enrolled in English 1 in the Falls of 1993, 1994, and 1995, 147 passed. This represented 88 percent of the original enrollment. Of the 144 students enrolled in English 111 with English 1 placement status, 81 of them passed the two semester course, English 111-112. This represented 56 percent of the original enrollment.

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If one looks instead at the combined pass rate for English 1 and English 2, it would be 88 percent times 75 percent, or 66 percent, roughly the same as that for English 2 students in English 111-112 and still higher than that for English 1 students in English 111-112. The combined pass rate for English 1 and 2 type students in English 111-112 is 62 percent (i.e., 380 / 609 = 0.62), roughly comparable for the English 1 - English 2 sequence. In all, it appears that English 111-112 produces lower pass rates for those students with English 1 placement, but a comparable pass rates for those with English 2 placement.

For students with English 110 placement, the experience appears divided based on whether or not the student came from the ESL sequence. For non-ESL students, the pass rates in English 110 verses English 111-112 appear comparable. Significantly more of the non-ESL students pass English 110 (80 percent) than English 111-112 (69 percent). However, the two-semester equivalent for English 110 would be almost the same (64 percent).

For students with English 110 placement from the ESL sequence the experience is reversed. For students enrolled in English 110, the pass rate of ESL students is not significantly different from their non-ESL counterparts (75 percent vs. 80 percent). However, the ESL students appear to do better in English 111-112 than in English 110. This is the only group where their pass rate is higher in English 111-112 that in one semester of the traditional writing sequence. Seventy-five percent of ESL students pass English 110, while 86 percent pass English 111-112. This difference is particularly striking when one considers that the two semester equivalent for ESL students in English 110 would be 56 percent. In addition, the experience of ESL students in English 111-112 (86 percent passing) appears to be the opposite of their non-ESL English 110 counterparts in English 111-112 (69 percent passing). Thus when English 111-112 is compared to English 110, we find comparable pass rates for non-ESL students with English 110 placement, and significantly higher pass rates for the ESL students with English 110 placement who enroll in English 111-112.

VI. Cumulative Credits

Since a major purpose of the introductory writing courses at CCNY is to prepare students for college coursework, a useful measure of student success is their progress toward

graduation in the form of credits earned in college-level coursework.[6] In addition, students in English 1 and English 2 earned only partial college credit for these courses (and now earn no credit for them). Also, their ability to enroll in other credit bearing courses is limited. By enrolling in English 111-112, these students are able to participate in a six credit course, and they are given the option of enrolling in other credit bearing courses such as World Humanities 101 and 102. This potentially gives them a jump in their progress toward graduation, increasing the likelihood that they will be able to graduate and reducing their overall costs in both time and tuition.

Exhibit 7 presents the average credits earned by participants in introductory writing courses beginning prior to their inclusion in this study and then after one, two, and three years. These are the actual averages, without controlling for selection bias in terms of prior student characteristics. In general, for students with English 1 placement, the average credits earned were consistently higher for those enrolled in the pilot writing course as opposed to the regular remedial program. The same is true for students with English 2 placement. For students with English 110 placement, the opposite seems to be true, regardless of their ESL or non-ESL origins. Students with English 110 placement who enrolled in English 111-112 earned on average fewer credits each year than their English 110 counterparts.

However, as noted above, because of concerns about selection bias not all of this difference can be attributed to participation in the pilot writing course. Students were recruited for the pilot writing course and selected the course based on their own assessment of the course and their abilities. In order to try to better isolate the effects of introductory writing course participation on students' accumulation of credits the regression analyses in Exhibits 8 through 10 controlled for student quality using the students' high school average (on a scale from 0-100) and participation in the SEEK program (coded 0 = No and 1 = Yes). In addition, there were differences among students in terms of the credits they had already earned (Exhibit 7). These differences, while small were significant in many cases. In addition, they seemed likely to represent differences in students that would correlate with their future ability to earn credits. Thus, the regressions on cumulative credits reported below control for SEEK status, high school average, and previously earned credits.

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[6] The directors of the pilot writing project also see the course as having a broader purpose. As one wrote, "The course is designed to teach students to write, read, and think critically. These are skills they can use as citizens, as participants in their community, as workers, and as students."

Exhibit 7
Cumulative Credits Earned One, Two, and Three Years After Enrollment in Introductory Writing by Course and Placement Category for Combined Fall 1993, 1994, and 1995 Cohorts Without Students Taking English 111-112 in Overlapping Years

Original Fall Enrollment	Mean Cumulative Credits Earned by the End of Summer			
	At the Start Cohorts 1, 2 & 3	After 1 Year Cohorts 1, 2 & 3	After 2 Years Cohorts 1 & 2	After 3 Years Cohort 1
Eng. 1	1.13	10.38	22.23	29.98
Eng. 111 w/ Eng. 1 Placement	4.81	21.50	36.30	50.12
Eng. 2	4.36	19.34	28.52	38.77
Eng. 111 w/ Eng. 2 Placement	2.95	29.35	32.09	45.57
Eng. 110 NOT ESL Students	9.17	42.73	43.36	53.97
Eng. 110 AND ESL Students	22.15	22.07	61.24	78.75
Eng. 111 w/ Eng. 110 Placement NOT ESL	5.58	36.63	33.72	41.62
Eng. 111 w/ Eng. 110 Placement AND ESL	16.69	23.07	52.88	63.31
Eng. 111 w/ NO Placement Information	5.67	20.76	34.76	44.67
All Introductory Writing Courses	8.93	38.01	41.11	52.96
Adjusted R Square*	N/A	11%	10%	8%

Read as: At the end of summer prior to enrollment in English 1 students in Cohorts 1, 2, and 3 had earned an average of 1.13 credits. At the end of summer one year after enrollment in introductory writing, students who enrolled in English 1 had earned an average of 10.38 credits. This includes those students from the Fall 1993, Fall 1994, and Fall 1994 cohorts who had not taken English 111 in previous years.

