AN ABSTRACT OF THE THESIS OF

Joyce Eileen Palmer for the Master of Arts Degree in General Studies

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Title: A Study of Drop-outs from the Accelerated Mathematics Classes of the Portland Public Schools, Portland, Oregon

Abstract approved [redacted]

Statement of the problem:

The study sought to determine whether certain measurable differences existed between students who had withdrawn after acceptance into the accelerated mathematics classes in the Portland schools and students who had persisted after acceptance into the program. Examined were: scores on the Iowa Tests of Basic Skills, the Iowa Algebra Aptitude Test, the Seattle Algebra Test, the Lankton First Year Algebra Test, the Iowa State Test of Educational Development, and the School and College Abilities Test; eighth grade and high school mathematics grades and total grade point averages; attendance; age; extra-curricular school activities and community activities; part-time jobs during the school year; sex; family composition; and occupations of parents.

Subjects:

Through the use of a random sampling technique, 160

subjects were selected from those 3,088 pupils who commenced the accelerated mathematics program in the Portland public schools in 1958, 1959, and 1960.

Data sources:

Data were collected from the files of the Mathematics Department, School District Number One, Portland, Oregon and the attendance records, transcripts, cumulative folders and counselors' personnel files in eleven high schools in the district.

Statistics:

The parametric statistic, Fisher's t, was employed to test the difference between means for the twenty variables which sufficiently satisfied the assumptions for its use. The distributions of observations for nine variables not satisfying these assumptions were examined by three non-parametric tests: the Kolmogorov-Smirnov test, Fisher exact probability test, and the χ^2 test. The test selected for each of the nine variables depended on the associated statistical model and level of measurement. A statistical analysis was not made for the variable of occupations of parents.

Conclusions:

Over all, except for the variable of sex, there were no statistically significant differences (at the .05 level of significance) for the variables tested between

students who were accepted into and who withdrew from the accelerated mathematics program in the Portland schools and those who were still in the program at the time of the study. This suggests that either the significant variables were not selected for testing; that patterns of multiple variables determine differences, rather than individual variables; or that the sample size was too small for the tests used.

Four of six comparisons made for the variable of sex showed significance at the .05 level. The pattern set was that of more girls in the groups who dropped and more boys in the groups who persisted. The two groups that failed to follow the pattern were the two samples from the 1960 class.

A STUDY OF DROP-OUTS FROM THE ACCELERATED MATHEMATICS CLASSES OF THE PORTLAND PUBLIC SCHOOLS, PORTLAND, OREGON

by

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A STUDY OF DROP-OUTS FROM THE ACCELERATED MATHEMATICS CLASSES OF THE PORTLAND PUBLIC SCHOOLS, PORTLAND, OREGON

Chapter 1. Introduction

The Accelerated Mathematics Program of the Portland Public Schools, Portland, Oregon, commenced in 1958 with 565 students taking first-year algebra (MA 1-2) in the eighth grade. These pupils were followed in 1959 by 954 more, in 1960 by 811, and in 1961 by 758. If these students were to persist in the program they would participate in the Educational Enrichment classes of second-year algebra (MA 3-4) and geometry (MG 1-2) during the first two years of high school and include two more years of Educational Enrichment mathematics classes in their plans for their remaining high school years.

The selection of the 1958, 1959, and 1960 groups was determined by policy set forth in a statement issued by the Mathematics Department of the Portland Public Schools in the Spring of 1958:

> In general the following criteria should be used in determining the personnel of the class. In all cases the teacher's judgment and other test data should be considered.
> 1. They should have mastered all arithmetic skills, should test 9.0 or above in arithmetic achievement (Iowa Tests of Basic Skills) at the end of the seventh grade.
> 2. Those at or above 9.0 should be given the Iowa

Algebra Prognostic Test; the same one given this year to eighth graders. To qualify for algebra in the eighth grade, they should score above the 65th percentile for eighth graders.

3. No single score or criterion alone can be the deciding factor. I.Q. and reading level are also significant. All of these should strengthen the teacher's judgment of the student's probable success.

A statement of February 28, 1961 from the same source affected selection of the 1962 group of students.

Since proper selection of students is a vital factor in the success of the program, the selection criteria used in the Portland Public Schools must be evaluated. Before the first class undertook the program, Harold E. Thomas studied the practices of ninth-grade mathematics pupil placement in the Oregon Secondary Schools. This was done by means of a survey of responses to questionnaires, which had been sent to every high and junior high school in the State whose enrollment was 200 or more pupils. (22, p. 1-2) Now that time has elapsed and material is available for validity studies, a systematic analysis of the program to date seems indicated. One method would be to utilize regression equations to determine the amount of weight given to variables for selection of eighth grade algebra class pupils and then center consideration on what weightings or variables might be altered to eliminate superfluous action and yet maintain the same amount of predictive ability, or more. The writer used

this method in examining the criteria of selection for MA 3-4 in a previous study (Appendix B). Another method would be to see if certain measurable differences exist between students who have been accepted in and have withdrawn from the accelerated mathematics classes in the Portland schools and students who have persisted in the program after acceptance through January, 1962. The latter approach is the focus of this study, which was undertaken in January of 1962. If these differences do exist, then candidates for the program might be screened with them in mind. Furthermore, the knowledge of factors contributing to persistence in the program might be utilized in counseling those already participating in it.

The points under examination in the present study were determined by past studies, by data available, and by the scope chosen for the study. In 1955, James Wolfe surveyed the secondary mathematics section of the gifted child project in the Portland Public Schools by means of questionnaires sent to three groups: students, teachers, and parents. The report indicated that students benefitting from (participating in) the program had a greater interest in school, that they undertook a variety of activities and that they tended to continue with those activities which they might otherwise have discontinued. (23, p. 1-2) Edward S. Cook, in studying students who

had withdrawn from school, examined results of standardized tests, sex, age, family composition, individuals' positions in the family, number of schools attended, amount of educational retardation, average grade, average number of days absent per year, number of courses failing, activity participation, and, for withdrawals, the stated reason for withdrawing. (2, Vol. 50, p. 191-192) His findings state:

> Youngest children are less likely to withdraw and children who are between other siblings are more likely to withdraw than are those in other family positions. The records of withdrawals reveal more high school transfers than do those of non-withdrawals. Withdrawals exhibit greater educational retardation than do non-withdrawals. Non-withdrawals have earned higher scholastic marks than have withdrawals. Non-withdrawals exhibit better attendance records than do withdrawals. Withdrawals earn failing marks in a larger number of their courses than do non-withdrawals. Non-withdrawals score higher measured I.Q.s than do withdrawals. The personal adjustment of withdrawals toward their school, home and family, and health is poorer than that of the non-withdrawals. The interviews between the counselor and withdrawing students revealed that in many cases there was a wide difference between the reason initially given by the student for his withdrawal, and the factors which the counselor believed to be the basic causes for the withdrawal.... It was finally concluded that in the individuals here studied measurable differences do exist between withdrawals and non-withdrawals. No one factor or simple combination of factors distinguished absolutely the two groups. It would seem, rather, that in most cases, school withdrawal results from a multiplicity of factors which when operating together present the individual student with seemingly insoluble problems which he can most easily meet by withdrawing from school.
> (2, vol. 50, p. 196)

The topic of Leslie J. Nason's work in 1958 focused on patterns of circumstances related to educational achievement of high school pupils of superior ability. With the use of cumulative records, confidential data sheets, standardized personality tests, pupils' self-evaluation, and ratings by teachers, he arrived at his conclusions:

1. A greater percentage of the boys of the high group than of boys of the low group indicated parental expectation of their going to college.
2. A difference was apparent in the indicated source of inspiration or encouragement to success between the high and low achievement groups.
3. No individual circumstance or trait was found which would distinguish the individual pupils as to membership in the high or low achievement group.
4. The scores of the high achievement group girls were significantly higher than those of the low achievement group girls on "School Relations" (5% level of confidence), "Community Relations" (1% level of confidence), and Total of Part II "Social Adjustment" (1% level of confidence).
5. No difference between the means of the respective social adjustment scores were found to be statistically significant in the comparison of scores made by the matched groups of boys.
6. Differences in mean scores on two subtests, "Sense of Personal Freedom" and "Nervous Symptoms (Freedom from)," were found to be significant at the 5% level of confidence for the boys of the two groups, the high achievement group having attained the higher mean score in each case.

Findings as to patterns of circumstances:

1. Certain patterns of circumstances associated with superior pupils appeared to be more closely related to pupil achievement than the individual circumstances making up the pattern.

2. A pattern of circumstances was found which seemed to be closely related to high-level pupil achievement. The pupil associated with the complete pattern of circumstances could be described as a pupil:
   a. who is satisfactorily adjusted personally and socially
   b. who includes college in his plans for the future
   c. who has a fairly specific vocational choice or plan
   d. who indicated that his parents expect him to go to college
   e. who feels no parental disagreement with his vocational plans, and
   f. who senses an inspiration or source of inspiration or encouragement to succeed....

