VI. SUMMARY OF FINDINGS FROM MEANS ANALYSIS

This section profiles the skills of successful and unsuccessful CUNY students. It examines the entire cohort of June 1997 BOE graduates by race, English language ability, immigration status, remedial status as of 8th grade, type of school attended in 8th grade, type of high school attended, and type of high school diploma. We found that regardless of how we sort the students, the need for remediation can be traced to the early grades. Furthermore, we found that the strongest students forgo CUNY altogether. Throughout our investigation, this story remains the same.

Each table below is accompanied by a source note, which refers the reader to the corresponding means presentation tables in Appendix E. The tables contain standard deviation values and population size by variable.

A. Profile of BOE Class of June 1997

Table 7 shows group averages for all June 1997 BOE high school graduates, for the sub-group that attends CUNY, and for the sub-group that does not. The data show that the average performance of the CUNY sub-group is weaker than the average performance of the non-CUNY sub-group. This observation is remarkable because the non-CUNY sub-group includes students who did not go to college at all.

8th grade. The pattern of performance appears as early as 8th grade. Table 7 shows that CUNY students scored below non-CUNY students and the total cohort on the last administration of the Degrees of Reading Power (DRP) and the California Achievement Test in mathematics (CAT-Math). CUNY students averaged only 56.67 out of 99 in reading and 54.76 out of 99 in math, while non-CUNY students earned 61.28 in reading and 66.29 in math. The total cohort averaged 60.14 in reading and 62.89 in math.

Secondary school. CUNY students' relatively poor performance continued from elementary school into high school. CUNY students averaged 67.47 out of 100 on the Regents English exam, compared with non-CUNY students' score of 71.59 and the total cohort's score of 70.39. Similarly, CUNY students scored 67.47 out of 100 on the Regents math exam, compared with non-CUNY students' score of 72.59 and the total cohort's score of 70.96. On a scale of one to four, CUNY students' highest level in math achievement was 2.55, compared with non-CUNY students' level of 2.87 and the total cohort's level of 2.78.

CUNY students scored slightly ahead of non-CUNY student on two measures, however. On a scale of zero to four, CUNY students earned an average of 3.46 CPI units in English, slightly ahead of non-CUNY students who earned 3.34, and the total cohort who earned 3.38. Similarly, CUNY students' grade point average in academic courses (75.50) was higher than the GPA of non-CUNY

students (72.20), and the total cohort (73.20). A possible explanation for the anomalies is the subjective element of grading and, therefore, credit accumulation.[18]

College entrance. BOE graduates' performance on college entrance exams, including the verbal and math SAT[19] and CUNY's Freshman Skills Assessment Tests (FSATs), mirrored their performance in elementary school and on the high school Regents exams. On SAT verbal, CUNY students averaged 420 on a 200-to-800 scale, while non-CUNY students scored 465 and the total cohort scored 434. On SAT math, CUNY students averaged 439, while non-CUNY students earned 499 and the total cohort scored 458. According to benchmarks identified by the National Center for Education Statistics (NCES) in *The Condition of Education 1998* (1998), CUNY students' average combined score of 859 would be used to characterize them as minimally prepared for college.

Only those BOE graduates who went on to attend CUNY took the FSATs. Overall, all CUNY students averaged 29.04 out of 45 on the RAT; 27.53 out of 40 on the MAT; and 6.45 out of 12 on the WAT. CUNY students' average RAT score fell below the remedial cut off score of 30 but their average MAT score hit above the cut off score of 25.

The Writing Assessment Test (WAT) score of CUNY students and every sub-group – except remedial students – barely climbed above the cut score of 8 out of 12 points. So little variance seems to confirm RAND's finding that the WAT's reliability is very low (*CUNY's Testing Program: Characteristics, Results, and Implications for Policy and Research*). So as we explained earlier in this report, we omit the WAT from our discussion hereinafter.

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[18] We have strong reason to believe that the BOE's grading policies tend to overstate students' subject mastery. A summary of Regents course grades and test scores in the same subject paired by high school, prepared by the UAPC, provides evidence (August 27, 1998). For example, at almost every school, students' average Regents Math I and II courses grades exceeded their average exam scores.

The exceptions are notable: Students at Brooklyn Tech, Staten Island Tech, Bronx Science, Stuyvesant and Townsend Harris – all on our National Merit school list – earned exam scores that exceeded their course grades in *both* Math I and II. In addition, students at CMSP, Fashion Industries and Jamaica earned Math I exam scores that exceeded their course grades; and students at Brooklyn College Academy, Liberty and Academy of American Studies earned Math II exam scores that exceeded their course grades.

It is interesting to note that admission to CUNY senior colleges is based almost entirely on CPI units (with a particular emphasis on English) and academic GPA. For more on CUNY's admission standards, see *Open Admissions and Remedial Education at the City University of New York*, Section IV.B.

[19] Throughout this report, we try to put students' SAT scores in some objective, national context. We interpret the scores in terms of benchmarks of performance developed by the National Center for Education Statistics (NCES), which can be found in Table 35, Appendix C. Ideally, our analysis would include indexing scores against an annual national percentile ranking. Because we do not know when students in our total cohort took the SAT, and because percentile rankings change slightly from year to year, we cannot index the scores in this way.

However, based on the fact that BOE students receive almost no college advisement until the spring of their junior year in high school, we think that most students who took the SAT probably did so in their senior year (BOE's *Handbook for College Advisors* (1997-98 and 1998-99). Therefore, to give the reader a bit more context, we supply percentile conversion tables for verbal (Table 34) and math (Table 36) scores generated nationwide during the 1996-97 administrations in Appendix C.

College performance. Students who went to CUNY attempted an average of 5.01 remedial equated credits, passed them at a rate of 72% and accumulated 3.47 of them. At the same time, CUNY students attempted 9.62 college-level credits, failed 1.31 and accumulated 7.62 of them.