*Read as: In a regression of student writing course placement on cumulative credits after one year, the adjusted R square is 11 percent. That is, course placement accounts for only 11 percent of the variance in cumulative credits after one year.

Exhibit 8
Regression of Introductory Writing Enrollment on Cumulative Credits Earned After One Year Controlling for Prior Credits, SEEK status, and High School Average for Combined Fall 1993, 1994, and 1995 Cohorts, by Course and Placement Category Without Students Taking English 111-112 in Previous Years

Independent Variables	Regression on Cumulative Credits Earned by the End of Summer After 1 Year			
	Coefficient (B)	Standard Error	T	Significance of T
Constant - Eng. 1	-1.53	1.33	-1.15	0.2506
Eng. 111 w/ Eng. 1 Placement	3.44	1.19	2.89	0.0039
Eng. 2	1.03	0.93	1.10	0.2696
Eng. 111 w/ Eng. 2 Placement	3.53	0.93	3.78	0.0002
Eng. 110 NOT ESL Students	7.38	0.83	8.87	0.0000
Eng. 110 AND ESL Students	9.17	0.98	9.35	0.0000
Eng. 111 w/ Eng. 110 Placement NOT ESL	4.86	1.00	4.83	0.0000
Eng. 111 w/ Eng. 110 Placement AND ESL	9.59	1.54	6.24	0.0000
Eng. 111 w/ NO Placement Information	4.45	1.86	2.40	0.0166
SEEK	-3.24	0.41	-7.90	0.0000
High School Average (0-100)	0.17	0.01	13.01	0.0000
Prior Credits Earned	1.00	0.02	53.91	0.0000
Adjusted R Square	57%			

N=3736 (The number in this analysis differs from the total in Exhibit 3 because of missing data.)

Read as: The constant in the regression equation on cumulative credits earned by the end of summer after one year is -1.53. Since English 1 students are not included as a variable, they represent the baseline to which the other course placements are compared. The standard error of the constant is 1.33. The T statistic for the constant is -1.15. This is the coefficient divided by the standard error. The significance of T is 0.2506. This represents the probability that the observed coefficient (B) differs from 0 only by chance.

Note: Guidance for interpreting the regressions is given on page 23 of the text.

Exhibit 9
Regression of Introductory Writing Enrollment on Cumulative Credits Earned After Two Years Controlling for Prior Credits, SEEK status, and High School Average for Combined Fall 1993 and 1994 Cohorts, by Course and Placement Category Without Students Taking English 111-112 in Previous Years or Year-Two

Independent Variables	Regression on Cumulative Credits Earned by the End of Summer After 2 Years			
	Coefficient (B)	Standard Error	T	Significance of T
Constant - Eng. 1	-0.96	3.05	-0.31	0.7536
Eng. 111 w/ Eng. 1 Placement	6.72	2.79	2.41	0.0161
Eng. 2	0.59	2.07	0.29	0.7745
Eng. 111 w/ Eng. 2 Placement	3.83	2.14	1.79	0.0740
Eng. 110 NOT ESL Students	9.09	1.84	4.95	0.0000
Eng. 110 AND ESL Students	14.71	2.23	6.60	0.0000
Eng. 111 w/ Eng. 110 Placement NOT ESL	4.40	2.38	1.85	0.0645
Eng. 111 w/ Eng. 110 Placement AND ESL	12.03	3.60	3.34	0.0008
Eng. 111 w/ NO Placement Information	3.17	4.91	0.65	0.5191
SEEK	-4.60	0.96	-4.80	0.0000
High School Average (0-100)	0.34	0.03	10.79	0.0000
Prior Credits Earned	0.95	0.04	22.70	0.0000
Adjusted R Square	31%			

N=2614 (The number in this analysis differs from the total in Exhibit 4 because of missing data.)

Read as: The constant in the regression equation on cumulative credits earned by the end of summer after two years is -0.96. Since English 1 students are not included as a variable, they represent the baseline to which the other course placements are compared. The standard error of the constant is 3.05. The T statistic for the constant is -0.31. This is the coefficient divided by the standard error. The significance of T is 0.7536. This represents the probability that the observed coefficient (B) differs from 0 only by chance.

Note: Guidance for interpreting the regressions is given on page 23 of the text.