   Patterns of circumstances related to pupils with low achievement lack one or more of the positive circumstances in the pattern associated with pupils of the highest level of achievement. Low achievement among pupils of superior intelligence appears to be associated with a lack of positive influences or circumstances rather than with the presense of negative influences.... Personal and social adjustment scores, while more satisfactory for the higher achievement groups than for the lower groups, were not a determining factor as to level of academic achievement.... The high achievement pupils among the superior pupil group tended to achieve more satisfactory status with their peers than the low achievement pupils. Peer relations did not, however, prove to be a discriminatory factor as far as the academic achievement of individual pupils was concerned. Academic and vocational planning are factors influencing the achievement of pupils of superior intelligence at all grade levels of the senior high school.
   (13, p. 81-86)

There have been many other projects dealing with under-achievement of gifted students. One of these should be noted, as it was conducted in the Portland, Oregon, schools. The faculty committee dealing with the Cooperative Program for Students of Exceptional Endowment

investigated "some of the reasons for underachievement and compared the characteristics and the backgrounds of these students with those of high-achieving students matched for intelligence, socioeconomic status, and grade in school (grades nine, ten, and eleven). The study was limited to 49 pairs of boys since there were not enough underachieving girls to attain significance in the findings. Selected findings from the committee report of March 1957 follow:

> The two groups of students tend to agree in viewing teachers as generally competent, sincere, and fair-minded. Their perceptions differ most in that the underachievers see the teacher as more often emotionally undermining rather than supporting. Though the low-achievers in various ways show less achievement-mindedness, three-fifths of them express dissatisfaction with their school achievement. But they set their sights lower, and are also less confident of their ability to make high grades, tending to rate their own intelligence as somewhat lower than do the high-achievers. Moreover, many of the underachievers express a negative view of those who make high grades as typically 'grinds' who turn away from social activities and athletics. This conception is contradicted by the two groups' reports of their extra-curricular and outside activities. These reports reveal the high-achievers to be more active. In general outlook on life, both as to achievement tasks and more personal problems, the high-achievers seem to be somewhat more confident, secure, and optimistic, as well as more concerned with social responsibility. The low-achievers more often show signs of a demoralized outlook, see adult authorities as domineering and victimizing, may be cynical, and sometimes show escapist inclinations toward 'excitement' and toward wishful solutions of problems. The low-achievers also somewhat more often describe their family situations as having relatively poor morale, with more parental domination, less sharing, and especially less mutual

affection and approval. The parents of the two groups do not differ, however, in their expressed philosophy of child rearing." (6, p. 393-394)

The following information pertaining to the Accelerated Mathematics Program was on file in the Mathematics Department, School District Number One, Portland, Oregon: names of participants in the program, the mathematics classes they were taking, their total arithmetic grade placement score from the Iowa Tests of Basic Skills, and their scores on the Iowa State Algebra Aptitude Test, the Seattle Algebra Aptitude Test, and the Lankton First Year Algebra Test. The I.Q. and reading level information, mentioned in the statement issued by the Mathematics Department of the Portland Public Schools in the Spring of 1958 (p. 1-2), was not available. The Iowa Tests of Basic Skills and the Iowa Algebra Aptitude Test were admimistered to the students in the seventh grade. As eighth grade algebra students, they were given the Seattle Algebra Test at the end of the first semester and the Lankton Algebra Test at the completion of the second semester. The Iowa State Test of Educational Development was administered to all students in the ninth grade. In the tenth grade, the School and College Abilities Test was given. At the eleventh grade level, the Iowa State Test of Educational Development was again administered. All of the scores on the ITED and the SCAT were in the

hands of the test coordinators for the individual schools or in the cumulative folders in these schools. High school attendance records and grades were on record in the individual high school offices. Information on activity participation was accumulated in the high school counselors' personnel files, with the amount of information included varying from counselor to counselor. The cumulative confidential folders contained data on age, sex, family composition, occupations of parents, number of schools attended, eighth grade attendance and grades.

The studies done in the past, then, indicated variables that might be examined beneficially and the material accessible rendered analysis of some more practical than others. The variables are limited further by the chosen scope of the study. No attempt is made to measure student, teacher, or parent attitudes toward the accelerated mathematics program.

Statement of the problem

The problem, now defined, is to determine if certain measurable differences exist between students who have withdrawn after acceptance into the accelerated mathematics classes in the Portland schools and students who have persisted after acceptance into the program. The points examined are:

A. Test scores

1. Total arithmetic grade placement score on the Iowa Tests of Basic Skills
2. Raw score on the Iowa Algebra Aptitude Test
3. Raw score on the Seattle Algebra Test
4. Raw score on the Lankton First Year Algebra Test
5. Raw score from the section on ability to do quantitative thinking and the composite score on the ITED administered during the Freshman and Junior years in high school
6. Raw score from the quantitative section and the total score on the SCAT

B. Grades

1. High school mathematics G.P.A. (grade point accumulation)
2. Number of failures in high school mathematics courses
3. High school total G.P.A.
4. Number of failures in all high school courses
5. Eighth grade mathematics grade
6. Number of Ns ("N" indicates need for improvement) in eighth grade mathematics
7. Eighth grade G.P.A.
8. Number of Ns in eighth grade
9. Total high school and eighth grade mathematics

G.P.A.

C. Attendance
   1. Number of schools attended for each pupil (including present school)
   2. Number of absences per term
   3. Number of tardies per term

D. Age

E. Activities
   1. Extra-curricular school activities
   2. Community activities
   3. Part-time job during school year

F. Sex

G. Family
   1. Number of siblings
   2. Number living with both parents, mother and step-father, mother, father and step-mother, father, or foster parents
   3. Occupations of parents

Chapter 2. Method

Subjects

The files of the Mathematics Department of School District Number One, Portland, Oregon, contained the names of the 3,088 program participants, grouped according to the year they entered the program. From the pupils who commenced the accelerated mathematics program in 1958 by taking MA 1-2 in the eighth grade, twenty were drawn who were continuing in the program in January, 1962, twenty more who dropped during or at the end of MG 1-2, and twenty who dropped during or at the end of MA 3-4. Since no records were kept of program participants until September, 1959, information on pupils who began the program in 1958 and dropped during or at the end of that same year was not available. To "drop" from the program is to fail to complete any of the following: MA 1-2 in the eighth grade, MA 3-4 in the Freshman year in high school, or MG 1-2 in the Sophomore year, or to exclude two more years of Educational Enrichment mathematics classes from plans for the remaining two years of high school. From the students who began MA 1-2 in the eighth grade in September, 1959, twenty were drawn who persisted through January, 1962, twenty more who dropped during or at the end of MA 3-4, and twenty who dropped during or at the end of MA 1-2. From those who began

MA 1-2 in the eighth grade in September, 1960, twenty were drawn who persisted through January, 1962, and twenty who dropped during or at the end of MA 1-2. The pupils who began MA 1-2 in 1961 would not have had an opportunity to complete MA 1-2 by January, 1962, and hence were not included in the study. The sample size for the eight samples was limited to less than or equal to twenty-one, since there were only twenty-one students who began MA 1-2 in the eighth grade in September, 1960, and dropped during or at the end of that same year and for whom adequate information was available. The grouping of the 160 subjects (5.15% of the total population) is summarized below:

Commenced program in 1958:

Still persisting in program in January, 1962	20
Dropped from the program during or at the end of MG 1-2	20
Dropped from program during or at the end of MA 3-4	20

Commenced program in 1959:

Still persisting in program in January, 1962	20
Dropped from program during or at the end of MA 3-4	20

Dropped from program during or at the end of MA 1-2	20
Commenced program in 1960:	
Still persisting in program in January, 1962	20
Dropped from program during or at the end of MA 1-2	20
	160

Though the samples were selected with the use of a random number table (3, p. 366-370), they were not strictly randomly chosen. The samples were limited to pupils for whom scores on the Iowa Test of Basic Skills, the ITED (given during the Freshman and Junior years), and the SCAT were available and who had not entered the program after the eighth grade nor withdrawn from the program because of transfer to schools outside of the Portland school system.

Data

The files in the Mathematics Department supplied, for those students selected for the study, the total arithmetic grade placement score from the Iowa Tests of Basic Skills and raw scores on the Iowa State Algebra Aptitude Test, the Seattle Algebra Aptitude Test and the Lankton First Year Algebra Test. In cases where percentile scores were recorded in the files rather than raw

scores, these were converted for the study by use of the conversion table used by the Portland Public Schools (Appendix C).

ITED and SCAT scores were obtained from the records of the test coordinators and the cumulative folders in the eleven schools where the 160 subjects were enrolled. The scores extracted and noted were: the composite score and the score from the section labeled "ability to do quantitative thinking" of the ITED from administrations during the Freshman year and again the Junior year and the total score and score on the quantitative section of the SCAT.

Information necessary to calculate high school mathematics G.P.A.s, number of failures in high school mathematics courses, high school total G.P.A.s, and number of failures in all high school courses was obtained for each subject from the transcripts in the individual high school offices and the 1961-1962 grade report cards in the counselors' files. This was current through the fifth grading period, 1961-1962. The eighth grade report cards in the cumulative folders supplied the eighth grade mathematics grades, the number of Ns in eighth grade mathematics, eighth grade G.P.A.s, and the total number of Ns in the eighth grade. Some of the report cards used the C, S, and N system (C= commendable, S = satisfactory, and N = needs improvement) of grading and others used

C, S, and N on part of a card and A, B, C, D, and F (A = exceptional, B = superior, C = average, D = inferior, and F = fail) on the remainder of the card. In order to measure and compare the performance of one group of subjects to another, a conversion scale (Appendix D) was constructed and applied to the C, S, and N system. In addition, the total high school and eighth grade mathematics G.P.A.s were computed for each subject.

Data were collected from the transcripts and 1961-1962 grade report cards for three aspects of attendance: number of schools attended for each pupil (including his present school), average number of absences per term, and average number of tardies per term.