Table 7. Academic Success of All, Non-CUNY and CUNY Students[20]

TEST & CREDIT VARIABLES	ALL STUDENTS n=29,854	NON-CUNY STUDENTS n=21,295	CUNY STUDENTS n=8,559
8TH GRADE			
DRP score	60.14	61.48	56.67
CAT-Math score	62.89	66.29	54.76
SECONDARY SCHOOL			
Regents English	70.39	71.59	67.47
Regents math	70.96	72.59	67.29
Highest math course	2.78	2.87	2.55
English CPI units	3.38	3.34	3.46
Academic GPA	73.20	72.20	75.50
COLLEGE ENTRY			
RAT score	-	-	29.04
MAT score	-	-	27.53
WAT score	-	-	6.54
SAT verbal score	434	465	420
SAT math score	458	499	439
SAT combined score	892	964	859
COLLEGE			
Equated credits			
• Attempted	-	-	5.01
• Failed	-	-	0.46
• Accumulated	-	-	3.47
• Accum./attempt.	-	-	72%
College credits			
• Attempted	-	-	9.62
• Failed	-	-	1.31
• Accumulated	-	-	7.62

Source: Table 37, Appendix E

B. Profile of CUNY Remedial and Non-Remedial Students

Table 8 shows the average performance of CUNY remedial and non-remedial students. The need for remediation at CUNY corresponds with poor performance in elementary and secondary school, suggesting that failure at CUNY is connected to failure in the earlier grades.

8th grade. In general, CUNY remedial students had weak basic skills in math and reading at least as far back as 8th grade. They scored an average of 49.51 out of 99 on the DRP and 46.42 on

[20] Note anomalies in the data presented on college performance. The number of equated credits failed plus the number of equated credits accumulated does not equal the number of equated credits attempted; and the number of college-level credits failed plus the number of college-level credits accumulated does not equal the number of college-level credits attempted. Similarly, the number of equated credits attempted multiplied by the percentage of equated credits passed does not equal the number of equated credits accumulated. Differences are caused by two factors. First, missing records distort our means calculations. In addition, our data set does not account for those credits for which students received a grade of "Repeat"; these credits are neither failed nor accumulated.

the CAT-Math – below the grade-level cut score of 50 and well below non-remedial students' average scores of 75.24 (DRP) and 74.55 (CAT-Math). Moreover, as students' average remedial needs increased in number of subjects, their 8th grade DRP and CAT-Math scores declined dramatically. On the DRP, students remedial in one subject scored 60.83, those remedial in two subjects scored 47.11, and those remedial in three subjects scored 36.35. On the CAT-Math, students remedial in one subject scored 57.52, those remedial in two subjects scored 45.21, and those remedial in three subjects scored 30.19. Thus, we can conclude that CUNY students who were remedial in more than one subject functioned profoundly below grade level in elementary school.

Secondary school. The pattern established in elementary school persisted in high school. CUNY remedial students averaged 64.23 and 63.70 on the Regents English and math exams, respectively, while non-remedial students averaged 74.92 and 77.19, respectively. Once again, as students' remedial needs increased in number of subjects, their test scores declined. On the Regents English exam, students remedial in one subject scored 68.80, those remedial in two subjects scored 63.13, and those remedial in three subjects scored 57.66. On the Regents math exam, students remedial in one subject scored 69.12, those remedial in two subjects scored 66.12, and those remedial in three subjects scored 51.28. Note that CUNY students who were remedial in more than one subject functioned well below grade level, particularly in English language arts, in high school.

On a scale of one to four, the highest level of math achieved by students who were remedial in three subjects averaged just 1.77 – too low to satisfy the Regents diploma requirement, and indicating that these students had failed to master algebra (see Appendix D for definition of math level variable).

The variance in CPI units and academic GPA was slight. This might be a reflection of BOE grading policies or the tendency of weaker students to drop out of high school before graduation.

College entry. Remedial students had average RAT scores that ranged from 32.33 (students remedial in one subject) to 21.35 (three subjects) and MAT scores that ranged from 29.41 (one subject) to 18.58 (three subjects). By contrast, non-remedial students earned a RAT score of 36.33 and a MAT score of 32.66. On the SAT, remedial students had verbal scores ranging from 428 (one subject) to 353 (three subjects) and math scores ranging from 447 (one subject) to 356 (three subjects). Remedial students scored far below non-remedial students' scores of 489 verbal and 493 math and would be thus characterized as minimally prepared for college.

College performance. Remedial students' pattern of failure from the early grades persisted at CUNY. Of course, the average number of equated credits attempted grew with the need for remediation – from 3.28 (one subject) to 6.51 (two subjects) to 9.40 (three subjects). What is remarkable is that, with each remedial subject, the rate at which students *accumulated* equated credits dropped, from 75% to 72% to 64%. From this, we conclude that students with greater remedial needs advanced through remediation more slowly than those with less extensive needs.

A similar phenomenon occurred with respect to earning college-level credits. As remedial students' needs grew by subject, the number of college-level credits they attempted dropped, from

10.95 (one subject) to 8.37 (two subjects) to 6.10 (three subjects) – all far below non-remedial students' average of 12.95 attempted credits. The average number of college credits accumulated by remedial students dropped from 8.60 (one subject) to 6.70 (two subjects) to 4.59 (three subjects), while non-remedial students accumulated an average of 10.43 credits. Thus, in addition to advancing more slowly through remediation, remedial students progressed more slowly toward a degree. Our concern here is that the slow rate of college credit acquisition might cause students to exhaust their Tuition Assistance (TAP) financial aid well before they achieve a degree – creating a real barrier to college completion.