Exhibit 10
Regression of Introductory Writing Enrollment on Cumulative Credits Earned After Three Years Controlling for Prior Credits, SEEK status, and High School Average for Fall 1993 Cohort, by Course and Placement Category Without Students Taking English 111-112 in Year-Two or Year-Three

Independent Variables	Regression on Cumulative Credits Earned by the End of Summer After 3 Years			
	Coefficient (B)	Standard Error	T	Significance of T
Constant - Eng. 1	2.00	6.21	0.32	0.7476
Eng. 111 w/ Eng. 1 Placement	10.35	5.75	1.80	0.0720
Eng. 2	1.50	4.51	0.33	0.7395
Eng. 111 w/ Eng. 2 Placement	4.76	4.80	0.99	0.3229
Eng. 110 NOT ESL Students	10.22	4.03	2.54	0.0114
Eng. 110 AND ESL Students	25.32	4.82	5.25	0.0000
Eng. 111 w/ Eng. 110 Placement NOT ESL	1.95	5.03	0.39	0.6992
Eng. 111 w/ Eng. 110 Placement AND ESL	9.87	10.26	0.96	0.3359
Eng. 111 w/ NO Placement Information	-0.55	8.67	-0.06	0.9495
SEEK	-5.34	2.00	-2.67	0.0078
High School Average (0-100)	0.42	0.06	6.87	0.0000
Prior Credits Earned	0.99	0.08	12.49	0.0000
Adjusted R Square	23%			

N=1366 (The number in this analysis differs from the total in Exhibit 5 because of missing data.)

Read as: The constant in the regression equation on cumulative credits earned by the end of summer after one year is 2.00. Since English 1 students are not included as a variable, they represent the baseline to which the other course placements are compared. The standard error of the constant is 6.21. The T statistic for the constant is 0.32. This is the coefficient divided by the standard error. The significance of T is 0.7476. This represents the probability that the observed coefficient (B) differs from 0 only by chance.

Note: Guidance for interpreting the regressions is given on page 23 of the text.

In each of these regressions (and those for GPA) enrollment in the different course and placement groups, except English 1, were included as dummy variables. That is, these variables were coded as 0 if students were not included in the given group and 1 if they were. English 1 enrollment was not included as a variable because it served as the baseline to which the other course participants were compared. This means that if a student was enrolled in English 1, the value for all of the course placement variables would be 0. For a student in English 111-112 with English 1 placement, the value for that variable would be 1 while all the other course placement variables would remain 0.

The effect of this is that in the regression results, the coefficients, labeled B, represent the difference between the mean credits earned by the given group as compared to the baseline, that is English 1 students, after one controls for SEEK status, high school average, and previously earned credits. For example, in Exhibit 8, the coefficient for English 111-112 students with English 1 placement is 3.44. This indicates that, on average, these students have earned 3.44 more credits at the end of our one-year analysis than English 1 students after one controls for SEEK status, high school average, and previously earned credits. The standard error given, 1.19, is the standard error of that difference, between the mean for English 111-112 students with English 1 placement and that of regular English 1 students. The T statistic, 2.89, is the number of standard errors by which B differs from zero (i.e., 3.44 / 1.19 = 2.89). Lastly the significance of T, 0.0039, reports the probability that B is equal to zero given the size of T. In this example, this represents the likelihood that the difference we have observed between average accumulated credits for English 111-112 students with English 1 placement and regular English 1 students is, in fact, due to chance rather than a real difference. In general, one would consider any probability under 0.05 to be statistically significant. This is the 95 percent significance level discussed above. In this case, since 0.0039 is less than 0.05, we could reject the null hypothesis that there was no difference between the two groups in terms of credits. The difference is statistically significant.[7]

[7] The coefficient for SEEK status can be interpreted as the difference in average accumulated credits between non-SEEK and SEEK students. The coefficient for high school average can be interpreted as the number of accumulated credits predicted on average by each additional point in the students' high school averages. High school average is measured on a 0-100 scale, and scores in our sample range from 11 to 97 with a mean of 78.43 and a standard deviation of 13.7. The coefficient for prior credits can be interpreted as the number of accumulated credits predicted on average by each additional credit the student earned prior to inclusion in the study. This should be near to one, since students' prior credits are included in their later accumulated credits. In addition, these prior credits may pick up the effects of other student characteristics that cause both prior and future accumulation of credits.

In interpreting the attached exhibits, it is important to remember that the regression coefficients (B) for each course placement group represent the amount by which the average credits accumulated by that group differ from the average for traditional English 1 students. The standard error, T statistics, and probabilities given all refer to that difference. In this discussion, this is not always the most important difference. For example, we are interested in the difference between the average credits accumulated by students with English 2 placement who enrolled in English 1111-112 and regular English 2 students. This difference is represented by the difference between the coefficients for these two groups. In this case the difference would be 3.53 minus 1.03, which equals 2.5. That is, students with English 2 placement who enrolled in English 111-112 earned, on average, 2.5 more credits after one year than students who enrolled in English 2, after one controls for SEEK status, high school average, and prior credits. These relevant differences and their significance are the ones discussed below.[8]

The regressions on cumulative credits for the three outcome years indicate that students with English 1 placement did better following enrollment in English 111-112. When one controls for SEEK status, high school average, and previous credits students with English 1 placement who took English 111-112 still did significantly better than their counterparts who did not. After one year, on average, these students had 3.44 more credits, a significant improvement (Exhibit 8). After two years, on average, these students had 6.72 more credits, also a significant difference (Exhibit 9). Finally, at the end of three years the gap had widened to 10.35 credits on average (Exhibit 10). While this difference is no longer statistically significant (note the small sample - see Exhibit 5), it is consistent with the difference seen in the first two years. In effect, students with English 1 placement who enrolled instead in English 111-112 earned on average a little over one course worth of credit each year more than those who remained in English 1, after one controls for SEEK status, high school average, and prior credits.

