

R E P O R T R E S U M E S

**ED 011 683**

CG 000 124

DISCOVERING AND DEVELOPING THE COLLEGE POTENTIAL OF DISADVANTAGED HIGH SCHOOL YOUTH, THE COLLEGE DISCOVERY AND DEVELOPMENT PROGRAM. A REPORT OF THE FIRST YEAR OF A LONGITUDINAL STUDY.

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PUB DATE JAN 67

EDRS PRICE MF-\$0.36 HC-\$10.52 263P.

DESCRIPTORS- \*DISADVANTAGED YOUTH, COLLEGE HIGH SCHOOL COOPERATION, \*SPECIAL PROGRAMS, \*UNDERACHIEVERS, \*COLLEGE PREPARATION, ACHIEVEMENT TESTS, SUMMER PROGRAMS, \*STUDENT DEVELOPMENT, APTITUDE TESTS, UPWARD BOUND, ANALYSIS OF VARIANCE, COLLEGE DISCOVERY AND DEVELOPMENT PROGRAM, NEW YORK CITY

THIS REPORT PRESENTS A 1ST-YEAR SUMMARY OF THE COLLEGE DISCOVERY AND DEVELOPMENT PROGRAM INSTITUTED BY THE CITY UNIVERSITY OF NEW YORK AND THE NEW YORK CITY SCHOOL SYSTEM. THE AIM OF THE LONGITUDINAL PROGRAM IS TO IDENTIFY DISADVANTAGED AND UNDERACHIEVING NINTH GRADERS AND TO DEVELOP THEIR COLLEGE POTENTIAL IN SPECIAL HIGH SCHOOL DEVELOPMENT CENTERS. IN THIS 1ST YEAR, 579 STUDENTS WERE IDENTIFIED AND ENROLLED IN FIVE CENTERS WHICH PROVIDED SMALL CLASSES, BLOCK-TIME STUDIES, CULTURAL ACTIVITIES, AND FULL-TIME COUNSELORS. THE UNIVERSITY FACULTY SERVED AS CURRICULUM CONSULTANTS, AND COLLEGE STUDENTS TUTORED THE YOUTH. A SUMMER PROGRAM IN CONNECTION WITH THE "UPWARD BOUND" PROGRAM AT COLUMBIA UNIVERSITY WAS ALSO PROVIDED. RESEARCH USING ACHIEVEMENT AND APTITUDE TESTS IS BEING DONE TO COMPARE THE DISADVANTAGED YOUTH TO REGULAR COLLEGE PREPARATORY YOUTH IN EACH OF THE FIVE HIGH SCHOOLS. THE CENTERS ARE ALSO BEING COMPARED ON SOCIOECONOMIC FACTORS AND STUDENT TEST RESULTS. THE LONGITUDINAL STUDY OFFERS OPPORTUNITY FOR MUCH RELATED RESEARCH, SUCH AS STUDIES OF ATTITUDES AND SELF-CONCEPT OF THE SELECTED STUDENTS. (NS)

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DISCOVERING AND DEVELOPING THE COLLEGE POTENTIAL  
OF  
DISADVANTAGED HIGH SCHOOL YOUTH

A Report of the First Year of a Longitudinal Study

on

THE COLLEGE DISCOVERY AND DEVELOPMENT PROGRAM

by

Daniel Tanner

and

Genaro Lachica

January, 1967

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A REPORT OF THE OFFICE OF RESEARCH AND EVALUATION

## FOREWORD

This is a report on the first year of a longitudinal study. The subjects, who were selected at the end of the ninth grade, will be followed up through high school and into college. Therefore, any findings other than those which describe certain characteristics of the students and their backgrounds, must be regarded as tentative.

This report is intended to give focus and direction to certain research strategies and problems which will be of major concern throughout the duration of the College Discovery and Development Program. The Program offers a variety of possible investigations, a few of which are mentioned briefly in this report.

The reader is cautioned against drawing any final conclusions from the first-year findings. At best, some of the data at this stage can serve to point out certain possible trends and to expose avenues for further inquiry.

## ACKNOWLEDGMENTS

The researchers are grateful to Chancellor Albert H. Bowker, Vice Chancellor Harry L. Levy, and Dean Harry N. Rivlin of the City University for their full support of the College Discovery and Development Program. With Dean Rivlin, Professor Albert J. Harris, Director of the Office of Research and Evaluation of the Division of Teacher Education, gave much of his time in offering wise counsel and direction throughout every stage of the project.

Dr. Bernard Donovan, Superintendent of Schools, and Dr. John B. King, Deputy Superintendent of Schools, supported the College Discovery and Development Program from its very inception and provided key leadership through its most critical phases. Invaluable counsel and leadership were provided by many other members of the staff of the Board of Education, namely: Associate Superintendent Maurice D. Hopkins; Associate Superintendent J. Wayne Wrightstone; Assistant Superintendent Jacob Landers; Assistant Superintendent Seelig Lester; Miss Florence Myers, Coordinator of the College Discovery and Development Program for the Board of Education; and Mr. Harold Zuckerman, Coordinator of College Guidance and Scholarships for the Board of Education.

Professor Aaron Carton of the Division of Teacher Education offered invaluable suggestions for certain conceptual aspects of the study. Professor Maurice Lohman of the Division of Teacher Education provided expert advice concerning the selection of instruments and the programming of data. Dr. Carl Steinhoff and Mrs. Ines Sala of the project staff were most helpful in handling many administrative details. Mr. Lian-Hwang Chiu, Mr. Martin Edelman, and Mr. Henry Tanners performed most ably in the task of gathering and processing various data. We are grateful to Mrs. Ruth Bruskin, project secretary, for her competent assistance with virtually every facet of the Program including the typing of this manuscript.

We are deeply indebted to the principals, administrative assistants, coordinators, counselors, faculty at the five high schools, and the college curriculum consultants without whom this study would not have been possible.

And, finally, we are grateful for the financial assistance offered by the State of New York, the Office of Economic Opportunity, the U. S. Office of Education, and the Community Action Board of New York City.

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## CHAPTER I

### BACKGROUND AND DEVELOPMENT

In recent years, officials of The City University and the Board of Education of the City of New York have been giving increasing attention to the problem of unrealized academic potential among disadvantaged high-school youth. Under the leadership of Chancellor Albert H. Bowker and Dean Harry L. Levy, preliminary plans were developed during the 1963 fall semester for admitting from 250 to 500 disadvantaged high-school graduates each year as "special matriculants" to two or more community colleges of The City University. This program was designed to discover college potential among youth who had completed a non-academic curriculum in high school and who heretofore had not been identified as college preparatory students.

As these plans were being formulated, Dean Harry N. Rivlin of the Division of Teacher Education proposed a second phase or "prong" to this program through which a population of from 500 to 600 disadvantaged and underachieving boys and girls would be identified each year at the end of the ninth-grade and enrolled in High School Development Centers where their college potential could be developed. Through a special grant from the State of New York, Prong I was initiated in June of 1964 with the admission of 230 high-school graduates to the Bronx Community College and Queensborough Community College. Also through the funding of this grant, an all-college faculty group in teacher education was established during the fall semester of 1964 to work with representatives of the Board of Education of New York City in drafting plans for the College Discovery and Development Program (Prong II).<sup>1</sup> In the spring of 1965 approximately 580 boys and girls were selected for enrollment the following fall in the tenth grade at five High School Development Centers (a Center having been designated for each Borough of the City of New York). As the program for Prong II progressed, additional financial support was provided: (1) through the Office of Economic Opportunity to support an Upward Bound component project; (2) through the Office of Education to support a tutoring project under the College Work-Study Program; and (3) through the Community Action Board of New York City to provide student stipends.

This report is limited to the College Discovery and Development Program (Prong II). Before describing in detail the specific phases and operations of

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<sup>1</sup>Report of the Planning Committee of the College Discovery and Development Program. New York: Division of Teacher Education of The City University of New York and The Board of Education of the City of New York, February 1, 1965 (mimeographed). 54 pages.



Prong II, a brief discussion of the general conditions leading to this special Program should be helpful to the reader.

Although the Program was not planned exclusively for "nonwhite" boys and girls, officials of The City University have long been aware of the great disparity between the "nonwhite" enrollment in the high schools of New York City and that of The City University. For example, while the "nonwhites" constitute over 40 percent of the high-school population of New York City, they comprise less than four percent of the full-time day matriculants at Queens College and Brooklyn College. Historically, the colleges of the City of New York have achieved recognition for serving disadvantaged and minority groups. But disproportionately few of the city's new immigrants--from the South and Puerto Rico--are gaining entrance to the senior colleges of The City University as full-time day matriculants. Yet surveys by the Board of Education, taken each year since 1957, show an increase in Negro and Puerto Rican pupils accompanied by a decline in white students. For example, the school census of 1957 reported that 31.7 percent of the pupil population was comprised of Negroes and Puerto Ricans. In 1965 these groups constituted 48.2 percent of the city's school population.<sup>2</sup> The census of 1965 also revealed that the Negro and Puerto Rican students comprised 57 percent of the enrollment in the city's vocational high schools, while accounting for only 32.6 percent of the enrollment in the city's academic high schools.<sup>3</sup> Similar patterns and trends are reported for other major cities such as Chicago, Detroit, and Philadelphia.<sup>4</sup>

In the Second Interim Revision of the Master Plan for The City University, it is proposed that by 1975, some 6.6 percent of the entering classes to the various units of The City University will be drawn from "college discovery" populations.<sup>5</sup> As mentioned earlier, the College Discovery Program of The City University consists of two "prongs" or phases at the present time. Prong I is concerned with the selection of high-school seniors who are not eligible for the transfer program of the community colleges and who are enrolled in a special freshman year program of the academic-transfer program of The City University's community colleges. Prong II is designed to select disadvantaged and underachieving students who are completing the ninth-grade and, through a special curriculum in selected high schools, prepare them for eventual entrance to a senior college or to an academic-transfer program of a

<sup>2</sup>The New York Times, "Racial Patterns Shift in Schools," June 7, 1966, pp. 1, 36.

<sup>3</sup>Ibid., p. 36

<sup>4</sup>The New York Times, "Integration and White Exodus," June 12, 1966, p. E 11.

<sup>5</sup>Board of Higher Education of the City of New York, Second Interim Revision of the 1964 Master Plan for The City University of New York. New York: The City University, June, 1966. p. 58.

community college. This report is concerned only with Prong II of the College Discovery Program and, because of the key emphasis given to long-range developmental goals, Prong II will hereafter be referred to as the College Discovery and Development Program, or more briefly as CDD.

Objectives. The major objective of the Program is 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. It was agreed that those students who are already academically successful would not be included in the Program--regardless of the extent of their socio-economic deprivation.

The specific objectives of the Program are: (1) to identify disadvantaged youth who, at the end of the ninth-grade, have 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.

The full commitment to the CDD on the part of The City University is exemplified by the fact that admission to one of its units (a community college or a senior college) is guaranteed any student who completes the Program and is recommended by the High School Development Center.

#### Selection Criteria and Procedures

The plan called for the selection of several hundred disadvantaged boys and girls who were finishing the ninth-grade. These youngsters were to be enrolled in five high-school centers where considerable curriculum innovation and intervention could be provided. During the 1965 spring semester, every junior and senior high school in New York City with a ninth grade was invited to submit nomination for the CDD. Nomination quotas were assigned to each school, with weightings favoring those schools serving geographic areas of the city with the greatest concentration of socio-economic deprivation. Of the more than 1,200 nominations received, 579 boys and girls were enrolled in September of 1965 as members of the first class in the CDD. The nominations were made by the school counselors with the assistance of teachers. All nominations were reviewed for final decision by a Selection Committee composed of representatives of The City University's Division of Teacher Education and the Board of Education of the City of New York, including the principals and coordinators of the five High School Development Centers.

The remainder of this section of the report summarizes the major selection criteria applied to the initial population.

Disadvantaged. Several criteria were applied in determining the socio-economic qualifications for each candidate. A candidate whose family is receiving welfare or aid to dependent children automatically was adjudged "disadvantaged." The total family income of each candidate was calculated on a per capita household basis, and those candidates with the lowest per capita family income were given preference. All sources of income were included in the calculation, including contributions by persons other than the head of household, social security, insurance, support payments, and money from employed siblings and relatives.

In addition to the criterion of income, the Life Chances Scale, from Dentler and Monroe, was used to gauge certain family circumstances which have a bearing on socio-economic opportunities and handicaps.<sup>6</sup> Youngsters with low life chances were given preference. Candidates with high life chances were those having (1) families that are intact, (2) families that are small in size (fewer than four siblings), (3) fathers who are high-school graduates, (4) mothers who are high-school graduates, and (5) fathers who hold skilled or managerial jobs, are self-employed, or are engaged in professional occupations. The Life Chances Scale was modified to include the birthplace of the parents. A candidate whose father and/or mother is native born North would be credited with one or two higher Life Chances than a candidate whose parents were born in Puerto Rico or in the South. Another related factor added to the Life Chances Scale is the crowdedness of the dwelling unit. Thus a candidate living under overcrowded conditions (more than one person per room) was credited with an additional factor of deprivation. Candidates ordinarily were disqualified if a member of the immediate family had a history of college attendance. In summary, the most favored candidates for selection were those with the lowest Life Chances: (1) living in a broken home or not having a father or mother, or living in a foster home or institution, (2) having more than four siblings, (3) having a father who is not a high-school graduate, (4) having a mother who is not a high-school graduate, (5) having a father who is unemployed or engaged in temporary or unskilled work, (6) having a father who was born in the South or Puerto Rico, (7) having a mother who was born in the South or Puerto Rico, (8) living under overcrowded conditions, and (9) being a member of a family that is on welfare or is receiving aid to dependent children.

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<sup>6</sup> See Robert A. Dentler and Lawrence J. Monroe, "The Family and Early Adolescent Conformity," Marriage and Family Living, XXIII, 3:241-47, August, 1961.

High Potential Relative to Low Achievement. Since the selection process was undertaken soon after the midyear grades for the ninth year were available, these grades were a key criterion. As mentioned earlier, a candidate with relatively high academic achievement was given lowest priority regardless of his socio-economic circumstances. (Some exceptions were made for students enrolled in special service schools or in vocational high schools, and for candidates with particularly severe socio-economic handicaps).

The policy of The City University has been to consider for admission to its senior colleges those graduates of academic high schools who rank in the top quarter of the entire body of all high schools. In recent years the number actually admitted has been regulated to fit the fiscal and spatial capacities of the colleges by adjusting the minimum high-school grade average. This has resulted in a floor of approximately 85 percent in the high-school average.

The mean ninth-grade average of the students admitted to the CDD Program was 75.6--approximately 10 points below the minimum high-school average required for admission to one of the senior colleges of The City University. However, it should be borne in mind that the ninth-grade averages of the students selected for CDD were inflated considerably for two reasons: (1) many students had been programmed for general mathematics instead of academic mathematics under the assumption that they were incapable of or insufficiently prepared for an academic curriculum, and (2) a majority of the students were enrolled in special service schools or schools serving disadvantaged neighborhoods; consequently, the ninth-grade averages of students in such schools could not be regarded as in any way comparable to those of students in schools where preparation for college is a dominant function. Furthermore, as stated earlier, the youngsters selected for CDD had heretofore not been identified as "college material."

In the absence of I.Q. scores, the following factors were applied to the criterion of "high academic potential": (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 is markedly above the student's actual grade level; (3) scores on the Iowa Tests of Educational Development that are 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) unevenness of academic performance, such as outstanding work in mathematics combined with low or failing grades in other subjects.



It should be noted that, for acceptance to the Program, nominees were not required to meet all of the above criteria of high potential. Authorities on the education of the disadvantaged generally accept the premise that our standardized measures of scholastic aptitude and achievement tend to discriminate against the disadvantaged.

This leads to the paradoxical question: "How does one identify academic potential among the disadvantaged if this potential is masked or hidden?" As a developmental and longitudinal study, it was agreed that approximately 40 percent of the nominees would be accepted without clear evidence of academic potential. For example, over 40 percent 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. Some of these factors are discussed below.

Leadership, Special Aptitudes, Creativity, and Personality Factors. A special nomination form to be completed by the guidance Counselor provided additional information concerning the nominee's potential--giving evidence of any special aptitude, talent, creativity, or leadership in or out of school. A rating scale was devised (see Appendix) to elicit counselor and teacher judgments of certain personality attributes of the nominees. For example, one of the chief personality factors sought for was assertiveness ("asserts himself when he believes that he is in the right") versus passive-conforming behavior--the assumption being that the independent-assertive youngster from a disadvantaged background is penalized academically through such behavior, while the academic potential of the passive-conforming youngster is likely to be overestimated.

Documentation of leadership activities in the school and community was provided through the nomination form and, in special cases, through telephone interviews with counselors and teachers. In addition, autobiographical statements written by the students themselves were carefully reviewed in the selection process.

Desire to Enter the Program. Each nominee was interviewed by his school guidance counselor and informed about the CDD Program. No student was nominated or admitted without giving evidence of a desire to enter the Program. Very few youngsters decline the opportunity to be nominated and to submit detailed information concerning their own home situations including an autobiographical statement. After notification of acceptance to the Program, the students were invited to orientation meetings at the five high school centers with the understanding that they reserved the right to withdraw from the Program at any time. (The relatively few who chose to withdraw

have reported that they were disappointed in the physical appearance of the school, the ghetto neighborhood of the school, or the great distance and difficulty in securing transportation between home and school).

Style and Content of Student's Autobiographical Statement. Each nominee was required to write an autobiographical statement which was read carefully for content and style of expression. While the autobiographical statement was not the most important factor in student selection, it was nevertheless a contributing factor. Unusually strong and weak statements were recorded for follow-up purposes.

School Attendance. Youngsters having a history of chronic truancy during the ninth grade ordinarily were not selected. In a few instances, however, students were accepted where it was determined that the truancy was caused by extenuating circumstances of a temporary nature.

Severe Physical and Emotional Disability. Nominees with a history of severe physical disability or emotional problems that require clinical help over and above what school personnel (and part-time specialists) could provide within a school setting were not knowingly admitted to the Program.

Ratio of Boys to Girls. The ratio of boys to girls admitted to the Program was approximately 60:40. The selection of more boys than girls was based on the assumption that among the disadvantaged it is the male who, lacking in education and salable skills, is likely to be unemployed and to desert the family. Moreover, the female is likely to marry early and forego a college education, even though she may show considerable college potential.

Age. Youngsters whose chronological age was two or more years above the usual ninth-grade placement were not selected.

Exceptions. The selection staff was allowed to waive any of the selection criteria when special circumstances indicated the desirability of admitting a particular boy or girl. Relatively few exceptions were made.

#### Rationale

In New York City, as in other major urban centers across the nation, a considerable proportion of adolescents in the secondary schools fail to show satisfactory academic performance as the result of an environment of socio-economic deprivation. They are lacking in self-esteem, self-confidence, and educational aspiration. To these adolescents and their families, college entrance is remote and unreal. These adolescents tend to regard schooling as a necessary hurdle to vocational goals,



rather than as a challenging opportunity for self-improvement and life success. Since the academic potentials of these boys and girls are not likely to be developed in the conventional high-school milieu, and 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."<sup>7</sup> The CDD is designed to develop the college potential of disadvantaged high school youth through a new, powerful, and consistent learning environment.

The attempt to create a new learning environment for these boys and girls should not be interpreted to mean that they are different from other high-school students in their basic needs, drives, interests, and aspirations. Indeed every human being needs to feel a sense of personal recognition or belonging, needs to develop intellectually, needs to achieve assurance of economic independence, needs to achieve socially responsible behavior, needs to gain vocational success, and needs to attain emotional independence.<sup>8</sup> In the conventional academic milieu of the high school, however, many disadvantaged youth are unable to realize their educational potentials because of the limitations imposed by a deprived environment at home and in their immediate community. Moreover, the conventional academic milieu of the high school is often not equipped or attuned to the problems of under-achieving, disadvantaged youth. From a growing body of literature on the education of the disadvantaged, it would appear that many disadvantaged youth tend to be lacking in long-range educational aspirations because (1) they are rarely in close association with youth who are attending or who plan to attend college, (2) their socio-economic limitations have caused them to conceive of education as a step toward more immediate vocational goals, (3) the limitations imposed by a disadvantaged environment have resulted in a relatively low level of self-esteem and self-confidence in the formal academic setting of the high school, (4) their lack of consistent success experience in the formal academic milieu has produced a self-fulfilling prophecy of low achievement and failure, (5) they are not sufficiently in close contact with those who are experiencing upward mobility in the socio-economic order, (6) they tend to have an inadequate understanding of middle-class

<sup>7</sup> Benjamin S. Bloom, Stability and Change in Human Characteristics. New York: John Wiley & Sons, Inc., 1964, p. 128.

<sup>8</sup> See Robert J. Havighurst, Developmental Tasks and Education. New York: Longmans, Green and Co., 1948.

persons and the avenues for upward mobility, (7) they are exposed to a school setting which tends to inculcate "feminine" values while their environment leans towards "masculine" values, and (8) high school teachers and the academic curricula tend to be attuned to middle-class values and needs.

Disadvantaged youth tend to find the academic program of the high school to be "nervous and impatient." Lacking speed and accuracy in basic skills, they do not perform well in school exercises that are timed. As a result, their level of performance does not reflect their real academic potential. Low achievement and failure become normal expectations to many disadvantaged youth. As mentioned previously, they do not have either the familial or extra-familial support which derives from contact with upwardly-mobile youth having high educational aspirations and expectations.

Adolescence is a period when great changes can be effected in attitudes and values. It is a period when educational decisions have long range consequences, for better or for worse. Adolescence is a crucial time for the setting of one's sights on social and occupational goals, for the development of attitudes toward education and the educational institution, and for the shaping of personal values and behaviors toward others. Bloom has noted that "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 occupational roles they desire."<sup>9</sup> 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."<sup>10</sup>

Through the CDD, it is hoped that by making significant changes in the learning environment, the undeveloped educational potential of disadvantaged youth will gain fruition. It is recognized that changes in the formal educational environment will not cancel out the many deficiencies of the home and community environment. Nevertheless, close cooperation between the school and the home should be helpful.

It is also recognized that it is not easy to bring about changes in institutionalized settings and in the roles of the agents within these settings.

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<sup>9</sup>Bloom, op. cit., p. 163.

<sup>10</sup>Ibid., p. 178.

Consequently, a significant part of the Program will necessitate educational intervention.

Changes in the Educational Environment

The High School Development Centers. It was recognized that the youngsters selected for this Program were those whose academic potentials are unlikely to develop in the conventional high school milieu and in the conventional college preparatory program. Therefore, five High School Development Centers were established (one in each borough of New York City). Each Center was organized within an existing high school. Each Center has its own coordinator and full-time counselor. Efforts were made to select teachers who desired to teach in a Center and who were adjudged by the principal of the host school as being generally competent for such an assignment. Small classes and block time instruction were designed to enable students to receive more individualized instruction and diagnostic and remedial work. As mentioned earlier, in order to encourage curriculum innovation The City University agreed to accept into one of its units (a community college or senior college) any student who completed the Program and was recommended for college admission by his High School Development Center.

None of the Centers is new or modern in physical appearance. Two of the Centers are located in slum neighborhoods with large Negro populations, and there is marked physical deterioration in the school buildings giving an almost dilapidated appearance in harmony with the slum-ghetto in which the schools are located. A third Center is located in a deteriorating neighborhood and the school itself has deteriorated markedly in appearance. A fourth Center is located in a high school originally designed as an elementary school. In this particular school, the Center is located in portable buildings adjacent to the main high-school plant. The fifth Center is housed in a high school which, although in an old building, presents a good physical appearance and boasts of a strong college preparatory tradition. Nevertheless, officials at this school admit that they heretofore have not been successful in getting their Negro students into The City University. The general neighborhood in which the fifth school is located may be described as residential and middle class, rather evenly divided among apartment buildings, duplexes, and private homes.

Thus, when we refer to the High School Development Centers as "new learning environments," we are doing so in terms of curriculum enrichment and intervention, and not in terms of the actual physical facilities of the Centers or the host schools.

The host schools were designated by the Board of Education. Accessibility by public transportation was a major factor in the selection of the host schools. While some nominees to the Program decided to withdraw after viewing the poor physical appearance of the Center, the location of such Centers primarily in slum schools provides a realistic setting in which to work with disadvantaged youth.