Table 8. Degree of Remedial Need as Related to Academic Success

TEST & CREDIT VARIABLES	REMEDIAL BY NUMBER OF SUBJECTS				
	None n=2,120	**One or More n=6,439**	**One n=2,196**	**Two n=2,487**	**Three n=1,756**
8TH GRADE					
DRP score	75.24	49.51	60.83	47.11	36.35
CAT-Math score	74.55	46.42	57.52	45.21	30.19
SECONDARY SCHOOL					
Regents English	74.92	64.23	68.80	63.13	57.66
Regents math	77.19	63.70	69.12	66.12	51.28
Highest level math course					
English CPI units	4.07	3.02	3.73	3.32	2.59
Academic GPA	80.10	74.00	77.00	74.80	69.20
COLLEGE ENTRY					
RAT score	36.33	26.58	32.33	24.98	21.35
MAT score	32.66	25.8	29.41	27.50	18.58
WAT score	8.2	5.98	6.71	5.79	5.32
SAT verbal score	489	389	428	372	353
SAT math score	493	416	447	420	356
SAT combined score	982	805	875	792	709
COLLEGE					
Equated credits					
• Attempted	1.02	6.24	3.28	6.51	9.40
• Failed	0.09	0.57	0.34	0.49	0.98
• Accumulated	0.78	4.30	2.41	4.69	6.02
• Accum./attempt.	83%	70%	75%	72%	64%
College credits					
• Attempted	12.94	8.6	10.95	8.37	6.10
• Failed	1.64	1.21	1.56	1.10	0.95
• Accumulated	10.43	16.91	8.60	6.70	4.59

Source: Tables 38-40, Appendix E

Type of remedial need at CUNY. When we sorted the CUNY remedial population by type of remedial need (basic reading, math and writing skills), as Table 9 indicates, we found that students who required remediation in a particular subject at CUNY tended to function below benchmarks in the same discipline throughout their schooling. For example, on a scale of one to four, the highest level of high school math achieved by CUNY remedial math students averaged just 1.81 – too low to satisfy the Regents requirement and indicating that these students did not master algebra. Similarly, on a scale of zero to four, CUNY remedial reading and writing students average only 3.05 and 3.16 CPI units, respectively.

Furthermore, the tendency toward remediation crossed over subject matter. In other words, CUNY remedial reading and writing students tended to have poor 8th grade and Regents math scores, while CUNY remedial math students had low average DRP and Regents English scores. (Strikingly, remedial math students had earned fewer English CPI units than remedial students.) Conversely, students who were "non-remedial" in a particular subject at CUNY tended to function above benchmarks on 8th grade and high school indicators in the same subject area.

Table 9. Type of Remedial Need as Related to Academic Success

TEST & CREDIT VARIABLES	REMEDIAL SUBJECTS					
	Reading		Writing		Math	
	Remedial n=4,250	Non-Remedial n=4,309	Remedial n=5,260	Non-Remedial n=3,293	Remedial n=2,922	Non-Remedial n=5,637
8TH GRADE SCHOOL						
Last DRP Score	41.78	68.52	47.95	68.11	45.67	62.52
Last CAT-Math Score	40.83	64.69	46.52	64.78	35.30	64.54
SECONDARY SCHOOL						
Regents English Score	61.35	71.88	63.35	72.42	62.08	69.78
Regents Math Score	62.57	71.61	64.29	71.78	52.32	73.75
Highest level math course	2.29	2.78	2.39	2.78	1.81	2.85
English CPI units	3.05	3.86	3.16	3.93	2.98	3.71
Academic GPA	73.10	77.80	73.80	78.30	70.60	78.00
COLLEGE ENTRY						
RAT Score	22.63	35.13	26.22	33.51	25.38	30.87
MAT Score	25.07	29.89	26.09	29.81	19.14	31.66
WAT Score	5.86	7.21	5.50	8.16	6.07	6.78
SAT Verbal Score	363	463	386	463	381	435
SAT Math Score	402	468	420	464	366	468
COLLEGE PERFORMANCE						
Equated Credits						
• Attempted	7.42	2.52	6.73	2.11	7.70	3.56
• Failed	0.63	0.28	0.60	0.23	0.87	0.24
• Accumulated	5.15	1.73	4.62	1.53	4.90	2.70
• Accumulated/Attempted	70%	74%	70%	77%	63%	78%
College Credits						
• Attempted	7.72	11.59	8.20	12.01	7.37	10.84
• Failed	1.04	1.59	1.12	1.63	1.21	1.37
• Accumulated	6.10	9.18	6.47	9.56	5.56	8.73

Source: Tables 41-43, Appendix E

C. Race

Race turned out to be an important variable in our analysis. We found that being Asian or white was often associated with strong performance, while being black or Hispanic was often associated with weak performance. Our research suggests that the BOE under-serves blacks and Hispanics; shut out from more competitive colleges, these students go to CUNY, where they continue to lag behind and require more remediation.

8th grade. As Table 10 indicates, patterns emerge as early as K-8 school. On average, Asians and whites substantially exceeded the remedial cut scores on the DRP and CAT-Math. By contrast, blacks' and Hispanics' scores on the DRP and CAT-Math were just about at the cut score.

Secondary school. On average, Asians and whites performed above the cut score on the Regents English and math exams although Asian CUNY students scored below the cut score on the Regents English exam. By contrast, blacks and Hispanics performed at or below the cut score on both the English and math exams. Furthermore, on average, they earned fewer than four CPI units in English and achieved slightly more than two levels of math. Asians and whites had stronger performance on both of these measures.

College entry. Students' SAT scores mirror their earlier performance. Asian and white students out-performed the total June 1997 cohort (see Table 7). On average, Asian and white students earned combined SAT scores that would be used to characterize them as moderately to highly qualified for college. On the verbal section, Asian students scored 414 (CUNY) and 463 (non-CUNY) and white students scored 440 (CUNY) and 490 (non-CUNY). In math, Asian students scored 497 (CUNY) and 560 (non-CUNY) and white students scored 461 (CUNY) and 523 (non-CUNY). The average combined scores earned by students in both sub-groups would be used to characterize them as moderately to highly prepared for college.

In contrast, black and Hispanic students trailed the cohort and earned average combined scores that would be used to characterize them as minimally to moderately prepared for college. On the verbal section of the SAT, black students scored 414 (CUNY) and 450 (non-CUNY), and Hispanic students scored 409 (CUNY) and 444 (non-CUNY). In math, black students scored 405 (CUNY) and 439 (non-CUNY) and Hispanic students scored 411 (CUNY) and 448 (non-CUNY). (See Appendix C for a year percentile conversion table.)