The difference in credits for students with English 2 placement who enrolled in the regular course or the pilot writing course is less marked after one controls for prior student characteristics, that is SEEK status, high school average, and prior credits. After one year following enrollment in the introductory writing courses regular English 2 students earned, on average, 1.03 more credits than students in the regular English 1 class, while students

[8] This explanation of how to interpret the regressions for credits holds true for the regressions on GPA. However, the regressions on GPA control only for SEEK status and high school average. Prior GPA is

with English 2 placement in English 111-112 averaged 3.53 more credits than the regular English 1 students. Thus students with English 2 placement in English 111-112 averaged 2.5 more credits (i.e., 3.53 - 1.01 = 2.5) after one year than their counterparts in the regular English 2 class. This difference is statistically significant, and comparable to the advantage shown for students with English 1 placement participating in the pilot writing course as compared to those in regular English 1.

However, after this first year, these differences do not appear to be sustained. After two years, the regression indicates that English 2 students who enrolled in English 111-112 earned only 3.24 more credits on average than students in the regular English 2 class (i.e., 3.83 - 0.059 = 3.24) . Not only is this not statistically significant, it is hardly different than the gap after one year. The same is true after three years where the gap remains essentially the same, 3.26 (i.e., 4.76 - 1.50 = 3.26). This indicates that whatever advantage is shown for English 2 students participating in the pilot writing course, it is primarily seen in the first year after enrollment once one controls for prior student characteristics.

Unlike the students with remedial writing placements, students in English 111-112 with English 110 placement generally seem to do worse than those in the regular program in terms of earning college credits, once one controls for SEEK status, high school average, and prior credits. Among non-ESL students, English 110 students in English 111-112 earned 2.52 fewer credits, on average, than those in the regular course, a significant difference equal to just less than one course. Over two and three years, this gap continued to grow. After two years, non-ESL English 110 students in the regular course had 4.69 more credits than those in English 111-112. After three years the gap widened to 8.27. This amounts to a difference of a little less than one course per year. However, the differences after two and three years are not significant at the 95 percent level (i.e., significance of T <= 0.05).

It would appear that the experience in terms of accumulated credits for students from the ESL sequence in English 110 and English 111-112 is less differentiated. After one year, students from the ESL sequence earned essentially the same number of credits on average regardless of their enrollment in English 110 or English 111-112. After two years, while the students in the pilot writing course did somewhat worse on average, the difference

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accounted for by regressing on students' GPA in coursework following enrollment in the introductory writing courses being studied.

(2.68) is not statistically significant. In the three-year analysis, the difference is large (15.45), but as there are only 13 ESL students in this sample that large result is unreliable and still insignificant. Still, it is consistent with the results for the non-ESL English 110 students. Thus, while English 110 students from the ESL sequence earned comparable numbers of credits whether they enrolled in English 110 or English 111-112, for non-ESL students, those that participated in the pilot writing course did not appear to do as well, on average, when it came to accumulating college credits over three years.

Another interesting pattern in the data, outside our main analysis, is the difference in performance between students with English 110 placement from the ESL sequence and the non-ESL students. In the original data on students credits (Exhibit 7) it is clear that the ESL students enter the analysis with more credits than their non-ESL counterparts. In addition, by the end of three years the ESL students clearly earn more credits on average than other students with English 110 placement. Even when one controls for SEEK status, high school average, and prior credits, ESL students still earn far more credits on average than other English 110 students after three years, whether enrolled in English 110 or English 111-112.

In summary, when one controls for SEEK status, high school average, and prior credits, certain patterns emerge with regard to participation in the pilot writing course. For students with English 1 placement status, participation in the pilot writing project is associated with somewhat higher credits on average over three years. For students with English 2 placement status, participation in the pilot writing course is associated with little difference after a one course advantage in the first year. For non-ESL students with English 110 placement, participation in the pilot writing course is associated with somewhat lower credits on average over three years. For students with English 110 placment from ESL, participation in the pilot course is associated with no signigicant difference in terms of cumulative credits.

However, it is important to note that all of these differences are rather small. The adjusted R squares for regressions of course placement status alone on outcomes after one, two, and three years range from 11 to 8 percent, indicating that course placement accounts for no more than 11 percent of the variance in cumulative credits. By comparison when one adds SEEK status, high school average, and prior credits to the model the adjusted R square rises to between 57 and 23 percent in the one-, two-, and three-year analyses. This

indicates that far more of the variance in cumulative credits can be explained by these prior characteristics of the students than by writing course placement.

VII. Grade Point Average

In addition to comparing the different experiences of students in earning course credit, it is also useful to assess how well, on average, students did in those classes. For this purpose, student grade point average (GPA) provides a useful measure of the quality of student performance as opposed to only assessing their progress in terms of credits. Credits are only a partial measure of student success, since they can, for example, represent a string of Ds as equal to a string of As. Similarly, GPA is also only a partial measure since the average does not give an indication of how many courses have been taken. One A, for example, will be counted as higher than one A and one B. Thus it is useful to look at both measures to better understand student progress and achievement.

At CCNY, GPA is measured on a four point scale where A = 4, B = 3, C = 2, D = 1, and F = 0. Courses that are taken Pass/Fail are not counted for purposes of the GPA. Exhibit 11 presents the GPAs at the end of Summer for students in the study, by their course and placement category. However, many students began their involvement in the study with a prior GPA, while we are more interested in their performance after enrollment in introductory writing. Unlike cumulative credits, students who have not taken any courses do not have a GPA of zero. Instead, their GPA is undefined. This was the case for roughly two-thirds of the students in our sample. While regression could control for the effects of prior credits by including it as an independent variable in the regression equation, this was not appropriate for prior GPA. In order to control for the effects of prior GPA it was necessary to calculate the students' GPAs in coursework after their enrollment in introductory writing courses. Exhibit 12 presents the mean GPA for students in their coursework following their enrollment in the introductory writing courses. The regressions in Exhibits 13, 14, and 15 are performed on this data.