Birth dates of the subjects were obtained from the transcripts and, when not available there, from the cumulative folders. For ease in comparing the ages of subjects in one class with the ages of subjects in another class when they were at an equivalent course level in the program, their ages to the nearest half year when they commenced MA 1-2 were noted and tallied.

To gain a measure of a subject's share in extra-curricular school and community activities, each subject's counselor was asked to rate him on a scale of 1 (above average), 2 (average), or 3 (below average) on his participation in each form of activity. It was found that this

scale, although coarse, was commensurate with the data contained in the counselors' personnel files, the counselors' personal knowledge of the subjects, and their ability to make judgments about the subject of the nature requested. Despite this, the counselors for thirteen of the 160 subjects did not feel adequately informed to rate their subjects on community activities. Consideration of the extra-curricular school activities variable for the totals of those who persisted and those who dropped during the program is affected by the fact that high school Freshman have less access to some school activities than do upper classmen.

The number of siblings in the subjects' families was collected from the cumulative folders. In some schools, additions to families in the time interval from September, 1961 to January, 1962 may not have been noted in the cumulative folders.

The sex of the subjects was obtained from the cumulative folders.

Counselors supplied information on part-time jobs held by their counselees during the school year. Such information was limited in some schools to the 1961-1962 school year and, hence, attention was focused only on the one year. The data were handled as a dichotomy, since incomplete information on some subjects prohibited any

attempt to classify jobs for the subjects.

However, since the schools obtain data on parents' occupations for each student at the commencement of every school year, classification of the occupations of both parents was possible. Anne Roe's two-way classification of occupations by field and level was used initially. (18, p. 151) In addition, a category for housewives was included. Table 1 illustrates the classification system. The selection of a classification involving both level and field was made in an effort to determine whether the parents' occupations exhibited homogeneity on one or both of the dimensions for any of the groupings of subjects. A vocational rehabilitation counselor classified the occupational data for the study. Of the 320 parents, the occupations of thirty-four fathers and eighteen mothers were unclassifiable for the following reasons: the parent was deceased, the available occupational information was insufficient to classify the person within the scheme, or there were no categories for students or for patients in mental hospitals.

The parents whose occupations were classified were those with whom the subjects were living in September, 1962. This information was tallied under the categories of: both parents, mother and step-father, mother only, father and step-mother, father only, and foster parents.

Table 1

Classification of Parents' Occupations

Level	Field								
	I Service	II Business Contact	III Organization	IV Technology	V Outdoor	VI Science	VII General Cultural	VIII Arts and Entertainment	Housewife
1 (Professional and Managerial 1)									
2 (Professional and Managerial 2)									
3 (Semi-professional and Small Business)									
4 (Skilled)									
5 (Semi-skilled)									
6 (Unskilled)									

The possibility exists that information in the cumulative folders regarding these relationships was not completely current.

Statistics

The data were numerical for the following variables:

1. Total arithmetic grade placement score on the Iowa Tests of Basic Skills
2. Raw score on the Iowa Algebra Aptitude Test
3. Raw score on the Seattle Algebra Test
4. Raw score on the Lankton First Year Algebra Test
5. Raw score from the section on ability to do quantitative thinking of the ITED administered during the Freshman year
6. Raw composite score from the ITED administered during the Freshman year
7. Raw score from the section on ability to do quantitative thinking of the ITED administered during the Junior year
8. Raw composite score from the ITED administered during the Junior year
9. Raw score from the quantitative section of the SCAT
10. Raw total score from the SCAT
11. High school mathematics G.P.A.
12. Number of failures in high school mathematics

courses

13. High school total G.P.A.
14. Number of failures in all high school courses
15. Eighth grade mathematics grade
16. Number of Ns in eighth grade mathematics
17. Eighth grade G.P.A.
18. Number of Ns in eighth grade
19. Total high school and eighth grade mathematics G.P.A.
20. Number of schools attended for each pupil
21. Number of absences per term
22. Number of tardies per term
23. Age
24. Extra-curricular school activities
25. Community activities
26. Number of siblings

These data were tallied and means computed for each group of twenty. Also, means for the total groups of sixty students who persisted and one hundred students who dropped were computed. Although observations of individuals tend to be lost in averages, the mean was selected as the measure of central tendency for this numerical data rather than the median, because of its tendency to give more weight to the extremes of the distribution. Moreover, the mean is the statistic the t test compares

for two samples. The *t* test appears to be the most powerful test with validity for the statistical model and measurement of this part of the study.

In accord with the nature of the problem, the mean of the observations of the group that persisted was compared on each variable to the mean of the observations of the group that dropped. Furthermore, the mean for the twenty that persisted from the 1958 class was compared to the mean for the twenty that dropped during or at the end of MG 1-2 and again for the twenty that dropped during or at the end of MA 3-4. In the same fashion, the mean for the twenty that persisted from the 1959 class was compared to the mean for the twenty that dropped during or at the end of MA 3-4 and again for those that dropped during or at the end of MA 1-2. The mean for the twenty that persisted from the 1960 class was compared to the mean for the twenty that dropped during or at the end of MA 1-2. These comparisons were made with the use of Fisher's *t* for testing a difference between uncorrelated means.

$$t = \frac{M_1 - M_2}{\sqrt{\left(\frac{\sum x_1^2 + \sum x_2^2}{N_1 + N_2 - 2}\right) \cdot \left(\frac{N_1 + N_2}{N_1 \cdot N_2}\right)}}$$

where M_1 and M_2 = means of the two samples,

$\sum x_1^2$ and $\sum x_2^2$ = sums of squares in the two samples,

and N_1 and N_2 = number of cases in the two samples.

This is equivalent to:

$$t = \frac{M_1 - M_2}{\sqrt{\frac{\sum x_1^2 + \sum x_2^2}{N(N-1)}}} \qquad \text{when } N_1 = N_2 = N.$$

The degrees of freedom are $N_1 + N_2 - 2$. Table D (8, p. 538-539) gives the standard t limits that are significant at the .05 and .01 levels of significance for different degrees of freedom.

According to J. P. Guilford, the statistic t is applicable regardless of the size of the sample, and hence useful with this study's small groups of twenty. He states,

> If there is good reason to believe that the population distribution is not normal but is seriously skewed, and especially if the samples are small, the t tests do not apply .... The reader should also be warned that if the two samples did not arise from the same population, so that the variances are homogeneous (differences are insignificant), the t test is invalid. The homogeneity of the two variances can be tested by making the F test.... (8, p. 221)

Sidney Siegel adds two more assumptions:

> The observations must be independent. That is, the selection of any one case from the population for inclusion in the sample must not bias the chances of any other case for inclusion, and the score which is assigned to any case must not bias the score which is assigned to any other case.... The variables involved must have been measured in at least an interval scale, so that it is possible to use the operations of arithmetic (adding, dividing, finding means, etc.) on the scores.... With the possible exception of the assumption of homoscedasticity (equal variances), these conditions are ordinarily not tested in the course of

> the performance of a statistical analysis. Rather, they are presumptions which are accepted, and their truth or falsity determines the meaningfulness of the probability statement arrived at by the parametric test. (19, p. 19-20)

> For a given research, the t test may be inapplicable for a variety of reasons. The researcher may find that (a) the assumptions of the t test are unrealistic for his data, (b) he prefers to avoid making the assumptions and thus to give his conclusions greater generality, or (c) his "scores" may not be truly numerical and therefore fail to meet the measurement requirement of the t test. In instances like these, the researcher may choose to analyze his data with one of the nonparametric statistical tests for two independent samples.... (19, p. 96)

The writer sees no particular reason why the population of 3,088 students selected for accelerated mathematics classes should be seriously skewed for any of the different variables. The F test was used to test the homogeneity of the variances of two samples whenever the t test was applied to their means.

$$F = \frac{\text{larger variance}}{\text{smaller variance}}$$

Table F (8, p. 541) gives the standard F limits that are significant at the .05 and .01 levels of significance when there are different combinations of degrees of freedom for each of the two variances in the ratio. (8, p. 224-225) The variables whose distributions appeared to satisfy the assumptions for the t test were:

1. Total arithmetic grade placement score on the Iowa Tests of Basic Skills

2. Raw score on the Iowa Algebra Aptitude Test
3. Raw score on the Seattle Algebra Test
4. Raw score on the Lankton First Year Algebra Test
5. Raw score from the section on ability to do quantitative thinking of the ITED administered during the Freshman year
6. Raw composite score from the ITED administered during the Freshman year
7. Raw score from the section on ability to do quantitative thinking of the ITED administered during the Junior year
8. Raw composite score from the ITED administered during the Junior year
9. Raw score from the quantitative section of the SCAT
10. Raw total score from the SCAT
11. High school mathematics G.P.A.
12. High school total G.P.A.
13. Eighth grade mathematics grade
14. Number of Ns in eighth grade mathematics
15. Eighth grade G.P.A.
16. Total high school and eighth grade mathematics G.P.A.
17. Number of schools attended for each pupil
18. Age

19. Extra-curricular school activities
20. Community activities

The variables whose distributions of observations had significantly different variances at the .05 level of significance for some of the pairs of samples being compared were:

1. Number of failures in high school mathematics courses
2. Total number of failures in high school courses
3. Total number of Ns in the eighth grade
4. Number of absences per term
5. Number of tardies per term
6. Number of siblings

Furthermore, some groups were composed of subjects who had no failures in high school courses and, hence, the F ratios for the variables of number of high school mathematics course failures and total number of high school course failures had zero in the denominator and were undefined. The t test was, therefore, invalid for these six variables. (Appendix E)

