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THE EFFECTS OF AN IN-RESIDENCE SUMMER PROGRAM ON THE ACADEMIC-YEAR PERFORMANCE OF UNDERACHIEVING DISADVANTAGED HIGH-SCHOOL YOUTH.

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A NEW YORK CITY PROGRAM TO IDENTIFY DISADVANTAGED YOUTH WITH UNDISCOVERED COLLEGE POTENTIAL AT THE END OF NINTH GRADE, TO IMPROVE THEIR MOTIVATION AND ACHIEVEMENT IN SCHOOL WORK, TO DEVELOP THEIR EXPECTATIONS FOR COLLEGE ENTRANCE, AND TO IMPROVE THEIR CHANCES FOR SUCCESS IN COLLEGE, IS DESCRIBED. DURING THE SPRING OF 1965, 579 DISADVANTAGED BOYS AND GIRLS WERE SELECTED ON THE BASIS OF EARLIER SCHOOL PERFORMANCE, SEVERE SOCIOECONOMIC HANDICAPS, STANDARDIZED TEST PERFORMANCE, AND COUNSELOR AND TEACHER RECOMMENDATIONS. AN EXPERIMENTAL GROUP OF 145 STUDENTS RANDOMLY CHOSEN FROM THE GROUP WAS GIVEN A SPECIAL 8-WEEK, IN-RESIDENCE SUMMER PROGRAM ON THE COLUMBIA UNIVERSITY CAMPUS--AN UPWARD BOUND PILOT PROJECT DESIGNED TO OVERCOME EDUCATIONAL DEFICIENCIES, DEVELOP IMPROVED ATTITUDES TOWARD LEARNING, AND DEVELOP MORE EFFECTIVE STUDY HABITS. THIS WAS FOLLOWED BY A SPECIAL SCHOOL-YEAR PROGRAM GIVEN IN FIVE HIGH SCHOOL DEVELOPMENT CENTERS, INCLUDING TUTORIAL SERVICES, CURRICULUM GUIDANCE, A CULTURAL PROGRAM, REMEDIAL WORK, BLOCK-TIME CLASSES, AND INDIVIDUALIZED INSTRUCTION. THE CONTROL GROUP OF 424 STUDENTS WAS EXPOSED ONLY TO THE SPECIAL SCHOOL-YEAR PROGRAM. AT THE END OF THE SCHOOL YEAR, THE TWO GROUPS WERE COMPARED FOR GRADES, REGENTS EXAMINATION SCORES, ATTENDANCE, AND DROPOUTS. THE EXPERIMENTAL GROUP SHOWED A SLIGHT ADVANTAGE. FURTHER RESULTS AND RECOMMENDATIONS ARE GIVEN. TABLES AND REFERENCES ARE INCLUDED. THIS PAPER WAS PRESENTED AT THE AMERICAN EDUCATIONAL RESEARCH ASSOCIATION MEETING (NEW YORK CITY, FEBRUARY 18, 1967). (LS)

THE EFFECTS OF AN IN-RESIDENCE SUMMER PROGRAM ON THE ACADEMIC-YEAR PERFORMANCE OF UNDERACHIEVING DISADVANTAGED HIGH-SCHOOL YOUTH

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Introduction

While the opportunity for higher education has been extended to an unprecedented proportion of our college-age population during the past two decades, only in recent years has attention been given to the failure of our educational institutions in developing the college potential of disadvantaged youth. In our major cities we have been witnessing a marked change in the ethnic composition of the student population in the public schools. As recently as 1957 Negro and Puerto Rican pupils accounted for less than one-third of the total public school population of New York City. Today, they comprise close to fifty per cent of the total enrollment. While the public colleges of the City of New York have gained historic recognition for serving the vast minority-immigrant groups during the early decades of

the twentieth century, disproportionately few of the city's new immigrants--the disadvantaged from the South and Puerto Rico--have been gaining entrance to the senior colleges of The City University as full-time day matriculants. For example, while "nonwhites" constitute over 40 per cent of New York City's high-school population, they comprise less than four per cent of the full-time day matriculants at Brooklyn College and Queens College.