College performance. From the preceding paragraphs, its seems clear that, within each racial group, the less well prepared students went to CUNY. At CUNY the patterns by race persisted. Asians and whites attempted fewer equated credits, passed them at a higher rate and accumulated more college-level credits than blacks and Hispanics. White students had the best CUNY record: they attempted only 3.25 equated credits, passed them at a rate of 76% and accumulated 9.14 out of 11.21 attempted college-level credits. (We also note that, from our BOE cohort, a greater number of blacks and Hispanics than Asian and whites went to CUNY.)

Table 10. Race as Related to Academic Success

TEST & CREDIT VARIABLES	ASIANS		WHITES		BLACK		HISPANICS	
	CUNY n=1,470	Non-CUNY n=3,491	CUNY n=2,008	Non-CUNY n=5,191	CUNY n=2,546	Non-CUNY n=7,211	CUNY n=2,517	Non-CUNY n=5,359
8TH GRADE								
DRP score	57.23	71.31	64.20	72.51	54.66	55.53	52.86	53.18
CAT-Math score	64.80	83.14	61.91	76.58	48.08	55.39	52.70	57.77
SECONDARY								
Regents English	68.86	75.33	70.72	76.64	65.46	67.71	66.00	67.77
Regents math	77.13	85.56	71.11	79.37	61.25	64.29	63.93	65.70
Highest level math course	3.04	3.55	2.71	3.22	2.34	2.51	2.29	2.37
English CPI units	3.84	3.70	3.95	3.92	3.37	3.13	3.02	2.75
Academic GPA	79.00	81.10	77.00	76.90	68.20	73.20	74.60	67.30
COLLEGE ENTRY								
RAT score	27.75	-	31.66	-	28.80	-	27.93	-
MAT score	31.76	-	28.97	-	25.81	-	25.63	-
WAT score	6.19	-	7.06	-	6.56	-	6.31	-
SAT verbal score	414	463	440	490	414	450	409	444
SAT math score	497	560	461	523	405	439	411	448
SAT combined score	911	1023	1023	1018	819	889	820	892
COLLEGE								
Equated credits								
• Attempted	4.91	-	3.25	-	5.52	-	5.90	-
• Failed	0.34	-	0.36	-	0.50	-	0.57	-
• Accumulated	3.50	-	2.42	-	3.65	-	4.07	-
• Accum./attempt.	74%	-	76%	-	69%	-	71%	-
College credits								
• Attempted	9.91	-	11.21	-	9.00	-	8.86	-
• Failed	0.98	-	1.52	-	1.33	-	1.33	-
• Accumulated	8.19	-	9.14	-	6.97	-	6.77	-

Source: Tables 44-47, Appendix E

D. Immigration Status

Like race, immigration status proved to be an important variable – in all, 80% of the students in our cohort were born outside the continental United States. We clustered countries of origin as Asia-East and Asia-West, the former USSR, and Puerto Rico[21] and the Caribbean countries (see Appendix D for a list of countries in each sub-group). In general, being from Asia-East, Asia-West or the former United Soviet Socialist Republic (USSR) was associated with stronger performance. Being from Puerto Rico or the Caribbean was associated with weak performance. Our research suggests that immigration status is a two-sided story. The BOE serves some students well – particularly those from Asia-East, Asia-West and the former USSR – but under-serves immigrant children who might need more help. This pattern followed students through high school and into college.

8th grade. As Table 11 indicates, the trend starts with elementary school indicators. Aside from relatively weak DRP reading scores, understandable among immigrant children, students from Asia-East, Asia-West and the former USSR scored at or above the cut scores on the CAT-Math. Conversely, students from Puerto Rico and the Caribbean performed at or below the line on the both the DRP and the CAT-Math. We note that the DRP posed a particular challenge to students who eventually went on to CUNY. Among them, all immigrant groups except students from Asia-West scored below grade level on the DRP.

Secondary school. Students' Regents exam performance was similar to their performance on the 8th grade CAT-Math and the DRP. On average, all sub-groups, except for students from Puerto Rico and the Caribbean, passed the Regents math exam. Like the DRP, the Regents English exam posed more difficulty, particularly among those who went on to CUNY. The sub-group from Puerto Rico and the Caribbean failed to exceed the cut score of 65 on the Regents exams. Not surprisingly, immigrant sub-groups that tested better completed a higher level of math and earned more CPI units in English.

College entry. Students' scores on college entrance exams mirrored their performance in school. Students from Asia-East, the former USSR and, to a lesser extent, Asia-West, out-performed the overall cohort and earned SAT scores that would be used to characterize them as moderately prepared for college. Students from Puerto Rico and the Caribbean had average scores of 396 (CUNY) and 406 (non-CUNY) on verbal; 397 (CUNY) and 413 (non-CUNY) on math; and combined scores of 793 (CUNY) and 819 (non-CUNY), which would be used to characterize them as minimally prepared for college. We note that more students go to CUNY from the Puerto Rico and Caribbean sub-groups than from the Asia-East, Asia-West and USSR sub-groups. With their superior skill sets, a larger proportion of these latter groups went elsewhere to college.

[21] Puerto Rico was clustered with the Caribbean, consistent with CUNY practice, even though the commonwealth is part of the US.

College performance. As we have seen, within each immigrant sub-group, the weaker students went to CUNY. While at CUNY, the split by immigrant status persists. Students from Asia-East, Asia-West and the former USSR took fewer equated credits, passed more of them, and accumulated more college-level credits. Students from the former USSR were outstanding. They attempted only 4.53 equated credits, passed 87% of them, and accumulated 9.17 out of 10.50 attempted college-level credits.