Since the one assumption was not met for the t test by the six variables, it was necessary to use a test not requiring homoscedasticity on these variables. William G. Cochran and Gertrude M. Cox (1, p. 77-80) provide a method for meeting the situation of unequal variances by

subdivision of the sum of squares for error. Attempts to apply this method in the study were unsuccessful. Non-parametric statistical tests for two independent samples were then considered. According to Sidney Siegel,

> ...if the researcher is interested in determining whether the two samples are from populations which differ in any respect at all, i.e., in location of dispersion or skewness, etc., he should choose one of these tests: the χ^2 test, the Kolmogorov-Smirnov test (two-tailed), or the Wald-Wolfowitz runs test.... The choice among the tests which are sensitive to all kinds of differences is predicted on the strength of the measurement obtained, the size of the two samples, and the relative power of the available tests. The χ^2 test is suitable for data which are in nominal or stronger scales. When the N is small and the data are in a 2 x 2 contingency table, the Fisher test should be used rather than χ^2. In many cases the χ^2 test may not make efficient use of all the information in the data. If the populations of scores are continuously distributed, we may choose either the Kolmogorov-Smirnov (two-tailed) test or the Wald-Wolfowitz runs test in preference to the χ^2 test. Of all tests for any kind of difference, the Kolmogorov-Smirnov test is the most powerful. If it is used with data which do not meet the assumption of continuity, it is still suitable but it operates more conservatively..., i.e., the obtained value of p in such cases will be slightly higher than it should be, and thus the probability of a Type II error (β error) will be slightly increased. If H_o (null hypothesis) is rejected with such data, we can surely have confidence in the decision. The runs test also guards against all kinds of differences, but it is not as powerful as the Kolmogorov-Smirnov test. (19, p. 157-158)

The Kolmogorov-Smirnov test was selected and applied because of its suitability to data not continuously distributed, but satisfying strong measurement on an interval scale. χ^2 would not make use of the latter

information. To use the Kolmogorov-Smirnov two-sample test:

1. Arrange each of the two groups of scores in a cumulative frequency distribution, using the same intervals (or classifications) for both distributions.
2. By subtraction, determine the difference between the two sample cumulative distributions at each listed point.
3. By inspection, determine the largest of these differences; this is D. (D = Maximum $|S_{n_1}(X) - S_{n_2}(X)|$)
4. To determine the significance of the observed D:
   a. When $n_1 = n_2 = N$, and when $N \leq 40$, Table L (19, p. 278) is used. It gives critical values of K_D (the numerator of D) for various levels of significance, for two-tailed tests.
   b. For a two-tailed test, when n_1 and n_2 are both larger than 40, Table M (19, p. 279) is used. In such cases it is not necessary that $n_1 = n_2$. Critical values of D for any given large values of n_1 and n_2 may be computed from the expressions given in the body of Table M.

If the observed value is equal to or larger than that given in the appropriate table for a particular level of significance, the null hypothesis may be rejected at that level of significance. (19, p. 135-136)

Data describing the remaining four variables:

1. Number with part-time jobs during the school year
2. Sex
3. Number living with both parents, mother and step-father, mother, father and step-mother, father, and foster parents
4. Occupations of parents

were not numerical, and hence arithmetic operations could not be applied. This necessitated using nonparametric statistics to compare the distributions of observations for different variables. Sidney Siegel's discussion of possible alternative statistics, cited earlier, indicated that χ^2 would be the statistic to use when the data are in nominal scales, unless the N is small and the data are in 2 x 2 contingency tables. In these cases, the Fisher test should be used rather than χ^2. He further refines this recommendation,

> If the frequencies are in a 2 x 2 contingency table, the decision concerning the use of χ^2 should be guided by these considerations:
> 1. When $N > 40$, use χ^2 corrected for continuity, i.e., in formula

$$\chi^2 = \frac{N(|AD - BC| - N/2)^2}{(A+B)(C+D)(A+C)(B+D)} \qquad df = 1.$$

2. When N is between 20 and 40, the χ^2 test may be used if all expected frequencies are 5 or more. If the smallest expected frequency is less than 5, use the Fisher test.
3. When N < 20, use the Fisher test in all cases.... When k is larger than 2 (and thus df = 1), the χ^2 test may be used if fewer than 20 per cent of the cells have an expected frequency of less than 5 and if no cell has an expected frequency of less than 1. If these requirements are not met by the data in the form in which they were originally collected, the researcher must combine adjacent categories in order to increase the expected frequency in the various cells. Only after he has combined categories to meet the above requirements may he meaningfully apply the χ^2 test. (19, p. 110)

The groups for this study all have $N \geq 20$. Three of the comparisons between samples for part-time jobs involved 2 x 2 contingency tables with expected frequencies of less than 5. Therefore, Fisher exact probability test was used for these three comparisons. The exact probability of observing a particular set of frequencies in a 2 x 2 contingency table, when the marginal totals are regarded as fixed, is obtained by recursive use of

$$p = \frac{(A+B)!\,(C+D)!\,(A+C)!\,(B+D)!}{N!\,A!\,B!\,C!\,D!}$$

The value yielded would be for a one-tailed test. For a two-tailed test, such as this study requires, the value p yielded by the formula must be doubled. If the significance level shown by 2p was less than or equal to .05,

the null hypothesis was rejected. (19, p. 96-104)

The other three comparisons between samples for part-time jobs, and all six comparisons between samples for the variable of sex involved 2 x 2 contingency tables with expected frequencies of five or more. Since requirements for the χ^2 test were satisfied, χ^2 corrected for continuity was applied.

$$\chi^2 = \frac{N(|AD-BC|-N/2)^2}{(A+B)(C+D)(A+C)(B+D)} \qquad df = 1$$

If an observed value of χ^2 was equal to or greater than the value given in Table C (19, p. 249) for a .05 level of significance, at the respective degrees of freedom, then the null hypothesis was rejected at the .05 level of significance. (19, p. 107-109)

Comparisons between samples for parents with whom the subjects were living involved 6 x 2 contingency tables with some cells containing less than one expected observation. (Appendix F) Therefore, adjacent categories were combined. The observations for the six categories were regrouped into two categories: with both father and mother and not with both father and mother. Even after this regrouping was performed and 2 x 2 contingency tables were created, the expected frequencies for some cells were less than five, in five of the comparisons. Fisher exact probability test was then applied for these five comparisons. The sixth comparison (total sixty

persisting subjects to one hundred subjects who dropped) satisfied the requirements for the χ^2 test. χ^2, corrected for continuity, was applied for this one comparison.

The classified data for the last variable, occupations of parents, suggested a 49 x 2 contingency table, but, in each of the six comparisons, some cells contained less than one expected frequency. The vocational rehabilitation counselor, who classified the data, thought that adjacent categories could not be combined to meet the requirements of the χ^2 test without distorting Roe's classification. In view of this, an attempt was made to reclassify the data in a one-way classification, similar to that used by the Dictionary of Occupational Titles (DOT). For the comparisons between samples of size N = 20, some cells would still contain less than one expected frequency. For the comparison between the sixty subjects who persisted and the one hundred subjects who dropped, the cells would contain at least one expected frequency, but more than twenty per cent of the cells would have an expected frequency of less than five. Hence, the requirements for the test would still not be satisfied. It would appear that the nominal data for this variable of parents' occupations does not lend itself to statistical analysis. However, descriptions of observable trends can

be stated.

In summary, the parametric statistic, Fisher's *t* was used to test the difference between means for the variables:

1. Total arithmetic grade placement score on the Iowa Tests of Basic Skills
2. Raw score on the Iowa Algebra Aptitude Test
3. Raw score on the Seattle Algebra Test
4. Raw score on the Lankton First Year Algebra Test
5. Raw score from the section on ability to do quantitative thinking of the ITED administered during the Freshman year
6. Raw composite score from the ITED administered during the Freshman year
7. Raw score from the section on ability to do quantitative thinking of the ITED administered during the Junior year
8. Raw composite score from the ITED administered during the Junior year
9. Raw score from the quantitative section on the SCAT
10. Raw total score from the SCAT
11. High school mathematics G.P.A.
12. High school total G.P.A.
13. Eighth grade mathematics grade

14. Number of Ns in eighth grade mathematics
15. Eighth grade G.P.A.
16. Total high school and eighth grade mathematics G.P.A.
17. Number of schools attended for each pupil
18. Age
19. Extra-curricular school activities
20. Community activities

The distributions of observations for the variables:

1. Number of failures in high school mathematics courses
2. Total number of failures in high school courses
3. Total number of Ns in the eighth grade
4. Number of absences per term
5. Number of tardies per term
6. Number of siblings

were compared for location, dispersion, skewness, et cetera, by the nonparametric Kolmogorov-Smirnov test. Three of the six comparisons between samples for number of part-time jobs held during the school year and five comparisons between samples for parents with whom the subjects were living were made with the nonparametric Fisher exact probability test. To the other three comparisons for number of part-time jobs held, the one comparison for parents with whom the subjects were living,

and all six comparisons for the variable of sex, the non-parametric statistic χ^2 was applied. A statistical analysis was not made for the variable of occupations of parents.