Classes in the Centers were limited in size to 25 students. Block-time instruction (double periods in certain subjects such as English and algebra) allowed time for diagnostic and remedial work, the development of study skills, and the assignment of college-student tutors to work individually and in small groups with the CDD pupils during the regular school day.

The CDD students were programmed for their classes as a group; however, individuals who were prepared for advanced work in certain subjects were assigned to classes in the regular college preparatory program or in an honors program of the host school.

Through student scholarship stipends, an ambitious cultural program was conducted at most of the Centers. For example, during the 1966 spring semester, one of the High School Development Centers scheduled the following cultural activities for the CDD students:

Marcel Marceau  
Ruddigore  
Nutmcracker Ballet  
Golden Boy  
You Can't Take It With You  
American Ballet  
Julius Caesar  
Comedie Francaise  
My Fair Lady  
Street Scene  
New York Philharmonic  
A Tree Grows in Brooklyn  
The New York City Ballet  
The Sound of Music  
Bear Mountain  
Guy and Dolls  
Annie Get Your Gun

Other field trips included visits to the various campuses of The City University.

While the High School Development Centers were established with the goal of serving as "new, powerful and consistent learning environments, it is exceedingly difficult to stimulate teachers to change their teaching styles and strategies with-



in a conventional departmental framework. In order to stimulate changes in curriculum and instruction, college curriculum consultants worked closely with the faculties of the Centers throughout the school year, and funds were made available for the purchase of special curricular materials for the use of the teachers and students.

Cooperation Between School and Home. It is generally recognized that "...when the school and home environments are mutually reinforcing, learning is likely to be greatest."<sup>11</sup> Educators have not given adequate attention to the home as a curriculum. The disadvantaged youngster frequently does not experience in his home the supporting mechanisms for the educative task of the schools which are taken for granted in the middle-class family. In view of this, orientation meetings for parents were conducted at the High School Development Centers, and parent-teacher and parent-counselor conferences were encouraged throughout the year. One Center in particular provided for frequent small-group and individual conferences with parents on a systematic basis. Nevertheless, the development of mutually reinforcing home-school ties is exceedingly difficult and appears to be a major deficiency in the Program at this time.

The College Curriculum Consultants. A unique feature of the Program is the assignment of faculty from the various senior colleges of The City University to serve as curriculum consultants to the faculties of the High School Development Centers. The assignment ratio was approximately one full-time-equivalent faculty position for each academic area--English, mathematics, modern foreign language, science, and social studies--plus counseling. Consequently, during the 1965-1966 academic year, fifteen college faculty members served part-time as consultants to the five Centers. These college professors worked with the Centers on problems of curriculum development and innovation. Teacher workshops were conducted by the professors throughout the school year. Project funds were available for the purchase of curriculum materials recommended by the college consultants. These materials were supplied to teachers and students wherever it was felt by the consultant that they were most needed and wherever the situation appeared "ripe" for curriculum change. In one center, for example, every College Discovery student in the eleventh grade will receive a subscription to The New York Times throughout the 1966-1967 academic year. In another center, during the 1966 spring semester, a series of foreign films was used in conjunction with the curriculum in literature. In addition to providing such enrichment materials, the college consultants worked with department chairmen and the faculties of the centers in instituting changes in curriculum content and process where needed. In certain instances new sets of textbooks were adopted.

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<sup>11</sup> Ibid., p. 128.

The Tutoring Program. Under the College Work-Study Program administered by the U. S. Office of Education, a grant was secured allowing 300 college students from The City University to be assigned as tutor-mentors in the five High School Development Centers. The college students were selected primarily on the basis of economic need, preparation in the subject area, and satisfactory academic standing in college. The work of the college student tutors was intended not only to develop study skills and assist in remedial instruction, but also to function as role models. Very few disadvantaged boys and girls are related to or are in frequent contact with a college student. It was felt that the tutoring project could provide such contact in a desired setting. In a number of cases, the college student tutors arranged visits to their college campuses for the tutees.

Initial screening of the tutor applicants was provided by the directors of student personnel at the various college campuses of The City University. Orientation meetings for the college student tutors were conducted at the beginning of each semester at all five High School Development Centers. Each college student was assigned at least two tutees. Through the block-time program of instruction, the tutoring project was scheduled in each Center during the regular school day. For example, the double-class period in each of the academic subjects permitted the tutors to observe the teacher and students during the first hour, followed by an hour of individual and small-group tutoring. In some cases the tutoring was conducted in the regular classroom under the direct supervision of the teacher. However, the most common practice was to have the tutoring take place in specially designated areas of the school--such as the cafeteria, auditorium, library, and vacant classrooms. The coordinator at each Center was responsible for administering the tutoring project. Where needed the tutors were provided with copies of the textbooks and other curricular materials.

During the early stages of the tutoring project, when it was not possible to provide a tutor for each youngster, the tutors were assigned to those boys and girls having the most severe scholastic deficiencies. Almost immediately, however, virtually all of the CDD students demanded tutors and, subsequently, the recruitment-selection process was stepped up to provide each CDD student with at least one tutor-mentor. Soon after the tutoring project was fully under way, groups of CDD students at each Center requested that additional tutoring be provided before and after the regular school day. Despite the longer school day as a result of the block-time classes, combined with the increased time for commuting between home and school, many of these CDD students participated in the extra tutoring sessions before and after school throughout the academic year.



The tutoring program was a time-consuming responsibility for the coordinator, in each Center, involving complicated scheduling, rescheduling, checking attendance, preparing payroll data, and distributing checks. Nevertheless it was administered in a very conscientious fashion.

The Summer Program. Early in the history of the College Discovery and Development Program, explorations were made to find facilities for an in-residence summer program for the boys and girls. Lacking dormitory facilities, The City University joined with Columbia University in forming a consortium under the Upward Bound Program of the Office of Economic Opportunity to provide an eight-week in-residence summer program on the Columbia campus for a portion of the College Discovery population. The summer component, known as Project Double Discovery, enrolled 155 of the 579 boys and girls in the College Discovery and Development Program (or approximately 27 per cent of the total College Discovery population) during the summer of 1965. For experimental purposes, the 155 boys and girls were selected at random from the College Discovery population.

The summer program was expanded in 1966 to 300 boys and girls--with 150 being drawn from the College Discovery population that had just completed the tenth grade. All of the boys and girls who completed the 1965 summer program at Columbia were invited back on the premise that repeated participation in a summer program would yield significant educational results. In addition, a group of 150 boys and girls who had just completed the ninth-grade and who were entering the new first-year class of the CDD was selected for Project Double Discovery in 1966. In order to comply with the rigid family income criteria of the OEO, the new group of 150 was selected for the summer program from the lowest quartile of family income, whereas the second-year group had been selected at random from the total original College Discovery population of 579. For research purposes, as discussed later in this report, the randomized selection procedure provides for a classical experimental design in evaluating the effects of a summer program.

Students from Columbia College and Barnard College were assigned to live in dormitory units with a ratio of approximately five CDD youngsters to each college student-counselor. During the 1965 summer program, formal instruction was provided daily in English and mathematics through regularly licensed teachers. This was followed by study-skill sessions, a recreational-skill program (dancing, swimming, chess, dramatics, singing, etc.), cultural activities (visits to museums, and attendance at plays and concerts), and community-study activities (visits to the office of the Mayor and a U.S. Senator, and visits to various community agencies).

The formal part of the curriculum in English and mathematics was not designed to duplicate the subject matter of the tenth grade. For example, major emphasis in English was given to reading for enjoyment and the writing of themes on topics of vitality for adolescents. Each CDD youngster completed the summer with his own paperback library of from 12 to 18 books.

Student Scholarships. Each student in the Program was granted a weekly scholarship of five dollars through the Office of Economic Opportunity and the New York City Community Action Board. These stipends are intended to carry the honor and dignity of scholarships and require only that the student maintain satisfactory attendance. Since most of the students are faced with additional expenses for carfare and lunches in attending a High School Center some distance from their homes, the scholarships are intended to defray such costs. Moreover, the scholarships enabled many youngsters to refrain from excessive outside employment--just as in the cases of youngsters from middle-class families who see to it that their children are able to devote adequate time to their studies. Up to 20 percent of the scholarship funds was devoted to cultural activities conducted through the High School Development Centers--such as attendance at plays and concerts, visits to museums, and visits to college campuses. In an interview survey, most of the College Discovery students reported spending some of their scholarship money on the purchase of paperbacks recommended by their teachers.

## CHAPTER II

### THE PROBLEM, HYPOTHESES, AND PROCEDURES

The Major Problem. The overall study is intended to determine the extent to which high-school students (beginning at the end of the ninth grade) can overcome severe educational and socio-economic deficiencies so that they may succeed in school and college. The nature and direction of changes from the ninth grade to high-school graduation, entrance to college, and during the college years will be studied. Such changes will include aptitudes, achievement, attitudes, and persistence. By analyzing these changes, in the light of the socio-economic and educational deficiencies which the boys and girls evidenced in the ninth and tenth grades, it is anticipated that more tangible data will emerge concerning the degree to which it is possible for the high school to discover and develop the college potential of disadvantaged youth.

While it is impossible to isolate and to analyze many of the ingredients in the creation of a "new learning environment," certain specific elements (including socio-economic factors or "Life Chances") can be studied in relation to aptitudes, academic achievement, persistence, and attitudes. In this connection the following questions deserve investigation:

1. To what extent can educational deficiencies be overcome during the high-school and early college years?
2. What is the nature and direction of attitudinal changes and how do these changes relate to academic achievement and retention?
3. To what extent are certain aptitude measures (i. e., reading and problem solving) valid predictors of academic success?
4. What are the long-range effects on attitudes, achievement, and persistence from repeated in-residence summer sessions on a college campus?
5. How are specific socio-economic factors related to success in school and college?
  - a. Parents not living together
  - b. Father unemployed
  - c. Family on welfare or aid-to-dependent children
  - d. Father engaged in unskilled occupation
  - e. More than four siblings in the family
  - f. Father not a high-school graduate
  - g. Mother not a high-school graduate

- h. Father born in the South or in Puerto Rico
  - i. Mother born in the South or in Puerto Rico
  - j. Student born in the South or in Puerto Rico
  - k. Dwelling unit overcrowded
  - l. Father deceased
  - m. Mother deceased
  - n. Total family income
6. How are attitudes, aptitudes, achievement, and retention related to the sex of the student?
  7. To what extent are the style and content of the student's autobiographical statement (ninth grade) related to achievement and retention?
  8. To what extent is the student's ninth-grade attendance record related to high-school attendance, persistence, and achievement?
  9. How does the College Discovery population in each Center compare to the regular college preparatory population of the host school in attitudes, persistence, and academic success in school and college?
  10. Are curricular and vocational choices in college related to specific socio-economic factors in the student's background?
  11. How are academic success and persistence related to enrollment in a specific High School Development Center?

It is assumed that many additional problems leading to testable hypotheses will be developed throughout the course of this longitudinal study, inasmuch as a new population of boys and girls will be selected each year--offering new opportunities for changes in research design.

Hypotheses to be Tested. The following hypotheses are offered in connection with the initial class of students:

1. Socio-economic factors (Life Chances) will have a significant relationship to retention and academic success or failure in school and college.
2. The ninth-grade average will have a significant relationship to retention and academic success or failure in school and college, although specific academic deficiencies in the ninth grade will have no significant relationship to later performance.
3. The ninth-grade attendance record will have a significant relationship to high-school attendance, retention, and academic

- success or failure in school and college.
4. Repeated in-residence summer sessions on a college campus (two or more) will have a positive and significant influence on persistence and academic success in high school, rate of entrance to college, and academic success in college.
  5. Attitudinal and personality measures, as derived from paper-and-pencil instruments, will yield no significant relationship to persistence and academic success in school and college.
  6. Persistence and academic performance will be related significantly to the High School Development Center to which a student is assigned. (The Centers selecting the most promising students will not necessarily have the lowest dropout rate or the highest record of achievement and entrance to college).
  7. Certain aptitude measures, such as reading comprehension and problem solving, will have a significant relationship to academic success.
  8. While the girls will attain a higher level of scholastic achievement, the rate of college entrance will be higher for the boys.
  9. Ratings by teachers and counselors in the ninth grade will have no significant relationship to scholastic achievement and retention.
  10. Curricular and vocational choices in college will have no significant relationship to specific socio-economic factors in the student's background.
  11. The rate of retention and college entrance for the comparison populations of college preparatory students will differ significantly among the five host schools.
  12. The College Discovery population will differ significantly by Center in aptitude, achievement, and certain socio-economic indicators (Life Chances).
  13. The college preparatory populations for the five host schools will differ significantly in aptitude and achievement.
  14. The gap in academic achievement between the College Discovery and college preparatory students will be narrowed significantly year by year throughout high school. (It is anticipated that significant differences in achievement will be most evident in favor of the college preparatory population for all five Centers combined during the tenth and eleventh grades).
  15. School attendance will reveal a gap between the College Discovery



and college preparatory populations, with the latter group having a significantly better attendance record. (This is anticipated only because of the relatively greater distance and time in commuting between home and school for the College Discovery population).

16. A host school with a relatively strong college preparatory function will tend to select a College Discovery population having a higher ninth-grade average and higher achievement and aptitude indices than a host school that does not have a strong college preparatory emphasis for its total student population.<sup>1</sup>
17. The College Discovery populations will not differ significantly by Center in measures of attitude.
18. The college preparatory populations will not differ significantly by host school in measures of attitude.
19. The College Discovery and College preparatory populations will not differ significantly from each other in measures of attitude.

In addition to the hypotheses listed above, a number of additional hypotheses will be investigated through adjunct or collateral research. These studies are discussed in a later chapter.

#### The Populations to be Studied

During the early planning stages, the possibilities of using a control population were carefully explored. However, for the random assignment of subjects to experimental and control populations it would have been necessary to recruit twice the number of candidates. This would have meant that a large number of nominees (the control population) would have been rejected--thereby immediately creating a disparate variable in favor of the experimental group. It was also felt that the number of nominees rejected should be kept to a minimum. Moreover, a standard control population is not necessarily the best comparison group for a longitudinal study such as this. For one thing, members of the control group would, of necessity, be scattered among the many different high schools of New York City. Secondly, it would not require much in the way of educational enrichment and intervention for

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<sup>1</sup> Representatives of the administration for each of the five host schools were involved in the selection of the College Discovery population for the Center located within that host school.

the experimental group to outstrip such a control population.

College Discovery vs. College Preparatory Populations. Instead of comparing the College Discovery population against a control population, it was decided to use a comparison population in each of the five High School Development Centers composed of students enrolled in the regular college preparatory program. In this way, the records of achievement, attendance, retention, and entrance to college for the College Discovery population could be compared with similar records of the college preparatory population in each of the five High School Development Centers. Thus, a random sample of college preparatory students, approximating the size of the College Discovery population (tenth grade) in each Center, was selected. It should be noted that students are often placed in the college preparatory program according to their own wishes and they are not required to meet strict academic criteria for such placement in the tenth grade. Nevertheless, the random sample population of college preparatory students represents a "practical ideal" against whose records the college preparatory population can be compared. Merely to compare the College Discovery population against a control population would be judging against a wooden-legged competitor:

You can evaluate how much your experimental group moves the pupil in various desirable directions without using a control group--though sometimes you want comparisons...The main goal in this type of research is to learn where you should try to improve your program. You judge against your ideal, not against a wooden-legged competitor.<sup>2</sup>

Pre-Measures and Post-Measures of the College Discovery Population. Through various pre-measures and post-measures, attempts will be made to ascertain patterns of change in student aptitude, achievement, interests and attitudes. In this way, it may be possible to chart significant changes and to identify certain socio-economic factors in the Life Chances of the students which are related significantly to academic success or failure in school and college. For example, various dimensions of the Life Chances Scale would be applied to (1) retention in school, (2) grades in school,

<sup>2</sup>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.

(3) high-school graduation, (4) entrance to college, and (5) success in college.

Comparison of College Discovery Subgroups. In addition to analyzing and comparing the results for the College Discovery populations in the five High School Development Centers, the experimental design provides for the comparison of two important subgroups: those who participated in repeated summer sessions on a college campus vs. those who were limited to the academic-year program only. (It will be recalled that for the first College Discovery class, the assignment to these subgroups was made by using a table of random numbers.) The longitudinal study will also include an analysis of results according to sex.

Comparison of College Discovery Population with Nominees Not Selected for the Program.

From the several hundred nominees not selected for the Program each year, various comparison groups can be created for longitudinal study. For example, a sizable number of nominees were not selected on the premise that they would probably succeed without the help of the CDD. Their grades in the ninth year and their Life Chances were adjudged to be sufficiently high for a favorable educational prognosis. It would be important to determine whether such students actually do succeed in high school and college, especially since they were adjudged by their junior high school counselors and teachers to be in need of CDD. Moreover, at the opposite end of the scale are a group of nominees who were not selected because they were considered to be too great a risk. For many of these nominees there was a noticeable lack of tangible evidence for educational potential. Is it possible that a significant number of these nominees will succeed in high school and college anyway? A longitudinal study of this subgroup would surely provide the answer to this question.

In summary, while the complexity of the Program, with its manifold characteristics, provides serious problems in isolating and manipulating certain variables for research, there are, nevertheless, many promising opportunities for fruitful investigation. Some of these opportunities are being pursued through adjunct or collateral investigations which are summarized briefly later in this report.

CHAPTER III  
INSTRUMENTS, STATISTICAL TOOLS  
AND  
ADJUNCT INVESTIGATIONS

For purposes of description, comparison, and evaluation, ninth-grade test data were collected from the nominating schools. Two of the tests, the Metropolitan Achievement Test (Reading) and the Iowa Tests of Educational Development figure significantly in our description of the groups in the five Centers. Four instruments, the Differential Aptitude Tests, the Stanford Achievement Test, the High School Characteristics Index and the Activities Index were administered during the fall semester to the College Discovery students and to a comparison group of college preparatory students enrolled in the same five schools. These tests, as well as the statistical techniques employed in this study, are described in this chapter. All tests were administered in the schools.

Metropolitan Achievement Tests: Advanced Battery. This is a series of "superlatively standard measures"<sup>1</sup> of achievement in ten high school subjects. The Reading Test (used as one of the selection criteria and to describe the CDD group in each center as well as the total group) is a valuable tool in estimating paragraph reading ability and word knowledge.

Iowa Tests of Educational Development (ITED). This series of nine tests published by Science Research Associates, Inc. is an excellent measure of certain broad aspects of the pupil's educational development. The test manual reports high reliability coefficients for the scales. Scale scores are provided which are supposed to have the same meaning for all the tests. The reported norms are claimed to be adequately representative of nationwide achievement.<sup>2</sup>

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<sup>1</sup>G. Findley Warren, Review of The Metropolitan Achievement Tests, in Oscar K. Buros. Fourth Mental Measurements Yearbook, Highland Park, N. J.: The Gryphon Press, 1953, p. 19.

<sup>2</sup>Eric Gardiner, Review of the Iowa Tests of Educational Development, in Oscar K. Buros (Ed.), Fourth Mental Measurements Yearbook, Highland Park, N. J.: The Gryphon Press, 1953. pp.45-46.

Stanford Achievement Test (High School Battery).<sup>3</sup> This battery seeks "to test the educational achievements that are commonly expected of students in a modern comprehensive school." Our study uses only three sub-tests: English, Numerical Competence, and Reading.

The English test consists of three parts. Part A asks the student to identify errors in capitalization, grammar, punctuation, and spelling. Part B asks the student to choose from among four sentences the one that best "expresses the idea." Part C is a test of competence in paragraph organization. The Numerical Competence test measures general mathematical ability, with emphasis on arithmetical and numerical concepts. The Reading test is essentially a test of comprehension as well as of the ability to discern what is implied in, and to draw inferences from, the material read.

Aside from the apparent content validity of the tests, the manual reports grade-to-grade increases in means which attest to the validity of the instrument as an achievement test. The only reliability data reported for the test have to do with the homogeneity of the content of the tests.

Differential Aptitude Tests (Form L).<sup>4</sup> This is a multi-factor battery designed to measure relatively independent abilities purportedly indicative of potential among high school students. The test constructors, however, were more intent on producing tests which are highly reliable, valid, and useful rather than being concerned with the factorial "purity" of the tests. The high quality of the tests is widely acknowledged and they have been extensively used in educational selection, placement, and guidance, as well as in research in educational psychology. Three sub-tests were administered to the students of the program as well as college preparatory students sampled from each center:

- (a) Verbal Reasoning--This combines "verbal" ability and "deductive" reasoning items to measure the student's ability to handle complex logical relationships;

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<sup>3</sup>Stanford Achievement Test (High School Battery). New York: Harcourt, Brace & World, Inc., 1965.

<sup>4</sup>Differential Aptitude Tests (Form L). New York: The Psychological Corporation, 1963.



- (b) Numerical Ability--This test consists of relatively simple numerical problems to measure mental computational skills as well as specific educational achievement in elementary mathematics; and
- (c) Abstract Reasoning--This measures the examinee's ability to see the logical development in a sequence of figures. The test is also intended as a non-verbal measure of reasoning ability.

The norms for the 1963 revision of the Differential Aptitude Tests are based on a population of more than 50,000 students in 43 states.

Test of Problem-Solving (High School Edition, Form A).<sup>5</sup> Developed at Michigan State University, this instrument is designed to test the ability to solve problems which require a number of critical-thinking skills, such as drawing inferences and conclusions from data, identification of problems, judging the strength of arguments, etc. The findings from this instrument will be related to scores on the Test of Critical Thinking (Form G) which will be administered during the freshman year of college.<sup>6</sup>

#### Tests for Attitudes and Personality

Activities Index and High School Characteristics Index These instruments are multi-dimensional inventories developed by Dr. George Stern of Syracuse University. Both instruments consist of 300 items distributed among 30 scales of 10 items each. The scales on each test parallel one another, those of the Activities Index corresponding to needs while those of the Characteristics Index to environmental press conditions associated with each need. An average scale reliability of .67 (Kuder-Richardson) has been reported, which is relatively high for 10-item scales. The homogeneity of the scales in content is shown by high item discrimination indices. The scales have been factor analyzed to yield both first order and second order factors. The inventories are self-administered and each required from 20 to 90 minutes completion time depending on the age and the reading rate of the subjects. Both instruments have been widely employed with other environmental indices (the

<sup>5</sup> A Test of Problem-Solving (Form A, High School Edition), Michigan State University, 1953.

<sup>6</sup> A Test of Critical Thinking (Form G), Cooperative Study of Evaluation in General Education. Washington, D. C.: American Council on Education, 1952.

College Characteristics Index, the Evening College Characteristics Index, by George Stern, and the Organizational Climate Index by George Stern and Carl Steinhoff) to describe the intellectual climates of different types of colleges and schools, to compare student groups, i. e., honor groups with the general run of students, and the organizational climate of a public school system.<sup>7</sup>

Behavior Rating Scale. This unpublished scale was developed specifically for the Project to obtain ratings on the nominees by teachers and counselors. The items are intended to discriminate for such factors as "independence-divergence" vs. "passivity and conformity," and "persistence" vs. "non-persistence" in the completion of tasks.<sup>8</sup>

Self-Radius and Goals Schedule. This instrument was developed to assess similarities and differences in attitudes, values, and goals of youth in the settings of low, middle, and high social rank.<sup>9</sup> The Self-Radius and Goals Schedules are being used in connection with adjunct research for the CDD, under the direction of Professors Muzafer Sherif and Carolyn W. Sherif of Pennsylvania State University. This research is discussed briefly later in this chapter.

Other Instruments. A variety of other instruments, such as the Mooney Problem Checklist, Edwards Personal Preference Schedule, and Inventory of Beliefs (Stern, Stein, and Bloom), will be used with the initial populations and subsequent populations of College Discovery and college preparatory groups. Measures of school-related concepts through the Semantic Differential (Osgood, Suci, and Tannenbaum) are being undertaken as part of the adjunct research, reviewed later in this chapter. Adjunct research on tutor-tutee communication involved the use of specially-constructed questionnaires.

#### Statistical Tools

A great mass of statistical information has been accumulated since the beginning of the Program. Descriptive data concerning the students in the Program have been extracted from the Nomination Forms and from the Personal Information

<sup>7</sup>George G. Stern, "Environments for Learning," in Nevitt Sanford, ed. The American College, New York and London: John Wiley and Sons, Inc., 1962, pp. 707-708.