Table 11. Immigrant Status as Related to Academic Success

TEST & CREDIT VARIABLES	ASIA-EAST		ASIA-WEST		FORMER USSR		PR & CARIBBEAN	
	CUNY n=491	Non-CUNY n=1,000	CUNY n=186	Non-CUNY n=261	CUNY n=305	Non-CUNY n=446	CUNY n=756	Non-CUNY n=1,439
8TH GRADE								
DRP score	47.69	61.03	53.94	57.43	48.69	63.08	47.40	49.62
CAT-Math score	64.56	81.64	54.54	58.33	55.74	67.82	46.26	51.22
SECONDARY								
Regents English	66.97	71.71	67.57	71.73	68.18	74.07	64.87	66.25
Regents math	81.45	87.33	76.15	81.16	75.86	81.80	62.84	64.82
Highest level math course	3.38	3.65	2.65	3.01	2.97	3.35	2.25	2.34
English CPI units	3.51	3.59	3.64	3.64	4.04	3.65	2.56	2.65
Academic GPA	80.84	82.49	77.10	73.13	78.13	73.26	75.30	70.82
COLLEGE ENTRY								
RAT score	25.30	-	25.44	-	28.51	-	25.47	-
MAT score	33.55	-	29.45	-	30.95	-	24.78	-
WAT score	5.46	-	6.03	-	6.41	-	5.82	-
SAT verbal score	387	408	374	408	388	433	396	406
SAT math score	522	573	442	504	488	560	397	413
SAT combined score	909	981	816	912	876	993	793	819
COLLEGE								
Equated credits								
• Attempted	6.26	-	5.47	-	4.53	-	6.89	-
• Failed	0.31	-	0.34	-	0.19	-	0.36	-
• Accumulated	4.53	-	4.16	-	3.92	-	5.06	-
• Accum./attempt.	74%	-	79%	-	87%	-	74%	-
College credits								
• Attempted	8.95	-	9.72	-	10.50	-	8.17	-
• Failed	0.70	-	1.01	-	0.93	-	0.95	-
• Accumulated	7.79	-	7.94	-	9.17	-	6.54	-

Source: Tables 48-51, Appendix E

E. Limited English Proficiency (LEP) Status

Our analysis reveals that LEP status, as of 8th grade and during high school, is the demographic characteristic most critical to student performance throughout the public education system in New York City.[22] The BOE was unable to furnish test scores on the BOE's Language Assessment Battery (LAB)

[22] From 1975 through 1996, which covers the period our cohort was in elementary through secondary school, the BOE used a three-step process to identify students as having limited proficiency in English (Rossell, January 5, 1999; Document Scan Center, Test Administration Division, BOE, November 13, 1998). First, the BOE administered a questionnaire to incoming students to ascertain if they spoke a language other than English at home. Second, to students who did speak another language or who had a Spanish surname, the BOE administered the English version

from kindergarten through 12th grade, so we extrapolated students' language deficiency from their participation in high school classes coded as "bilingual" or "English as a second language (ESL)."[23] Our research indicates that having good English language skills was associated with strong performance, while being LEP was associated with weak performance. Indeed, many students who were LEP in high school did not catch up by the time they got to CUNY. Math performance was a possible bright spot, perhaps buoyed by the excellent performance of certain immigrant groups (see preceding sub-section).

8th grade. As Table 12 indicates, the pattern started early. Non-LEP students performed at or above the remedial line on the DRP and CAT-Math tests. In contrast, LEP students earned profoundly low scores: those who went on to CUNY scored 27.89 on the DRP and 37.87 on the CAT-Math; and those who did not go to CUNY scored 26.04 on the DRP and 41.38 on the CAT-Math. We note that LEP students' reading and math skills may have been even weaker than these scores indicated. As we reported earlier, at the time our cohort was in school, the BOE had a policy that allowed schools to exempt certain LEP students from standardized testing.

Secondary school. Students' secondary school performance mirrored their performance in 8th grade. LEP students under-performed non-LEP students, and LEP students who went to CUNY performed worse yet. On average, non-LEP students earned passing Regents English and Regents math scores; completed more than two levels of math, satisfying the math requirements for a Regents diploma; and came close to completing the English course requirements for a Regents diploma. In contrast, LEP students barely passed the Regents English exam and earned one fewer CPI unit in English. On average, CUNY LEP students earned a failing Regents English score of 62.02, compared to non-CUNY LEP students who earned a score of 64.37. Meanwhile, CUNY non-LEP students averaged 68.27 and non-CUNY non-LEP students averaged 72.27.

Math skills of non-LEP and LEP students showed near parity. Their average scores on the Regents math exam were within six points of one another, and their highest level of math attainment varied only by about half a point.

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of the LAB – the oral portion to students at the end of kindergarten through 12th grade and the written portion to students. The LAB threshold for LEP status was the 40th percentile. Students who scored below the 40th percentile were assigned to appropriate programs. Among these students, those with Spanish surnames were given the Spanish version of the LAB.

In 1996, the BOE stopped automatically testing students with Spanish surnames, formalized the home-language questionnaire into the Home Language Identification Survey (HLIS), and began administering the LAB only to students whose HLIS responses indicate they speak a language other than English (BOE memo submitted by Hernandez, April 29, 1999). Under current policy, the Spanish LAB is administered to students who score at or below the 20th percentile and are Spanish speakers.

[23] Bilingual and ESL are pedagogical terms. According to a BOE pamphlet entitled *Bilingual Education and English as a Second Language Programs: A Guide for Parents*, bilingual education is "instruction in two languages, the student's native language and English," and ESL is supplemental instruction in English "while [students] continue to learn the subject areas in their native language" (pamphlet provided by Lillian Hernandez, Director, Office of Bilingual Education, April 29, 1999).

College entry. Students' average scores on college entrance exams confirmed the trend. Non-LEP students matched or out-performed the total June 1997 cohort. Their average SAT verbal scores – 434 (CUNY) and 482 (non-CUNY) – and SAT math scores – 437 (CUNY) and 496 (non-CUNY) – that would characterize them as moderately qualified for college. In contrast, LEP students earned SAT verbal scores – 361 (CUNY) to 377 (non-CUNY) – would be used to characterize them as minimally prepared for college. LEP students' average SAT math score – 448 (CUNY) and 514 (non-CUNY) – was much higher. The strong performance of some immigrant groups probably skewed the means upward.

On average, LEP students failed the RAT and passed the MAT, while non-LEP students barely passed the RAT and comfortably passed the MAT.

College performance. Within both LEP and non-LEP sub-groups, the weaker students went to CUNY. At CUNY, non-LEP students attempted fewer equated credits and accumulated more college-level credits than LEP students did.