Exhibit 11
Mean Grade Point Average One, Two, and Three Years After Enrollment in Introductory Writing, by Course and Placement Category for Combined Fall 1993, 1994, and 1995 Cohorts Without Students Taking English 111-112 in Overlapping Years

Original Fall Enrollment	Mean GPA at the End of Summer		
	After 1 Year Cohorts 1,2,&3	After 2 Years Cohorts 1&2	After 3 Years Cohort 1
Eng. 1	1.92	1.62	1.64
Eng. 111 w/ Eng. 1 Placement	2.06	2.12	2.07
Eng. 2	2.04	1.90	1.85
Eng. 111 w/ Eng. 2 Placement	2.08	2.08	2.17
Eng. 110 NOT ESL Students	2.36	2.27	2.22
Eng. 110 AND ESL Students	2.47	2.40	2.44
Eng. 111 w/ Eng. 110 Placement NOT ESL	2.25	2.07	2.05
Eng. 111 w/ Eng. 110 Placement AND ESL	2.60	2.45	2.59
Eng. 111 w/ NO Placement Information	2.52	2.12	2.10
All Introductory Writing Courses	2.52	2.19	2.18
Adjusted R Square*	2%	4%	3%

Read as: At the end of Summer one year after enrollment in introductory writing, students who enrolled in English 1 had a mean grade point average (GPA) of 1.92 . This includes those students from the Fall 1993, Fall 1994, and Fall 1994 cohorts who had not taken English 111 in previous years.

*Read as: In a regression of student course placement on GPA after one year, the adjusted R square is 2 percent. That is, course placement accounts for only 2 percent of the variance in student GPAs.

Exhibit 12
Mean Grade Point Average During the One, Two, and Three Years After Enrollment in Introductory Writing, by Course and Placement Category for Combined Fall 1993, 1994, and 1995 Cohorts Without Students Taking English 111-112 in Overlapping Years

Original Fall Enrollment	GPA From Introductory Writing Enrollment Through the End of Summer		
	During 1 Year Cohorts 1,2,&3	During 2 Years Cohorts 1&2	During 3 Years Cohort 1
Eng. 1	1.92	1.67	1.48
Eng. 111 w/ Eng. 1 Placement	2.02	2.22	2.29
Eng. 2	1.98	2.02	1.98
Eng. 111 w/ Eng. 2 Placement	2.10	2.17	2.27
Eng. 110 NOT ESL Students	2.33	2.28	2.17
Eng. 110 AND ESL Students	1.90	1.97	2.03
Eng. 111 w/ Eng. 110 Placement NOT ESL	2.26	2.13	2.16
Eng. 111 w/ Eng. 110 Placement AND ESL	2.18	2.25	2.56
Eng. 111 w/ NO Placement Information	2.64	2.40	2.29
All Introductory Writing Courses	2.28	2.17	2.12
Adjusted R Square*	2%	1%	1%

Read as: In courses taken during the one year after enrollment in introductory writing, beginning in the Fall and running throught the end of Summer, students who enrolled in English 1 had a mean grade point average (GPA) of 1.92 . This includes those students from the Fall 1993, Fall 1994, and Fall 1994 cohorts who had not taken English 111 in previous years.

*Read as: In a regression of student course placement on GPA during one year, the adjusted R square is 2 percent. That is, English course placement accounts for only 2 percent of the variance in student GPAs during the one year following enrollment in introductory writing.

Exhibit 13
Regression of Introductory Writing Enrollment on GPA During the One Year After Introductory Writing Enrollment Controlling for SEEK Status and High School Average for Combined Fall 1993, 1994, and 1995 Cohorts, by Course and Placement Category Without Students Taking English 111-112 in Previous Years

Independent Variables	Regression on GPA During 1 Year, Fall through Summer			
	B (Effect)	Standard Error	T	Significance of T
Constant - Eng. 1	0.91	0.15	6.27	0.0000
Eng. 111 w/ Eng. 1 Placement	-0.05	0.13	-0.35	0.7283
Eng. 2	0.03	0.10	0.29	0.7728
Eng. 111 w/ Eng. 2 Placement	0.01	0.10	0.14	0.8885
Eng. 110 NOT ESL Students	0.13	0.09	1.47	0.1431
Eng. 110 AND ESL Students	-0.18	0.10	-1.74	0.0814
Eng. 111 w/ Eng. 110 Placement NOT ESL	0.12	0.11	1.07	0.2858
Eng. 111 w/ Eng. 110 Placement AND ESL	0.09	0.16	0.55	0.5800
Eng. 111 w/ NO Placement Information	0.25	0.20	1.28	0.2022
SEEK	-0.23	0.05	-5.07	0.0000
High School Average (0-100)	0.02	0.00	11.77	0.0000
Adjusted R Square	9%			

N=4038 (The number in this analysis differs from the total in Exhibit 3 because of missing data.)

Read as: In the regression on GPA for coursework in the one year following enrollment in introductory writing, Fall through Summer, the constant is 0.91. Since English 1 students are not included as a variable, they represent the baseline to which the other course placements are compared. The standard error of the constant is 0.15. The T statistic for the constant is 6.27. This is the coefficient divided by the standard error. The significance of T is 0.0000. This represents the probability that the observed coefficient (B) differs from 0 only by chance.