<sup>8</sup>Aaron Carton, Behavior Rating Form (Mimeographed). New York: The City University of New York, Division of Teacher Education, 1965.

<sup>9</sup>See Muzafer Sherif and Carolyn W. Sherif, Reference Groups. New York: Harper and Row, Publishers, 1964.

Forms. These data are presented in various statistical tables in later chapters, giving a composite picture of the total CDD population while, at the same time, describing the group in each Center.

Continuous variables such as grade averages, test scores, attendance, weekly family income and the like are given in terms of means and standard deviations. The analysis of variance is employed to test differences among means and where the resulting F-ratio is significant, the t-test is then used to determine the significance of the differences between pairs of means.

The results of the pre-tests (the Differential Aptitude Tests, the Standard Achievement Tests, and the Test for Problem-Solving) are presented in tables of means and standard deviations. The means of the CDD group and the college preparatory group are compared for each Center as well as for the total groups in the five Centers and host schools. These differences will be considered later in the comparison of means for the criterion measures (i. e., the grade averages and the Regents examination scores). The Activities Index and the High School Characteristics Index data will be treated in an adjunct study on attitudes, to appear in a later report.

Means and standard deviations for the above-mentioned criterion measures on aptitude and achievement are presented in tables. Differences between group means (i. e., the CDD group with the college preparatory group, the CDD students who were in the Columbia summer program and those who were not) are analyzed for significance by using the t-test. Differences among Center means are tested by analysis of variance. These tests were made without providing for the effects of the pre-tests. The appropriate co-variance analyses will be made during the 1966-1967 academic year.

Correlation matrices will be set up preliminary to an analysis of co-variance design for comparing achievement among centers and between groups. The measures to be included as co-variates will depend on the significance of differences between means and the coefficients of correlation with the criterion measures. The co-variance technique is considered appropriate for the final comparison because of the impossibility of imposing controls on our comparison groups.

#### Adjunct Studies

The College Discovery and Development Program provides an infinite variety of possible studies. Undoubtedly, new avenues of investigation will be pursued as new populations are admitted to the Program. Reviewed in this section are some of the adjunct studies which are presently in progress.

Personality and Attitudes. A study on the relationship between personality variables and academic achievement of the CDD youngsters is in progress. It is aimed at determining how personality variables as measured by the Activities Index are associated with academic performance among the College Discovery and Development Program students and the parallel group of college preparatory students. The investigator hopes to derive multiple regression equations using the best combinations of personality factors as independent variables and the general average and Regent Examination scores as criterion variables. The study seeks to answer the need for devices of assessing potential especially when the search for talent involves the underprivileged and the cultural minorities for whom most of the older tools for assessment are of limited applicability.

Dr. Carl Steinhoff and Genaro Lachica have likewise proposed to investigate the educational climates in the different centers by using Stern's High School Characteristics Index and the Activities Index. The study will describe the intellectual climate in each school in terms of student needs and environmental press; and if there are any significant differences in intellectual climate among the five development centers, the differential effects of the environment on academic achievement will be determined. The study will also include a comparison of the profiles of needs and presses between the upper 10 per cent and the lower 10 per cent in academic achievement among the students in the program.

A variety of other studies on attitudes, values, and personality are contemplated.

Attitudes and Self-Concept. The self-concept and attitudes of College Discovery students were compared with those of students enrolled in the college preparatory and general curricula at one of the host schools.<sup>10</sup> The purpose was to ascertain how College Discovery students regard themselves as students, and how they perceive high school and college preparatory and general students. This research, conducted independently, will be replicated in other Centers and with new populations as the Program progresses. The results of this study are reported in Chapter VI.

<sup>10</sup>Judith Halpern, "The Attitudes of College Discovery, General and Regents Students Toward School Related Concepts," Graduate Research in Education and Related Disciplines. Vol. 2, 1:84-93. New York: The City College of the City University of New York, April, 1966.



Behavior. Several groups of College Discovery boys and other students in one of the host schools are being studied in differentiated social settings. The focus is on the interaction processes in voluntarily-constituted reference groups in school, in the neighborhood, and in the summer program at Columbia. This research is under the direction of Professor Muzafer Sherif and Professor Carolyn W. Sherif of Pennsylvania State University. This is an outgrowth of their earlier work with groups of adolescent boys of three socio-economic levels in urban areas of the Southwest.<sup>11</sup> The research involves observation of adolescent groups in a variety of ecological settings. It is anticipated that this research will provide valuable clues to the relationship of individual and group behavior to performance in school.

Tutoring. With more than 300 college students assigned as tutor-mentors of the College Discovery boys and girls, opportunities are presented for a wide range of studies on attitudes and learning outcomes relative to the climate of the tutoring situation. Now in progress is a study of attitudes and information related to tutor-tutee communication. Both the College Discovery youngsters and the college student tutor-mentors are the subjects of this study. The findings will appear in a subsequent report.

<sup>11</sup> Sherif and Sherif, op. cit.



CHAPTER IV

CHARACTERISTICS OF THE POPULATIONS

The initial class of College Discovery students enrolled in the five High School Development Centers included 579 students. Of these, 61.2 percent were males. Table 1 presents the enrollments by Centers, including the sex distributions. As mentioned earlier, it was originally intended that males would constitute approximately 60 percent of the entering population. However, it can be seen in Table 1 that Center II enrolled 70.2 percent males, while Center IV enrolled only 49 percent males. Center II is located in one of the poorest Negro areas of the city, and a number of the junior high school counselors reported that many of the female nominees could not obtain parental consent to attend this Center. The neighborhood has a reputation, rightly or wrongly, of being "dangerous"--although there have been no untoward incidents there since the Program has gone into operation. In contrast, Center IV is located in a "middle-class" neighborhood. The host school for Center IV is oriented toward a college-preparatory program for most of its students and the school itself, while not new, presents the most attractive physical appearance of any of the five Centers. In the selection process, Center IV showed a preference for female nominees over male nominees, as shown in Table 1.

TABLE 1

COLLEGE DISCOVERY ENROLLMENT BY CENTERS  
MALES AND FEMALES

Center	Male		Female		Total
	N	%	N	%	
I	78	59.5	53	40.5	131
II	87	70.2	37	29.8	124
III	76	61.8	47	38.2	123
IV	50	49.0	51	51.0	101
V	64	64.0	36	36.0	100
Total	355	61.2	224	38.8	579

Ethnic Distribution

The College Discovery and Development Program was intended to have a racially-integrated enrollment. While Negro and Puerto Rican students constitute almost 50 percent of the total enrollment for all of the junior high schools of New York City,<sup>1</sup> most of the students for the College Discovery and Development Program are drawn from schools serving disadvantaged neighborhoods with disproportionately high populations of Negroes and Puerto Ricans.

In Table 2 we see that in three of the five Centers the combined Negro and Puerto Rican populations accounted for more than 75 percent of the enrollment. In a fourth Center the combined Negro and Puerto Rican population constituted 62 per cent of the College Discovery Population. Center V, with only 31.3 percent Negro and Puerto Rican students enrolled, is located in the borough having the lowest proportion of nonwhites of the five boroughs in New York City. It should be noted that Center IV, although located in a school serving largely a middle-class neighborhood, has a College Discovery enrollment consisting of 76.1 percent nonwhite students.

The ethnic data summarized in Table 2 were gathered by "head count" or observation and, therefore, 21 students are unaccounted for in the totals because of absenteeism.

TABLE 2  
ETHNIC DISTRIBUTIONS BY CENTERS

Center	Negroes		Puerto Ricans		Orientals		Others	
	N	%	N	%	N	%	N	%
I	52	41.6	44	35.2	3	2.4	26	20.8
II	61	50.4	14	11.6	0	0	46	38.0
III	49	40.5	43	35.5	10	8.3	19	15.7
IV	53	57.6	17	18.5	0	0	22	23.9
V	21	21.2	10	10.1	0	0	68	68.7
Total	236	42.3	128	22.9	13	2.3	181	32.5

<sup>1</sup>The New York Times, June 7, 1967, p.36.

Much of the data in the sections which follow were obtained through a four-page Personal Information Form completed by the nominee and his family, and verified by the school counselor who is responsible for nominating the student.

Intactness of Families

In Table 3 we find that in Centers I, II, and III approximately half of the College Discovery students are in families that are not intact. In the overwhelming proportion of these families, the mother is the head of the household (Table 4). These data fit the classical patterns for disadvantaged families. Although Center IV has a high nonwhite population (76 percent Negroes and Puerto Ricans combined), only 30 percent of the families are not intact. It will be recalled that Center IV is located in a school which serves largely a middle-class area. Nonwhites in this borough tend to be higher in socio-economic status and are more likely to be upwardly mobile than in the boroughs in which Centers I, II, and III are located.

We find in Table 5 that Center V presents a unique case. While only 29 percent of the families of the College Discovery students in Center V are in families that are not intact (Table 3), in approximately half of these cases the youngsters are under the care of institutions and foster homes (Table 5). Thus, while Center V has the lowest proportion of nonwhite (31.3 percent as shown in Table 2), it has the highest proportion of students who are under the care of institutions and foster homes (Table 5).

TABLE 3

BOTH PARENTS ALIVE AND LIVING TOGETHER

Center	Yes		No		No Information	
	N	%	N	%	N	%
I	55	42.0	69	52.7	7	5.3
II	63	50.8	57	46.0	4	3.2
III	61	49.6	59	48.0	3	2.4
IV	70	70.0	27	27.0	3	3.0
V	69	69.0	29	29.0	2	2.0
Total	318	55.0	241	41.7	19	3.3

TABLE 4

HEAD OF HOUSEHOLD WHERE PARENTS ARE NOT LIVING TOGETHER

Center	Head of Household										Total	
	Mother		Father		Stepfather		Grandparent		Other			
	N	%	N	%	N	%	N	%	N	%	N	%
I	44	33.6	11	8.4	4	3.1	8	6.1	9	6.9	76	58.1
II	40	32.3	2	1.6	9	7.3	6	4.8	4	3.2	61	49.2
III	47	38.2	5	4.1	2	1.6	2	1.6	6	4.9	62	50.4
IV	16	16.0	4	4.0	2	2.0	1	1.0	7	7.0	30	30.0
V	15	15.0	0	0	2	3.0	0	0	14	14.0	31	31.0
Total	162	28.0	22	3.8	19	3.3	17	2.9	40	6.9	260	44.9

TABLE 5

STUDENTS LIVING WITH FOSTER PARENTS AND IN INSTITUTIONS

Center	Foster Parents		Institutions		Total	
	N	%	N	%	N	%
I	7	5.3	2	1.5	9	6.9
II	2	1.6	0	0	2	1.6
III	3	2.4	0	0	3	2.4
IV	4	4.0	0	0	4	4.0
V	3	3.0	10	10.0	13	13.0
Total	19	3.3	12	2.1	31	5.4

Tables 6 and 7 show data by Centers on the fathers and mothers who are living and deceased. In Table 5 we find that the students reporting their fathers to be alive ranged from 70.2 percent in Center I to 92 percent in Center IV. The percentages of students reporting their mothers to be alive ranged from 88.5 in Center I to 96.8 in Center III (Table 7). It should be noted that 18.3 percent of the students in Center I could provide no information on their fathers (Table 6). For all Centers, where 9.8 percent of the students were unable to account for their fathers (living or deceased), only 3.1 percent were unable to do so for their mothers.

TABLE 6

STUDENTS REPORTING FATHERS LIVING OR DECEASED

Center	Father Living		Father Deceased		No Information	
	N	%	N	%	N	%
I	92	70.2	15	11.5	24	18.3
II	99	79.8	13	10.5	12	9.7
III	98	79.7	13	10.6	12	9.7
IV	92	92.0	3	3.0	5	5.0
V	87	87.0	9	9.0	4	4.0
Total	468	81.0	53	9.2	57	9.8

TABLE 7

STUDENTS REPORTING MOTHERS LIVING OR DECEASED

Center	Mother Living		Mother Deceased		No Information	
	N	%	N	%	N	%
I	116	88.5	8	6.1	7	5.4
II	115	92.8	6	4.8	3	2.4
III	119	96.8	3	2.4	1	0.8
IV	93	93.0	2	2.0	5	5.0
V	95	95.0	3	3.0	2	2.0
Total	538	93.1	22	3.8	18	3.1



Size of Family

Although more than 40 percent of the College Discovery students are in families that are not intact, as shown earlier in Table 3, the mean number of persons in the family is 5.24 for all Centers combined (Table 8). This statistic ranges from a mean of 4.66 in Center III to 5.97 in Center V. In Table 9 we find that the analysis of variance for the differences among Centers yields an F value which is statistically significant at the .01 level. Comparing the differences between centers in the number of persons per family, we find that Center V has significantly larger families than Centers I, II, and III (Table 10). The size of families for male and female students is not significantly different, as revealed by analysis of variance (Table 11).

TABLE 8  
NUMBER OF PERSONS IN FAMILY BY CENTER

Center	N	Mean	S. D.
I	128	5.07	2.12
II	123	5.31	2.13
III	123	4.66	1.65
IV	100	5.45	1.69
V	88	5.97	2.33
Total	562	5.24	1.97

TABLE 9  
NUMBER OF PERSONS IN FAMILY:  
ANALYSIS OF VARIANCE AMONG CENTERS

Source	SS	df	MS	F
Center	98.096	4	24.524	6.578**
Error	2076.993	557	3.728	
Total	2175.089	561		

\*\*Significant at the .01 level

TABLE 10  
DIFFERENCES BETWEEN CENTERS  
IN THE  
NUMBER OF PERSONS IN FAMILY

Center	V	IV	II	I	III
V	0	.52	.66*	.90**	1.31**
IV		0	.14	.38	.79**
II			0	.24	.65**
I				0	.41
III					0

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

TABLE 11  
NUMBER OF PERSONS IN FAMILY:  
ANALYSIS OF VARIANCE BY SEX

Source	SS	df	MS	F
Sex	2.097	1	2.097	.540
Error	2172.992	560	3.880	
Total	2175.089	561		

Birthplace of Parents and Students

Only 28.6 percent of the College Discovery youngsters reported that the birthplace of their fathers was in the northern United States or Canada. The South and Puerto Rico accounted for 38.4 percent, while 16.4 percent did not know or failed to provide the information. For the mothers, 34.3 percent were reported as having been born in the North or in Canada, while the South and Puerto Rico accounted for 42.7 percent. These data are presented in Tables 12 and 13. The place of birth

for parents varies markedly according to Center. For example, in Center I we find that only 16.8 percent report the birthplace of fathers in the North, while the South and Puerto Rico account for 52.7 percent. In contrast, 50 percent of the students in Center V report that their fathers were born in the North.

TABLE 12  
FATHER'S BIRTHPLACE

Center	U.S. North and Canada		U.S. South		Puerto Rico		Other		Don't Know Or No Information	
	N	%	N	%	N	%	N	%	N	%
I	22	16.8	28	21.4	41	31.3	19	14.5	21	16.0
II	39	31.5	23	18.5	13	10.5	26	21.0	23	18.5
III	22	17.9	27	21.9	28	22.8	23	18.7	23	18.7
IV	32	32.0	34	34.0	10	10.0	11	11.0	13	13.0
V	50	50.0	11	11.0	7	7.0	17	17.0	15	15.0
Total	165	28.6	123	21.3	99	17.1	96	16.6	95	16.4

TABLE 13  
MOTHER'S BIRTHPLACE

Center	U.S. North and Canada		U.S. South		Puerto Rico		Other		Don't Know Or No Information	
	N	%	N	%	N	%	N	%	N	%
I	32	24.4	30	22.9	41	31.3	12	9.2	16	12.2
II	47	37.9	31	25.0	14	11.3	23	18.5	9	7.3
III	24	19.5	35	28.5	32	26.0	21	17.1	11	8.9
IV	31	31.0	38	38.0	9	9.0	10	10.0	12	12.0
V	64	64.0	10	10.0	7	7.0	8	8.0	11	11.0
Total	198	34.3	144	24.9	103	17.8	74	12.8	59	10.2

Table 14 reveals that 74.2 percent of the total College Discovery population was born in the North, with the South and Puerto Rico accounting for 14.5 percent. The South and Puerto Rico account for 22.2 percent of the students in Center I and only 7 percent of the students in Center V. As mentioned earlier in this report, Center V is located in the borough having the lowest populations of Negroes and Puerto Ricans of the five boroughs in New York City.

TABLE 14  
STUDENT'S BIRTHPLACE

Center	U.S. North and Canada		U.S. South		Puerto Rico		Other		No Information	
	N	%	N	%	N	%	N	%	N	%
I	92	70.2	9	6.9	20	15.3	8	6.1	2	1.5
II	85	68.5	7	5.6	9	7.3	17	13.7	6	4.9
III	83	67.5	6	4.9	15	12.2	17	13.8	2	1.6
IV	84	84.0	7	7.0	4	4.0	5	5.0	0	0
V	85	85.0	5	5.0	2	2.0	6	6.0	2	0
Total	429	74.2	34	5.9	50	8.6	53	9.2	12	2.1

Length of Residence at Present Address

In Table 15 we find that the mean number of years of residence at the present address ranges from 5.35 for Center I to 7.79 for Center IV. The analysis of variance comparing differences in the length of residence among the five Centers is statistically significant at the .01 level (Table 16). In comparing certain centers by pairs (Table 17), we see that the students in Center IV have lived at their present address for a significantly longer period than the students in Centers I and II. Similarly, the length of residence for students in Center III is significantly greater than for Center I. There is no statistically significant difference between the sexes in the length of residence at the present address (Table 18).

TABLE 15  
NUMBER OF YEARS AT PRESENT ADDRESS

Center	N	Mean	S.D.
I	130	5.35	5.30
II	121	6.23	5.72
III	123	7.13	5.24
IV	97	7.79	5.14
V	98	6.38	4.91
Total	569	6.51	5.35

TABLE 16  
LENGTH OF RESIDENCE AT PRESENT ADDRESS:  
ANALYSIS OF VARIANCE AMONG CENTERS

Source	SS	df	MS	F
Center	394.352	4	98.588	3.493**
Error	15915.772	564	28.219	
Total	16310.124	568		

TABLE 17  
DIFFERENCES BETWEEN CENTERS  
IN MEAN LENGTH OF RESIDENCE AT PRESENT ADDRESS

	IV	III	V	II	I
IV	0	.66	1.41	1.56*	2.44**
III		0	.75	.90	1.78**
V			0	.15	1.03
II				0	.88
I					0

\*\* Significant at the .01 Level  
\* Significant at the .05 Level



TABLE 18

LENGTH OF RESIDENCE AT PRESENT ADDRESS:  
ANALYSIS OF VARIANCE BY SEX

Source	SS	df	MS	F
Sex	16.098	1	16.098	.560
Error	16294.026	567	28.737	
Total	16310.124	568		

Employment of Parents

Approximately 40 percent of the total College Discovery students reported either that their fathers were unemployed or that they had no information concerning their fathers' employment. In Table 19 we see that the employment status of fathers varies sharply according to Center. In Center IV no less than 75 percent of the fathers are reported as employed, whereas in Center I the figure is only 50.4 percent. The employment status of mothers also varies significantly by Center. For example, for Center V we find in Table 20 that only 25 percent of the students report that their mothers are employed, while in Center III the figure is 42.3 percent.

TABLE 19

EMPLOYMENT: FATHER

Center	Employed		Unemployed or No Information	
	N	%	N	%
I	66	50.4	65	49.6
II	72	58.1	52	41.9
III	68	55.3	55	44.7
IV	75	75.0	25	25.0
V	66	66.0	34	34.0
Total	347	60.0	231	40.0

TABLE 20  
EMPLOYMENT: MOTHER

Center	Employed		Unemployed or no Information	
	N	%	N	%
I	45	34.4	86	65.6
II	45	36.3	79	63.7
III	52	42.3	71	57.7
IV	37	37.0	63	63.0
V	25	25.0	75	75.0
Total	204	35.3	374	64.7

Family Income

The total weekly income per family varies significantly from Center to Center, as shown in Tables 21, 22, and 23. It is important to note that the family income data do not include youngsters who are living in institutions or with foster parents. Therefore, the income data summarized in Table 21 are somewhat inflated for the total population. Moreover, the weekly income reported includes all sources from all members of the family including welfare, aid-to-dependent children, and social security.

In Table 21 we see that the mean weekly income per family ranged from \$82.10 on Center III to \$115.45 in Center IV. The analysis of variance reveals significant differences in the mean weekly family income among the Centers (Table 22). However, there is no statistically significant difference by sex (Table 24).

Comparison in the mean weekly family income by Center reveal that Center IV is significantly higher at the .01 level of confidence than Centers I, II, and III (Table 23). While Center V appears to be approximately equal to Center IV in family income, this is not really the case. Center V, it will be recalled, has the greatest number of youngsters who are under institutional and foster care--and family income data for these youngsters are not included in Table 21 and 23. Consequently, the mean family income reported in Tables 21 and 23 for

Center V presents an inflated picture. In actuality, Center IV stands by itself as having the highest family income. By adjusting the income per family (Table 21) to the size of the family (Table 8), we find that the weekly income per family member ranged from \$17.56 in Center I to \$21.18 in Center IV. Thus we find that the data for Center IV consistently show this population to be favored over the populations in the other Centers in a variety of socio-economic indicators.

In Table 24 the analysis of variance in the mean weekly income per family reveals no statistically significant difference by sex.

TABLE 21  
WEEKLY FAMILY INCOME\*

Center	N	Mean	S.D.
I	119	89.04	32.43
II	114	94.55	33.73
III	113	82.10	30.75
IV	91	115.45	35.98
V	82	115.38	37.62
Total	519	97.53	36.37

\*Excluding youngsters in institutions and foster homes.

TABLE 22  
WEEKLY FAMILY INCOME:  
ANALYSIS OF VARIANCE AMONG CENTERS

Source	SS	df	MS	F
Center	91842.512	4	22960.628	19.844**
Error	594710.714	514	1157.024	
Total	686553.226	518		

\*\*Significant at the .01 level

TABLE 23  
DIFFERENCES BETWEEN CENTERS  
IN  
WEEKLY FAMILY INCOME

Center	IV	V	II	I	III
IV	0	.07	20.90**	26.41**	33.35**
V		0	20.83**	26.34**	33.28**
II			0	5.51	12.45**
I				0	6.94
III					0

\*\*Significant at the .01 level

TABLE 24  
WEEKLY FAMILY INCOME:  
ANALYSIS OF VARIANCE BY SEX

Source	SS	df	MS	F
Sex	4556.539	1	4556.539	3.454
Error	681996.687	517	1319.142	
Total	686553.226	518		

Sources of Supplementary Family Income

An inherent weakness in the instrument used to obtain data on family income (Personal Information Form) is that it fails to require the family to specify the separate sources of supplementary income. Consequently, many families tended to lump together their sources of supplementary income while failing to indicate such sources as welfare and aid-to-dependent children. (This form has been revised extensively to correct this and other omissions for the second class which was selected in the spring of 1966). Nevertheless, as shown in Table 25, we find that 14 per cent of the families did report supplementary income through welfare and aid-to-dependent children. As anticipated, Center IV with the highest level of

family income (Table 21) yields the lowest percentages of families receiving welfare assistance and aid-to-dependent children (Table 25). Where the families of the College Discovery students in Center IV show no cases on welfare and only 7 percent receiving aid-to-dependent children, in Center III there are 18.7 percent on welfare and 4.9 percent receiving aid-to-dependent children (Table 25).

TABLE 25  
SOURCE OF SUPPLEMENTARY INCOME

Center	Welfare		A D C		Soc. Sec. Pensions		Insurance Benefits		None Stated	
	N	%	N	%	N	%	N	%	N	%
I	12	9.1	8	6.1	14	10.7	1	0.8	96	73.3
II	14	11.3	2	1.6	15	12.1	1	0.8	92	74.2
III	23	18.7	6	4.9	10	8.1	3	2.4	81	65.9
IV	0	0	7	7.0	8	8.0	1	1.0	84	84.0
V	5	5.0	4	4.0	14	14.0	0	0	77	77.0
Total	54	9.3	27	4.7	61	10.6	6	1.0	430	74.4

Monthly Rent and Number of Rooms

The mean monthly rent per family ranges from \$63.92 for Center III to \$96.70 for Center IV. The mean monthly rent for all families of students in the College Discovery and Development Program is \$78.24. These data are presented in Table 26. The analysis of variance among Centers is statistically significant at the .01 level (Table 27); statistically significant differences at the .01 level are evident in Comparing Center IV with Centers I, II, and III--with Center IV showing significantly higher rental payments (Table 28). Once again, these data are consistent with other socio-economic data in revealing that the families of the students in Center IV are relatively in the most favorable position.