Through a planning grant from the State of New York, the Division of Teacher Education of The City University of New York developed plans during the 1964-1965 academic year for a program to discover and develop the college potential of disadvantaged youth who, without the benefit of intensive and long-range educational support of a special nature, would be unlikely to enter college. Identified as the College Discovery and Development Program, the specific objectives were: (1) to identify disadvantaged youth who, at the end of the ninth grade, had heretofore been "undiscovered" in their potential for college, (2) to improve their motivation for school work, (3) to improve their levels of achievement in school, (4) to develop their expectations for college entrance, and (5) to improve their chances for success in college.

Identifying the Disadvantaged and Underachieving Students. During the spring of 1965 we identified a population of 579 disadvantaged boys and girls who were completing the ninth-grade in schools scattered throughout New York City. These students were adjudged "non-college bound" by their counselors, teachers and principals. Indeed many of them at the time of selection were enrolled in non-academic courses. It was agreed that those students who were already academically successful would not be selected--regardless of the extent of their socio-economic deprivation.

In the selection process, preference was given to youngsters whose home and family situations presented the most severe combination of socio-economic handicaps, such as (1) being a member of a low-income family, (2) being a member of a family on welfare or aid-for-dependent children, (3) living in a broken home or not having a father or mother, (4) having more than 4 siblings, (5) having parents and older siblings with low educational attainment, (6) having a father who is unemployed or engaged in temporary or unskilled work, (7) having parents who were born in the South or Puerto Rico, and (8) living under overcrowded conditions.

In seeking evidence of academic potential in the face of these socio-economic handicaps, combined with relatively low academic achievement, the following factors were applied in selecting boys and girls for the program: (1) a record of high academic performance earlier in the student's history (in the elementary school or in grades 7 or 8), followed by a marked and seemingly permanent decline in school performance, (2) a reading score on the Metropolitan Reading Test, administered during the ninth grade, that was markedly above the student's actual grade level, (3) scores on the Iowa Tests of Educational Development that were well above the 50th percentile, (4) high scores on other tests given in the elementary school or in grades 7, 8, or 9, and (5) uneveness of academic performance, such as outstanding work in mathematics combined with low or failing grades in other subjects.

Nominees were not required to meet all of the above criteria of high potential. Authorities on the education of the disadvantaged generally are in agreement that standardized measures of scholastic aptitude and achievement tend to discriminate against the disadvantaged. As a developmental and

longitudinal study, it was agreed that approximately 40 per cent of the nominees would be accepted without clear evidence of academic potential. For example, over 40 per cent of the nominees accepted to the Program were reading below grade level. Close attention was given to statements and ratings by counselors and teachers on factors other than scores on standardized tests. Evidences of unusual leadership ability in or out of school, special talent, aptitude, and the desire to enter the program and improve one's chances for life success were sought in statements by teachers and counselors and in student autobiographies.

Changing the High School Environment. Recognizing that the academic potentials of these boys and girls are unlikely to be developed in the conventional high-school milieu, and noting that many of these youngsters have already been marked for a general, commercial, or vocational curriculum, it was decided that a new learning environment should be created. Bloom has observed that "It is also likely that the greatest changes may take place in the individual when he enters a new level of school environment, that is, high school or college, if the new environment is different from the previous one and if it is a powerful and consistent learning environment."[1] The College Discovery and Development Program is designed to develop the college potential of disadvantaged high-school youth through a new, powerful, and consistent learning environment. According to Bloom, "It is possible that marked changes take place in interests between ages 14 and 17 and that this is the point in the adolescent period where individuals make the greatest change in determining the activities they prefer and the social and

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[1]Benjamin S. Bloom, Stability and Change in Human Characteristics. New York: John Wiley & Sons, Inc., 1964, p. 128.

occupational roles they desire."[2] He further states that "...a considerable amount of change does take place in certain personality characteristics during this period (ages 10 to 21) and that any notions of complete personality development by ages 9 and 10 are not consistent with the longitudinal evidence we have found."[3]

Through the cooperation of the New York City Board of Education, five High School Development Centers were designated (one in each borough of New York City). Each Center was located within an existing high school. While the host high schools left much to be desired in physical appearance, and although the neighborhoods of two of the schools could best be described as "slum-ghettos", it was our intent to create a new pre-college learning environment for disadvantaged youth. Some of the features of the new learning environment were block-time classes to permit individualized instruction and remedial work, a daily tutorial program involving 300 college students serving as tutor-mentors, a team of City University professors who were relieved of part of their college assignments in order to work with the faculties of the Development Centers on matters of curriculum innovation, a cultural program involving weekly visits to museums and attendance at theaters and concerts, and field trips to college campuses. Administratively, each Center was organized with its own coordinator, counselor, and faculty group---although the faculty also taught outside the Center. The plan also called for close cooperation between the Centers and the homes through parent meetings and small-group and individual conferences.