Chapter 3. Results

The *t* values recorded in Tables 2 - 21, obtained from a comparison of means (Appendix G) for the variables:

1. Total arithmetic grade placement score on the Iowa Tests of Basic Skills
2. Raw score on the Iowa Algebra Aptitude Test
3. Raw score on the Seattle Algebra Test
4. Raw score on the Lankton First Year Algebra Test
5. Raw score from the section on ability to do quantitative thinking of the ITED administered during the Freshman year
6. Raw composite score from the ITED administered during the Freshman year
7. Raw score from the section on ability to do quantitative thinking of the ITED administered during the Junior year
8. Raw composite score from the ITED administered during the Junior year
9. Raw score from the quantitative section of the SCAT
10. Raw total score from the SCAT
11. High school mathematics G.P.A.
12. High school total G.P.A.
13. Eighth grade mathematics grade
14. Number of Ns in eighth grade mathematics

15. Eighth grade G.P.A.
16. Total high school and eighth grade mathematics G.P.A.
17. Number of schools attended for each pupil
18. Age
19. Extra-curricular school activities
20. Community activities

do not meet the standard t limit significant at the .05 level of significance. For the comparisons of samples of size N = 20 (df = 38), the t limit significant at the .05 level is $2.021 < t < 2.030$. For the comparisons between the total persisting group of subjects and the total group of subjects who dropped during the program (df = 158), the t limit significant at the .05 level is $1.972 < t < 1.976$.

Table 2

T Test Values for Differences between Means of Total Arithmetic Grade Placement Score of Iowa Tests of Basic Skills

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
Commenced program in				
1958	----	0.03	0.12	
1959	0.16	0.03	----	
1960	0.05	----	----	0.09

Table 3

T Test Values for Differences between Means of Raw Scores on the Iowa Algebra Aptitude Test

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
Commenced program in				
1958	----	0.13	0.07	
1959	0.22	0.01	----	
1960	0.14	----	----	
				0.16

Table 4

T Test Values for Differences between Means of Raw Scores on the Seattle Algebra Test

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
Commenced program in				
1958	----	0.38	0.19	
1959	0.40	0.09	----	
1960	0.62	----	----	
				0.70

Table 5

T Test Values for Differences between Means of Raw Scores on the Lankton First Year Algebra Test

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
Commenced program in				
1958	----	0.75	0.46	
1959	0.60	0.04	----	
1960	0.67	----	----	
				0.97

Table 6

T Test Values for Differences between Means of Raw Scores from the Section on Ability To Do Quantitative Thinking of the ITED Administered during the Freshman Year

	Persisted to dropped during or at the end of MA 1-2	Persisted to dropped during or at the end of MA 3-4	Persisted to dropped during or at the end of MG 1-2	Persisted to dropped during program
Commenced program in				
1958	----	0.29	0.33	
1959	0.29	0.07	----	
1960	0.27	----	----	
				0.46

Table 7

T Test Values for Differences between Means of Raw Composite Scores from the ITED Administered during the Freshman Year

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
Commenced program in				
1958	----	0.24	0.10	
1959	0.07	0.07	----	
1960	0.29	----	----	
				0.31

Table 8

T Test Values for Differences between Means of Raw Scores from the Section on Ability To Do Quantitative Thinking of the ITED Administered during the Junior Year

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
Commenced program in				
1958	----	0.42	0.31	
1959	----	----	----	
1960	----	----	----	
				0.43

Table 9

T Test Values for Differences between Means of Raw Composite Scores from the ITED Administered during the Junior Year

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
Commenced program in				
1958	----	0.31	0.17	
1959	----	----	----	
1960	----	----	----	
				0.24

Table 10

T Test Values for Differences between Means of Raw Scores from the Quantitative Section of the SCAT

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
Commenced program in				
1958	----	0.28	0.26	
1959	0.25	0.14	----	
1960	----	----	----	
				0.40

Table 11

T Test Values for Differences between Means of Raw Total Scores from the SCAT

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
Commenced program in 1958	----	0.20	0.17	
1959	0.11	0.04	----	
1960	----	----	----	
				0.22

Table 12

T Test Values for Differences between Means of High School Mathematics G.P.A.s

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
Commenced program in 1958	----	0.72	0.51	
1959	0.38	0.29	----	
1960	1.02	----	----	
				1.50

Table 13

T Test Values for Differences between Means of High School Total G.P.A.s

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
Commenced program in 1958	----	0.05	0.25	
1959	0.10	0.03	----	
1960	0.05	----	----	
				0.03

Table 14

T Test Values for Differences between Means of Eighth Grade Mathematics Grades

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persist to dropped during program
Commenced program in 1958	----	0.24	0.06	
1959	0.80	0.14	----	
1960	0.54	----	----	
				0.56

Table 15

T Test Values for Differences between Means of Number of Ns in Eighth Grade Mathematics

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
Commenced program in				
1958	----	0.00	0.00	
1959	0.00	0.00	----	
1960	0.00	----	----	
				0.00

Table 16

T Test Values for Differences between Means of Eighth Grade G.P.A.s

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
Commenced program in				
1958	----	0.23	0.12	
1959	0.04	0.23	----	
1960	0.14	----	----	
				0.11

Table 17

T Test Values for Differences between Means of Total High School and Eighth Grade Mathematics G.P.A.s

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
Commenced program in				
1958	----	0.45	0.39	
1959	0.04	0.05	----	
1960	0.25	----	----	
				0.18

Table 18

T Test Values for Differences between Means of Number of Schools Attended for Each Pupil

	Persisted to dropped during or at the end of MA 1-2	Persisted to dropped during or at the end of MA 3-4	Persisted to dropped during or at the end of MG 1-2	Persisted to dropped during program
Commenced program in				
1958	----	0.58	0.23	
1959	0.05	0.05	----	
1960	0.19	----	----	
				0.43

Table 19

T Test Values for Differences between Means of Ages

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
Commenced program in				
1958	----	0.06	0.06	
1959	0.00	0.00	----	
1960	0.12	----	----	
				0.04

Table 20

T Test Values for Differences between Means of Ratings of Extra-curricular School Activities

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
Commenced program in				
1958	----	0.17	0.64	
1959	0.28	0.07	----	
1960	0.62	----	----	
				0.67

Table 21

T Test Values for Differences between Means of Ratings of Community Activities

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
Commenced program in				
1958	----	0.02	0.75	
1959	0.01	0.01	----	
1960	0.12	----	----	
				0.45

The largest t values obtained for the sixty students who persisted compared to the one hundred students who dropped were $t = 1.50$ for high school mathematics G.P.A.s and $t = 0.97$ for scores on the Lankton First Year Algebra Test. Although not significantly different at the .05 level of significance, the means for the persisting groups were consistently "better" than the means for the corresponding groups of students who dropped for the following variables:

Iowa Algebra Aptitude Test raw score

Seattle Algebra Test raw score

Lankton First Year Algebra Test raw score

All four raw scores from the section on ability to

to quantitative thinking and composite score of the ITED for each administration (Freshman and Junior years)

Both the raw score from the quantitative section and the total raw score of the SCAT.

The Kolmogorov-Smirnov test, applied to data for the variables:

1. Number of failures in high school mathematics courses
2. Total number of failures in high school courses
3. Total number of Ns in the eighth grade
4. Number of absences per term
5. Number of tardies per term
6. Number of siblings

resulted in values of K_D and D, which were not significant at the .05 level of significance. The values of K_D, obtained when the samples of size N = 20 were compared, are given in Tables 22 - 27. The critical value of K_D at the .05 level of significance is 9. (19, p. 278)

Table 22

Kolmogorov-Smirnov Test Values for Number of Failures in High School Mathematics Courses

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2
Commenced program in			
1958	-	1	0
1959	0	0	-
1960	2	-	-

Table 23

Kolmogorov-Smirnov Test Values for Total Number of Failures in High School Courses

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2
Commenced program in			
1958	-	2	1
1959	0	0	-
1960	2	-	-

Table 24

Kolmogorov-Smirnov Test Values for Total Number of Ns in the Eighth Grade

	Persisted to dropped during or at the end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2
Commenced program in			
1958	-	1	3
1959	3	2	-
1960	2	-	-

Table 25

Kolmogorov-Smirnov Test Values for Number of Absences Per Term

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2
Commenced program in			
1958	-	6	8
1959	3	2	-
1960	2	-	-

Table 26

Kolmogorov-Smirnov Test Values for
Number of Tardies Per Term

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2
Commenced program in			
1958	-	5	4
1959	3	2	-
1960	2	-	-

Table 27

Kolmogorov-Smirnov Test Values for
Number of Siblings

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2
Commenced program in			
1958	-	3	2
1959	1	2	-
1960	5	-	-

The values of D, obtained when the total group of persisting subjects and the total group of subjects who dropped were compared, were as follows for the six different variables:

1. Number of failures in high school mathematics courses, D = 0.04
2. Total number of failures in high school courses, D = 0.01
3. Total number of Ns in the eighth grade, D = 0.07
4. Number of absences per term, D = 0.05
5. Number of tardies per term, D = 0.08
6. Number of siblings, D = 0.13

The critical value of D at the .05 level of significance is 0.22. (19, p. 279) The largest K_D values occurred for comparisons of number of absences per term. The largest D value occurred for the comparison of number of siblings. Appendix H contains the cumulative frequency distribution tables used in the computation of K_D and D values.