In Table 29 we find that there are statistically significant differences in monthly rent according to the sex of the student.



TABLE 26  
MONTHLY RENT

Center	N	Mean	S.D.
I	122	75.14	22.65
II	110	74.15	24.51
III	119	63.92	22.79
IV	84	96.70	36.44
V	69	92.48	26.79
Total	504	78.24	28.92

TABLE 27  
ANALYSIS OF VARIANCE AMONG CENTERS

Source	SS	df	MS	F
Center	70045.526	4	17511.3815	24.854**
Error	351568.946	499	704.5469	
Total	421614.469	503		

\*\*Significant at the .01 level

TABLE 28  
DIFFERENCES BETWEEN CENTERS  
IN  
MONTHLY RENT

Center	IV	V	I	II	III
IV	0	4.22	21.56**	22.55**	32.78**
V		0	17.34**	18.33**	28.56**
I			0	0.99	11.22**
II				0	10.23**
III					0

\*\*Significant at the .01 level

TABLE 29

MONTHLY RENT:  
ANALYSIS OF VARIANCE BY SEX

Source	SS	df	MS	F
Sex	129.523	1	129.523	.154
Error	421484.946	502	839.611	
Total	421614.469	503		

As in the case of the monthly rent, we find differences by Centers in the number of rooms per household. In Table 30 we see that the number of rooms per household ranges from a mean of 4.84 for the students in Center I to a mean of 6.07 for the students in Center II. For Center IV the mean is 5.86.

Analysis of variance for the number of rooms per household shows a statistically significant difference among Centers at the .01 level (Table 31). In Table 32 we find that the number of rooms per household for students in Center V is greater at the .01 level than for students in Centers I, II, and III. Similarly, for Center IV the number of rooms per household is greater than for Centers I, II, and III.

There is no statistically significant difference in the number of rooms per household according to the sex of the student (Table 33).

TABLE 30

NUMBER OF ROOMS PER HOUSEHOLD BY CENTER

Center	N	Mean	S.D.
I	128	4.84	1.35
II	124	5.00	1.37
III	122	4.52	1.12
IV	98	5.86	1.80
V	84	6.07	1.58
Total	556	5.17	1.55

TABLE 31

NUMBER OF ROOMS PER HOUSEHOLD:  
ANALYSIS OF VARIANCE AMONG CENTERS

Source	SS	df	MS	F
Center	183.853	4	45.963	22.129**
Error	1144.915	551	2.077	
Total	1328.768	555		

\*\*Significant at the .01 level

TABLE 32

DIFFERENCES BETWEEN CENTERS  
IN  
NUMBER OF ROOMS PER HOUSEHOLD

Center	V	IV	II	I	III
V	0	.21	1.07**	1.23**	1.55**
IV		0	.86**	1.02**	1.34**
II			0	.16	.48**
I				0	.32
III					0

\*\*Significant at the .01 level

TABLE 33

NUMBER OF ROOMS PER HOUSEHOLD:  
ANALYSIS OF VARIANCE BY SEX

Source	SS	df	MS	F
Sex	3.249	1	3.249	1.538
Error	1325.519	554	2.392	
Total	1328.768	555		

Parents' Schooling

The level of schooling attained by one's parents has an important bearing on the educational opportunities afforded a boy or girl from a disadvantaged home. In Table 34 we see that the mean number of years of schooling ranges from 8.7 for the fathers of students in Center III to 10.32 for the fathers of students in Center IV. The mean number of school years completed by fathers of all College Discovery students is 9.6. The analysis of variance among the five Centers yields an F ratio which is statistically significant at the .01 level (Table 35). In Table 36 we find that the level of schooling attained by the fathers of students in Center IV is significantly higher than for Centers I and III. Moreover, Center III is significantly lower at the .001 level than Centers II and V (Table 36). It should be noted that 99 students failed to report their fathers' level of schooling. Our data on the intactness of families, reported earlier, would indicate that many of these youngsters and their mothers or guardians have no information on their fathers' schooling.

TABLE 34

YEARS OF SCHOOLING COMPLETED BY FATHERS

Center	N	Mean	S.D.
I	112	9.21	3.52
II	99	9.97	2.80
III	99	8.70	3.67
IV	90	10.32	2.81
V	80	10.00	2.38
Total	480	9.60	3.14

TABLE 35

YEARS OF SCHOOLING COMPLETED BY FATHERS:  
ANALYSIS OF VARIANCE AMONG CENTERS

Source	SS	DF	MS	F
Center	135.664	4	33.916	3.577**
Error	4503.334	475	9.480	
Total	4638.998	479		

\*\*Significant at the .01 level

TABLE 36

DIFFERENCES BETWEEN CENTERS  
IN  
YEARS OF SCHOOLING COMPLETED BY FATHERS

Center	IV	V	II	I	III
IV	0	.32	.35	1.11*	1.62**
V		0	.03	.79	1.30**
II			0	.76	1.27**
I				0	.51
III					0

\*\*Significant at the .01 level

\*Significant at the .05 level

TABLE 37

YEARS OF SCHOOLING COMPLETED BY FATHERS:  
ANALYSIS OF VARIANCE BY SEX OF STUDENTS

Source	SS	df	MS	F
Sex	25.990	1	25.990	2.693
error	4613.008	478	9.650	
Total	4638.998	479		

In Table 38 we see that the mean number of years of schooling completed for the mothers of the College Discovery students is 9.7 in comparison to 9.6 for the fathers. For mothers, the mean number of years of schooling completed ranges



from 8.56 in Center III to 10.78 in Center IV, as in the case of the fathers' schooling. The analysis of variance among Centers reveals an F ratio that is statistically significant at the .01 level (Table 39). Table 40 reveals that the mothers' level of schooling for Centers IV and V is significantly higher at the .01 level than that for Centers I, II, and III. Where 99 students were unable to report the years of schooling completed by their fathers, only 50 students could not do so in the cases of their mothers.

The analysis of variance reveals no statistically significant differences between the boys and girls in the number of years of schooling completed by their fathers and mothers (Tables 37 and 41).

TABLE 38  
YEARS OF SCHOOLING COMPLETED BY MOTHER

Center	N	Mean	S.D.
I	117	9.25	3.37
II	116	9.62	2.97
III	113	8.56	3.42
IV	94	10.78	2.71
V	89	10.70	1.94
Total	529	9.70	3.06

TABLE 39  
YEARS OF SCHOOLING COMPLETED BY MOTHER:  
ANALYSIS OF VARIANCE AMONG CENTERS

Source	SS	df	MS	F
Center	369.489	4	92.372	11.593**
Error	4587.118	524	8.754	
Total	4956.607	528		

\*\*Significant at the .01 level

TABLE 40  
DIFFERENCES BETWEEN CENTERS IN  
YEARS OF SCHOOLING COMPLETED BY MOTHERS

Center	IV	V	II	I	III
IV	0	.08	1.16**	1.53**	2.22**
V		0	1.08**	1.45**	2.14**
II			0	.37	1.06**
I				0	.69
III					0

\*\*Significant at the .01 level

TABLE 41  
YEARS OF SCHOOLING COMPLETED BY MOTHERS:  
ANALYSIS OF VARIANCE BY SEX OF STUDENTS

Source	SS	df	MS	F
Sex	4.618	1	4.618	1.444
Error	4951.989	527	10.378	
Total	4956.607	528		

Life Chances

As discussed in Chapter I, a "Modified Life Chances Scale" was used in the process of selecting students for the College Discovery and Development Program. The Scale consisted of the following seven items: (1) both parents alive and living together, (2) father a high-school graduate, (3) mother a high-school graduate, (4) fewer than four siblings, (5) father engaged in skilled, professional or self-employment, (6) father native born North, and (7) mother native born North. Thus a student with "high" life chances would report favorably on at least five of the seven items in the Scale.

In Table 42 we find that the mean "Modified Life Chances" score for all College Discovery students is 1.98. The range of means is from 1.58 for students in Center I to 2.52 for students in Center V. Center IV has the second highest score with 2.46. The F-ratio for the analysis of variance reveals statistically significant differences among the Centers (Table 43); In Table 44 we find that the "Modified Life Chances" means for Centers IV and V are significantly higher at the .01 level than those for Centers I, II, and III.

TABLE 42  
MODIFIED LIFE CHANCES SCORE

Center	N	Mean	S.D.
I	128	1.58	1.83
II	124	1.83	1.83
III	123	1.73	1.34
IV	99	2.46	1.65
V	100	2.52	2.03
Total	574	1.98	1.67

TABLE 43  
DIFFERENCES BETWEEN CENTERS  
IN  
MODIFIED LIFE CHANCES SCORE

Center	V	IV	II	III	I
V	0	.06	.69**	.79**	.94**
IV		0	.63**	.73**	.88**
II			0	.10	.25
III				0	.15
I					0

\*\*Significant at the .01 level

TABLE 44

MODIFIED LIFE CHANCES SCORE:  
ANALYSIS OF VARIANCE AMONG CENTERS

Source	SS	df	MS	F
Centers	83.4307	4	20.8576	7.8162**
Error	1518.3951	569	2.6685	
Total	1601.8258	573		

\*\*Significant at the .01 level

Two important findings can be drawn from the data in Table 42 and 44. First, the total College Discovery population is clearly disadvantaged according to the "Modified Life Chances Scale."<sup>2</sup> Second, the College Discovery populations differ significantly by Centers in Life Chances--corroborating the findings elsewhere in this report on such socio-economic indicators as family income, intactness of families, etc.

It was hypothesized (Chapter II) that the College Discovery populations will differ significantly by Center in certain socio-economic indicators (Life Chances). We have seen that these populations do indeed differ significantly in size of family, family income, ethnic composition, schooling of parents, etc. Consequently, this hypothesis is confirmed for the first population of College Discovery boys and girls.

The significant differences between and among Centers in various socio-economic indicators may be explained by the fact that the socio-economic conditions differ significantly by borough and each Center draws its College Discovery population from within its own borough. Moreover, representatives of the administration for each of the five host schools were involved in the selection of their College Discovery students, and it is possible that the application of the selection criteria differed somewhat according to the nature of the host school and its

<sup>2</sup>Dentler and Monroe regard a favorable report on six items for a six-point Life Chances Scale as indicating high life chances (op. cit.).

agents. For example, it was hypothesized in Chapter III that a host school with a strong college preparatory function will tend to select a College Discovery population having higher indices of aptitude and achievement than a host school that does not have a strong college preparatory emphasis for its total student population. The testing of this hypothesis is reported later in this chapter and in Chapter V and VI.

#### Students from Special Service Schools

In Centers I, II, and III a significant proportion of the College Discovery population was drawn from junior high schools bearing a "Special Service" classification:

Special service schools are those with a high evidence of special needs based on the following criteria: reading age, I. Q., number of pupils receiving free lunch, pupil mobility, language handicap of pupils, and permanent census.<sup>3</sup>

Table 45 reveals that 70.1 percent of the College Discovery population in Center III are from Special Service junior high schools. For Centers I and II, the percentages are 44.3 and 51.6 respectively. In comparison, only a negligible number of College Discovery students in Centers IV and V are from Special Service schools. Higher Horizon junior high schools are also characterized by special needs resulting from a disadvantaged student population.<sup>4</sup>

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<sup>3</sup>J. Wayne Wrightstone, et. al., "Evaluation of the Higher Horizons Program for Underprivileged Children." Cooperative Research Project No. 1124, N. w York, N. Y.: Board of Education of the City of New York, 1964. p. 10.

<sup>4</sup>Ibid., p.3.



TABLE 45

SCHOOL OF ORIGIN: SPECIAL SERVICE AND HIGHER HORIZONS

Center	Special Service		Higher Horizons		Both (SS+HH)		Neither	
	N	%	N	%	N	%	N	%
I	55	42.0	7	5.3	3	2.3	66	50.4
II	60	48.4	0	0	4	3.2	60	48.4
III	70	62.6	5	4.1	10	8.1	31	25.2
IV <sup>t</sup>	0	0	1	1.0	8	8.0	91	91.0
V	0	0	0	0	1	1.0	99	99.0
Total	192	33.2	13	2.3	26	4.5	347	60.0

Ninth-Grade Average

A student's previous academic record is recognized as the best single predictor of academic performance in school or college. Inasmuch as the College Discovery and Development Program is intended for boys and girls whose present level of academic performance and socio-economic deprivation yield a poor prognosis for college, the ninth-grade average was regarded as an important criterion in the selection of the initial population.

In Table 46 we find that the ninth-grade average for all College Discovery students in the five Centers was 75.61. Over the past several years, the minimum high-school average for full-time matriculation at the senior college of The City University has been approximately 85 percent. The minimum average for admission to the transfer program of the community colleges has been 80 percent. The ninth-grade averages for the College Discovery population may be somewhat inflated for at least two reasons: (1) many of the College Discovery students were not programmed for academic courses in the ninth-grade; a large proportion, for example, were enrolled in general mathematics instead of ninth-grade algebra; and (2) a high proportion of the College Discovery students in Centers I, II, and III come from Special-Service junior high schools where the academic competition is not keen. Thus, the gap of almost 10 points between the high-school average of 85 required for regular matriculation at one of the senior colleges of The City University, and

the mean of 75.61 attained in the ninth grade present a rather formidable challenge. Although the usual entrance requirements of The City University will be waived for the College Discovery population, the students must, nevertheless, meet the academic standards of the college once they are matriculated.

While the analysis of variance among the five Centers reveals no statistically significant differences in the ninth-grade averages (Table 47), we find in Table 48 that the mean for Center IV is significantly higher at the .01 level than that for Center I. All other comparisons between Centers are not statistically significant, although Center IV, with a mean of 76.88, is the highest of the five Centers.

As shown in Table 46, the ninth-grade average for girls was 3.46 points higher than that for boys in the College Discovery and Development Program. The F-ratio for the analysis of variance by sex is statistically significant at the .01 level in favor of the girls (Table 49).

TABLE 46  
NINTH-GRADE AVERAGE

Center	Sex	N	Mean	Standard Deviation
I	Male	76	73.43	8.32
	Female	52	76.10	8.82
	Total	128	74.52	8.63
II	Male	87	74.26	7.11
	Female	37	77.76	7.25
	Total	124	75.31	7.33
III	Male	75	74.79	8.10
	Female	47	79.06	7.01
	Total	122	76.43	7.98
IV	Male	47	75.53	7.53
	Female	50	78.14	6.50
	Total	97	76.88	7.14
V	Male	64	73.70	10.39
	Female	36	77.69	8.77
	Total	100	75.14	10.02
Total	Male	349	74.26	8.35
	Female	222	77.72	7.77
	Total	571	75.61	8.30

TABLE 47

NINTH-GRADE AVERAGE:  
ANALYSIS OF VARIANCE AMONG CENTERS

Source	SS	df	MS	F
Centers	425.26	4	106.3150	1.546
Error	38930.87	566	68.7824	
Total	39356.73	570		

TABLE 48

DIFFERENCES BETWEEN CENTERS  
IN  
NINTH-GRADE AVERAGES

Center	IV	III	II	V	I
IV	0	.45	1.57	1.74	2.36**
III		0	1.12	1.29	1.91
II			0	.17	.79
V				0	.62
I					0

\*\*Significant at the .01 level

TABLE 49

NINTH-GRADE AVERAGES:  
ANALYSIS OF VARIANCE BY SEX

Source	SS	df	MS	F
Sex	1621.69	1	1621.69	24.45**
Error	37734.44	569	66.317	
Total	39356.13	570		

\*\*Significant at the .01 level

Failures in the Ninth Grade

At the time of selection, 30.8 percent of the College Discovery students were failing one or more subjects in the ninth grade. Table 50 reveals that students passing all subjects in the ninth year (grades of 65 or higher) range from 63.4 percent for Center I to 74 percent for Centers III and V.

TABLE 50

FAILING NINTH-YEAR GRADES  
BY  
NUMBER OF SUBJECTS

Center	Number of Subjects Failed										No Infor- mation.			
	0		1		2		3		4		5		N	%
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
I	83	63.4	25	19.1	14	10.7	5	3.8	4	3.0	0	0	0	0
II	80	64.5	24	19.4	17	13.7	1	0.8	0	0	1	0.8	1	0.8
III	91	74.0	19	15.4	5	4.1	5	4.1	3	2.4	0	0	0	0
IV	67	67.0	22	22.0	6	6.0	0	0	1	1.0	0	0	4	4.0
V	74	74.0	15	15.0	4	4.0	4	4.0	3	3.0	0	0	0	0
Total	395	68.3	105	18.2	46	7.9	15	2.6	11	1.9	1	0.2	5	0.9

Age of Students

Table 51 shows the mean ages of students in months by Center. The differences among the five Centers is not statistically significant (Table 52), although the mean age for Center III is significantly higher than that for Center II at the .05 level (Table 53). There are no significant differences among the Centers by sex in the age of Students (Table 54). Most students were 14 or 15 years old.



TABLE 51

AGE OF STUDENTS IN MONTHS  
BY  
CENTERS

Center	N	Mean (Months)	S.D.
I	130	184.76	14.38
II	124	182.61	6.75
III	123	185.29	7.56
IV	100	183.04	6.04
V	100	183.13	14.38
Total	577	183.83	10.44

TABLE 52

AGE OF STUDENTS:  
ANALYSIS OF VARIANCE AMONG CENTERS

Source	SS	df	MS	F
Center	671.06	4	168.76	1.553
Error	62241.64	573	108.62	
Total	62912.70	576		

TABLE 53  
DIFFERENCES BETWEEN CENTERS  
IN  
AGE OF STUDENTS

Center	III	I	IV	V	II
III	0	.53	2.16	2.25	2.68*
I		0	1.63	1.72	2.15
V			0	.09	.52
IV				0	.43
II					0

\*Significant at the .05 level

TABLE 54  
AGE OF STUDENTS:  
ANALYSIS OF VARIANCE BY SEX

Source	SS	df	MS	F
Sex	25.00	1	25.00	.228
Error	62887.70	575	109.37	
Total	62912.70	576		

CHAPTER V

DIFFERENCES AMONG THE SCHOOL POPULATIONS  
ON  
STANDARDIZED MEASURES OF APTITUDE AND ACHIEVEMENT

In this chapter we are concerned with findings related to: (1) the College Discovery populations in the five Centers; (2) the college preparatory populations in the five host schools; and (3) the College Discovery sub-population that participated in the in-residence, eight-week summer project at Columbia University (Project Double Discovery) relative to (4) the College Discovery population that did not participate in Project Double Discovery.

As mentioned in the Foreword of this report, any findings at this stage must be regarded as tentative, since this is a longitudinal program. Nevertheless, the first-year findings should point to certain directions and trends, and should lead to avenues for further inquiry.

Differences Among College Discovery Populations by Centers

on

Standardized Tests for Achievement and Aptitude

It was hypothesized in Chapter II that the College Discovery populations will differ significantly by Center in measures of aptitude and achievement. Closely related is the hypothesis that the comparison populations of college preparatory students will differ significantly by host school in aptitude and achievement. A third related hypothesis is that a host school with a relatively strong college preparatory function will tend to enroll a College Discovery population having higher indices of aptitude and achievement than a host school that does not have a strong college preparatory emphasis for its total student population.

Data from tests administered by the schools during the ninth grade were used in testing the above hypotheses, along with the results of the College Discovery testing program.

Iowa Tests of Educational Development. The Iowa Tests of Educational Development, administered city-wide during the ninth grade, were used as one of the indicators of academic potential where students obtained high scores relative to their actual achievement in the ninth grade. Table 55 reveals that the mean percentile score

(composite) on the ITED for all students selected for the College Discovery and Development Program is 65.87. Nearly all the CDD students had scored at or above the 50th percentile, and almost half scored in the upper third of the national norms. Since a minimum composite score in the 50th percentile on the ITED had been used as one of the evidences of academic potential, the data in Table 55 reflect the use of this test in the selection process.

Statistically significant differences at the .01 level are found among the Centers for the ITED scores, as shown in Table 56. The composite ITED percentiles ranged from a mean of 62.26 for the College Discovery students in Center III to a mean of 71.39 for the College Discovery students in Center IV (Table 55). In Table 57 we find that the mean percentile for Center IV is significantly higher than that for Centers I, III, and V. In Center IV almost one-third of the College Discovery students have composite ITED scores in the 80th percentile or higher, whereas only 8.3 percent of the students in Center V are at the 80th percentile or higher. The mean score for Center II is significantly higher at the .01 level than that for Centers III and V (Table 57). Center I is significantly higher than Centers III and V at the .05 level of confidence. No differences are evident by sex, according to the F-ratio for the analysis of variance (Table 58).

The findings from the Iowa Tests of Educational Development tend to support the hypotheses that the College Discovery populations differ significantly by host school in measures of achievement, and that the host school with a relatively strong college preparatory function (the host school in which Center IV is located) has selected a College Discovery population with higher indices of achievement than host schools which do not have a strong college preparatory emphasis for its total student population.

TABLE 55

COMPOSITE ITED PERCENTILE SCORE

Center	Sex	N	Mean	S. D.
I	Male	67	66.27	14.83
	Female	40	67.20	14.03
	Total	107	66.62	14.54
II	Male	77	67.01	10.32
	Female	33	68.88	15.00
	Total	110	67.57	11.95
III	Male	63	60.52	16.94
	Female	41	64.93	12.79
	Total	104	62.26	15.59
IV	Male	42	75.69	13.69
	Female	47	67.55	15.97
	Total	89	71.39	15.48
V	Male	62	62.65	13.77
	Female	35	60.60	13.76
	Total	97	61.91	13.80
Total	Male	311	65.84	14.70
	Female	196	65.91	14.66
	Total	507	65.87	14.69



TABLE 56

ITED COMPOSITE PERCENTILE SCORE:  
ANALYSIS OF VARIANCE AMONG CENTERS

Source	SS	df	MS	F
Center	5973.55	4	1493.387	7.250**
Error	103398.60	502	205.973	
Total	109372.15	506		

\*\*Significant at the .01 level

TABLE 57

DIFFERENCES BETWEEN CENTERS  
IN  
COMPOSITE ITED PERCENTILE SCORES

Center	IV	II	I	III	V
IV	0	3.82	4.77*	9.13**	9.48**
II		0	.95	5.31**	5.66**
I			0	4.36*	4.71*
III				0	.35
V					0

\*\*Significant at the .01 level

\*Significant at the .05 level

TABLE 58

COMPOSITE ITED PERCENTILE SCORES:  
ANALYSIS OF VARIANCE BY SEX

Source	SS	df	MS	F
Sex	.66	1	.66	.003
Error	109371.49	505	216.577	
Total	109372.15	506		

Metropolitan Reading Test. The Metropolitan Reading Test, administered city-wide in January of the ninth grade, was used as one of the indicators of academic potential, where students obtained high reading scores relative to their actual achievement in the ninth grade. Applicants with reading scores below grade 7.5 generally were rejected unless academic potential was otherwise in evidence.

For all College Discovery students tested, the mean grade score was 10.28 (Table 59). Thus, the mean reading score was .78 of a year above grade level. Nevertheless, over 40 percent of the students were reading below grade level.

The mean reading scores range from 9.71 for Center V to 10.69 for Center IV (Table 59). The analysis of variance for the reading scores among Centers reveals an F-ratio which is significant at the .01 level (Table 60). Center IV, with the highest mean score, is significantly higher than Centers III and IV at the .01 level of confidence (Table 61). The mean reading score for students in Center V is significantly below that for each of the other four Centers at the .01 level of confidence (Table 61). As an example of the differences between Centers in the distribution of reading scores, in Center IV more than 51 percent of the College Discovery population attained a reading score of grade 11 or above, while only 22 percent of the students in Center V scored at this level. The data in Tables 60 and 61 support the hypotheses that the College discovery populations differ significantly by Center in reading, and that a host school with a relatively strong college preparatory function (the host school in which Center IV is located) selected a College Discovery population having higher reading ability than host schools that do not have a strong college preparatory emphasis.