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[2]Benjamin S. Bloom, Stability and Change in Human Characteristics. New York: John Wiley & Sons, Inc., 1964, p. 163.

[3]Ibid., P. 178

Methods and Procedures

Summer and Non-Summer Groups. During the spring of 1965, the Office of Economic Opportunity announced grants for eighteen pilot Upward Bound Projects throughout the United States. One of the pilot projects was operated as a consortium by The City University of New York and Columbia University. This Upward Bound pilot project was designed as two components: (1) an in-residence, eight-week summer session on the Columbia University campus, and (2) an academic-year program in the High School Development Centers.

The Upward Bound project was limited to an initial population of 155 boys and girls who had just completed the ninth grade. Thus, for our experimental design we selected the 155 youngsters at random from our universe of 579 disadvantaged boys and girls (amounting to approximately 27 per cent of the total first-year enrollment in the College Discovery and Development Program). The 155 Upward Bound students were designated as the experimental group and participated in the eight-week summer program on the Columbia campus, followed by an academic-year program in the High School Development Centers. The control group did not participate in the summer project, but were enrolled in the academic-year program in the Development Centers. In summary, the experimental population of 145 students was exposed to the eight-week summer sessions followed by the academic-year follow-up program, while the control population of 424 students participated only in the academic-year program. In this way we could determine the effects of an eight-week in-residence summer program on the academic-year performance of the Upward Bound students.

It will be recalled that the summer group was selected at random from

the universe of 579 disadvantaged students. The randomized selection procedure was intended to provide for comparison groups (summer vs. non-summer) that were equivalent initially in aptitude and achievement. Since both groups were exposed to identical academic-year follow-up programs, the effects of the summer could be assessed according to subsequent academic achievement, attendance, and persistence in school. However, approximately 10 per cent of the students invited to participate in the summer program declined the invitation on the grounds that they had already made their summer plans. Therefore, we felt it necessary to test whether the summer and non-summer groups were actually statistically equivalent in prior aptitude and achievement. During the ninth grade, prior to their selection for the College Discovery and Development Program, all of the subjects (summer and non-summer) had taken the Iowa Tests of Educational Development. The t-test was applied to measure the significance of the differences between the mean scores on the ITED by the summer and non-summer groups. While the summer group obtained a slightly lower mean than the non-summer group, the difference was not statistically significant.

During the 1965 fall semester, following the summer program, both the summer and non-summer groups submitted to three subtests of the Stanford Achievement Test (English, Reading, and Numerical Competence), three subtests of the Differential Aptitude Tests (Verbal Reasoning, Numerical Ability, and Abstract Reasoning), and the Michigan State Test for Problem-Solving. On all three subtests of the Stanford Achievement Test, the mean scores for the summer group were lower than those of the non-summer group, but the t-tests were not statistically significant. On two of the three subtests of the DAT the mean scores for the summer group were lower than those of the non-summer group, but once again the differences between means were not significant.

Only on the DAT subtest on Abstract Reasoning was the mean for the summer group higher than the mean for the non-summer population, but the difference was not significant. On the Test for Problem-Solving, the summer group obtained a lower mean than that obtained by the non-summer group, but the difference was not significant.

Statistical Treatment. Although the differences between the summer and non-summer groups on the above test batteries in aptitude and achievement are not statistically significant, the consistently lower means obtained by the summer group indicated that the experimental and control populations were not truly equivalent groups in prior aptitude and achievement. Consequently, in comparing the academic-year performance between the summer and non-summer groups, the analysis of covariance technique was employed to compensate for the initial differences between these groups---with the Verbal Reasoning and Numerical Ability subtest scores of the Differential Aptitude Tests serving as the covariate in adjusting the mean grades obtained.