The three comparisons using Fisher exact probability test between samples for number of part-time jobs held by the subjects resulted in the following values of probability of chance occurence:

The 1958 group of students who persisted compared to those that dropped during or at the end of MG 1-2, $p' = 2p = 1.32$

The 1959 group of students who persisted compared to those that dropped during or at the end of MA 3-4, $p' = 2p = 0.004$

The 1960 group of students who persisted compared to those that dropped during or at the end of MA 1-2, $p' = 2p = 1.36$

The second of the three results is highly significant. The other three comparisons for this variable, using the χ^2 test, yielded the following χ^2 values:

The 1958 group of students who persisted compared to those that dropped during or at the end of MA 3-4, $\chi^2 = 0.13$

The 1959 group of students who persisted compared to those that dropped during or at the end of MA 1-2, $\chi^2 = 2.01$

The total group of students that persisted compared to the total group of students that dropped during the program, $\chi^2 = 1.41$

All of the three values are less than 3.84, the critical value for the .05 level of significance. (19, p. 249) Appendix I contains the 2 x 2 contingency tables for all six comparisons.

The application of Fisher exact probability test to the data regarding parents with whom the subjects were living resulted in the probability values given in

Table 28 for comparisons between samples of size N = 20.

Table 28

Fisher Exact Probability Test Values for Parents with Whom the Subjects Were Living

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2
Commenced program in			
1958	----	1.00	1.00
1959	1.00	1.00	----
1960	0.60	----	----

None of these is equal to or less than 2p = .05. For the sixth comparison (sixty subjects who persisted to one hundred subjects who dropped during the program), χ^2 yielded the value 0.03. This value is less than 3.84, the critical value at the .05 level of significance. Appendix I contains the 2 x 2 contingency tables for these six comparisons.

Application of the χ^2 test to data for the variable of sex, resulted in the values given in Table 29.

Table 29

χ^2 Test for the Variable of Sex

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped from program
Commenced program in				
1958	----	8.10	6.42	
1959	1.64	3.84	----	
1960	0.41	----	----	
				8.03

Four of the six values are significant at the .05 level of significance. The 2 x 2 contingency tables for the six comparisons are contained in Appendix I.

The results of the classification of data on parents' occupations appears in Tables 30-39. Although a statistical analysis of the data for this variable was not performed, the following observations were made:

1. The preponderance of frequencies for each of the groupings fall between Roe's Groups I and IV and at Level 4 or above. In the case of all those students who persisted, 93.5 per cent of the fathers' occupations fall above Level 4 (the

level which includes principally the semi-skilled occupations) and 89.4 per cent between Groups I and IV (which includes Service, Business Contact, Organization, and Technology). In the same manner, 94.7 per cent of the fathers of the students who dropped are engaged in occupations at or above Level 4, with 78.5 per cent of them in Groups I and IV.

2. The same general pattern of occupational activity is apparent for both groups, with the largest number of fathers engaged in occupations in the Technology grouping (for example, engineers of varying levels of responsibility, contractors, electricians, and related skilled trades), the second largest in various forms of Organization (business executives, CPAs, owners of various small businesses, and varying levels of clerical activities), and the third largest in Business Contact (salesmen, dealers of various forms, et cetera). The one occupational grouping into which none of the fathers for either group fall is V, Roe's Outdoor category. Included under this group are persons engaged in various agricultural pursuits, conservation, mining, and oil well drilling.

Table 30

Classification of Parents' Occupations for Those Who Persisted from the Class of 1958

	Field								
Level	I	II	III	IV	V	VI	VII	VIII	Housewife
	H W[a]	H W	H W	H W	H W	H W	H W	H W	
1	1		1				1		
2	1 1	1	3 1	1			1 1		
3			1	1 1					
4				3					
5									
6	1								
									14

Number of unclassified fathers 4

Number of unclassified mothers 2

[a] H denotes father and W denotes mother

Table 31

Classification of Parents' Occupations for Those Who Dropped During or at the End of MG 1-2 from the Class of 1958

	Field								
Level	I	II	III	IV	V	VI	VII	VIII	Housewife
	H W[a]	H W	H W	H W	H W	H W	H W	H W	
1	1						4		
2							1		
3		2 1	2	1 1		1			
4			1 2	1		1			
5				2					
6	1					1			
									13

Number of unclassified fathers 3

Number of unclassified mothers 1

[a] H denotes father and W denotes mother

Table 32

Classification of Parents' Occupations for Those Who Dropped During or at the End of MA 3-4 from the Class of 1958

	Field								
Level	I	II	III	IV	V	VI	VII	VIII	Housewife
	H W[a]	H W	H W	H W	H W	H W	H W	H W	
1	1								
2		3	1				1	1	
3		2	2 2				1 1		
4	1		3	5					
5				1					
6									
									10

Number of unclassified fathers 3

Number of unclassified mothers 2

[a] H denotes father and W denotes mother

Table 33

Classification of Parents' Occupations for Those Who Persisted from the Class of 1959

	Field								
Level	I H W[a]	II H W	III H W	IV H W	V H W	VI H W	VII H W	VIII H W	Housewife
1	1								
2				1		1	2		
3		4	3					1	
4			1 3	3					
5									
6									
									15

Number of unclassified fathers 5

Number of unclassified mothers 0

[a] H denotes father and W denotes mother

Table 34

Classification of Parents' Occupations for Those Who Dropped During or at the End of MA 3-4 from the Class of 1959

Level	Field								
	I	II	III	IV	V	VI	VII	VIII	Housewife
	H W[a]	H W	H W	H W	H W	H W	H W	H W	
1							1		
2			1	1		1	1		
3	1	3	2						
4			2 3	1					
5									
6									

12

Number of unclassified fathers 6

Number of unclassified mothers 5

[a] H denotes father and W denotes mother

Table 35

Classification of Parents' Occupations for Those Who Dropped During or at the End of MA 1-2 from the Class of 1959

	Field								
Level	I	II	III	IV	V	VI	VII	VIII	Housewife
	H W[a]	H W	H W	H W	H W	H W	H W	H W	
1	2 1					1	3		
2			1	1					
3		3	1						
4			1	4					
5									
6									
									17

Number of unclassified fathers 4

Number of unclassified fathers 1

[a] H denotes father and W denotes mother

Table 36

Classification of Parents' Occupations for Those Who Persisted from the Class of 1960

Level	Field								
	I	II	III	IV	V	VI	VII	VIII	Housewife
	H W[a]	H W	H W	H W	H W	H W	H W	H W	
1							1		
2			2	1					
3		4 2		2					
4			2	3				1	
5	1			1					
6				1					
									13

Number of unclassified fathers 4

Number of unclassified mothers 2

[a] H denotes fathers and W denotes mothers

Table 37

Classification of Parents' Occupations for Those Who Dropped During or at the End of MA 1-2 from the Class of 1960

	Field								
Level	I	II	III	IV	V	VI	VII	VIII	Housewife
	H W[a]	H W	H W	H W	H W	H W	H W	H W	
1									
2			2	1		1	2 2		
3		1	2	1					
4			3	4					
5	1		1						
6									
									9

Number of unclassified fathers 5

Number of unclassified mothers 5

[a] H denotes fathers and W denotes mothers

Table 38

Classification of Parents' Occupations for Those Who Persisted

	Field								
Level	I	II	III	IV	V	VI	VII	VIII	Housewife
	H W[a]	H W	H W	H W	H W	H W	H W	H W	
1	2		1				2		
2	1 1	1	5 1	3		1	3 1		
3		8 2	4	3 1				1	
4			1 5	9				1	
5	1			1					
6	1			1					
									42

Number of unclassified fathers 13

Number of unclasified mothers 4

[a] H denotes fathers and W denotes mothers

Table 39

Classification of Parents' Occupations for Those Who Dropped During the Program

Level	Field I H	I W[a]	II H	II W	III H	III W	IV H	IV W	V H	V W	VI H	VI W	VII H	VII W	VIII H	VIII W	Housewife
1	3	1									1		8				
2	1		3		5		3				1	1	4	3	1		
3	1		11	1	9	2	2	1				1	1	1			
4		1			3	12	15				1						
5	1				1		3										
6	1											1					
																	61

Number of unclassified fathers 21

Number of unclassified mothers 14

[a] H denotes father and W denotes mother

Chapter 4. Conclusions and Recommendations

Although the twenty variables tested with Fisher's *t* for difference between means of observations did not prove significant at the .05 level of significance for the samples in this study, there were observable trends. For only nine variables in the study, were the means of observations for the three groups who persisted and their total consistently more toward one end of their respective continua than the means of the five corresponding groups who dropped and their total. All these were scores on standardized tests: Iowa Algebra Aptitude Test, Seattle Algebra Test, Lankton First Year Algebra Test, both administrations of the ITED, and the SCAT. For the ITED and SCAT, this was true of the composite, as well as quantitative, scores. The means of the scores of those who persisted were higher than for those who dropped. The *t* values for the Lankton First Year Algebra Test were the second highest *t* values obtained for the twenty variables. This is interesting in view of the fact that the multiple regression equation study on similar samples from the Accelerated Mathematics Program (Appendix B) indicated that the Lankton First Year Algebra Test contributed the only positive weighting to the prediction of MA 3-4 grades. Other predictor variables for this previous study were the criteria for selection of

students for MA 3-4: MA 1-2 teacher comments, Iowa Algebra Aptitude Test, Seattle Algebra Test, and MA 1-2 grades. The highest *t* values were obtained for differences between means of high school mathematics grades. Although the differences between the mathematics grades' means were larger than those for other variables, the means for the persisting groups were not consistently more toward one end of the grade continuum than those of the groups that dropped. The results of the *t* test for the variables of extra-curricular school activities and community activities are of doubtful validity, since the data are ratings on an ordinal scale. Fisher's *t* test assumes interval data.