No statistically significant differences are observed by sex on the Metropolitan Reading Test, as shown in Table 62.

TABLE 59

MEAN NINTH-YEAR READING LEVEL BY CENTER

Center	N	Mean	S. D.
I	91	10.28	1.51
II	109	10.49	1.38
III	111	10.16	1.51
IV	76	10.69	1.22
V	81	9.71	1.34
Total	468	10.28	1.44

TABLE 60

MEAN NINTH-YEAR READING LEVEL:  
ANALYSIS OF VARIANCE AMONG CENTERS

Source	SS	df	MS	F
Centers	39.3937	4	9.8484	4.927**
Experimental Error	925.4146	463	1.9987	
Total	964.8083	467		

\*\*Significant at the .01 level

TABLE 61

DIFFERENCES BETWEEN CENTERS  
IN  
NINTH-YEAR READING LEVEL

Center	IV	II	I	III	V
IV	0	0.20	0.41	0.53**	0.98**
II		0	0.21	0.33	0.78**
I		0	0	0.12	0.57**
III				0	0.45**
V					0

\*\*Significant at the .01 level

TABLE 62

NINTH-YEAR READING LEVEL:  
ANALYSIS OF VARIANCE BY SEX

Source	SS	df	MS	F
Sex	3.4073	1	3.4073	1.6480
Experimental Error	961.4010	465	2.0675	
Total	964.8083	467		

Comparisons Between College Discovery and College Preparatory Population  
on  
Standardized Tests for Achievement and Aptitude

As part of the research design, intra-school comparisons were made for the CDD population and the college preparatory population (the latter group having been selected by random sampling from the total college preparatory enrollment in the tenth grade of the host school). Since one of the important criteria in the selection of the College Discovery population is a record of relatively high attainment on standardized measures of aptitude and achievement, combined with a history of relatively low academic achievement, one might have expected the College Discovery population to be fully comparable to the College preparatory population in each school. However, this was not anticipated in view of the fact that the selection criterion of high test scores in aptitude and achievement is only relative to low academic performance.

Moreover, it is hypothesized that the profile of the College Discovery population in each Center is related to the college preparatory orientation of the host school in which the Center is located. Thus, a host school serving a student body that is strongly oriented toward college preparation will also tend to select a College Discovery group which is relatively high in various measures of aptitude and achievement--although the college preparatory population will outperform the College Discovery population within that school.

What about a host school which serves a student body that is composed of predominantly disadvantaged youngsters who are lacking in orientation toward college? In such a case, we might expect the CDD population to be closer to the host school's college preparatory population. Where the socio-economic conditions are unusually severe, as in the case of host school II, both the CDD and the college preparatory populations should be lower in standardized measures of aptitude and achievement.

Stanford Achievement Test. In addition to the tests administered by the schools during the ninth grade, achievement and aptitude batteries were given to the College Discovery population and the comparison population of college preparatory students in each of the five schools during the first semester of the tenth grade.



As a measure of achievement, three subtests of the Stanford Achievement Test (High School Form 1965) were administered (English, Numerical Competence, and Reading).

The results on the English subtest reveal that, once again, Center IV has the highest mean score for its College Discovery population (Table 63). In comparing the College Discovery population with the comparison college preparatory population in each host school (Table 63), we find that the latter group in host schools IV and V scored significantly higher at the .01 level than did the College Discovery group. In host school II, the reverse is the case--with the College Discovery population scoring significantly higher at the .01 level (Table 63).

TABLE 63

COMPARISON OF COLLEGE DISCOVERY AND COLLEGE PREPARATORY POPULATIONS  
ON THE STANFORD ACHIEVEMENT TEST (ENGLISH)

Center + Host School	Mean		Diff. bet. Means	t
	College Prep.	CDD		
I	47.95	51.39	-3.44	-1.653
II	46.24	52.06	-5.82	-3.516**
III	52.65	50.26	2.39	1.439
IV	60.56	55.20	5.36	3.834**
V	54.00	49.80	4.20	2.629**
<b>Total</b>	<b>52.44</b>	<b>51.69</b>	<b>.75</b>	<b>.954</b>

\*\*Significant at the .01 level

Host school II, it will be recalled, is located in the most seriously disadvantaged area of any of the five host schools, whereas host school IV is located in the most favored socio-economic area. The severe deprivation in the neighborhood served by host school II is indicative of the student population served by this school. Consequently, it should not be surprising to find that the CDD population in this school actually outstrips the college preparatory population in various indicators of aptitude and achievement. The finding that host school IV yields the highest scores for both the CDD and college preparatory groups assigned to this school supports the hypothesis that a host school with a strong college preparatory function will have a College Discovery population with higher achievement indices than other host schools.

Similar patterns are revealed for the mean scores on the Reading subtest (Table 64) and on the Numerical Competence subtest (Table 65) of the Stanford Achievement Test. We find that, once again, the CDD population in Center II is significantly higher than the comparison college preparatory population in this school, whereas the reverse is the case for Centers III, IV, and V on Numerical Competence (Table 65). On the Reading subtest, the CDD population in Center II is significantly higher than the comparison college preparatory population in the host school at the .01 level, whereas we have reverse findings for Centers IV and V.

The host school for Center I has a liberal policy in classifying students as college preparatory and, consequently, the college preparatory population in this school scores lower than the College Discovery population on two of the subtests though the differences are not statistically significant.

As anticipated, host School IV, with its strong college preparatory emphasis and its location in the most favored socio-economic area of any of the five schools, consistently yields the highest scores for the college preparatory population, as well as for the College Discovery population.

TABLE 64

COMPARISONS OF COLLEGE DISCOVERY AND COLLEGE PREPARATORY POPULATIONS  
ON THE STANFORD ACHIEVEMENT TEST (READING)

Center + Host School	Mean		Diff. bet. Means	t
	College Prep.	CDD		
I	30.15	32.39	-2.24	-1.574
II	28.21	32.98	-4.77	-4.457**
III	33.80	32.69	1.11	.940
IV	40.84	37.10	3.74	3.083**
V	37.00	32.52	4.48	3.444**
Total	34.08	33.46	.62	1.046

TABLE 65

COMPARISONS OF COLLEGE DISCOVERY AND COLLEGE PREPARATORY POPULATIONS  
ON THE STANFORD ACHIEVEMENT TEST (NUMERICAL COMPETENCE)

Center + Host School	Mean		Diff. bet. Means	t
	College Prep.	CDD		
I	24.02	23.74	.28	.271
II	23.23	26.90	-3.67	-3.739**
III	29.14	25.98	3.16	3.561**
IV	32.71	27.05	5.66	6.231**
V	28.78	25.32	3.46	3.547**
Total	27.78	25.80	1.98	4.338**

\*\*Significant at the .01 level

Comparisons Among the College Discovery Populations on the Stanford Achievement Test. It was hypothesized in Chapter II that inter-Center comparisons (among the five schools) will reveal significant differences among the CDD populations. This hypothesis appears to be supported by the findings on the Stanford Achievement Test. However, these differences are accounted for mainly by Center IV, where the CDD population is significantly higher than the other four Centers on the subtests for English and Reading (Tables 66 and 68). The differences in favor of Center IV are of such magnitude that the analysis of variance among the five Centers yield an F-ratio that is statistically significant at the .01 level (Tables 67 and 69). On Numerical Competence, we also find an F-ratio showing a significant difference at the .01 level among the five Centers (Table 71); however, it is seen in Table 70 that this difference is produced by the fact that the College Discovery population in Center I has a significantly lower mean score than the populations in three of the other four Centers.

TABLE 66  
DIFFERENCES BETWEEN CENTERS  
ON THE STANFORD ACHIEVEMENT TEST (ENGLISH)

Center	IV	II	I	III	V
IV	0	3.14*	3.81*	4.94**	5.40**
II		0	.67	1.80	2.26
I			0	1.13	1.59
III				0	.46
V					0

\*\*Significant at the .01 level.

\*Significant at the .05 level

TABLE 67

STANFORD ACHIEVEMENT TEST (ENGLISH):  
ANALYSIS OF VARIANCE AMONG CENTERS

Source	SS	df	MS	F
Center	1749.527	4	437.381	4.06**
Error	55253.182	513	107.706	
Total	57002.709	517		

\*\*Significant at the .01 level

TABLE 68

DIFFERENCES BETWEEN CENTERS  
ON THE STANFORD ACHIEVEMENT TEST (READING)

Center	IV	II	III	V	I
IV	0	4.12**	4.41**	4.58**	4.71**
II		0	.29	.46	.59
III			0	.17	.30
II				0	.13
I					0

\*\*Significant at the .01 level

TABLE 69

STANFORD ACHIEVEMENT TEST (READING):  
ANALYSIS OF VARIANCE AMONG CENTERS

Source	SS	df	MS	F
Center	1536.951	4	384.237	6.396**
Error	30975.705	517	59.914	
Total	32512.656	521		

\*\*Significant at the .01 level

TABLE 70  
DIFFERENCES BETWEEN CENTERS  
ON THE STANFORD ACHIEVEMENT TEST (NUMERICAL COMPETENCE)

Center	IV	II	III	V	I
IV	0	.15	1.07	1.73	3.31**
II		0	.92	1.58	3.16**
III			0	.66	2.24**
V				0	1.58
I					0

\*\*Significant at the .01 level

TABLE 71  
STANFORD ACHIEVEMENT TEST (NUMERICAL COMPETENCE):  
ANALYSIS OF VARIANCE AMONG CENTERS

Source	SS	df	MS	F
Center	770.690	4	192.672	5.162**
Error	19520.627	523	37.324	
Total	20291.317	527		

\*\*Significant at the .01 level

Differential Aptitude Tests. Three subtests of the Differential Aptitude Tests were administered to the CDD population and the comparison population of college preparatory students in each of the five schools during the first semester of the tenth grade. The findings on the DAT closely parallel those for the Stanford Achievement Test.



On all three subtests (Verbal Reasoning, Numerical Ability, and Abstract Reasoning) the college preparatory and CDD population at host school IV are consistently higher than those of the other host schools (Tables 72 through 83). Moreover, the college preparatory populations in host schools IV and V attained significantly higher scores (at the .01 level) on all three subtests than the CDD students. On Numerical Ability (Table 67) the college preparatory populations in schools III, IV, and V scored significantly higher than the CDD groups.

As in the case of the Stanford Achievement Test, Center II consistently reveals a contrary trend--with the College Discovery students producing significantly higher scores (at the .01 level) than their college preparatory counterparts. A similar pattern is evident for Center I (at the .05 level) in two of the three subtests (Verbal Reasoning and Abstract Reasoning).

Inasmuch as the combination of subtests for verbal reasoning and numerical ability (VR + NA) is typically represented in so-called intelligence tests, the mean combinations for these subtests are treated for statistical differences by Centers in Table 75. Here we find that significantly higher means are obtained for the college preparatory students over the CDD students in Centers III, IV, and V. In Center II the CDD group has a significantly higher combined mean than the college preparatory population. No statistically significant differences are observed for the two populations in Center I. The highest combined mean score for both populations is obtained at Center IV.

Thus, the host school in the most favorable socio-economic location (School IV) consistently reveals significantly higher scores in measures of aptitude and achievement for its college preparatory and CDD populations in comparison to the other schools. The scores for the college preparatory group in school IV are also consistently and significantly higher than those for the CDD population within this same school. These findings, once again, tend to support the hypothesis that the host school with the strongest college preparatory orientation will select a CDD population that is higher in achievement and aptitudes than other host schools.

As mentioned earlier, host school II, serving the most disadvantaged student population and located in the poorest socio-economic area of the five host schools, yields a reverse pattern, showing its CDD population to be higher in

aptitude and achievement measures than its college preparatory population. A similar trend on the DAT is shown for host school I which also serves a large disadvantaged population and follows a liberal policy in classifying its tenth graders as "college preparatory."

TABLE 72

COMPARISONS OF COLLEGE PREPARATORY AND COLLEGE DISCOVERY POPULATIONS ON THE DIFFERENTIAL APTITUDE TEST (VERBAL REASONING)

Center & Host School	Mean		Diff. bet. Means	t
	College Prep.	CDD		
I	22.51	25.27	-2.76	-2.056*
II	21.33	27.90	-6.57	-5.921**
III	26.37	25.88	.49	.449
IV	33.00	29.75	3.25	2.758**
V	31.31	25.81	5.50	4.409**
Total	26.82	26.83	-.01	-.025

\*\*Significant at the .01 level

\*Significant at the .05 level

TABLE 73

COMPARISONS OF COLLEGE PREPARATORY AND COLLEGE DISCOVERY POPULATIONS ON THE DIFFERENTIAL APTITUDE TEST (NUMERICAL ABILITY)

Center & Host School	Mean		Diff. bet. Means	t
	College Prep.	CDD		
I	20.08	18.92	1.16	1.128
II	17.61	20.72	-3.11	-3.598**
III	23.57	19.81	3.76	4.204**
IV	26.86	23.92	2.94	3.343**
V	23.98	21.03	2.95	3.529**
Total	22.42	20.74	1.68	3.865**

\*\*Significant at the .01 level

TABLE 74

COMPARISONS OF COLLEGE PREPARATORY AND COLLEGE DISCOVERY POPULATIONS  
ON THE DIFFERENTIAL APTITUDE TEST (ABSTRACT REASONING)

Center & Host School	Mean		Diff. Bet. Means	t
	College Prep.	CDD		
I	30.46	32.85	-2.39	-1.995*
II	28.10	33.10	-5.00	-4.147**
III	33.23	33.56	- .33	- .336
IV	37.92	35.50	2.42	2.725**
V	35.85	33.27	2.58	2.580**
<b>Total</b>	<b>33.02</b>	<b>33.59</b>	<b>- .57</b>	<b>1.144</b>

\*\*Significant at the .01 level

\*Significant at the .05 level

TABLE 75

COMPARISONS OF COLLEGE PREPARATORY AND COLLEGE DISCOVERY POPULATIONS  
ON THE DIFFERENTIAL APTITUDE TEST (VERBAL REASONING + NUMERICAL ABILITY)

Center & Host School	Mean		Diff. bet. Means	t
	Control	CDD		
I	42.71	44.19	-1.48	- .688
II	39.20	48.68	-9.48	-5.829**
III	49.94	45.69	4.25	2.572*
IV	59.93	53.66	6.27	3.652**
V	55.33	46.85	8.48	4.725**
<b>Total</b>	<b>49.37</b>	<b>47.59</b>	<b>1.78</b>	<b>2.043*</b>

\*\*Significant at the .01 level

\*Significant at the .05 level

Comparisons Among the College Discovery Populations on the Differential Aptitude Test. Are the College Discovery populations among the five Centers significantly different in measures of aptitude? In Chapter II it was hypothesized that there are significant differences in aptitude among the College Discovery populations. The data in Tables 76 through 83 tend to support this hypothesis. On the verbal reasoning subtest of the Differential Aptitude Tests, the College Discovery populations in Centers II and IV have significantly higher mean scores than Centers I, III, and V (Table 76). On Numerical Ability, the mean scores for Center IV are significantly higher than the means for the other four Centers, while the mean scores for Center I are significantly lower than those for all other Centers except Center V (Table 78).

In Table 80 we see that the combined mean score on Verbal Reasoning and Numerical Ability is highest for Center IV and the difference is statistically significant at the .01 level against each of the other four Centers. Center II is significantly higher than Center I (at the .01 level) and higher than Center III (at the .05 level). On Abstract Reasoning, once again the mean score for Center IV is significantly higher than the other four Centers (Table 82). The analysis of variance among the five Centers yields F-ratios on the subtests of Verbal Reasoning and Numerical Ability that are statistically significant at the .01 level (Tables 77, 79, and 81). The F-ratio for Abstract Reasoning is significant at the .05 level (Table 83).

TABLE 76  
DIFFERENCES BETWEEN CENTERS ON THE  
DIFFERENTIAL APTITUDE TEST (VERBAL REASONING)

Center	IV	II	III	V	I
IV	0	1.85	3.67**	3.94**	4.48**
II		0	2.02*	2.09*	2.63**
III			0	.07	.61
V				0	.54
I					0

\*\*Significant at the .01 level

\*Significant at the .05 level

TABLE 77

DIFFERENTIAL APTITUDE TEST (VERBAL REASONING):  
ANALYSIS OF VARIANCE AMONG CENTERS

Source	SS	df	MS	F
Centers	1439.436	4	359.859	6.428**
Error	30173.342	539	55.980	
Total	31612.778	543		

\*\*Significant at the .01 level

TABLE 78

DIFFERENCES BETWEEN CENTERS ON THE  
DIFFERENTIAL APTITUDE TEST (NUMERICAL ABILITY)

Center	IV	V	II	III	I
IV	0	2.89*	3.20*	4.11*	4.95**
V		0	.31	1.12	2.10**
II			0	.91	1.79*
III				0	.88
I					0

\*\*Significant at the .01 level

\*Significant at the .05 level

TABLE 79

DIFFERENTIAL APTITUDE TEST (NUMERICAL ABILITY):  
ANALYSIS OF VARIANCE AMONG CENTERS

Source	SS	df	MS	F
Center	1462.978	4	365.744	10.259**
Error	19358.227	543	35.650	
Total	20821.205	547		

\*\*Significant at the .01 level

TABLE 80

DIFFERENCES BETWEEN CENTERS ON THE  
DIFFERENTIAL APTITUDE TEST (VERBAL REASONING AND NUMERICAL ABILITY)

Center	IV	II	V	III	I
IV	0	4.98**	6.82**	7.97**	9.47**
II		0	1.84	2.99*	4.49**
V			0	1.15	2.65
III				0	1.50
I					0

\*\*Significant at the .01 level

\*Significant at the .05 level

TABLE 81

DIFFERENTIAL APTITUDE TEST (VERBAL REASONING + NUMERICAL ABILITY):  
ANALYSIS OF VARIANCE AMONG CENTERS

Source	SS	df	MS	F
Center	5503.796	4	1375.949	12.190**
Error	60837.144	539	112.870	
Total	66340.940	543		

\*\*Significant at the .01 level

TABLE 82

DIFFERENCES BETWEEN CENTERS ON THE  
DIFFERENTIAL APTITUDE TEST (ABSTRACT REASONING)

Center	IV	III	V	II	I
IV	0	1.94*	2.24*	2.41*	2.66**
III		0	.30	.47	.72
V			0	.17	.42
II				0	.25
I					0

\*\*Significant at the .01 level

\*Significant at the .05 level



TABLE 83

DIFFERENTIAL APTITUDE TEST (ABSTRACT REASONING):  
ANALYSIS OF VARIANCE AMONG CENTERS

Source	SS	df	MS	F
Center	452.437	4	113.109	2.406*
Error	25525.817	543	47.008	
Total	25978.254	547		

\*Significant at the .05 level

Test for Problem-Solving. An important dimension of college success is the ability to find solutions to a variety of problems which require such critical-thinking skills as analyzing data, identifying assumptions and hypotheses, formulating conclusions, etc. The Test for Problem-Solving was administered to the College Discovery and college preparatory populations, along with the DAT and Stanford Achievement Test.

The Test for Problem-Solving was administered as a power test, with most students being allowed sufficient time for its completion. While no norms are available for this test, it was selected as a promising measure for predicting college success by virtue of its emphasis on certain critical-thinking skills and because of its stress on power over speed. Many standardized tests for aptitude and achievement emphasize speed over power. Yet the disadvantaged student is apt to pursue a slower and more deliberate style of test-taking and studying. Even the classroom style of teaching and testing for grades tends to emphasize speed, thereby giving the more deliberative students an impression that the school is impatient and nervous. Performance by such students is apt to be underestimated. As part of the longitudinal research, this instrument will be assessed for predictability of college success for the populations studied.

Table 84 presents the differences between means for the five pairs of CDD and college preparatory populations. The means are derived from the raw scores of number of items correct from the 40-item Test for Problem-Solving. Only in

Centers IV and V are the differences statistically significant in favor of the college preparatory group over the CDD population. For all college preparatory groups combined, compared with all CDD groups combined, the mean difference is not statistically significant--although it is slightly higher for the college preparatory students. However, in Table 84 it is seen that both the college preparatory and CDD populations in Center IV made the highest mean scores, with the CDD population in Center IV outscoring the college preparatory populations in each of the other four Centers.

TABLE 84

COMPARISONS OF COLLEGE PREPARATORY AND COLLEGE DISCOVERY POPULATIONS ON THE TEST FOR PROBLEM-SOLVING

Center	Means		Diff. bet. Means	t
	Control	CDD		
I	22.13	23.62	-1.49	-1.580
II	23.35	24.52	-1.17	-1.400
III	24.11	23.69	.42	.571
IV	29.49	27.31	2.18	2.700**
V	26.96	24.69	2.27	2.464*
Total	25.01	24.66	.35	.879

\*\*Significant at the .01 level

\*Significant at the .05 level

Comparisons Among the College Discovery Populations on the Test for Problem-Solving. In comparing the differences between the CDD populations by Centers, we find in Table 85 that Center IV has significantly higher mean score than each of the other four Centers. These differences are statistically significant at the

.01 level. None of the other paired comparisons yield a statistically significant difference. While the analysis of variance among Centers yields an F-ratio that is statistically significant at the .01 level, this difference is accounted for by the higher mean score for Center IV over each of the other four Centers (Table 86).

TABLE 85  
DIFFERENCES BETWEEN CENTERS  
ON THE TEST FOR PROBLEM SOLVING

Center	IV	V	II	III	I
IV	0	2.62**	2.79**	3.62**	3.69**
V		0	.17	1.00	1.07
II			0	.83	.90
III				0	.07
I					0

\*\*Significant at the .01 level

TABLE 86  
TEST FOR PROBLEM-SOLVING:  
ANALYSIS OF VARIANCE AMONG CENTERS

Source	SS	df	MS	t
Center	1621	4	405.25	11.05**
Error	17142	552	34.86	
Total	18763	556		

\*\*Significant at the .01 level

Summary of Differences Among the College Discovery Population by Center

Throughout this chapter we have emphasized that (1) each host school presents a somewhat different total environment and serves a somewhat different socio-economic area, and (2) each Center within the host school has a somewhat different makeup of College Discovery students. This is why, in our analysis of data, we have treated each Center as a subgroup to be studied.

Figure 1 presents profiles on 13 measures (aptitude, achievement, income, attendance, etc.) for the CDD populations in Centers I and IV. As revealed in the various statistical tests reported throughout this chapter, the differences are significant. In Chapter VI are the findings on academic achievement, attendance, persistence and attitudes. In examining Figure 1, the reader is reminded that one of the hypotheses in the evaluation of the Program is that persistence and academic performance will be related significantly to the High School Development Center, and that the Centers with the more promising students will not necessarily have the lowest dropout rate or the highest record of achievement and entrance to college.