The Summer Program. The students assigned to the summer program, designated as Upward Bound, were brought into close contact with college students. Each college-student counselor was assigned a group of five Upward Bound youngsters. . The counselors resided in the dormitories with the Upward Bound students, worked with them on study skills, organized field trips to museums and community agencies, arranged for theater attendance, managed skill sessions in such activities as swimming, modern dance, chess, photography, art, and science, and supervised the recreational events. Approximately one-half of each day was devoted to formal instruction in English language arts and mathematics under the direction of licensed teachers. However, it is important to note that the formal academic program was designed so as not to duplicate the high-school curriculum. Emphasis

was given to remedial work and learning enrichment. The objectives were to overcome educational deficiencies, develop improved attitudes toward learning, and develop more effective habits of study. In the English language arts, for example, a variety of paperbacks were used which were not in the English curriculum of the high schools of New York City. The summer curriculum was designed in cooperation with the college consultants of The City University. The goal was not to enable the students to obtain advanced placement in their high-school subjects, but to generate attitudes and skills of a longer-range impact. In addition to the formal program in English and mathematics, some emphasis was given to the social studies through field trips and special lectures by Columbia University faculty with a focus on problems of urban society (sociology, economics, politics, and education).

Hypotheses and Limitations. As a longitudinal study, it was hypothesized that repeated in-residence summer programs on a college campus will result in (1) higher achievement in high school, and (2) a lower dropout rate from the special academic-year follow-up program for disadvantaged youth. This report is limited to the findings from one summer session only and, therefore, the results must be regarded as tentative. Moreover, the findings relate to the effects of a summer program on subsequent school achievement when the summer program was deliberately designed so as not to duplicate the actual curriculum of the high school. This investigation does not include changes in attitudes, values, and self-concept.

In experimental studies in the behavioral sciences, it is commonly the practice to compare the experimental group against a "wooden-legged competitor"[4]

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[4]Lee J. Cronbach, "The Nature of Learning," in Paul C. Rosenbloom (Ed.), Modern Viewpoints in the Curriculum. New York: McGraw-Hill Book Company, 1964. p. 24.

--a control population that receives no special treatment whatsoever. In our study we were interested in comparing our summer group against a population that was exposed to a high-powered academic-year program for disadvantaged youth.

Findings

As mentioned earlier, the academic performance during the tenth grade by the experimental (summer) and control (non-summer) populations was compared through the analysis of covariance technique in order to compensate for initial differences between the two groups. The composite Verbal Reasoning-Numerical Ability (VR + NA) score on the Differential Aptitude Tests was used as the covariate in adjusting the means for both fall and spring semester averages, and also for the New York State Biology Regents Examination scores. The Numerical Ability score of the DAT was used to adjust the Regents Examination scores in algebra and geometry.

To make the N's of the much larger control (non-summer) population approximately equal to those of the experimental (summer) population, samples were drawn from the former group. Covariate adjustments were not made in instances where the means were virtually equal.

Fall Semester Averages. The adjusted mean grades for all courses combined at the end of the first semester revealed that the summer or Upward Bound group obtained a significantly higher mean at the .05 level than the non-summer group. These data are presented in Table I along with the adjusted means for the two groups within each of the five High School Development Centers. In Center III the F was 5.758 and was significant

at the .01 level. Interviews with teachers at the High School Development Centers during the fall semester disclosed that many teachers viewed the summer group as a "problem" because this group showed an academic advantage over the non-summer group. These teachers confessed that they were having difficulty in "keeping the summer group down to the level of the rest of the class." However, the data in Table I fail to reveal a truly dramatic difference between the two groups in fall semester grades. On the other hand, many of the students in the summer or Upward Bound group complained that high school was somewhat of a "letdown" after having spent a summer "at college."

Spring Semester Averages. At the end of the spring semester, the grades for all courses combined, excluding Regents Examinations, showed that the summer or Upward Bound group obtained only a slightly higher adjusted mean than that of the non-summer group, and that the difference was not statistically significant. In Table II we also find that the non-summer group in Center IV obtained a higher mean than the summer group, with the difference being significant at the .05 level. However, in Center II, the adjusted mean for the summer group was almost six points higher than the non-summer group, and was significant at the .05 level.