Table 12. LEP Status as Related to Academic Success

TEST & CREDIT VARIABLES	NON-LEP		LEP	
	CUNY n=6,529	Non-CUNY n=18,025	CUNY n=2,030	Non-CUNY n=3,270
8TH GRADE				
DRP score	59.75	63.96	27.79	26.04
CAT-Math score	55.89	67.13	37.87	41.38
SECONDARY SCHOOL				
Regents English	68.27	72.27	62.02	64.37
Regents math	66.57	72.72	69.59	71.85
Highest level math course	2.55	2.90	2.57	2.70
English CPI units	3.65	3.50	2.84	2.50
Academic GPA	75.40	72.80	75.80	68.90
COLLEGE ENTRY				
RAT score	30.71	-	23.63	-
MAT score	27.56	-	27.41	-
WAT score	6.88	-	5.44	-
SAT verbal score	434	482	361	377
SAT math score	437	496	448	514
SAT combined score	871	978	809	891
COLLEGE				
Equated credits				
• Attempted	4.23	-	7.47	-
• Failed	0.46	-	0.45	-
• Accumulated	2.82	-	5.52	-
• Accum./attempt.	70%	-	75%	-
College credits				
• Attempted	10.14	-	7.96	-
• Failed	1.44	-	0.89	-
• Accumulated	7.96	-	6.51	-

Source: Tables 52-53, Appendix E

F. Remedial Status in Early Grades

We found that students who scored below grade level (50th percentile) on the DRP and CAT-Math exams on the last administration in 8th grade – our proxy for remedial status in the early grades – performed poorly thereafter.[24] Our findings here were striking. Students who functioned at or above grade level were among the strongest performers in our total cohort, while students who functioned below grade level, especially in reading, were among the weakest performers. We think this scenario, among other factors, highlights the pernicious effect of social promotion.

[24] Robert Tobias, Executive Director, Division of Assessment and Accountability, BOE, said that the BOE "uses the 50th percentile operationally as grade level" on standardized tests (February 9 and 19, 1999). Tobias confirmed that the BOE applied this policy to the DRP and CAT-Math during the 1992-93 school year, when most of our cohort was in 8th grade.

We note that DRP results are usually expressed in "DRP units," which describe students' ability to read prose materials with different readability values and then answer questions about those materials (Deb Hogan, Office of State Assessment, SED, February 2, 1999). Tobias said the BOE used an "emulated national percentile rank" on a 1-99 scale that was constructed by norming the performance of students in the state of New York against the performance of a national sample of students (February 19, 1999). Raymond Domanico, President, Public Education Association (PEA), confirmed that this is the BOE's practice (February 19, 1999).

Secondary school. As Table 13 indicates, the pattern was apparent as soon as students got to high school. On average, students who were not remedial scored 10-15 points above the passing score of the Regents English and math exams, earned over four English CPI units, completed about three levels of math, and earned an academic GPA of 78.80 (CUNY) and 81.30 (non-CUNY). Students who were remedial in reading or in both math and reading scored at or below the benchmark on all measures.

Students who were remedial only in math in 8th grade appeared to catch up by the end of high school, performing at or slightly above the line on all measures. This may be another manifestation of the strong performance of certain immigrant groups and students who overcome English language deficiency.

Within this each sub-group, CUNY students consistently trailed non-CUNY students. Thus, in addition to tracing the roots of remediation, Table 13 displays evidence that students who went to CUNY were the chronic under-performers in high school.

College entry. Students' scores on college entrance exams continued the trend. Students who left 8th grade with adequate reading and math skills performed the best. They passed the RAT and MAT and earned an average SAT verbal score of 477 (CUNY) and 526 (non-CUNY), an average SAT math score of 483 (CUNY) and 538 (non-CUNY), and an average combined score of 860 (CUNY) and 1064 (non-CUNY). Non-CUNY students' average combined score would characterize them as moderately to highly prepared for college.

In contrast, students who were remedial in both reading and math failed the RAT and barely passed the MAT. On the SAT, they averaged a verbal score of 379 (CUNY) and 408 (non-CUNY), a math score of 417 (CUNY) and 474 (non-CUNY), and a combined score of 796 (CUNY) and 882 (non-CUNY). Students who left 8th grade with remedial skills in reading and math were among the weakest in our entire study.

On average, students who were remedial in math alone earned passing – albeit modestly passing – scores on the RAT and MAT and earned combined SAT scores of 838 (CUNY) and 974 (non-CUNY). Non-CUNY students achieved scores that would be used to characterize them as moderately prepared for college.

College performance. Students who left elementary school functioning at or above grade level in both reading and math attempted only 2.10 equated credits, passed them at a rate of 78%, and accumulated 9.35 out of 11.92 attempted college-level credits. In contrast, students who were remedial in reading alone attempted 4.79 equated credits, passed them at a rate of 75%, and accumulated 7.83 out of 9.74 attempted college-level credits. Students who were remedial in both reading and math did even worse. They attempted 6.77 equated credits, passed them at a rate of only 71%, and accumulated only 6.63 out of 8.29 attempted college-level credits.

Table 13. Grade Level (At and Above or Below) as Related to Academic Success

TEST & CREDIT VARIABLES	DRP AND CAT-MATH SCORES				BELOW ON DRP & ABOVE ON CAT-MATH		BELOW ON CAT-MATH & ABOVE ON DRP	
	At and Above		Below					
	CUNY n=1654	Non-CUNY n=5446	CUNY n=4,392	Non-CUNY n=9,873	CUNY n=412	Non-CUNY n=706	CUNY n=2,101	Non-CUNY n=5,270
SECONDARY								
Regents English	73.17	78.07	63.12	65.59	64.69	65.52	69.72	72.56
Regents math	74.50	82.06	64.47	66.48	67.00	68.76	66.89	71.43
Highest level math course	2.99	3.42	2.36	2.51	2.67	2.77	2.54	2.79
English CPI units	4.04	4.28	3.07	2.67	3.55	3.57	3.79	3.61
Academic GPA	78.80	81.30	73.70	65.50	76.30	76.50	76.60	74.8
COLLEGE ENTRY								
RAT score	34.72	-	25.41	-	27.68	-	32.41	-
MAT score	31.37	-	25.78	-	28.70	-	27.92	-
WAT score	7.40	-	5.97	-	6.44	-	7.05	-
SAT verbal score	477	526	379	408	389	401	444	484
SAT math score	483	538	417	474	441	480	439	490
SAT combined score	860	1064	796	882	830	881	838	974
COLLEGE								
Equated credits								
• Attempted	2.10	-	6.77	-	4.79	-	3.55	-
• Failed	0.25	-	0.55	-	0.42	-	0.43	-
• Accumulated	1.54	-	4.69	-	3.55	-	2.34	-
• Accum./attempt.	78%	-	71%	-	75%	-	71%	-
College credits								
• Attempted	11.92	-	8.29	-	9.74	-	10.66	-
• Failed	1.75	-	1.05	-	1.24	-	1.55	-
• Accumulated	9.35	-	6.63	-	7.83	-	8.34	-