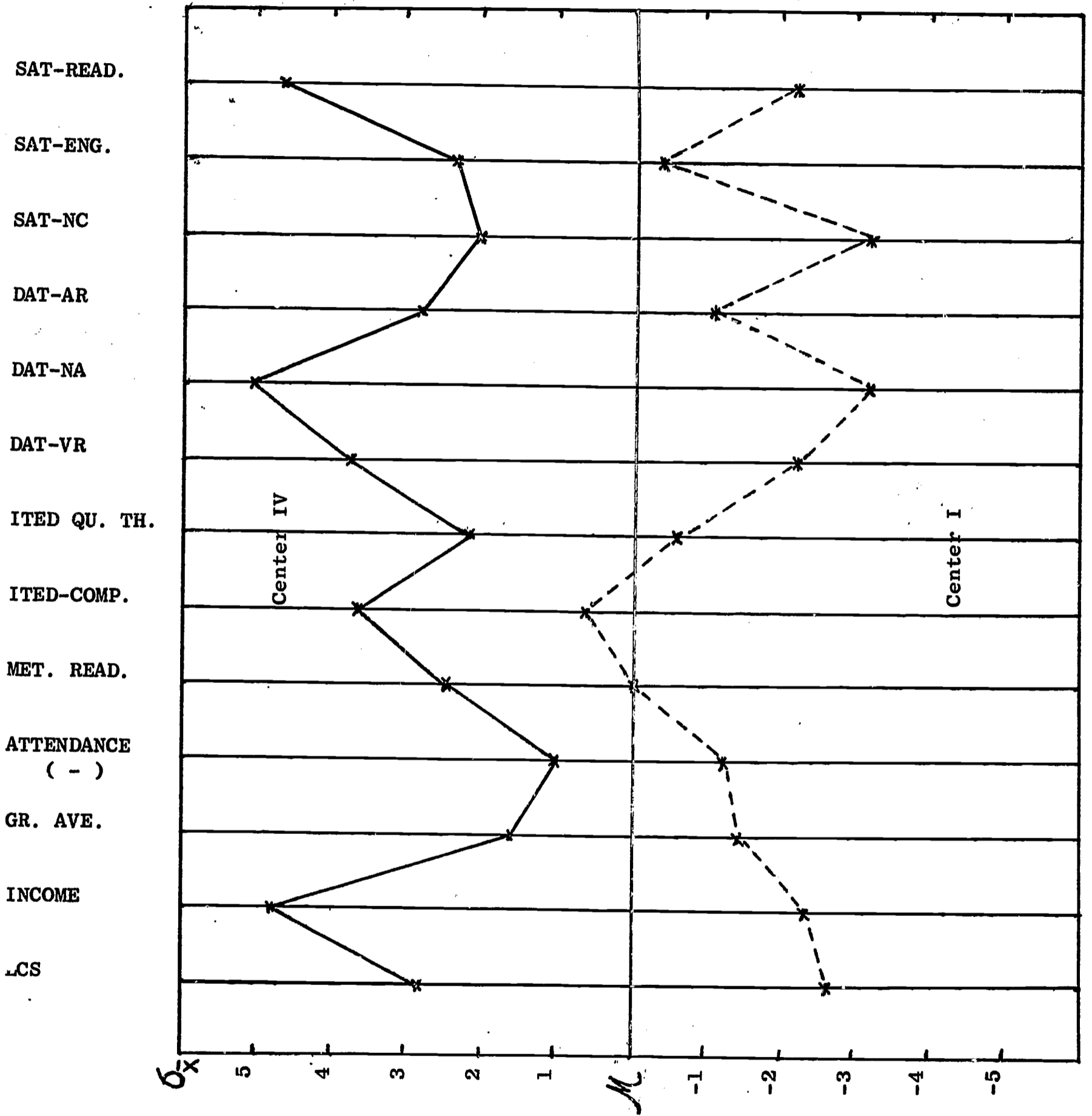


FIGURE 1. PROFILES OF THE COLLEGE DISCOVERY STUDENTS  
IN  
TWO HIGH SCHOOL DEVELOPMENT CENTERS

CHAPTER VI

ACADEMIC ACHIEVEMENT, ATTENDANCE, PERSISTENCE AND ATTITUDES

Comparisons Between College Discovery and College Preparatory Populations  
in  
Academic Achievement

In analyzing the grades obtained after the first and second semesters of enrollment in the College Discovery and Development Program, it was anticipated that (1) the college preparatory population would gain significantly higher grades than the College Discovery population (though not necessarily in each of the five Centers); (2) academic performance on the part of the CDD populations will differ significantly among the five Centers; (3) academic performance on the part of the college preparatory populations will differ significantly among the five host schools; and (4) female CDD students will have higher grades than their male counterparts.

First-Semester Average. At the end of the 1965 fall semester, comparisons in academic performance were made for the CDD and college preparatory populations. In only two of the five Centers were significant differences found (Table 87). The college preparatory population in school IV received higher grades than the CDD population (significant at the .01 level). In Center II, the CDD population received higher grades than the college preparatory population (significant at the .05 level). These results are consistent with the earlier findings which revealed that the college preparatory population in school IV is significantly higher than the CDD population on standardized measures of aptitude and achievement, while in school II these measures favor the CDD group over the college preparatory group. It is noteworthy, however, that despite the generally superior scores for the college preparatory populations in schools III, IV, and V on standardized tests for aptitude and achievement, the actual academic performance of these populations, compared with the CDD populations, reveal no statistically significant differences for the fall semester (Table 87). The data on scholastic performance over the full academic year, including Regents grades, are presented later in this chapter.



TABLE 87

COMPARISONS OF COLLEGE PREPARATORY AND COLLEGE DISCOVERY POPULATIONS  
IN ACADEMIC AVERAGES (FALL SEMESTER, 1965)

Center & Host School	Mean		Diff. bet. Means	t
	College Prep.	CDD		
I	70.67	72.35	-1.68	-1.03
II	72.29	76.17	-3.88	-2.31*
III	74.32	73.55	.77	.50
IV	78.71	73.84	4.87	4.51**
V	75.37	74.66	.71	.53
Total	74.08	74.14	.06	- .086

\*\*Significant at the .01 level

\*Significant at the .05 level

Inter-Center comparisons on fall-semester grades received by the CDD populations reveal that Center II had the highest average, and the mean differences are statistically significant over Centers I (.01 level), III and IV (.05 level). Center V is statistically higher than I at the .05 level. These data are presented in Table 88. The analysis of variance among Centers in fall semester grades is significant at the .05 level (Table 89).

TABLE 88

DIFFERENCES BETWEEN MEANS  
IN ACADEMIC GRADES BY CENTERS (FALL SEMESTER, 1965)

Center	II	V	IV	III	I
II	0	1.51	2.53*	2.62*	4.08**
V		0	1.02	1.11	2.57*
IV			0	.09	1.55
III				0	1.46
I					0

\*\*Significant at the .01 level

\*Significant at the .05 level

TABLE 89

ACADEMIC AVERAGES (FALL SEMESTER, 1965):  
ANALYSIS OF VARIANCE AMONG CENTERS

Source	SS	df	MS	F
Centers	1108.167	4	277.046	3.226*
Error	46457.304	549	85.873	
Total	47565.471	553		

\*Significant at the .05 level

Final Averages for the First Year. The final first-year averages (excluding Regents Examination scores) are presented in Table 90. Again we find that the college preparatory population in Center IV received higher grades than the CDD population (significant at the .01 level). The same pattern is shown for Center V (significant at the .05 level). It will be recalled that, for standardized measures of aptitude and achievement, schools IV and V both show significantly higher mean scores for their college preparatory groups than their CDD populations. All other intra-school comparisons between the CDD and college preparatory populations in final averages are not significantly different.

How do the five College Discovery populations differ from each other in final averages for the first academic year (excluding Regents grades)? In Table 91 we find that the final average for the CDD students in Center IV is significantly higher than for Centers I, III, and V. The final average for Center II is also significantly higher than for Centers I and III. All other inter-Center differences in final averages for the CDD populations are not statistically significant. The analysis of variance among Centers for the final averages is statistically significant at the .05 level (Table 92).

TABLE 90

COMPARISONS OF COLLEGE PREPARATORY AND COLLEGE DISCOVERY POPULATIONS  
IN FINAL ACADEMIC GRADES (SPRING SEMESTER, 1966)

Center	Means		Diff. bet. Means	t
	College Prep.	CDD		
I	67.64	70.88	-3.24	-1.811
II	73.15	74.39	-1.24	-.767
III	72.87	71.27	1.60	.972
IV	79.77	75.28	4.49	4.155**
V	75.53	72.40	3.13	2.224*
Total	73.39	72.78	.61	.832

\*\*Significant at the .01 level

\*Significant at the .05 level

TABLE 91

DIFFERENCES BETWEEN MEANS IN FINAL GRADES  
FOR THE 1965-1966 ACADEMIC YEAR (EXCLUDING REGENTS)

Center	IV	II	V	III	I
IV	0	.89	2.88*	4.01*	4.40**
II		0	1.99	3.12*	3.51*
V			0	1.13	1.52
III				0	.39
I					0

\*\*Significant at the .01 level

\*Significant at the .05 level

TABLE 92

FINAL AVERAGES FOR THE 1965-1966 ACADEMIC YEAR:  
ANALYSIS OF VARIANCE AMONG CENTERS

Source	SS	df	MS	F
Center	1544.187	4	386.046	3.240*
Error	62661.724	526	119.128	
Total	64205.911	530		

\*Significant at the .05 level

Regents Examination Grades in Algebra. The Regents Examinations have been used for over 100 years in New York State. These examinations are "intended for use in what are essentially first-track courses."<sup>1</sup> It is claimed that the Regents examinations have established "quality standards of achievement for pupils and teachers."<sup>2</sup> Regardless of the pros and cons for this statewide testing program, the Regents tests provide a useful tool for comparing the college preparatory and CDD populations in this study, since grading practices may differ among schools.

It was hypothesized in Chapter I that there will be significant differences in achievement in favor of the combined college preparatory populations over the combined CDD populations during the tenth and eleventh grades, but these differences will diminish significantly by the senior year of high school.

Table 93 presents the results of the Algebra Regents taken at the end of the tenth year by the college preparatory and CDD populations in each of the five schools. Statistically significant differences in the mean scores are obtained for the college preparatory students over the CDD population in three of the five schools (at the .01 level). All college preparatory groups combined produced a mean of 76.14 compared with 68.14 for all CDD groups combined. This difference is also significant at the .01 level. These results are in support of the hypothesis that initial differences in achievement will be significantly in favor of the college preparatory students over the CDD students.

<sup>1</sup> Sherman N. Tinkleman, "Regents Examinations in New York State After 100 Years." Proceedings of the 1965 Invitational Conference on Testing Problems. Princeton, N. J.: Educational Testing Service, 1966. p.88.

<sup>2</sup> Ibid., p. 94.

TABLE 93

COMPARISONS OF COLLEGE PREPARATORY AND COLLEGE DISCOVERY POPULATIONS  
IN THE ALGEBRA REGENTS EXAMINATION

Center	Means		Diff. Bet. Means	t
	College Prep.	CDD		
I	67.00	69.76	-2.76	- .771
II	75.63	76.80	-1.17	- .343
III	75.59	61.89	13.69	4.218**
IV	84.10	67.75	16.35	6.914**
V	76.77	63.18	13.59	4.692**
Total	76.14	68.14	8.00	5.763**

\*\*Significant at the .01 level

From the earlier findings, which revealed that the college preparatory and CDD students in Center IV consistently produced higher scores on standardized measures of aptitude and achievement, it might well be anticipated that the Regents grades would follow this same pattern. However, it was hypothesized that the Centers selecting the most promising students will not necessarily produce the highest record of scholastic achievement.

In Table 93 we see that, while the college preparatory group in school IV attained by far the highest mean score on the Algebra Regents, the CDD population in this school ranked only third among the five Centers. The highest mean score among the five CDD groups was obtained in Center II. Here the CDD students performed as well as all college preparatory students in the five high schools combined. The mean score on the Algebra Regents for the CDD students in Center II is significantly higher (at the .01 level) than for each of the other four Centers (Table 94). These differences cannot be accounted for by any measures of aptitude, achievement, or Life Chances as reported in preceding chapters. The results may be indicative of the success of the mathematics faculty in Center II. In Table 94

we also find that Centers III and V obtained mean scores that are significantly lower than those obtained by Centers I and IV (Table 94). In comparing the mean score for all of the college preparatory students against that for all of the CDD students in the five schools, we find in Table 93 that the former group is significantly higher at the .01 level as expected. The analysis of variance among Centers yields an F-ratio that is statistically significant at the .01 level (Table 95). This finding supports the hypothesis that significant differences in academic achievement will be evidenced among the Centers.

TABLE 94  
DIFFERENCES BETWEEN CENTERS  
IN THE ALGEBRA REGENTS EXAMINATION

Center	II	I	IV	V	III
II	0	7.04**	9.05**	13.62**	14.91**
I		0	2.01	6.58*	7.87**
IV			0	4.57**	5.86**
V				0	1.29
III					0

\*\*Significant at the .01 level

\*Significant at the .05 level



TABLE 95

ALGEBRA REGENTS EXAMINATION:  
ANALYSIS OF VARIANCE AMONG CENTERS

Source	SS	df	MS	F
Center	15285.121	4	3821.280	10.469**
Error	174108.002	477	365.006	
Total	189393.123	481		

\*\*Significant at the .01 level

Regents Examination Grades in Biology. Virtually every student in the college preparatory and CDD populations took the Regents examination in Biology. In Table 96 we find, as anticipated, that the college preparatory populations for all schools combined obtained a significantly higher mean score than the combined CDD populations (significant at the .01 level). School IV produced the highest mean scores for both its college preparatory and CDD populations. Although in each of the five schools the college preparatory population obtained a higher mean score than the College Discovery population, the mean difference was statistically significant only in schools IV and V.

In Table 97 we find that the Biology mean for the CDD population in Center IV is statistically higher than that obtained in each of the other four Centers at the .01 level. This finding, unlike the results on the Algebra Regents, is consistent with the standardized measures for aptitude and achievement discussed in the preceding chapter. The CDD students in Centers I and V obtained significantly lower means on the Biology Regents than students in the other three Centers (Table 97). The analysis of variance among the five Centers is statistically significant at the .01 level (Table 98).

TABLE 96

COMPARISONS OF COLLEGE PREPARATORY AND COLLEGE DISCOVERY POPULATIONS  
IN THE  
BIOLOGY REGENTS EXAMINATION

Center	Means		Diff. Bet. Means	t
	College Prep.	CDD		
I	67.49	64.83	2.66	1.392
II	71.44	68.88	2.56	1.421
III	69.49	67.68	1.81	.953
IV	78.98	73.66	5.32	3.954**
V	74.82	63.46	11.36	6.398**
Total	72.57	67.66	4.91	5.999**

\*\*Significant at the .01 level

TABLE 97

DIFFERENCES BETWEEN CENTERS  
IN THE  
BIOLOGY REGENTS EXAMINATION

Center	IV	II	III	I	V
IV	0	4.78**	5.97**	8.83**	10.20**
II		0	1.19	4.05**	5.42**
III			0	2.86	4.23**
I				0	1.37
V					0

\*\*Significant at the .01 level

TABLE 98

BIOLOGY REGENTS EXAMINATION:  
ANALYSIS OF VARIANCE AMONG CENTERS

Source	SS	df	MS	F
Center	5871.190	4	1467.797	11.591**
Error	62045.427	490	126.623	
Total	67916.617	494		

\*\*Significant at the .01 level

Attendance in the Tenth Grade

Since each Center serves a borough-wide population of CDD students, these boys and girls must spend considerable time in traveling between home and school. It is not uncommon for College Discovery students to spend two or more hours per day on subways and buses. On the other hand, the college preparatory students in each host school are, for the most part, drawn from the immediate school neighborhood. Furthermore, the College Discovery groups are exposed to a longer school day as a result of the 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 CDD students than for the college preparatory boys and girls.

However, despite the two-week transit strike near the end of the fall semester, the record of fall-semester attendance for all CDD students compared with all college preparatory students (in the five schools combined) revealed no statistically significant difference (Table 99). However, for Centers III and V the transportation problems were most severe during the transit strike and, consequently, the absenteeism for the CDD groups at these two Centers was higher than the comparison group of college preparatory students during the fall semester.

TABLE 99

COMPARISONS OF COLLEGE PREPARATORY AND COLLEGE DISCOVERY POPULATIONS  
IN FALL-SEMESTER ABSENCES

Center	Means		Diff. Bet. Means	t
	College Prep.	CDD		
I	11.42	11.74	- .32	-.31*
II	10.04	9.85	.19	.14
III	8.51	11.03	-2.52	-2.27*
IV	6.62	6.63	- .01	- .01
V	3.48	5.62	-1.78	-2.44*
Total	8.43	9.21	- .78	-1.56

\*Significant at the .05 level

The impact of the transit strike in reducing school attendance is evident by the record of improved attendance during the spring semester (Table 100). In four of the five schools, the record of attendance was in favor of the CDD students over the college preparatory students. As shown in Table 100, the difference in favor of the CDD students is statistically significant at the .01 level. College Discovery students in Center V were particularly handicapped by poor transportation in their borough--with the majority of students traveling over two hours per day between home and school. Nevertheless, although the CDD students in Center V were higher in absenteeism than the college preparatory group in the host school, their record of attendance was second only to the CDD students in Center IV (Table 100).

These findings are suggestive of remarkably high motivation on the part of the CDD students. Obviously, the hypothesis that attendance would be significantly better for the college preparatory students over the CDD Discovery students must be rejected on the basis of the first-year results, as summarized in Table

101. In Table 102 we find that absenteeism for the College Discovery students in Centers I, II, and III was significantly higher than in Centers IV and V (at the .01 level), although it should be reiterated that there are no statistically significant differences within these schools between the college preparatory and CDD groups.

TABLE 100  
COMPARISONS OF COLLEGE PREPARATORY AND COLLEGE DISCOVERY POPULATIONS  
SPRING-SEMESTER ABSENCES

Center	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

TABLE 101  
COMPARISONS OF COLLEGE PREPARATORY AND COLLEGE DISCOVERY POPULATIONS  
TOTAL-YEAR ABSENCES

Center	Means		Diff. Bet. Means	t
	Control	CDD		
I	20.96	19.22	1.74	.825
II	21.31	16.89	4.42	1.636
III	16.26	20.32	-4.06	-1.867
IV	14.99	10.27	4.72	3.742**
V	7.66	11.66	-4.00	-3.368**
Total	16.46	16.07	.39	.414

\*\*Significant at the .01 level

TABLE 102  
DIFFERENCES BETWEEN CENTERS  
IN  
TOTAL-YEAR ABSENCES

Center	III	I	II	V	IV
III	0	1.10	3.43	8.66**	10.05**
I		0	2.33	7.56**	8.95**
II			0	5.23**	6.62**
V				0	1.39
IV					0

\*\*Significant at the .01 level

TABLE 103  
TOTAL-YEAR ABSENCES:  
ANALYSIS OF VARIANCE AMONG CENTERS

Source	SS	df	MS	F
Center	8161.289	4	2040.322	10.750**
Error	99833.405	526	189.797	
Total	107994.694	530		

The Dropouts

It was assumed early in the Program that a considerable number of dropouts would occur during the first year as a result of the distance and time in commuting between home and the High School Development Center, and because of the longer school day. However, it soon became evident from the excellent records of attendance that the dropout rate would be far below what was originally anticipated. Nevertheless, the dropout rate varied considerably by Center. But a word of



caution is in order. A number of College Discovery students with failing first-year averages enrolled in the summer Project Double Discovery Program and in the regular summer session of the New York City schools in an effort to make up their failures. Additional dropouts are likely during the coming school year, especially among those who are unable to make progress during the summer. Slightly more than 20 per cent of the total College Discovery population finished the academic year with averages below 65.

The dropouts by Center, as of June 1966, are summarized in Table 104. While the dropout rate for all Centers is only 9.3 per cent, Center IV has the highest dropout rate with 18.8 per cent. The lowest rates are in Centers II and V with only 4 per cent each. No significant differences were found between the number of male and female dropouts at the end of the first year. Consequently, the male/female dropout ratios are not included in Table 104.

TABLE 104  
DROPOUTS BY CENTERS  
JUNE, 1966

Center	Retained		Dropped-out		Total
	N	%	N	%	
I	119	91.5	11	8.5	130
II	120	96.0	5	4.0	125
III	108	87.8	15	12.2	123
IV	82	81.2	19	18.8	101
V	96	96.0	4	4.0	100
Total	525	90.7	54	9.3	579

Comparisons between the dropouts and the total CDD population were made on 17 measures, as shown in Table 105. None of the standardized measures of aptitude and achievement (the DAT and the Stanford Achievement Test) yield a significant difference between the dropouts and the total CDD population. Moreover, the Life

Chances score is not significantly different. However, the means of the dropouts in ninth-grade average and attendance are significantly lower than the mean for the total CDD population.

After the second year, a more detailed analysis by Centers will be made. It would appear from the data on the magnitude of dropouts by Center (Table 104) that the criteria for dropping students from the Program vary considerably by Center. A careful follow-up study will be made to determine the reasons why some students are dropped from the Program, and the reasons why other students decide voluntarily to drop from the Program. Furthermore, the future academic careers of all dropouts will be an important phase of this longitudinal study.

TABLE 105

DIFFERENCES BETWEEN DROPOUTS AND NON-DROPOUTS ON 17 MEASURES

Measure	Mean CDD Population	Mean Drop-Outs	Difference	t
Average (9th Grade)	75.61	71.87	3.74	3.249**
Reading Grade	10.28	10.40	- .12	- .526
ITED Composite	65.87	66.96	-1.09	- .514
ITED Quantitative Thinking	60.52	58.88	1.64	.539
Adjusted Life Chances Score	1.67	1.63	.04	.172
Absences (9th Grade)	5.49	8.43	-2.94	-2.96*
Weekly Income	97.53	99.52	-1.99	- .371
No. of Persons in Family	5.24	5.37	- .13	- .471
Age	183.83	185.11	-1.28	- .893
Father's Schooling	9.60	9.25	.35	.745
Mother's Schooling	9.70	9.65	.05	.113
DAT-Verbal Reasoning	26.83	26.66	.17	.131
DAT-Abstract Reasoning	33.59	31.34	2.25	1.848
DAT-Num. Ability	20.74	19.88	.86	.794
Stanford-Reading	33.46	32.64	.82	.600
Stanford-English	51.69	50.73	.96	.525
Stanford-Num. Competence	25.80	24.27	1.53	1.598

\*\*Significant at the .01 level

\*Significant at the .05 level

### Attitudes

Several studies are being undertaken on the attitudes and behaviors of the College Discovery and comparison populations. Some of these investigations are being conducted as part of the overall evaluation of the Program, while other studies are adjunct or collateral to the general evaluation. The results of these investigations will appear in later reports.

One study of attitudes and self-concept was conducted independently in one of the host schools during the 1965-1966 school year.<sup>3</sup> The purpose of this study was to compare the College Discovery boys and girls with college preparatory students and general course students on attitudes about themselves as students, and about high school, college, and reading. The hypotheses of this investigation were that (1) College Discovery students will rate the concepts "Myself as a Student," "College," "Reading," and "High School" more positively than will students enrolled in the general curriculum, and (2) College Discovery students will rate the concept "Myself as a Student" less positively than will Regents (college preparatory students), while not differing from the Regents students in the ratings of other concepts. Through the Semantic Differential technique, the students were asked to evaluate the four concepts using eight adjective pairs or scales. Each scale consisted of a five-point continuum. The chi-square statistic was used to test the significance of the differences in the ratings by the groups.

The findings of the investigation were that the College Discovery students rated themselves significantly higher than the general students on all four concepts. Moreover, the College Discovery students and Regents students did not differ significantly in their ratings on the four concepts. Therefore, the hypothesis that the College Discovery students will rate the concept "Myself as a Student" less positively than the Regents students was unsupported by the data. The investigator concluded that "...underachievers who are given an opportunity to improve their academic success place a higher value on certain concepts related to education than general students, and place the same value on education as students following an academic course... College Discovery students have a higher opinion of themselves than do general students and...there are no significant differences between the attitudes that Regents students and College Discovery

<sup>3</sup>Judith Halpern, "The Attitudes of College Discovery, General and Regents Students Toward School Related Concepts." Graduate Research in Education and Related Disciplines, Vol. 2, 1:84-95, April, 1966.

students have toward themselves as students."<sup>4</sup> The investigator surmises that "It may be that the College Discovery Program has had an elevating effect on the students' self-concept."<sup>5</sup>

Other studies of the attitudes and values of the CDD students are in process, and not yet ready for even preliminary reporting.

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<sup>4</sup>Ibid., p. 93.

<sup>5</sup>Ibid., p. 92.

CHAPTER VII

EFFECTS OF THE SUMMER PROGRAM

The eight-week summer program, Project Double Discovery, conducted on the campus of Columbia University and sponsored jointly by The City University and Columbia University as an Upward Bound project under the Office of Economic Opportunity, is described in some detail in Chapter I. It will be recalled that 155 boys and girls were selected at random from the 579 who were admitted to the College Discovery and Development Program. The 155 students were enrolled in an eight-week, in-residence session at Columbia University during the summer of 1965. Table 106 presents a summary of the number of students who completed the summer program contrasted with the non-summer group by Centers. The summer group is referred to as "Double Discovery" (DD).

Comparisons Between Summer and Non-Summer Groups on Standardized Tests. The randomized selection procedure was intended to provide for comparison groups (summer vs. non-summer) that are initially equivalent in aptitude and achievement. By following-up these equivalent comparison groups, it is then possible to treat the summer program as an experimental variable and to assess its effects on academic achievement, attitudes, and persistence.