TABLE I

ANALYSIS OF COVARIANCE:
ADJUSTED MEANS FOR FALL SEMESTER GRADES
(SUMMER VS. NON-SUMMER GROUPS)

Center	Summer		Non-Summer		Difference	F
	N	Mean	N	Mean		
I	35	70.51	33	71.98	-1.47	.335
II	21	79.86	21	75.14	4.72	5.758*
III	29	77.23	30	70.31	6.92	7.482**
IV	24	74.85	24	75.44	- .59	.393
V	25	75.81	25	73.35	2.46	1.020
TOTAL	134	75.38	133	72.80	2.58	5.52 *

*Significant at the .05 level.
**Significant at the .01 level.

TABLE II

ANALYSIS OF COVARIANCE:
ADJUSTED MEANS FOR SPRING SEMESTER GRADES
(SUMMER VS. NON-SUMMER GROUPS)

Center	Summer		Non-Summer		Difference	F
	N	Mean	N	Mean		
I	30	69.13	30	72.81	-3.68	1.54
II	21	78.30	21	72.32	5.98	4.83*
III	33	73.48	33	68.58	4.90	2.097
IV	24	74.32	24	78.14	-3.82	6.55*
V	24	72.98	25	71.26	1.72	.375
TOTAL	132	73.38	133	72.29	1.09	.701

*Significant at the .05 level.

Regents Examination Scores in Algebra and Geometry. It will be recalled that systematic instruction in mathematics was provided for the summer or Upward Bound group. However, the summer program in mathematics was not designed to cover the regular high-school curriculum in algebra or geometry. Nevertheless, as the eight-week session was drawing to a close, it was apparent that a considerable number of the students showed sufficient achievement in algebra so that authorization was granted for them to take the Algebra Regents Examination. A majority of these students received passing grades on the Algebra Regents and were programmed for geometry upon entering the tenth grade in the fall. Consequently, only a relatively small group of Upward Bound or summer students were enrolled in algebra during the tenth grade. Therefore, the true effects of the summer program cannot be obtained from comparing the adjusted means between the summer and non-summer groups on the Algebra Regents during the tenth grade. In effect, the summer group enrolled in algebra during the tenth grade represents a depleted population. The analysis of covariance in Table III reveals that the non-summer group obtained a slightly higher mean than that of the summer group on the Algebra Regents in the tenth grade, but the difference was not statistically significant.

On the other hand, the covariance analysis comparing the summer and non-summer groups on the Geometry Regents Examination taken at the end of the tenth grade presents a statistically significant difference at the .01 level in favor of the Upward Bound or summer group. These data are presented in Table IV. The summer group obtained an adjusted mean score on the Geometry Regents Examination that was 9.38 points higher than that for the non-summer group.

TABLE III

ANALYSIS OF COVARIANCE:
ADJUSTED MEANS FOR THE ALGEBRA REGENTS EXAMINATION
(SUMMER VS. NON-SUMMER GROUPS)

Center	Summer		Non-Summer		Difference	F
	N	Mean	N	Mean		
I	15	61.93*	18	67.83*	-5.90	.978
II**	--	-----	--	-----	-----	---
III**	--	-----	--	-----	-----	---
IV	15	63.25	11	58.78	4.47	.230
V	12	62.23	10	55.21	7.02	.602
TOTAL	53	64.71	55	66.02	-1.31	.116

*Unadjusted.
**Comparisons not possible because of small N's.

TABLE IV

ANALYSIS OF COVARIANCE:
ADJUSTED MEANS FOR THE GEOMETRY REGENTS EXAMINATION
(SUMMER VS. NON-SUMMER GROUPS)

Center	Summer		Non-Summer		Difference	F
	N	Mean	N	Mean		
I*	--	-----	--	-----	-----	-----
II*	--	-----	--	-----	-----	-----
III	14	76.69	17	63.26	13.43	6.030**
IV	13	74.19	17	74.04	.15	.004
V	12	73.17	14	61.33	11.84	1.962
TOTAL	66	75.78	60	66.40	9.38	11.029***

* Comparisons not possible because of small N's.
** Significant at .05 level.
*** Significant at .01 level.