Source: Tables 54-57, Appendix E

G. Type of School Attended Just Before Entering High School

Our analysis reveals that where a student attended 8th grade mattered. As Table 14 indicates, we coded each school as a BOE (public) school, a City private (including parochial) school, a school outside the City, or any other type of school. Going to a City private school is associated with strong performance and attending a City public school, a school outside the City, or any other kind of school is associated with weak performance.

Secondary school. While students from all types of schools scored above the cut score on both Regents exams, students from private schools out-performed students from all other types of school. Furthermore, within each school type, non-CUNY students out-performed CUNY students. For example, on average, non-CUNY students from BOE schools scored 71.54 on the Regents English exam and 72.23 on the Regents math exam, while CUNY students from BOE schools scored 67.51on the Regents English exam and 66.50 on the Regents math exam. We observed similar differences between non-CUNY and CUNY students in terms of English CPI units, academic GPA and, to a lesser extent, highest level of math achievement.

Note that, on average, students from private schools performed well – and those who did not go to CUNY performed outstandingly well. With a Regents English score of 75.83 and Regents math score of 76.36, they out-performed the total cohort.

College entry. Students' scores on college entrance exams confirm the pattern. On the SAT, private school students out-performed the total June 1997 cohort and earned scores that would be used to characterize them as moderately prepared for college. On the FSATs, City private school students earned the highest average scores – a passing RAT score of 31.99 and a passing MAT score of 28.05. In contrast, New York City public school students earned a passing RAT score of 29.80 and a failing MAT score of 27.44. Students from elementary schools outside the City and other types of elementary schools scored lower still.

College performance. At CUNY, students from private schools continued their superior performance. On average, they attempted only 3.76 equated credits, passed them at a rate of 74%, and accumulated 8.19 out of 10.53 attempted college-level credits. In contrast, New York City public school students attempted 4.69 equated credits, passed 71% of them, and accumulated only 7.74 out of 9.83 attempted college-level credits. Students who attended schools outside New York City and other types of schools out-performed CUNY students from New York City public schools but under-performed students from private schools.

Table 14. Type of 8th Grade School as Related to Academic Success

TEST & CREDIT VARIABLES	NYC PUBLIC		NYC PRIVATE		NON-NYC		OTHER	
	CUNY n=6,336	Non-CUNY n=16,053	CUNY n=531	Non-CUNY n=1,446	CUNY n=94	Non-CUNY n=372	CUNY n=1,598	Non-CUNY n=3,424
SECONDARY								
Regents English score	67.51	71.54	69.56	75.83	66.70	70.25	66.02	69.30
Regents math score	66.50	72.23	66.82	76.36	67.86	71.92	70.63	72.65
Highest level math course	2.55	2.90	2.64	3.07	2.58	2.67	2.52	2.65
English CPI units	3.55	3.42	3.73	3.78	3.52	3.36	3.02	2.81
Academic GPA	75.50	72.40	76.20	76.50	76.60	70.80	75.40	69.80
COLLEGE ENTRY								
RAT score	29.80	-	31.79	-	28.65	-	25.13	-
MAT score	27.44	-	28.05	-	27.57	-	27.69	-
WAT score	6.69	-	7.07	-	6.39	-	5.78	-
SAT verbal score	424	471	435	493	409	446	387	421
SAT math score	437	495	436	505	451	473	452	519
SAT combined score	861	966	871	998	860	919	839	940
COLLEGE								
Equated credits								
• Attempted	4.69	-	3.76	-	5.61	-	6.64	-
• Failed	0.47	-	0.40	-	0.57	-	0.44	-
• Accumulated	3.16	-	2.65	-	3.83	-	4.92	-
• Accum./attempt.	71%	-	74%	-	73%	-	75%	-
College credits								
• Attempted	9.83	-	10.53	-	8.32	-	8.56	-
• Failed	1.38	-	1.49	-	1.10	-	1.01	-
• Accumulated	7.74	-	8.19	-	6.42	-	7.01	-

Source: Tables 58-61, Appendix E

H. Type of High School

We found that the type of high school a student attended mattered We characterized each high school as follows:

- Schools whose students' outstanding performance on the SAT earned them National Merit recognition[25] – our proxy for a superior high school;
- school under registration review (SURR) by the SED[26] – our proxy for an inferior high school;
- vocational school; or
- another type of high school.

Attending a National Merit school was associated with strong performance, and attending a SURR school was associated with weak performance. Our research indicates that students who attended better high schools performed better – and most of them bypassed CUNY.

Secondary school. Students from National Merit schools far and away out-performed students from other types of high schools on all measures. On average, they earned passing Regents English and math scores, about four English CPI units, academic GPAs of about 80, and completed over three levels of math.

Students from SURR and vocational schools consistently fell below norms and cut scores. On average, SURR high school students failed the Regents English and math exams, achieved far fewer English CPI units, and completed far fewer levels of math than the total cohort. On average, students from vocational high schools performed better than students from SURR high schools, but they still earned borderline or failing Regents English and math exam scores and under-performed the total June 1997 cohort. Students whose schools fell into the "other" category out-performed students from SURR and vocational high schools on all measures. We lack sufficient information to account for this outcome.