The six variables tested with the Kolmogorov-Smirnov test for differences in the observations' distributions yielded results well below the critical values for the .05 level of significance. The means of the groups that persisted were not consistently more toward one end of a continuum than were the means of the groups that dropped.

The holding of a part-time job seemed to have little bearing on whether a student persisted or dropped. In only one class, 1959, was there a significant relationship when those who persisted were compared with those in the class who dropped during or at the end of MA 3-4. A significantly larger number of the persisting group held

part-time jobs than those who dropped (significant at the .004 level). A comparison between those who persisted in the 1959 class and those in that class who dropped during or at the end of MA 1-2 showed a similar pattern, but the value of χ^2, although high, was not a statistically significant. There was no significant difference for the total groups of sixty and one hundred.

Four of the six comparisons made for the variable of sex showed significance at the .05 level. This included the comparison of the total group of persisting subjects to the total group of subjects who dropped. In four of the five groups of subjects who dropped, there were more girls than boys. The fifth group was composed of half boys and half girls. In two of the three groups of persisting subjects, there were more boys than girls. The two groups that failed to follow the pattern of more girls in the groups who dropped and more boys in the groups who persisted were the two samples from the 1960 class. This change in pattern may be a chance occurance or may be due to the operation of some systematic factor not taken into account in the present study.

The variable of parents with whom the subjects were living yielded test results not significant at the .05 level. Moreover, for the distributions of the occupations of these parents, the observable trends noted in Chapter

Three point toward similarities, rather than differences, between the groups of students who persisted and students who dropped. Facts about agreement in the general pattern of classification were indicated: for both groups, the largest number of fathers engaged in occupations in the Technology grouping, the second largest in various forms of Organization, and the third largest in Business Contact; for both groups, there were no fathers in Roe's Outdoor category, Group V; for all groupings, the preponderance of frequencies fell between Roe's Groups I and IV and at Level 4 or above. That none of the fathers' occupations were classified under Group V, Outdoor, might be in part due to the fact that the samples came from the metropolitan area. In general, it can be stated that if a student is selected for participation in the Accelerated Mathematics Program, the prediction can be made with reasonable certainity that his father's occupation will fall above Roe's semi-skilled Level 4 and between Groups I and IV (including Service, Business Contact, Organization, and Technology). However, this conclusion is not surprising, as Groups I through IV contain those occupations in which the bulk of the working population is employed. Roe fails to offer comparisons of her breakdown with the general labor force. In making a statement about quantities above a certain level (such as Level 4)

in more than one group (such as Groups I - IV), it should be noted that the graduations along the level continuum for a given group do not appear comparable with that of other groups. Further limitation is imposed on the above statement by the fact that fifty-two of the 320 parents' occupations were unclassified.

Over all, except for the variable of sex, there were no measurable significant (at .05 level of significance) differences for the variables tested between students who were accepted into and who withdrew from the Accelerated Mathematics Program in the Portland schools and those who were still persisting at the time of this study. This suggests that either the significant variables were not selected for testing; that patterns of multiple variables determine differences, rather than individual variables; or that the sample size was too small for the tests used.

An analysis, with larger samples, of patterns of circumstances leading to dropping from the program would be an interesting topic for future research. This analysis, assisted by an analysis of criteria of selection through the means of multiple regression equations, might provide valuable information for counseling participants prior to and after their selection into the program and for re-evaluation of existing selection criteria.

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APPENDICES

Mathematics

PORTLAND PUBLIC SCHOOLS

631 NORTHEAST CLACKAMAS STREET
PORTLAND 8, OREGON

CURRICULUM DIVISION

March 5, 1962

To All High School Principals:

Mrs. Joyce Palmer has been given approval by Dr. Victor Doherty, Director of Research, to make a study of the students who began algebra in grade eight. This letter is to introduce Mrs. Palmer and to request the cooperation of you and your school in giving her assistance for the purpose of obtaining needed information. She will need information from transcripts and accumulative folders.

Her study is one of interest and value to our school district.

Sincerely,

William W. Matson
Supervisor
Mathematics

WM:sw

B. Summary of "A Study of Criteria for Selection of Accelerated Mathematics Program Pupils"

Statement of problem

1. What amount of weight, as estimated from collected data, is given to variables for selection of eighth grade algebra class pupils?
2. How might the weightings or variables be altered to eliminate superfluous action and yet maintain the same amount of predictive ability, or more?

Scope

Attention was directed to the class of pupils who, in the fall of 1959, took MA 1-2 in the eighth grade. Consideration was given to criteria of selection for MA 3-4, as defined in a statement from the Mathematics Department, Portland Public Schools.

Assumptions

Assumptions to be met for the statistical design chosen are rectilinear relationship (straight-line regression) between the variables, two-by-two, and homoscedasticity (fairly symmetric and unimodal distributions). Scattergrams were made and they indicated that a passing rectilinear relationship between variables, two-by-two, for the sample existed. Whether homoscedasticity existed throughout the distributions of variables

for the sample was questionable.

Sampling

A sample was drawn from the limited population of those 811 Freshman students in Fall, 1960, MA 3-4 algebra classes, for whom MA 1-2 grades, MA 1-2 teacher comments, MA 3-4 grades, Iowa Algebra Aptitude Test scores, Seattle Algebra Achievement Test scores, and Lankton First Year Algebra Test scores were available. From this limited population, a sample of fifty students was randomly selected.

Data source

The data was obtained from numerous folders and forms in the files of the Mathematics Department, Portland Public Schools.

Statistic

A multiple regression equation was computed to answer the first question, "What amount of weight, as estimated from collected data, is given to variables for selection of eighth grade algebra class pupils?", within the scope of this study. The question then became: What weight should be assigned to each of the predictor (independent) variables in order to obtain the best estimate of the criterion (dependent) variable? The independent variables were:

X_1 = MA 1-2 teacher comments (1 = above average,

2 = average, 3 = below average)

X_2 = Iowa Algebra Aptitude Test raw scores

X_3 = Seattle Algebra Test raw scores

X_4 = Lankton First Year Algebra Test raw scores

X_5 = MA 1-2 grade (1 = A, 2 = B, 3 = C, 4 = D, 5 = F)

The dependent variable was : Y = MA 3-4 grade (1 = A, 2 = B, 3 = C, 4 = D, 5 = F). The coefficient of correlation ($R_{y.12345}$), between the observed grades (Y) and predicted grades ($\widetilde{Y}$) was computed to determine how good an estimate $\widetilde{Y}$ was of Y.

To answer the second questions, "How might the weightings or variables be altered to eliminate superfluous action and yet maintain the same amount of predictive ability, or more?", each X_i's correlation with Y (other $X_{j\neq i}$'s allowed to vary), each X_i's weight in the multiple regression equation, and each X_i's correlation with every other $X_{j\neq i}$ (remaining $X_{k\neq j\neq i}$ allowed to vary) was noted.

Conclusions

What amount of weight is given to variables for selection of eighth algebra class pupils?

$$\widetilde{Y} = 7.580 - .801\,X_1 - .008\,X_2 - .136\,X_3 + .051\,X_4 - .103\,X_5$$

where X_1 = MA 1-2 teacher comments (1 = above average, 2 = average, 3 = below average)

X_2 = Iowa Algebra Aptitude Test raw scores

X_3 = Seattle Algebra Test raw scores

X_4 = Lankton First Year Algebra Test raw scores

X_5 = MA 1-2 grade (1 = A, 2 = B, 3 = C, 4 = D, and 5 = F)

$\widetilde{Y}$ = MA 3-4 grade (1 = A, 2 = B, 3 = C, 4 = D, and 5 = F)

The coefficient of correlation between the observed grades, Y, and the predicted grades, $\widetilde{Y}$, was $R_{y.12345} = .649$.

How might the weightings or variables be altered to eliminate superfluous action and yet maintain the same amount of predictive ability, or more? The multiple regression equation derived from the sample indicated that the Lankton First Year Algebra scores contributed most in a positive sense to the prediction of MA 3-4 grades for these fifty pupils. Teacher comments (90% of them indicating average performance) seemed to be contributing least positively. Of the independent variables' correlation with one another, the Seattle Algebra Achievement Test raw scores, the Lankton First Year Algebra Test raw scores, and the Iowa Algebra Aptitude Test raw scores all showed good positive correlation with one another.

$r_{23} = .331$, $r_{24} = .401$, $r_{34} = .757$

The dependent variable's relationship to the independent

variables, one at a time with the others varying, was interesting when compared with its relation to them in the regression equation.

$r_{y1} = .197$, $r_{y2} = -.225$, $r_{y3} = -.818$, $r_{y4} = -.561$, $r_{y5} = .351$

Note should be made that for this one sample, neither the Iowa Algebra Aptitude Test or the Seattle Algebra Achievement Test added positively to the prediction of Y by means of the multiple regression equation or by independent correlation with Y. Criteria of MA 1-2 grades and Lankton scores might predict MA 3-4 grades with satisfaction equal to the existing more numerous set of variables.

Recommendations

1. This study treated only one factor of success in the program and that with only a limited sample. It was recommended that since both grades and persistence in the program are measures of success, the multiple regression equation in this study should be calculated again with persistence in the program as the dependent variable. Furthermore, one class might not be indicative of all four that have participated in the accelerated mathematics classes to this point. It would be advantageous to calculate the two equations for all four classes.