Regents Examination Scores in Biology. It will be recalled that while the Upward Bound students received formal instruction in mathematics during the summer program, no instruction was provided in biology. In Table V we find that the analysis of covariance shows no statistically significant difference in the Biology Regents scores obtained by the summer and non-summer groups, although the latter obtained a slightly higher adjusted mean. Apparently the eight-week summer program, which provided no instruction in biology, produced no noticeable effect on the Biology Regents Examination which represented the culmination of a full academic year or 44 weeks of study in this field.

TABLE V

ANALYSIS OF COVARIANCE:
ADJUSTED MEANS FOR THE BIOLOGY REGENTS EXAMINATION
(SUMMER VS. NON-SUMMER GROUPS)

Center	Summer		Non-Summer		Difference	F
	N	Mean	N	Mean		
I	26	63.96	31	66.90	-2.94	.825
II	21	68.56	17	71.72	-3.16	.907
III	28	68.39	23	69.35	- .96	.082
IV	24	73.25	23	72.91	.34	.017
V	22	63.03	25	61.97	1.06	.041
TOTAL	121	67.42	119	68.23	- .81	.375

Academic-Year Attendance. The attendance records over the entire school year in the tenth grade were used as a criterion for assessing motivation for education. In Table VI we find that while the number of absences during the tenth grade was slightly lower for the Upward Bound or summer group, the F-ratios were not statistically significant. (The ninth-year absences were used in adjusting the means for absences during the tenth grade).

As a further follow-up of attendance as a criterion of motivation, it was decided that the academic-year attendance records for the combined summer and non-summer groups be compared with those of college-preparatory students attending the five host schools in which the High School Development Centers were located. Thus, instead of comparing the total College Discovery population (summer and non-summer groups combined) against a population of similarly disadvantaged and underachieving tenth-graders, or what we would term a "wooden-legged competitor," it was decided to compare the attendance records against what might be considered our theoretical ideal. A random sample of the college-preparatory enrollment was made in each host school and attendance records for these students were compared with those of the College Discovery students within each of the five schools.

It should be emphasized that since each Center served a borough-wide population of College Discovery students, these youngsters spent considerably more time in travelling between home and school than the college-preparatory students who, for the most part, had elected to attend a high school within relatively easy commuting distance from their homes. Moreover, the College Discovery students were exposed to a longer school day as the result of block-time classes and additional tutoring before and after school. Therefore,

It was hypothesized that the record of absenteeism would be significantly higher for the College Discovery students than for the college-preparatory boys and girls.

Despite a two-week transit strike near the end of the first semester, attendance on the part of the College Discovery students in all five Centers combined was slightly, but not significantly better than the attendance records of the college-preparatory populations in all five host schools combined.

Because of the two-week transit strike during the fall semester, it was decided that a separate analysis be made of attendance on the part of the College Discovery and college-preparatory populations during the spring semester. As shown in Table VII, the difference between the unadjusted means were in favor of the combined College Discovery populations at the .01 level. Only in one of the five schools did the college-preparatory population have a lower record of absences (School V), but this was attributed to the fact that the college-preparatory population lived within very close proximity of this school.

It would appear that the remarkably good attendance records on the part of the College Discovery students are indicative of the high level of motivation which was sustained from participating in a special academic-year program.

TABLE VI

ANALYSIS OF COVARIANCE:
ADJUSTED MEANS FOR ACADEMIC-YEAR ABSENCES
(SUMMER VS. NON-SUMMER GROUPS)

Center	Summer		Non-Summer		Difference	F
	N	Mean	N	Mean		
I	31	22.21	22	20.39	1.82	.255
II	18	16.37	16	16.83	- .46	.015
III	26	22.65	22	26.13	-3.48	.398
IV	22	8.41	20	8.27	.14	.133
V	19	10.16	19	11.74	-1.58	.467
TOTAL	116	16.66	99	17.36	- .70	.144

TABLE VII

COMPARISONS OF COLLEGE PREPARATORY AND COLLEGE DISCOVERY POPULATIONS
IN
SPRING-SEMESTER ABSENCES
(UNADJUSTED MEANS)

School	Means		Diff. Bet. Means	t
	Control	CDD		
I	13.31	8.48	4.83	2.978**
II	12.76	7.38	5.38	3.045**
III	10.85	9.75	1.10	.663
IV	8.29	4.44	3.85	4.956**
V	4.82	6.29	-1.47	-2.036*
TOTAL	10.24	7.45	2.79	4.133**

** Significant at the .01 level.
* Significant at the .05 level.

Dropouts. At the end of the first academic year, 10.1 per cent of the non-summer students had dropped out of the College Discovery and Development Program, while only 7.1 per cent of the Upward Bound or summer group had dropped out. The dropout rate will be a key criterion in assessing the effects of the summer program as the students advance to the senior year of high school.