[25] High schools that produced students whose 1997 SAT scores warranted National Merit recognition were Benjamin Cardozo, Midwood, Townsend Harris, Staten Island Technical, Tottenville and the selective high schools, Stuyvesant, Brooklyn Technical and Bronx High School of Science (*Handbook for College Advisors 1997-1998*, Office of Post-Secondary Planning, 1997).

[26] High schools under registration review by the SED as of November 12, 1997 were Automotive Vocational, Bushwick, Harry Van Arsdale, George Washington, Seward Park, Wadleigh and William Taft (list supplied by Office of the Mayor, November 24, 1998).

College entry. On the SATs, students from National Merit schools earned an average verbal scores of 486 (CUNY) and 545 (non-CUNY) and an average math score of 505 (CUNY) and 581 (non-CUNY). Although it is axiomatic that these students would score well on the SAT, the degree to which they surpassed the average combined score of the total cohort – about 150 points – is remarkable. Their scores would be used to characterize them as highly prepared for college. Conversely, students from other types of high schools earned SAT scores that would characterize them as minimally to moderately prepared for college.

College performance. Within the sub-groups by high school type, the weaker students went to CUNY. Only 701 out of 3,811 students from National Merit schools went to CUNY, where they performed better than any other sub-group in our study. They attempted only 2.30 equated credits, passed them at the high rate of 78%, and accumulated 9.78 college-level credits. In contrast, students from schools on the SURR list were the weakest performers. They took 7.87 equated credits and passed them at a rate of only 71%. These same students attempted only 7.46 college-level credits and accumulated only 5.74 of them.

Table 15. Type of High School as Related to Academic Success

TEST & CREDIT VARIABLES	SURR		NATIONAL MERIT		VOCATIONAL		OTHER	
	CUNY n=373	Non-CUNY n=685	CUNY n=701	Non-CUNY n=3,811	CUNY n=257	Non-CUNY n=676	CUNY n=7,228	Non-CUNY n=16,123
SECONDARY								
Regents English	60.95	62.22	74.00	80.90	65.82	64.87	67.01	69.16
Regents math	59.01	60.65	75.46	87.31	57.30	54.77	67.15	69.46
Highest level math course	2.29	2.22	3.12	3.70	2.18	2.14	2.52	2.68
English CPI units	1.45	1.46	3.82	4.24	3.34	3.06	3.53	3.22
Academic GPA	73.10	69.00	78.20	81.30	73.40	69.40	75.50	70.30
COLLEGE ENTRY								
RAT score	24.38	-	34.23	-	28.81	-	28.78	-
MAT score	24.17	-	31.55	-	25.00	-	27.40	-
WAT score	5.70	-	7.42	-	6.51	-	6.50	-
SAT verbal score	371	401	486	545	399	412	414	446
SAT math score	401	409	505	581	391	381	434	481
SAT combined score	792	810	991	1126	790	784	848	927
COLLEGE								
Equated credits								
• Attempted	7.87	-	2.30	-	5.42	-	5.10	-
• Failed	0.55	-	0.28	-	5.42	-	0.46	-
• Accumulated	5.59	-	1.64	-	0.85	-	3.53	-
• Accum./attempt.	71%	-	78%	-	67%	-	72%	-
College credits								
• Attempted	7.46	-	11.80	-	8.88	-	9.56	-
• Failed	1.11	-	0.83	-	1.59	-	1.31	-
• Accumulated	5.74	-	9.78	-	6.33	-	7.56	-

Source: Tables 62-65, Appendix E

I. Type of High School Diploma

Our research reveals that the type of high school diploma a student earned – either a Regents or local diploma – was related to student performance on college entrance exams and in the freshman year of college.[27] The Regents diploma was associated with strong performance and the local diploma was related to weak performance. Our research indicates that students who mastered a more academic high school track and, thereby, earned a Regents diploma, performed better than those who defaulted to a local diploma. Moreover, the vast majority of students who earned Regents diplomas bypassed CUNY – presumably because they could.

College entry. With combined SAT scores of 987 (CUNY) and 1019 (non-CUNY), Regents diploma students out-performed the total June 1997 cohort on the SAT – almost to the extent that National Merit school students did. Local diploma students' average combined SAT scores of 816 (CUNY) and 862 (non-CUNY) were much lower. Such performance would be used to characterize local diploma students as minimally prepared for college.

Regents diploma students also out-performed the total cohort on the FSATs. On average, they earned a RAT score of 35.59 and MAT score of 34.28, compared to local diploma students, who earned a RAT score of 27.86 and MAT score of 26.31.

College performance. Only 1,332 out of the total 7,826 Regents diploma graduates in our total June 1997 cohort went to CUNY. During freshman year, Regents diploma graduates out-performed local diploma graduates. Regents diploma graduates attempted just 1.14 equated credits and accumulated them at a rate of 85%, compared to local diploma students who attempted 5.66 equated credits and accumulated 3.90 of them at a rate of 71%. The superior performance of Regents diploma students carried over to their pursuit of college-level credits. They attempted 12.87 credits and passed 11.02. In contrast, local diploma students attempted 9.08 and accumulated only 7.05.

[27] The SED recently set new high school graduation requirements that will alter high school curricula and evaluation protocols. For more information, see Appendix A, "Background Information on New High School Graduation Requirements."

Table 1. Type of High School Diploma as Related to Academic Success

TEST & CREDIT VARIABLES	LOCAL DIPLOMA		REGENTS DIPLOMA	
	CUNY n=7,208	Non-CUNY n=13,996	CUNY n=1,332	Non-CUNY n=6,494
COLLEGE ENTRY				
RAT score	27.86	-	35.59	-
MAT score	26.31	-	34.28	-
WAT score	6.35	-	7.59	-
SAT verbal score	399	417	494	523
SAT math score	417	445	525	570
SAT combined score	816	862	1019	987
COLLEGE				
Equated credits				
• Attempted	5.66	-	1.14	-
• Failed	0.52	-	0.08	-
• Accumulated	3.90	-	0.92	-
• Accum./attempt.	71%	-	85%	-
College credits				
• Attempted	9.08	-	12.87	-
• Failed	1.35	-	1.05	-
• Accumulated	7.05	-	11.02	-

Source: Tables 66-67, Appendix E