Note: Guidance for interpreting the regressions is given on page 23 of the text.

Exhibit 14
Regression of Introductory Writing Enrollment on GPA During the Two Years After Introductory Writing Enrollment Controlling for SEEK status and High School Average for Combined Fall 1993 and 1994 Cohorts, by Course and Placement Category Without Students Taking English 111-112 in Previous Years or Year-Two

Independent Variables	Regression on GPA During 2 Years, Fall through Summer			
	B (Effect)	Standard Error	T	Significance of T
Constant - Eng. 1	0.68	0.16	4.19	0.0000
Eng. 111 w/ Eng. 1 Placement	0.34	0.15	2.30	0.0216
Eng. 2	0.22	0.11	1.98	0.0476
Eng. 111 w/ Eng. 2 Placement	0.38	0.11	3.39	0.0007
Eng. 110 NOT ESL Students	0.39	0.10	4.04	0.0001
Eng. 110 AND ESL Students	0.22	0.11	2.02	0.0436
Eng. 111 w/ Eng. 110 Placement NOT ESL	0.29	0.13	2.33	0.0200
Eng. 111 w/ Eng. 110 Placement AND ESL	0.35	0.18	1.93	0.0533
Eng. 111 w/ NO Placement Information	0.30	0.25	1.17	0.2438
SEEK	-0.21	0.05	-4.00	0.0001
High School Average (0-100)	0.02	0.00	9.20	0.0000
Adjusted R Square	8%			

N=2801 (The number in this analysis differs from the total in Exhibit 4 because of missing data.)

Read as: In the regression on GPA for coursework in the two years following enrollment in introductory writing, Fall through Summer, the constant is 0.68. Since English 1 students are not included as a variable, they represent the baseline to which the other course placements are compared. The standard error of the constant is 0.16. The T statistic for the constant is 4.19. This is the coefficient divided by the standard error. The significance of T is 0.0000. This represents the probability that the observed coefficient (B) differs from 0 only by chance.

Note: Guidance for interpreting the regressions is given on page 23 of the text.

Exhibit 15
Regression of Introductory Writing Enrollment on GPA
During the Three Years After Introductory Writing Enrollment
Controlling for SEEK status and High School Average
for Fall 1993 Cohort, by Course and Placement Category
Without Students Taking English 111-112 in Year-Two or Year-Three

Independent Variables	Regression on GPA During 3 Years, Fall through Summer			
	B (Effect)	Standard Error	T	Significance of T
Constant - Eng. 1	0.73	0.24	3.05	0.0024
Eng. 111 w/ Eng. 1 Placement	0.55	0.23	2.39	0.0168
Eng. 2	0.38	0.18	2.05	0.0404
Eng. 111 w/ Eng. 2 Placement	0.63	0.19	3.26	0.0012
Eng. 110 NOT ESL Students	0.48	0.16	2.93	0.0035
Eng. 110 AND ESL Students	0.52	0.18	2.86	0.0043
Eng. 111 w/ Eng. 110 Placement NOT ESL	0.41	0.20	2.04	0.0417
Eng. 111 w/ Eng. 110 Placement AND ESL	0.72	0.36	2.00	0.0453
Eng. 111 w/ NO Placement Information	0.43	0.34	1.28	0.2001
SEEK	-0.24	0.07	-3.23	0.0013
High School Average (0-100)	0.01	0.00	5.53	0.0000
Adjusted R Square	7%			

N=1414 (The number in this analysis differs from the total in Exhibit 5 because of missing data.)

Read as: In the regression on GPA for coursework in the three years following enrollment in introductory writing, Fall through Summer, the constant is 0.73. Since English 1 students are not included as a variable, they represent the baseline to which the other course placements are compared. The standard error of the constant is 0.24. The T statistic for the constant is 3.05. This is the coefficient divided by the standard error. The significance of T is 0.0024. This represents the probability that the observed coefficient (B) differs from 0 only by chance.

Note: Guidance for interpreting the regressions is given on page 23 of the text.

While this analysis makes intuitive sense it also has a disadvantage. Including prior credits in the regressions on cumulative credits was likely to control somewhat for the effects of student characteristics that caused both prior credits and writing course selection. In all, writing course participation appears to be very weakly related to students' GPA in subsequent courses. The regressions of course participation alone on subsequent GPA yield adjusted R squares between 1 and 2 percent, as opposed to R squares of 8 to 11 percent for the similar regressions on cumulative credits. This indicates that writing course participation accounts for little of the variance in GPA.

When one does not control for SEEK status or high school average, the GPAs for student coursework during the one, two, and three years following enrollment in the study courses appear to follow a similar pattern to true averages for cumulative credits. In Exhibit 12, it appears that English 1 and English 2 placement students who participate in the pilot writing course have higher GPAs on average than those that remain in the regular courses. This appears to be the case after one, two, and three years, and the gap widens over time. Non-ESL students with English 110 placement who enroll in English 111-112 appear to do roughly the same as non-ESL students in English. However, students with English 110 placement from ESL who participated in the pilot writing course appear to do a good deal better than their ESL counterparts in the English 110. Their average GPA is between a quarter and a half a grade better.