Conclusions and Recommendations

In this research, the Upward Bound group was compared in academic-year performance with a special College Discovery population which received an identical academic-year follow-up program. One might not anticipate that one eight-week summer session would produce a measurable effect on scholastic achievement and attendance through a 44-week academic year, especially when the control group constitutes a special College Discovery and Development population. Nevertheless, at the end of the fall semester, the Upward Bound students obtained significantly higher grades (at the .05 level) in their academic subjects than their College Discovery counterparts. Moreover, the Upward Bound students outscored the College Discovery pupils significantly (at the .01 level) in the Geometry Regents Examination. Academic performance in other subjects was not significantly different for the two groups. However, the Upward Bound or summer group had a lower dropout rate than the non-summer group at the close of the first academic year.

Had the attendance and achievement records of the Upward Bound students been compared with those of similarly disadvantaged and underachieving tenth-graders enrolled in conventional academic-year programs, there is little doubt in the minds of the investigators that the Upward Bound students would have outstripped their counterparts significantly and dramatically on most measures. Indeed, it is commonly the practice in such research to compare

the performance of the experimental group against that of a similarly disadvantaged and underachieving group which receives the benefit of no special educational program during the academic year. But this would only be tantamount to running against what has been referred to as a "wooden-legged competitor."

As a longitudinal study, it is hypothesized that participation in repeated summer programs will eventually find the Upward Bound group at a significant advantage over the College Discovery population, not only in academic achievement, but in rate of college entrance and performance in college.

Nevertheless, a number of changes in the summer program have been effected as a result of the findings of this study. During the 1966 summer session for the new class of Upward Bound students, the formal academic program was deliberately keyed to acceleration in high school by preparing these students for Regents Examinations. As a consequence, 108 of the new Upward Bound population took the Regents Examination in Algebra at the end of the eight-week summer program, with a majority obtaining passing grades. Most of these Upward Bound students who passed the Algebra Regents at the end of the summer session had been programmed in the ninth grade for non-academic mathematics. It is evident that these students should have been enrolled in algebra during the ninth grade. These findings point to the need for the New York City schools to re-examine the criteria and procedures for placing students in non-academic mathematics in the ninth grade.

On the Biology Regents, of the 41 Upward Bound students taking the test at the end of the summer, 70 per cent received passing scores. In the Geometry Regents, eleven of fourteen new Upward Bound students taking the

examination at the end of the summer received passing scores.

From the findings in this research, it would appear desirable to explore ways during the academic year of capitalizing on the special learning experiences which derive from participation in the Upward Bound summer program. Merely to treat this population as though it had not been exposed to an Upward Bound summer program would only serve to thwart or to dissipate the advantages which might be obtained when high-school youngsters experience living and studying on a college campus.

Our research has also shown that disadvantaged and underachieving students can be motivated, through the creation of a highly supportive academic-year environment, so that their records of school attendance become significantly better than those of college-preparatory students enrolled in the same schools. These findings were not anticipated because we were comparing disadvantaged-underachieving students against college-preparatory students. Results of these comparisons are indicative of the high level of motivation sustained throughout the school year on the part of the Upward Bound and College Discovery populations.

On February 4, 1967, the Board of Education of New York City announced that it was ready to launch a large-scale College Bound program in the fall of 1967, which will enroll from 2,000 to 3,000 disadvantaged ninth and tenth-graders who ordinarily would not be expected to go on to college. From our research we have discovered that many boys and girls who are fully capable of doing high-quality academic work are being placed in non-academic classes in the ninth grade. In launching the large-scale College Bound program, it is recommended that the New York City schools overhaul their criteria and procedures for placing disadvantaged ninth-graders in non-academic classes. When we improve the learning environment for disadvantaged youth, traditional standards and mechanisms for assessing college potential and grouping students for non-academic classes become outmoded.