As a check on the assumption that both groups (summer and non-summer) were initially equal in educational development, the t-test was applied to measure the significance between the mean scores for the two groups on the Iowa Test of Educational Development. It will be recalled that the ITED was administered during the ninth grade--before the students entered the College Discovery and Development Program. In Table 107 we find that in four of the five Centers the summer group produced lower mean scores than the non-summer group. Although the t-values are not statistically significant, a similar pattern in favor of the non-summer group emerges on each of the three subtests of the Stanford Achievement Test (English, Reading, and Numerical Competence). Again, the mean differences are not of sufficient magnitude to be of statistical significance. These data are presented in Tables 108 through 110.



TABLE 106  
 SUMMER AND NON-SUMMER GROUPS  
 BY  
 CENTERS

Center	College Discovery		Total
	Summer (DD)	Non-Summer	
I	37	93	130
II	25	100	125
III	37	86	123
IV	29	72	101
V	27	73	100
<b>Total</b>	<b>155</b>	<b>424</b>	<b>579</b>

TABLE 107  
 COMPARISONS BETWEEN SUMMER AND NON-SUMMER GROUPS  
 ON THE IOWA TESTS OF EDUCATIONAL DEVELOPMENT (COMPOSITE SCORE)

Center	Mean		Diff. Bet. Means	t
	Summer	Non-Summer		
I	64.74	67.38	-2.64	-.792
II	66.76	67.76	-1.00	-.358
III	59.88	63.37	-3.49	-.981
IV	72.12	71.11	1.01	.242
V	60.78	62.26	-1.48	-.410
<b>Total</b>	<b>64.56</b>	<b>66.33</b>	<b>-1.77</b>	<b>-.110</b>

TABLE 108

DIFFERENCES BETWEEN MEANS  
SUMMER VS. NON-SUMMER GROUPS  
STANFORD ACHIEVEMENT TEST: ENGLISH

Center	Mean		Diff. Bet. Means	t
	Summer	Non-Summer		
I	52.25	51.06	1.19	.368
II	51.85	52.05	- .20	- .075
III	50.19	50.29	- .10	- .043
IV	56.32	54.80	1.52	.695
V	46.95	50.67	-3.71	-1.543
Total	51.56	51.72	- .16	- .136

TABLE 109

DIFFERENCES BETWEEN MEANS  
SUMMER VS. NON-SUMMER GROUPS  
STANFORD ACHIEVEMENT TEST: READING

Center	Mean		Diff. Bet. Means	t
	Summer	Non-Summer		
I	30.55	33.12	-2.57	-1.244
II	32.45	33.11	- .66	- .364
III	34.13	32.14	1.99	1.131
IV	36.70	37.25	- .55	- .297
V	31.50	32.87	-1.37	- .759
Total	33.13	33.57	- .45	- .528

TABLE 110

DIFFERENCES BETWEEN MEANS  
SUMMER VS. NON-SUMMER GROUP  
STANFORD ACHIEVEMENT TEST: NUMERICAL COMPETENCE

Center	Mean		Diff. Bet. Means	t
	Summer	Non-Summer		
I	22.23	24.35	-2.12	-1.38
II	27.10	26.85	.25	.149
III	26.19	25.90	.29	.250
IV	27.28	26.97	.31	.231
V	26.50	24.96	1.54	1.009
Total	25.65	25.85	- .20	- .309

The t-test was also applied to the mean scores for both groups (summer and non-summer) for all three subtests of the Differential Aptitude Tests. The findings again, are generally consistent with the results obtained on the ITED and Stanford Achievement Tests. In Tables 111 through 113 we see that the mean scores for two of the subtests (Verbal Reasoning and Numerical Ability) are lower for the summer group, but the t-values are not statistically significant. Only on the subtest for Abstract Reasoning is the difference in favor of the summer group, but again the t-value is not significant (Table 114).

On the Test of Problem-Solving, we find in Table 115 that the non-summer group has a slightly higher mean score, but the difference is not statistically significant.

Thus we find that the differences between the summer and non-summer groups on standardized tests for aptitude and achievement, while slightly in favor of the non-summer group, are not significant. The two groups are also being analyzed on various socio-economic indicators (Life Chances), but these findings will appear in a subsequent report.

TABLE 111

DIFFERENCES BETWEEN MEANS  
SUMMER VS. NON-SUMMER GROUP  
DAT: VERBAL REASONING

Center	Means		Diff. Bet. Means	t
	Summer	Non-Summer		
I	24.67	25.52	- .85	- .506
II	26.33	28.26	-1.93	-1.077
III	26.91	25.48	1.43	.981
IV	30.81	29.35	1.46	.902
V	25.04	26.10	-1.06	- .5763
Total	26.63	26.91	- .28	- .364

TABLE 112

DIFFERENCES BETWEEN MEANS  
SUMMER VS. NON-SUMMER GROUP  
DAT: NUMERICAL ABILITY

Center	Means		Diff. Bet. Means	t
	Summer	Non-Summer		
I	18.42	19.14	- .72	- .518
II	21.32	20.58	.74	.633
III	19.85	19.80	.05	.040
IV	23.42	24.10	- .68	- .510
V	21.42	20.89	.53	.425
Total	20.65	20.77	- .12	- .204

TABLE 113

DIFFERENCES BETWEEN MEANS  
SUMMER VS. NON-SUMMER GROUPS  
DAT: VERBAL & NUMERICAL ABILITY

Center	Means		Diff. Bet. Means	t
	Summer	Non-Summer		
I	43.08	44.67	-1.59	- .618
II	47.71	48.90	-1.19	- .520
III	46.76	45.28	1.48	.741
IV	54.23	53.45	.83	.341
V	46.46	46.99	- .53	- .202
Totals	47.28	47.68	- .41	- .371

TABLE 114

DIFFERENCES BETWEEN MEANS  
SUMMER VS. NON-SUMMER GROUPS  
DAT: ABSTRACT REASONING

Center	Means		Diff. Bet. Means	t
	Summer	Non-Summer		
I	33.56	32.55	1.01	.768
II	32.68	33.20	- .52	- .299
III	34.03	33.39	.64	.495
IV	36.73	35.04	1.69	1.371
V	32.54	33.54	-1.00	- .714
Total	33.92	33.48	.41	.724

TABLE 115

DIFFERENCES BETWEEN MEANS  
SUMMER VS. NON-SUMMER GROUPS  
TEST FOR PROBLEM-SOLVING

Center	Means		Diff. Bet. Means	t
	Summer	Non-Summer		
I	23.44	23.69	- .25	- .177
II	23.21	24.85	-1.64	-1.154
III	24.57	23.33	1.24	1.287
IV	28.89	26.70	2.19	1.686
V	22.81	25.38	-2.57	-1.904
Total	24.55	24.70	- .15	- .239

Effects of the Summer Program: Project Double Discovery

The preceding findings indicate that the summer and non-summer groups are approximately equivalent in standardized measures of aptitude and achievement, although there appears to be a slight trend (not statistically significant) in favor of the non-summer group on the tests administered during the ninth-grade before the summer session, as well as on the tests given during the tenth-grade. These findings should not be interpreted to mean that the summer program was ineffectual. The summer group entered the Program with initially lower measures of aptitude and achievement. Furthermore, the criteria for measuring the effect of the summer program (Project Double Discovery) are academic performance, attendance, entrance to college and, ultimately, success in college. As will be seen later in this chapter, despite the slightly higher scores on standardized tests for aptitude and achievement on the part of the non-summer group, in actual tenth-grade achievement the summer group performed slightly better than did the non-summer group.

Although the selection of the summer group was made at random from the total population of CDD students, a number of those invited elected to decline on the grounds that they had already made their summer plans. Is it possible that



such youngsters have an edge, scholastically and socially, over those without binding summer plans? This question is certainly worth investigating with this population and subsequent groups of CDD youngsters.

In Chapter II it is hypothesized that repeated in-residence summer sessions on a college campus (two or more) will have a positive and significant influence on persistence and academic success in high school, rate of entrance to college, and academic success in college. It was not anticipated that a single eight-week summer program would make a significant difference in academic achievement and attitudes.

The Summer Curriculum. Moreover, the curriculum emphasis for the summer program was not designed to enable the students to accelerate in their regular high-school work or to gain additional high-school credits. The objective was to expose students to new learning styles and college life. The curriculum emphasis was on "generative" learning, rather than on academic credits. By "generative" learning we mean creating habits of reading for pleasure, experiencing creative writing, and developing study skills. The curriculum area of English was closely related to urban problems. Work in mathematics was provided daily with the emphasis on diagnostic and remedial work. The college students served as tutors, as well as counselors, and worked with small groups each day on study skills. The College Discovery boys and girls lived in the dormitories of Columbia College and Barnard College with their college-student counselors. The formal part of the learning program in English and Mathematics was conducted in small groups with licensed teachers. Special lectures and demonstrations in science and the social sciences were conducted by college professors. Activity groups were formed in such areas as science, modern dancing, dramatics, chess, swimming, art, etc. Concerts, museums, foreign films, and other cultural activities were provided. The field trips focused on problems of urban society (sociology, economics, politics, and education).

In summation, the objectives of the summer program were designed for long-range learning outcomes, rather than for immediate academic payoff in the high-school. Nevertheless, when these students entered the Centers in the fall, the teachers reported that they were ahead of the other students. The Centers were

unable to provide for advanced placement of the most outstanding youngsters from the summer group, and many of these students felt that they were being held back somewhat. Going to high-school after a summer on a college campus seemed to be a letdown to some youngsters.

Comparisons in Academic Achievement. While it was not anticipated that measurable gains in academic achievement would be obtained after only one summer, statistical comparisons on academic averages were made at the end of the fall and spring semesters. In Table 116 we find that the fall semester average was significantly higher for the summer group at the .05 level. It is seen in Table 116 that in four of the five Centers, the differences between the mean grades favor the summer group. In Center III the mean difference is greatest, being 4.91 percentage points higher for the summer group.

TABLE 116  
COMPARISONS BETWEEN SUMMER AND NON-SUMMER GROUPS  
IN  
FALL SEMESTER AVERAGES

Center	Means		Diff. Bet. Means	t
	Summer	Non-Summer		
I	71.44	72.83	-1.39	-.63
II	79.17	75.45	3.72	1.93
III	76.94	72.03	4.91	2.36*
IV	75.23	73.04	2.19	1.85
V	76.28	74.11	2.17	.96
Total	75.56	73.61	1.95	2.10*

\*Significant at the .05 level

The comparisons in final grades for the 1965-1966 academic year (excluding Regents) are presented in Table 117. Here we find that, while the combined means show no statistically significant difference, in four of the five Centers

the summer group obtained slightly higher averages than the non-summer group. Only in Center II is the difference significant (at the .05 level).

Regents Examinations. Similar comparisons were made for differences by the two groups on the Regents Examinations in Algebra and Biology. In Table 118 we find that the summer groups in four of the five Centers produced higher mean scores on the Regents Examination in Algebra than the non-summer groups. In Centers III and V the differences are statistically significant at the .05 level. In these two Centers, the mean is approximately 10.6 points higher for the summer group over the non-summer group. These differences approach the .01 level. For all five summer groups combined, compared with all five non-summer groups combined, the difference in favor of the summer group approaches statistical significance at the .05 level.

It will be recalled that systematic instruction in mathematics was provided during the summer session. However, this was not so in the case of Biology, which was taken by all College Discovery students during the tenth-grade. The results on the Biology Regents are summarized in Table 119. Here we find that the summer group obtained lower mean scores in four of the five Centers, although the differences do not approach statistical significance.

It would appear from the data in Table 118 that the summer group may have benefited from the summer curriculum in mathematics. Where no biology instruction was provided during the summer, the differences provide a noticeable contrast with the Algebra Regents results.

TABLE 117

COMPARISONS BETWEEN SUMMER AND NON-SUMMER GROUPS  
IN FINAL GRADES FOR THE 1965-1966 ACADEMIC YEAR  
(EXCLUDING REGENTS)

Center	Means		Diff. Bet. Means	t
	Summer	Non-Summer		
I	70.92	70.87	.05	.023
II	77.97	73.53	4.44	2.290*
III	72.54	70.75	1.79	.674
IV	73.50	75.96	-2.46	-1.732
V	74.02	71.86	2.16	.798
Total	73.54	72.52	1.02	.994

\*Significant at the .05 level

TABLE 118

COMPARISONS BETWEEN SUMMER AND NON-SUMMER GROUPS  
ON THE ALGEBRA REGENTS EXAMINATION

Center	Means		Diff. Bet. Means	t
	Summer	Non-Summer		
I	67.93	70.57	-2.64	-.656
II	79.26	76.18	3.08	.899
III	69.35	58.73	10.62	2.289*
IV	68.38	67.52	.86	.204
V	70.67	60.58	10.59	2.192*
Total	70.92	67.15	3.77	1.931

\*Significant at the .05 level

TABLE 119  
 COMPARISONS BETWEEN SUMMER AND NON-SUMMER GROUPS  
 ON THE BIOLOGY REGENTS EXAMINATION

Center	Means		Diff. Bet. Means	t
	Summer	Non-Summer		
I	63.67	65.24	-1.57	- .551
II	68.35	69.02	- .67	- .239
III	67.38	67.82	- .44	- .172
IV	72.42	74.16	-1.74	- .833
V	64.64	63.10	1.54	.527
Total	67.32	67.77	- .45	- .373

Attendance

In Chapter VI it was reported that school attendance for the College Discovery population was somewhat better than for the college preparatory group, despite the greater distance and time required for commuting between home and school for the former group. In comparing the attendance records for the summer group with the non-summer group we find no significant differences between means over the entire academic year. These findings are presented in Table 120.

TABLE 120

COMPARISONS BETWEEN SUMMER AND NON-SUMMER GROUPS  
IN TOTAL-YEAR ABSENCES

Center	Means		Diff. Bet. Means	t
	Summer	Non-Summer		
I	20.85	18.53	2.32	.792
II	14.52	17.47	-2.95	-1.036
III	21.09	20.00	1.09	.289
IV	10.25	10.28	- .03	- .011
V	11.17	12.15	- .98	- .447
Total	16.19	16.02	.17	.115

The Dropouts

One of the important criteria in assessing the effectiveness of the summer program is persistence in the College Discovery and Development Program. Table 121 presents the dropout rates at the end of the first academic year for the summer and non-summer groups. It is seen that the dropout rate is slightly higher for the non-summer group (10.1 percent as compared with 7.1 percent).

It may be recalled that the summer group did not differ significantly from the non-summer group, but the slight differences consistently favored the non-summer group. A co-variance analysis to be carried out later should indicate better how the two sub-populations compare when ability levels are equalized.

As mentioned in the preceding chapter, a study-in-depth is being undertaken to ascertain the factors related to persistence and non-persistence in the College Discovery and Development Program. Dropouts will also be followed-up throughout their high-school careers.



TABLE 121

DROPOUTS FROM THE COLLEGE DISCOVERY AND DEVELOPMENT PROGRAM:  
SUMMER AND NON-SUMMER GROUPS

Group	Retained		Dropped		Total
	N	%	N	%	
<i>NON</i> -Summer	381	89.9	43	10.1	424
<del>NON</del> -Summer	144	92.9	11	7.1	155
Total	525	90.7	54	9.3	579

## CHAPTER VIII

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### Summary

Statement of the Problem. The study is intended to determine the extent to which high-school students (beginning at the end of the ninth-grade) can overcome severe educational and socio-economic deficiencies so that they can succeed in school and college. The College Discovery and Development Program is designed as a longitudinal study to discover and develop the college potential of disadvantaged boys and girls who, without the benefit of intensive and long-range educational support of a special nature, would be unlikely to prepare for and gain entrance to college. The specific objectives of the Program are: (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.

Procedures and Design. During the spring semester of 1965, a population of 579 boys and girls, who were enrolled in the ninth-grade in schools throughout the five boroughs of New York City, were selected for the College Discovery and Development Program. Several criteria were applied in determining the degree to which each candidate qualified as "disadvantaged." In addition to the criteria of low income and welfare assistance or aid to dependent children, preference was given to those candidates showing "low-life chances" by having (1) families that are not intact (absence of father and/or mother), (2) families that are large in size (four or more siblings), (3) fathers who did not complete high-school, (4) mothers who did not complete high-school, (5) fathers who are unemployed or who are engaged in unskilled or temporary employment, (6) fathers who were born in the South or Puerto Rico, (7) mothers who were born in the South or Puerto Rico, and (8) living under overcrowded conditions.

In general, each candidate was adjudged by his or her nominating school as having a record of low scholastic achievement relative to high potential -- the latter being evidenced through (1) scores on the Iowa Tests of Educational

Development that are above the 50th percentile, (2) a score on the Metropolitan Reading Test that is markedly above the student's actual grade levels, (3) high scores on other tests administered earlier in the student's school career, (4) a record of high academic performance in the elementary school or in grades 7 or 8, followed by a marked and seemingly permanent decline in school performance, and (5) unevenness of academic performance, such as outstanding work in mathematics combined with low or failing grades in other subjects. Approximately 40 percent of the candidates selected did not meet the above criteria for high academic potential, but were adjudged by their teachers and counselors as high in "leadership, special aptitudes, and creativity."

From the population of 579 boys and girls selected for participation in the Program, 155 (or approximately 27 percent) were selected at random for participation in an eight-week in-residence program at Columbia University during the summer of 1965.

In September of 1965, the total population of 579 boys and girls was enrolled in five High School Development Centers (one in each borough of New York City). Each Center was organized as a "school-within-a-school" to provide a new learning environment with considerable curriculum flexibility.

While a considerable number of problems were identified for longitudinal investigation, this report is concerned with only the first year of the Program and, therefore, only certain elements of the following questions are treated herein:

1. To what extent can educational deficiencies be overcome during the high-school and early college years?
2. What is the nature and direction of attitudinal changes and how do these changes relate to academic achievement and retention?
3. To what extent are certain aptitude measures (i. e., reading and problem solving) valid predictors of academic success?
4. What are the long-range effects on attitudes, achievement, and persistence from repeated in-residence summer sessions on a college campus?

5. How are specific socio-economic factors related to success in school and college?
  - a. Parents not living together
  - b. Father unemployed
  - c. Family on welfare or aid-to-dependent children
  - d. Father engaged in unskilled occupation
  - e. More than four siblings in the family
  - f. Father not a high-school graduate
  - g. Mother not a high-school graduate
  - h. Father born in the South or in Puerto Rico
  - i. Mother born in the South or in Puerto Rico
  - j. Student born in the South or in Puerto Rico
  - k. Dwelling unit overcrowded
  - l. Father deceased
  - m. Mother deceased
  - n. Total family income
6. How are attitudes, aptitudes, achievement, and retention related to the sex of the student?
7. To what extent are the style and content of the student's autobiographical statement (ninth-grade) related to achievement and retention?
8. To what extent is the student's ninth-grade attendance record related to high-school attendance, persistence, and achievement?
9. How does the College Discovery population in each Center compare to the regular college preparatory population of that high-school in attitudes, persistence, and academic success in school and college?
10. Are curricular and vocational choices in college related to specific socio-economic factors in the student's background?
11. How are academic success and persistence related to enrollment in a specific High School Development Center?

It is assumed that many additional problems leading to testable hypotheses will be developed throughout the course of this longitudinal study, inasmuch as a new population of boys and girls will be selected each year--offering new opportunities for changes in research design.

The following hypotheses are offered in connection with the initial class of students:

1. Socio-economic factors (Life Chances) will have a significant relationship to retention and academic success or failure in school and college.
2. The ninth-grade average will have a significant relationship to retention and academic success or failure in school and college, although specific academic deficiencies in the ninth-grade will have no significant relationship to later performance.
3. The ninth-grade attendance record will have a significant relationship to high-school attendance, retention, and academic success or failure in school and college.
4. Repeated in-residence summer session on a college campus (three or more) will have a positive and significant influence on persistence and academic success in high school, rate of entrance to college, and academic success in college.
5. Attitudinal and personality measures, as derived from paper-and-pencil instruments, will yield no significant relationship to persistence and academic success in school and college.
6. Persistence and academic performance will be related significantly to the High School Development Center to which a student is assigned. (The Centers selecting the most promising students will not necessarily have the lowest dropout rate or the highest record of achievement and entrance to college).
7. Certain aptitude measures, such as reading comprehension and problem solving, will have a significant relationship to academic success.

8. While the girls will attain a higher level of scholastic achievement, the rate of college entrance will be higher for the boys.
9. Ratings by teachers and counselors in the ninth-grade will have no significant relationship to scholastic achievement and retention.
10. Curricular and vocational choices in college will have no significant relationship to specific socio-economic factors in the student's background.
11. The rate of retention and college entrance for the comparison populations of college preparatory students will differ significantly among the five host schools.
12. The College Discovery population will differ significantly by Center in aptitude, achievement, and certain socio-economic indicators (Life Chances).
13. The college preparatory populations for the five host schools will differ significantly in aptitude and achievement.
14. The gap in academic achievement between the College Discovery and college preparatory students will be narrowed significantly year by year throughout high school. (It is anticipated that significant differences in achievement will be most evident in favor of the college preparatory population for all five Centers combined during the tenth and eleventh grades).
15. School attendance will reveal a gap between the College Discovery and college preparatory populations, with the latter group having a significantly better attendance record. (This is anticipated only because of the relatively greater distance and time in commuting between home and school for the College Discovery population).
16. A host school with a relatively strong college preparatory function will tend to select a College Discovery population having a higher ninth-grade average and higher achievement and aptitude indices than a host school that does not have a strong college preparatory emphasis for its total student population.<sup>1</sup>

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<sup>1</sup> Representatives of the administration for each of the five host schools were involved in the selection of the College Discovery population for the Center located within that host school.



17. The College Discovery populations will not differ significantly by Center in measures of attitude.
18. The college preparatory populations will not differ significantly by host school in measures of attitude.
19. The College Discovery and college preparatory populations will not differ significantly from each other in measures of attitude.

The total College Discovery population was divided into five sub-populations according to their enrollment in the five High School Development Centers. In each Center, a comparison population of students enrolled in the regular college preparatory program was identified by random selection. In this way, the records of academic achievement, attendance, and eventual rate of entrance to college could be compared (College Discovery vs. college preparatory populations) within and among the five High School Development Centers. Thus, the random sample of college preparatory students in each Center was considered as a "practical ideal" against whose records the College Discovery students could be compared. Comparisons were also made for these populations on various standardized tests for aptitudes, achievement, and attitudes which were administered during the first semester of the tenth-grade.<sup>2</sup>

Turning to the longitudinal aspects of the study which are not included in this report, through various pre-measures and post-measures, attempts will be made to ascertain patterns of change in student aptitude, achievement, interests and attitudes. In this way, it may be possible to chart significant changes and to identify certain socio-economic factors in the Life Chances of the students which are related significantly to academic success or failure in school and college. For example, various dimensions of the Life Chances Scale would be applied to (1) retention in school, (2) grades in school, (3) high-school graduation, (4) entrance to college, and (5) success in college.

In addition to analyzing and comparing the results for the College Discovery and college preparatory populations in the five High School Development Centers, the experimental design provides for the comparison of two important

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<sup>2</sup>These instruments included the Stanford Achievement Test (High School Battery), the Differential Aptitude Tests (Form L), the Michigan State University Test of Problem-Solving (High School Edition, Form A), the Syracuse Activities Index, the Syracuse High School Characteristics Index, and the Self-Radius and Goals Schedules.

subgroups: those who participated in repeated summer sessions on a college campus vs. those who were limited to the academic-year program only. (it will be recalled that for the first College Discovery class, the assignment to these subgroups was made by using a table of random numbers). The longitudinal study will also include an analysis of results according to sex.

Since the population of 579 boys and girls were selected from a universe of approximately 1,200 students who were nominated for admission to the CDD Program, those youngsters not selected constitute an additional comparison group for longitudinal study.

In comparing the various populations, the analysis of variance was employed to determine differences among means and, where the resulting F-ratio is significant, the t-test was used to ascertain the significance of the differences between pairs of means. Differences between group means (i.e., the CDD group with the college preparatory group; the CDD students who were in the Columbia summer program and those who were not) were analyzed for significance by using the t-test. Differences among Center means were tested by analysis of variance. These tests were made without providing for the effects of the pre-tests. The appropriate co-variance analyses will be made during the 1966-1967 academic year.