However, when one controls for SEEK status and high school average there appear to be few differences in average GPA associated with participation in the pilot writing course. After one year, there are no significant differences between the GPA for students in English 111-112 and their counterparts with the same placement status in the regular writing sequence. In addition, after two years and after three years, there were not significant differences in GPAs associated with pilot course participation for students with either English 2 or English 110 placement status. This was regardless of students' ESL status.[9]

However, after the first year, there were differences associated with pilot course participation for students with English 1 placement status. After two years or three years, students with English 1 placement in English 111-112 did significantly better than those in

[9] For further explanation of how to interpret the regression results, see the explanation under "Cumulative Credits" on page 23. This explanation of how to interpret the regressions for credits holds true for the regressions on GPA. However, the regressions on GPA control only for SEEK status and high school average. Prior GPA is accounted for by regressing on students' GPA in coursework following enrollment in the introductory writing courses being studied.

the regular writing course. The difference was 0.34 after two years, and 0.55 after three years, when one controls for SEEK status and high school average. These differences of a third to a half a grade in GPA would appear to represent somewhat better course performance. The standard deviation for GPA overall was 1.24 over two years, and 1.34 over three years.

It is also interesting to note, that while most groups of students did not show significantly different GPAs associated with pilot course participation, almost every group of students had GPAs significantly higher than the students enrolled in English 1. In addition, this gap tended to widen over time, indicating that on average English 1 students did not begin to keep pace with higher level students after one or two years.

In summary, the analysis of students' GPA in coursework following enrollment in introductory writing indicates that when one controls for SEEK status and high school average the pilot writing course is associated with better performance for students with English 1 placement. Other than this, participation in the pilot course does not appear to be associated with significant differences in terms of GPA.

VIII. World Humanities

In addition to tracking the overall performance of pilot writing course participants in terms of credits and GPA, it is also useful to see how well they performed relative to other students in selected classes. In addition, one aspect of the pilot writing course was to allow students to enroll in five core courses required for graduation, World Humanities 101 and 102, World Civilizations 101 and 102, and Philosophy 101. Other students with English 1, English 2, or English 110 placements who participated in the regular program could not enroll in these courses until after they had either enrolled in or completed English 110. This analysis focuses on two of these five core courses, World Humanities 101 and 102.

The pilot writing course was designed to give students support in enrolling in the regular college-level program. In addition, undergraduate advisors and SEEK advisors consulted with students on enrollment in the five core courses above. Students also needed to pass the CUNY Reading Assessment Test as a requirement for enrollment in them. Analysis of the performance of writing course students simultaneously enrolled in the World Humanities courses gives some indication of the success associated with providing this

course option for students. Because student choice was part of the design for student participation in World Humanities, selection was part of the treatment, not a problem to be statistically controlled. As a result, the analysis deals only with whether there is a difference between the actual passing rates (Exhibits 16 and 17).

For students enrolling in World Humanities 101 during the same year as their enrollment in the introductory writing courses, the passing rates are fairly similar. Exhibit 16 shows that 78 percent of students with English 1 or 2 placement status who enrolled in English 111-112 and in World Humanities 101 in the same year passed this World Humanities course. This is somewhat less than the rate of 82 percent for students from English 110 who enrolled in World Humanities 101. However, this difference of 4 percent is not statistically significant. The probability that the true difference is zero is 0.3427. At the same time, students with English 110 placement who enrolled in the pilot writing course and then simultaneously enrolled in World Humanities 101 passed the course at a rate of 87 percent, 5 percent more than the students from English 110. However, this difference is also not statistically significant. The probability that this difference is due to chance is 0.2034 (Exhbit 16).

The same pattern occurs for students enrolled in World Humanities 102. Again students enrolled in the pilot project with English 1 or 2 placement passed World Humanities 102 at a somewhat lower rate (73 percent) than did students who enrolled in English 110 (80 percent), while pilot course students with English 110 placement passed at a somewhat higher rate (85 percent). Given the smaller number of students in this sample, it is not surprising that these small difference fail to be statistically significant as well (Exhibit 17).

In all, the analysis of passing rates for World Humanities show no significant difference in passing rates for pilot project participants as compared to students completing the traditional series of prerequisites for participation in the World Humanities courses. This indicates that providing the option of concurrent enrollment in English 111-112 and the World Humanities courses produced results in terms of student course completion that are comparable to the traditional model of prerequisites. In addition, the pilot writing project was able to speed the completion of these required courses for students with English 1 and 2 placement. As a result, 105 students were able to successfully complete World Humanities 101 and 19 students were able to complete World Humanities 102 who would not otherwise have been able to enroll.

Exhibit 16
Passing Rates for Students Enrolled in World Humanities 101 in the Same Year as Introductory Writing, by English Course and Placement Status for Combined Fall 1993, Fall 1994, and Fall 1995 Cohorts Without Students Taking English 111-112 in Previous Years

Fall English Enrollment	Enrolled in World Humanities 101			
	Total Enrollment	Number Passing	Percent Passing	P Dif=0 from Eng. 110
Eng. 111 w/ Eng. 1 or 2 Placement	134	105	78%	0.3427
Eng. 111 w/ Eng. 110 Placement	112	97	87%	0.2034
Eng. 110	1024	837	82%	N/A
Grand Total	1270	1039	82%	N/A

Read as: Of the students enrolled in English 111 with English 1 or 2 placement status, 134 enrolled in World Humanities 101 during the same academic year. Of these 134 students, 105 passed World Humanities 101. This represented 78 percent of the original 134. The probability (P) that the difference between this rate of 78 percent and the rate of 82 percent for English 110 students is equal to zero is 0.3427.