In the longitudinal study, correlation matrices will be set up preliminary to an analysis of co-variance design for comparing achievement among centers and between groups. The measures to be included as co-variates will depend on the significance of differences between means and the coefficient of correlation with the criterion measures. The co-variance technique is considered appropriate for the final comparisons because of the impossibility of imposing controls on our comparison groups.

Adjunct Studies. A variety of adjunct studies have been undertaken. These include investigations of (1) the relationship between personality variables and academic achievement, (2) the relationship of the intellectual climate of the school to academic achievement and student needs, (3) the self-concept and attitudes of CDD students compared with those of students in the college preparatory and general curricula, (4) behavior patterns of voluntarily-constituted reference groups in

the school, neighborhood, and summer program, and (5) attitudes and learning outcomes relative to the tutoring project. Findings, from these and other adjunct investigations, will appear in subsequent reports.

Longitudinal Studies of Subsequent Populations. In the spring of 1966, a second population of approximately 555 boys and girls who were completing the ninth-grade, were selected for the CDD Program. While this second class of CDD youngsters will be followed up much in the same manner as the initial population, the selection of the second population, and subsequent populations, presents opportunities for employing other instruments and pursuing additional adjunct investigations.

Major Findings and Conclusions

Characteristics of the Populations Related to Socio-Economic Factors. Since each host school in each borough represents a different geographic area of New York City, serving a somewhat different socio-economic population, it was hypothesized that the Centers would differ in the makeup of their populations selected for the CDD Program. The findings clearly corroborate this hypothesis:

1. While the ratio of males to females was approximately 61 to 39 percent for all Centers combined, Center IV, located in a middle-class neighborhood, enrolled only 49 percent males, while Center II, located in a Negro slum area, enrolled over 70 percent males.
2. The combined Negro and Puerto Rican populations for all five Centers constituted more than 65 percent of the CDD enrollment. However, Center V, located in the borough having the lowest proportion of nonwhites of the five boroughs of New York City, enrolled only 31.3 percent nonwhites. In contrast, the nonwhite population constituted more than 84 percent of the enrollment in Center III. Center III is located in the borough having the highest non-white school enrollment.
3. Fifty-five percent of the total CDD population in all five Centers combined are in families that are intact. In Center I, only 42 percent of the families were reported as intact, in comparison with 70 percent for Center IV. It will be recalled that Center IV is located in a school which serves largely a middle-class area. Although the nonwhite enrollment in Center IV was 76 percent, nonwhites in the borough in which Center IV is located tend to be relatively higher socio-economically than are nonwhites in other boroughs. In the overwhelming proportion of broken families, the mother was reported as head of the household.
4. The percentage of CDD students who reported their fathers to be alive ranged from 92 percent in Center IV to 70.2 percent in Center I.
5. Although more than 40 percent of all CDD students are in families that are not intact, the mean number of persons in the family is 5.24. However, this statistic ranges from a mean of 4.7 in Center III to almost 6.0 in Center V.

6. Only 28.6 percent of the CDD students reported that the birthplace of their fathers was in the northern United States or Canada. The South and Puerto Rico accounted for 38.4 percent while 16.4 percent did not know or failed to provide the information. The place of birth for parents varies markedly according to Center. Only 16.8 percent of the students in Center I reported the birthplace of their fathers in the North, in comparison with 50 percent for Center V and 32 percent for Center IV. The birthplace of mothers tended to follow a similar pattern as for fathers, although a slightly higher percentage of mothers were reported as having been born in the North.
7. Although 74 percent of the total CDD population was born in the North, this statistic ranged from 67.5 percent in Center III to 85 and 84 percent in Centers V and IV respectively.
8. The mean number of years of residence at the present address ranged from 5.35 in Center I to 7.79 in Center IV. The analysis of variance comparing differences among the five Centers was significant at the .01 level.
9. Approximately 40 percent of the total CDD population reported either that their fathers were unemployed or that they had no information concerning their fathers' employment. The percentage of employed fathers ranged from 50 percent in Center I to 75 percent in Center IV.
10. The analysis of variance for weekly income of the CDD populations among the five Centers is statistically significant at the .01 level. The weekly family income per family member ranged from \$17.56 in Center I to \$21.18 in Center IV. Center IV also had the lowest proportion of families receiving welfare assistance or aid to dependent children.
11. The mean monthly rent per family ranged from \$63.92 for Center III to \$96.70 for Center IV. The analysis of variance among Centers was statistically significant at the .01 level.
12. While the mean number of school years completed by fathers of all CDD students reporting was 9.6, the range was from 8.7 in Center III to 10.32 in Center IV. The analysis of variance among the five Centers was statistically significant at the .01 level. It should be noted that more than 17 percent of all CDD students were unable to report the amount of schooling completed by their fathers. Similar patterns were observed in the years of schooling completed by mothers.



13. The "Life Chances" of the CDD students differed significantly among Centers at the .01 level. Using a scale of seven items,<sup>3</sup> which provided for a maximum possible score of "7," the mean "Life Chances" ranged from 1.58 for students in Center I to 2.52 for students in Center V and 2.46 for students in Center IV.
14. The ninth-grade average for all CDD students in the five Centers was 75.61 -- almost 10 percentage points below the average required for full-time matriculation at the senior colleges of The City University. Moreover, the ninth-grade average of 75.61 for the total CDD population is somewhat inflated because (1) many of these youngsters were programmed for non-academic courses in the ninth-grade, and (2) a high proportion of the CDD students were in Special Service schools where academic competition was not keen. The ninth-grade average ranged from 74.5 for students in Center I to 76.9 for students in Center IV. This difference was statistically significant at the .01 level.

The above findings reveal that the total CDD population is clearly disadvantaged according to the criteria given and, without educational intervention as provided by the CDD Program, was performing scholastically in the ninth-grade at a level which precludes regular matriculation at one of the senior colleges under existing admission standards. These findings also reveal that the CDD populations among Centers differ significantly and that these differences appear to be related to the socio-economic environs of the host schools and to the type of student population served by the host school.

Standardized Measures of Aptitude and Achievement. If the populations differ significantly among Centers in socio-economic factors, similar patterns could also be expected on standardized measures of aptitude and achievement. It was further hypothesized that (1) the comparison populations of college preparatory students will differ significantly by host school in aptitude and achievement, and (2) a

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<sup>3</sup>The Scale consisted of the following seven items: (1) both parents alive and living together, (2) father a high-school graduate, (3) mother a high-school graduate, (4) fewer than four siblings, (5) father engaged in skilled, professional or self-employment, (6) father native born North, and (7) mother native born North. Thus a student with "high" life chances would report favorably on at least five of the seven items in the Scale.



a host school with a relatively strong college preparatory function will tend to enroll a College Discovery population having higher indices of aptitude and achievement than a host school that does not have a strong college preparatory emphasis for its total student population. In this connection, the results of tests administered by the schools during the ninth-grade, along with the results of the CDD testing program, were analyzed in reaching the following findings:

1. On the Iowa Tests of Educational Development (administered during the ninth-grade), statistically significant differences at the .01 level were found among the Centers. The percentile scores ranged from a mean of 61.9 for Center V to a mean of 71.4 for Center IV. For all five Centers combined, the mean ITED percentile was 65.9.
2. The analysis of variance for scores among Centers on the city-wide Metropolitan Reading Test revealed an F-ratio which was significant at the .01 level. The mean grade level reading score ranged from 9.7 in Center V to 10.7 in Center IV. In Center IV, more than 51 percent of the CDD students attained a reading score of grade 11 or above (when tested at grade 9.5), whereas only 22 percent of the students in Center V scored at grade 11 or above.
3. On each of the three subtests of the Stanford Achievement Test (administered in grade 10), the analysis of variance among Centers yielded an F-ratio that was statistically significant at the .01 level. However, these differences were accounted for mainly by Center IV where the test scores were markedly higher than those obtained at the other four Centers.
4. On each of the three subtests of the Stanford Achievement Test, the college preparatory population in Host School IV obtained the highest mean score among the college preparatory populations in the five host schools. This difference was statistically significant at the .01 level.
5. On each of the three subtests of the Stanford Achievement Test, the college preparatory populations in Host Schools IV and V obtained higher mean scores (significant at the .01 level) than their CDD counterparts.

6. While the composite college preparatory population (for all five host schools combined) tended to obtain higher mean scores on the subtests of the Stanford Achievement Test, the CDD population in Center II actually produced higher mean scores on the three subtests than did the comparison college preparatory population in the same school. (Host School II, it will be recalled, is located in the most seriously disadvantaged area of any of the five host schools, and the college preparatory population in this school is indicative of the area which it serves). A similar pattern emerged in Center I where the CDD population attained slightly higher mean scores on two of the three subtests of the Stanford Achievement Test, though the differences were not statistically significant. (Host School I has a liberal policy of classifying students as college preparatory).
7. On each of the three subtests of the Differential Aptitude Tests, the college preparatory and College Discovery populations at host School IV obtained significantly higher scores than did their counterpart populations in the other four schools.
8. While the combined college discovery populations obtained higher scores on the DAT than the combined CDD populations, the CDD students in Center II produced significantly higher scores (at the .01 level) than their college preparatory counterparts within the same school. In School I, the CDD population outscored the college preparatory group on two of the three subtests of the DAT (significant at the .05 level).
9. The analysis of variance among the five Centers yielded F-ratios on each of the DAT subtests that were statistically significant.
10. On the Michigan State University Test for Problem-Solving, both the college preparatory populations in Center IV obtained the highest mean scores relative to their counterpart populations in the other four schools. The differences were statistically significant at the .01 level.

Thus it is seen that the findings from the standardized tests of aptitude and achievement tend to support the hypotheses that (1) the CDD populations differ significantly between and among Centers, (2) the college preparatory populations differ significantly between and among host schools, and (3) the host school with a relatively strong college preparatory function tended to enroll a CDD population having higher indices of aptitude and achievement than host schools that did not have a strong college preparatory emphasis for its total student population.

Academic Achievement. In analyzing the grades obtained after the first full academic year (completion of the tenth grade), it was anticipated that (1) the college preparatory population would gain significantly higher grades than the College Discovery population (though not necessarily in each of the five Centers), (2) academic performance on the part of the College Discovery populations will differ significantly among the five Centers, and (3) academic performance on the part of the college preparatory populations will differ significantly among the five host schools.

The scholastic performances in the tenth-grade, comparing the CDD populations and the college preparatory populations, for the five Centers and host schools are summarized as follows:

1. Excluding Regents Examinations, the final average for the composite college preparatory populations (all five host schools combined) was only slightly higher than that of the composite CDD populations (all five Centers combined). Although the difference between the composite groups was not statistically significant, in host schools IV and V the college preparatory groups obtained higher averages than their CDD counterparts, and these differences were significant at the .01 and .05 levels respectively. (It should be recalled that the college preparatory populations in host schools IV and V were consistently and significantly higher in standardized measures of aptitude and achievement than their CDD counterparts, while this was not the case in the other three schools).
2. In Centers I and II, the CDD populations earned slightly higher final grades (excluding Regents Examinations) than their college preparatory counterparts, but the differences were not statistically significant.

3. The analysis of variance among Centers for the final averages, excluding Regents Examinations, was statistically significant at the .05 level.
4. In the Algebra Regents Examination, the five college preparatory groups combined produced a mean score of 76.14 compared with only 68.14 for all five CDD groups combined. This difference was significant at the .01 level. However, in schools I and II the differences between the mean scores obtained by the college preparatory and CDD groups were not statistically significant, although the CDD group in both of these schools actually obtained higher mean scores than their college preparatory counterparts.
5. The mean score on the Algebra Regents Examination for the college preparatory groups in the five host schools ranged from 67 percent in host school I to 84.1 percent in host school IV.
6. Although it was anticipated that the CDD students in Center IV would obtain the highest mean score on the Algebra Regents (judging from the earlier findings on aptitude, achievement, and various socio-economic criteria which tended to favor this group over the other four CDD groups), these students in Center IV obtained a mean score of only 67.75 in comparison to 76.8 for the CDD students in Center II. Center IV ranked only third among the five CDD Centers in the mean score on the Algebra Regents Examination.
7. The mean score of 76.8 on the Algebra Regents Examination, obtained by the CDD group in Center II, was higher than that obtained by any of the college preparatory groups with the exception of host school IV.
8. The mean score on the Regents Examination in Biology for all five CDD groups combined was 67.7, in comparison to a mean score of 72.6 for all five college preparatory groups combined. Although the college preparatory population in each of the five host schools obtained a higher mean score than did the corresponding CDD population within each school, the difference between means was statistically significant only in schools IV and V. The CDD population in Center IV actually obtained a higher Biology Regents mean score than that obtained by the college preparatory students in host schools I, II and III.
9. The CDD students in Center IV obtained a mean score of 73.7 on the Biology Regents; this score was significantly higher at the .01 level than that obtained in each of the other four Centers. This finding, unlike the results

on the Algebra Regents, was consistent with the standardized measures for aptitude and achievement which tended to favor this CDD group over the other four groups.

10. The analysis of variance among the five Centers, on the Biology Regents, was statistically significant at the .01 level. The mean score ranged from 73.7 for the CDD students in Center IV to 63.5 for the CDD students in Center V.
11. Among the five college preparatory groups in the five host schools, the students in Center IV obtained the highest mean score. (78.98).
12. The above findings, relating to the academic achievement among Centers, tend to support the hypothesis that the Centers having selected the most promising students initially for CDD will not necessarily have the highest record of academic achievement.

Although the five college preparatory groups combined tended to obtain higher final grades and scores on the Regents Examinations than the five CDD groups combined, the CDD group in Center II actually obtained a higher mean on the Algebra Regents than four of the five college preparatory groups. These results were not expected in view of the earlier findings on the standardized tests for aptitude and achievement which tended to favor the college preparatory populations and the CDD group in Center IV on most measures. On the Biology Regents, the CDD group in Center IV outscored three of the five college preparatory groups.

The hypotheses that (1) the academic performance on the part of the CDD group will differ significantly among the five Centers, and (2) academic performance on the part of the college preparatory groups will differ significantly among the five host schools were found tenable. An analysis of the academic grades and Regents scores by sex is being undertaken to determine whether the CDD girls and college preparatory girls tend to outperform their male counterparts as originally hypothesized.

Attendance. Since each Center serves a borough-wide population of CDD students and since each host school, for the most part, draws its college preparatory



population from the more immediate school neighborhood, it was anticipated that the attendance records of the CDD students would be significantly below those of the college preparatory students. Moreover, the exposure of the CDD students to a longer school day as a result of block-time classes and tutoring was expected to produce a poorer attendance record for these youngsters.

With the occurrence of a two-week transit strike during the winter period of the fall semester, it was decided to analyze the attendance records for the fall and spring semesters separately. The findings relative to the attendance records for the CDD and college preparatory groups are summarized as follows:

1. Despite the transit strike, the record of fall-semester absenteeism for all CDD groups combined was only slightly higher (not statistically significant) than that for all college preparatory groups combined.
2. During the spring semester, absenteeism for all CDD students combined was lower than for all college preparatory students combined. The difference was statistically significant at the .01 level in favor of the CDD students. The mean number of absences for all CDD students during this semester was only 7.45 compared with a mean of 10.24 for all college preparatory students. The mean number of days of absence during the spring semester among the CDD students ranged from 4.4 in Center IV to 9.8 in Center III. Among the college preparatory groups, the range was from 4.8 in school V to 13.3 in school I.

In view of the above findings, the hypothesis that the college preparatory students would maintain significantly better records of school attendance than the CDD students during the tenth grade must be rejected. In fact, the exact reverse was the case. These findings are indicative of the remarkably high level of motivation which was sustained throughout the academic year on the part of the CDD students.

Dropouts. Since participation in the CDD Program is voluntary, and because such participation requires an extended school day and considerable time in commuting between home and Center, school authorities anticipated a much higher dropout



rate than that which actually occurred during the first year. The following findings pertain to the dropout rates among the CDD Centers:

1. Although the dropout rate for all Centers combined was only 9.3 percent for the 1965-1966 academic year, the range was from only 4 percent for Centers II and V to 18.8 percent for Center IV.
2. Although the CDD students selected for Center IV obtained the highest scores among the five Centers on most standardized tests of aptitude and achievement, and ranked highest on the socio-economic measures for Life Chances, the dropout rate for this Center was by far the highest of the five schools. Center IV is located in a host school having a strong college-preparatory function. The relatively high dropout rate for the CDD population in Center IV supports the hypothesis that the Centers having selected what was initially considered to be the most promising students, will not necessarily have a correspondingly low dropout rate.
3. None of the standardized measures of aptitude and achievement (the Differential Aptitude Tests and the Stanford Achievement Test) discriminated between dropouts and non-dropouts.
4. The Life Chances score did not discriminate between dropouts and non-dropouts.
5. Non-dropouts had significantly higher grades (.01 level of confidence) during the ninth-year than the dropouts.
6. School attendance during the ninth-grade was significantly better (.05 level of confidence) for the non-dropouts over the dropouts. This finding supports the hypothesis that the ninth-grade attendance record will have a significant relationship to persistence in the CDD Program.

It is obvious from the analysis of data concerning the dropout rates by Centers that the criteria for dropping students from the CDD Program varied considerably by Center. With regard to the failure of certain measures to discriminate between dropouts and non-dropouts at the end of the first year, a word of caution is in order. Such measures as Life Chances, which pertain to socio-economic factors, may be discriminative over the long pull. Moreover, the fact that the

various Centers applied different criteria in dropping students from the CDD Program may well have negated or masked the actual relationship of Life Chances and objective test scores to persistence in the Program.

Attitudes. While the major investigations on student attitudes are not yet complete, one study on attitudes and self-concept compared the CDD students with academic and general students in one of the host schools. In this study it was hypothesized that (1) the academic students would rate the concept "Myself as a Student" more positively than the CDD students, (2) The academic and CDD students would rate the concepts "Myself as a Student," "College," "Reading," and "High School" more positively than will students enrolled in the general curriculum. The following results were obtained in this investigation:

1. The CDD students rated themselves significantly higher than the general students on all four concepts.
2. The CDD students and the academic students did not differ significantly in their ratings on the four concepts.

In view of the above findings, the hypothesis that the CDD students would rate "Myself as a Student" less positively than the academic students was rejected. This study revealed that the CDD students in this Center tended to place the same value on education as students in the academic curriculum, and a higher value on education than students in the general curriculum.

The Summer Program. It was hypothesized that repeated in-residence summer sessions on a college campus will have a positive and significant influence on persistence and academic success, as well as resulting in a higher rate of entrance to college and greater success in college. Since this report is based upon the completion of only one summer by a randomly-selected group of 155 CDD boys and girls, all findings must be regarded as tentative. Moreover, although the summer group had been selected at random from the universe of 579 CDD students (representing the first class to participate in the CDD Program), standardized measures of aptitude and achievement taken prior to the summer program tended to favor the non-summer group, but these differences were not statistically significant. In

comparing the summer and non-summer groups of CDD students in achievement and attendance during the 1965-1966 academic year, the following findings were observed:

1. At the end of the first semester, the summer group of CDD students obtained somewhat higher grades than the non-summer CDD students (significant at the .05 level).
2. At the end of the first full academic year, the summer group of CDD students obtained only slightly higher grades than the non-summer CDD group, but the difference was statistically significant (at the .05 level) in Center II only.
3. On the Algebra Regents Examination, the summer groups in two Centers obtained significantly higher scores (at the .05 level) than their non-summer counterparts in these very same Centers (II and V). No statistically significant differences were obtained for the groups in the other three Centers.
4. On the Biology Regents Examination, no statistically significant differences were obtained between the groups in any of the Centers, although the non-summer group (all Centers combined) produced a very slightly higher mean score than the summer group (all Centers combined).
5. No significant differences in school attendance were obtained between the summer and non-summer groups.
6. The dropout rate at the end of the first full academic year was slightly higher for the non-summer group (10.1 percent vs. 7.1 percent).

At the end of the second summer program, those CDD students having failed one or more Regents Examinations were given the opportunity to re-take the Regents. The Biology Regents was taken by 41 CDD students at the end of the summer program and 28 (or 70 percent) received passing grades. Fourteen students took the Geometry Regents and 11 (or 80 percent) received passing grades. In addition, 18 students out of the 25 who had failed English in June received passing grades for the year at the end of the summer.

Recommendations

In view of the above findings and tentative conclusions reached at the end of the first year of this longitudinal study, the following recommendations are offered:

1. A series of follow-up studies should be conducted on:
  - a. Those students who were nominated but not selected for the CDD Program.
  - b. Those students who were selected but who chose not to participate in the CDD Program.
  - c. Those students who dropped out of the CDD Program (voluntarily and otherwise) to determine the reasons for their leaving and to study their subsequent school careers.
  - d. Those students who were invited to participate in the summer program but who chose not to do so.
2. More uniform criteria should be established and applied by the Centers in determining which students should be dropped from the Program. The policy of retaining as many CDD students through the tenth and eleventh grades was not followed in two of the Centers. Indeed there was evidence to show that a student who was dropped from a given Center may have been quite successful had he been enrolled in another Center. In this connection, the possibility of transferring certain students to another Center might be explored.
3. Further investigations on student self-concept and attitudes toward the school should be made, using a variety of instruments. Studies on adolescent problems, focusing on disadvantaged youth, should also be undertaken. Efforts should be made to assay changes in students' attitudes, self-concepts, and perceived problems as they progress through high school and into college.
4. The encouraging results, on the Regents Examinations through the summer program give evidence that more summer students should be allowed to accelerate their studies by being placed in second-semester English, for example, instead of being placed with other CDD students who did not participate or benefit

from the summer program. Informal interviews with the summer CDD students revealed that most of the higher achieving youngsters felt that, following the summer program, the pace in some classes at the Centers was too slow.

5. Interview-type studies might be undertaken to ascertain parental attitudes toward the school and toward the child as a student.
6. Adjunct studies on the tutoring program should be attempted to determine what factors are most closely associated with successful tutoring. Attitudes of tutors, as well as tutees, might be explored.
7. Studies relating to the attitudes of teachers should be undertaken, particularly with regard to those teachers who volunteer for the CDD Program in contrast to those who are assigned to the Program.
8. The original design of treating the summer population as an experimental subgroup should be continued with both the initial class of CDD students and with subsequent classes.
9. The original design of using a random sample of college preparatory students from each host school as a comparison population should be continued with both the initial class of CDD students and with subsequent classes.
10. The investigation of the relationship between certain socio-economic factors (Life Chances) and academic performance and persistence should be continued with both the initial group of CDD students and with subsequent groups. Only through a longitudinal study can the validity of these socio-economic factors be tested.
11. A study should be initiated to determine the attitudes of the CDD boys and girls to the cultural program.

Many of the CDD students who had been programmed for non-academic mathematics in the ninth-grade were able to obtain satisfactory scores on the Algebra Regents Examination at the end of the tenth grade. This finding raises the question as to whether these students should have been placed in non-academic mathematics in the ninth-grade. In this connection it is further recommended that (1) a special study be initiated on those CDD students who had been programmed



for non-academic mathematics in the ninth-grade to determine how they fare on the Algebra Regents at the end of the tenth grade, and (2) a study be undertaken to ascertain the criteria through which students are placed in non-academic and in academic mathematics in the ninth grade. The findings should be made available to all feeder schools.

There is some evidence that students who are capable of a college preparatory program are enrolled instead in a vocational high school. A special study should be made to follow up all students enrolled in the CDD Program from vocational high schools.

Whenever unexpected findings occur, such as the relatively high achievement of the CDD students in Center II on the Algebra Regents, an opportunity is presented to attempt to determine the factors which may have a causal bearing on such results. Did this group receive more intensive tutoring in mathematics? Did the mathematics faculty at this Center provide special instructional techniques? Did the college curriculum consultant for this school provide special assistance?

A longitudinal study of this type presents an infinite variety of alternatives for research and evaluation, not only with the initial groups of students studied during the 1965-1966 academic year, but also with subsequent populations. The foregoing recommendations represent an attempt to identify what now appear to be most needed and most promising avenues for follow-up. Undoubtedly, as the Program progresses, new avenues of research and evaluation will be opened.



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