Exhibit 17
Passing Rates for Students Enrolled in World Humanities 102
in the Same Year as Introductory Writing, by English Course and Placement Status
for Combined Fall 1993, Fall 1994, and Fall 1995 Cohorts
Without Students Taking English 111-112 in Previous Years

Fall English Enrollment	Enrolled in World Humanities 102			
	Total Enrollment	Number Passing	Percent Passing	P Dif=0 from Eng. 110
Eng. 111 w/ Eng. 1 or 2 Placement	26	19	73%	0.4078
Eng. 111 w/ Eng. 110 Placement	34	29	85%	0.4638
Eng. 110	257	205	80%	N/A
Grand Total	317	253	80%	N/A

Read as: Of the students enrolled in English 111 with English 1 or 2 placement status, 26 enrolled in World Humanities 102 during the same academic year. Of these 26 students, 19 passed World Humanities 101. This represented 73 percent of the original 26 The probability (P) that the difference between this rate of 73 percent and the rate of 80 percent for English 110 students is equal to zero is 0.4078.

IX. Conclusion

While the pilot enrichment project developed by the writing program at CCNY was non-experimental in design, statistical analysis of the outcomes associated with project participants reveals some interesting patterns.

- Pass rates in the introductory writing courses indicate that students with English 1 placement passed the pilot writing course at a significantly lower rate than their counterparts in the traditional English 1. For students with English 2 placement, the passing rates were comparable in the regular course and the pilot writing course. For students with English 110 placement who are not from the ESL program, the passing rate in the pilot course was also comparable to that in the regular course. However, for students from the ESL sequence with English 110 placement, the passing rate in the pilot writing course was much higher than that in the regular program.
- Analysis of cumulative credits over the three years of the study indicates that, when one controls for SEEK status, high school average, and prior credits, students with English 1 placement status who enroll in the pilot writing course earn more credits on average over all three years than do those in the regular writing course, equivalent to roughly one course per year. Students with English 2 placement show little difference after the first year associated with participation in the pilot writing course. Students with English 110 placement who are not from the ESL sequence tended to do worse in the pilot writing course as compared to the traditional writing course, equivalent to a little less than one course per year. English 110 students from the ESL sequence showed no significant differences associated with pilot course participation.
- Analysis of student GPAs for coursework following enrollment in the study courses indicates that, when one controls for SEEK status and high school average, only students with English 1 placement show significant differences in GPA associated with pilot course participation. For these students, those participating in the pilot writing course earned significantly higher GPAs during the two and three years after enrollment in the study courses. On average, their GPAs were roughly a third of a grade higher during two years and roughly half a grade higher during three years.
- Pilot writing course students who enrolled in World Humanities 101 or World Humanities 102 in the same year as their enrollment in the writing course passed at a rate comparable to that of students from English 110 who followed the traditional path of prerequisites. This was true for students with English 1 and 2 placement status who

would not have been able to enroll in the World Humanities courses were they not participating in the pilot course. This was also true for students with English 110 placement who enrolled in English 111-112.

In all, these results indicate that the three year pilot writing project at CCNY is a promising model for the lowest level of writing students at CCNY. For those students with English 1 placement who participated, participation in English 111-112 was associated with more rapid progress toward graduation in the form of credits, and better performance in the form of higher GPAs. This is in spite of the fact that fewer students with English 1 placement passed the pilot writing course than did those in the regular course. Because students selected themselves for participation in the pilot writing course it is possible that this represents characteristics of the English 1 students who chose to enroll in English 111-112 as much as characteristics of the pilot course. However, this itself suggests that English 111-112 provided a positive option for some students with English 1 placement.

For those students with English 2 placement, participation in the pilot writing project was not associated with notable differences in passing rates, accumulated credits, or subsequent GPA. However, one advantage did appear. Students with English 1 or 2 placement who enrolled in English 111-112 were able to enroll in World Humanities 101 and 102 earlier in their college career, and they passed those courses at a rate comparable to students from English 110. Thus, for remedial students overall, the pilot writing course appears to represent a positive option.

The results above are more mixed with regard to students who placed into the traditional college-level introductory writing course, English 110. For students with English 110 placement who did not come from the ESL sequence, participation in English 111-112 was associated with comparable performance in terms of writing course performance and GPA. However, in terms of cumulative credits, non-ESL students with English 110 placement who participated in the pilot writing course did significantly worse on average. Thus for this group of students, participation in the pilot writing course was associated with a somewhat negative outcome. For students who placed into English 110 out of the ESL sequence, the results were somewhat different. For ESL students with English 110 placement, enrollment in English 111-112 was associated with comparable outcomes in terms of accumulated credits and GPA. Furthermore, ESL students passed English 111-112 at significantly higher rates than they passed English 110. Thus, for English 110 students from the ESL sequence, participation in the pilot writing project was associated

with a somewhat more positive outcome. For the analysis of passing rates in World Humanities 101 and 102, students with English 110 placement were treated as a single group. In both of the World Humanities courses, students with English 110 placement passed at a comparable rate regardless of whether they enrolled in English 110 or in English 111-112. Again, all of the above differences may represent selection on the part of the pilot course participants. However, in this case, it is less clear whether the pilot writing course is a positive option. The results for students with English 110 placement from the ESL sequence appear promising, while those for the English 110 students who are not from ESL are somewhat troubling.

How to weight the apparent costs and benefits of this model for introductory writing is a difficult question. However, the outcomes associated with the pilot writing project at CCNY indicate that this model has potential lessons for the teaching of college-level writing to new students, particularly those at the lower level.

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