2. Selection must not only be made for MA 3-4, but also for MA 1-2. Consideration might be given to an equation of the form:

$$Y = A_{y.1234} + b_{y1.234} X_1 + b_{y2.134} X_2 + b_{y3.124} X_3 + b_{y4.123} X_4$$

where X_1 = Seventh grade teacher comments

X_2 = Iowa Test of Basic Skills - Problem solving section scores

X_3 = Iowa Algebra Prognostic Test (or Portland Prognostic Algebra Test) raw scores

X_4 = Seventh grade arithmetic grade,

calculated once for Y as MA 1-2 grades and again for Y as persistence through MA 1-2.

3. It was recommended that stricter attention be paid to satisfaction of the assumptions for the statistic.

Note:

The variables for the multiple regression equation were those defined as criteria for selection of MA 3-4 pupils. The purpose of the thesis, then, was to determine whether these same five variables, in addition to a number of others, could be found to discriminate at a statistically significant level between the group of students who persisted in the program and the group who dropped.

Table C-1

Iowa Algebra Aptitude Test Conversion Scale as Issued by the Portland Public Schools, Portland, Oregon on May 25, 1960

Raw score	Percentile	Raw score	Percentile
87-86	99	49	50
84-85	98	48	48
82-83	97	47	46-45
80-81	96	43	38
79	95	42	36
77-78	94	41	34
76	93	40	32
75	92	39	30
73-74	91	38	28
72	90	37	27
71	88	36	25
70	87	35	23
69	86-85	34	22
67-68	84	33	20
66	83	32	18
65	81	31	17
64	80	30	16
63	79	29	14
62	77	28	13
61	76	27	11
60	75	26	10
59	73	25	9
58	72	24	8
57	70	23	7
56	68	22	6
55	65	21	5
54	63	19-20	4
53	60	18	3
52	58	16-17	2
51	56-55	15	1
50	53		

Table C-2

Seattle Algebra Test Conversion Scale as Issued by the Portland Public Schools, Portland, Oregon on May 25, 1960

Raw Score	Standard Score	Percentile
47	156	
46	153	
45	150	99
44	147	99
43	144	99
42	141	98
41	139	97
40	136	96
39	134	95
38	132	94
37	130	91
36	127	89
35	126	86
34	124	84
33	122	81
32	121	77
31	119	74
30	117	71
29	116	67
28	114	64
27	113	60
26	111	56
25	110	52
24	108	48
23	107	44
22	105	40
21	104	36
20	102	33
19	101	30
18	99	25
17	97	21
16	96	19
15	94	16
14	92	13
13	90	11
12	88	8
11	85	6
10	83	4
9	80	3

Table C-2

Seattle Algebra Test Conversion Scale as Issued by the Portland Public Schools, Portland, Oregon on May 25, 1960 (continued)

Raw Score	Standard Score	Percentile
8	76	2
7	73	1
6	69	1-

Table C-3

Lankton First Year Algebra Test Conversion Scale as Issued by the Portland Public Schools, Portland, Oregon on May 25, 1960

Raw Score	Standard Score	Percentile	Raw Score	Standard Score	Percentile
55	150	99+	27	107	53
54	148	99+	26	106	48
53	147	99+	25	104	44
52	145	99+	24	103	40
50	141	99+	22	100	31
49	139	99+	21	98	28
48	138	99+	20	97	24
47	136	99	19	96	21
46	135	99	18	94	16
45	133	98	17	92	13
44	131	98	16	90	10
43	130	97	15	89	8
42	128	96	14	86	6
41	127	95	13	84	4
40	125	93	12	82	3
39	124	92	11	81	2
38	122	90	10	78	1
37	121	88	9	77	1-
36	119	86	8	75	
35	118	83	7	73	
34	117	80	6	70	
33	115	77	5	67	
32	114	73	4	65	
31	112	69	3	63	
30	111	65	2	61	
29	110	61	1	59	
28	108	57			

Table D

Conversion Scale for Systems of Grading

C,S,N[a]	A,B,C,D,F[b]	Proportional Parts C,S,N	Proportional Parts A,B,C,D,F
1.0	4.00	+.01	-.015
1.1	3.85	+.02	-.030
1.2	3.70	+.03	-.045
1.3	3.55	+.04	-.060
1.4	3.40	+.05	-.075
1.5	3.25	+.06	-.090
1.6	3.10	+.07	-.105
1.7	2.95	+.08	-.120
1.8	2.80	+.09	-.135
1.9	2.65		
2.0	2.50		
2.1	2.35		
2.2	2.20		
2.3	2.05		
2.4	1.90		
2.5	1.75		
2.6	1.60		
2.7	1.45		
2.8	1.30		
2.9	1.15		
3.0	1.00		

a C = 1
S = 2
N = 3

b A = 4
B = 3
C = 2
D = 1
F = 0

Table E-1

F Test Values for Homogeneity of Variances of Total Arithmetic Grade Placement Scores of Iowa Tests of Basic Skills

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
Commenced program in				
1958	----	1.02	1.08	
1959	1.12	1.02	----	
1960	1.03	----	----	
				1.04

Table E-2

F Test Values for Homogeneity of Variances of Raw Scores on the Iowa Algebra Aptitude Test

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
Commenced program in				
1958	----	1.10	1.07	
1959	1.09	1.02	----	
1960	1.11	----	----	
				1.07

Table E-3

F Test Values for Homogeneity of Variances of Raw Scores on the Seattle Algebra Test

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
Commenced program in				
1958	----	1.26	1.08	
1959	1.31	1.07	----	
1960	1.48	----	----	
				1.25

Table E-4

F Test Values for Homogeneity of Variances of Raw Scores on the Lankton First Year Algebra Test

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
Commenced program in				
1958	----	1.63	1.31	
1959	1.47	1.03	----	
1960	1.51	----	----	
				1.36

Table E-5

F Test Values for Homogeneity of Variances or Raw Scores from the Section on Ability To Do Quantitative Thinking of the ITED Administered during the Freshman Year

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
Commenced program in				
1958	----	1.21	1.24	
1959	1.20	1.05	----	
1960	1.19	----	----	
				1.17

Table E-6

F Test Values for Homogeneity of Variances of Raw Composite Scores from the ITED Administered during the Freshman Year

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
Commenced program in				
1958	----	1.17	1.07	
1959	1.04	1.06	----	
1960	1.20	----	----	
				1.11

Table E-7

F Test Values for Homogeneity of Variances of Raw Scores from the Section on Ability To Do Quantitative Thinking of the ITED Administered during the Junior Year

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
Commenced program in				
1958	----	1.31	1.23	
1959	----	----	----	
1960	----	----	----	
				1.30

Table E-8

F Test Values for Homogeneity of Variances of Raw Composite Scores from the ITED Administered during the Junior Year

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
Commenced program in				
1958	----	1.22	1.11	
1959	----	----	----	
1960	----	----	----	
				1.19

Table E-9

F Test Values for Homogeneity of Variances of Raw Scores from the Quantitative Section of the SCAT

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
Commenced program in				
1958	----	1.20	1.18	
1959	1.17	1.10	----	
1960	----	----	----	
				1.18

Table E-10

F Test Values for Homogeneity of Variances of Raw Total Scores from the SCAT

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
Commenced program in				
1958	----	1.13	1.11	
1959	1.07	1.03	----	
1960	----	----	----	
				1.10

Table E-11

F Test Values for Homogeneity of Variances of High School Mathematics G.P.A.

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
Commenced program in				
1958	----	1.78	1.38	
1959	1.18	1.17	----	
1960	1.78	----	-----	
				1.02

Table E-12

F Test Values for Homogeneity of Variances of Number of Failures in High School Mathematics Courses

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
Commenced program in				
1958	----	undefined	1.00	
1959	undefined	undefined	----	
1960	undefined	----	----	
				5.00

Table E-13

F Test Values for Homogeneity of Variances of High School Total G.P.A.s

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped through program
Commenced program in				
1958	----	1.03	1.16	
1959	1.02	1.01	----	
1960	1.07	----	----	
				1.00

Table E-14

F Test Values for Homogeneity of Variances of Number of Failures in All High School Courses

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
Commenced program in				
1958	----	undefined	1.25	
1959	undefined	undefined	----	
1960	3.00	----	----	
				1.43

Table E-15

F Test Values for Homogeneity of Variances of Eighth Grade Mathematics Grades

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
Commenced program in				
1958	----	1.19	1.03	
1959	1.64	1.09	----	
1960	1.40	----	----	
				1.19

Table E-16

F Test Values for Homogeneity of Variances of Number of Ns in Eighth Grade Mathematics[a]

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
Commenced program in				
1958	----	undefined	undefined	
1959	undefined	undefined	----	
1960	undefined	----	----	
				undefined

a The number of Ns in eighth grade mathematics was zero for every group of twenty subjects.

Table E-17

F Test Values for Homogeneity of Variances of Eighth Grade G.P.A.s

Commenced program in	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
1958	----	1.16	1.07	
1959	1.01	1.15	----	
1960	1.09	----	----	
				1.03

Table E-18

F Test Values for Homogeneity of Variances of Number of Ns in Eighth Grade

Commenced program in	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
1958	----	2.20	1.09	
1959	92.00	6.00	----	
1960	3.39	----	----	
				3.11

Table E-19

F Test Values for Homogeneity of Variances of Total High School and Eighth Grade Mathematics G.P.A.s

Commenced program in	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
1958	----	1.36	1.30	
1959	1.07	1.04	----	
1960	1.14	----	----	
				1.10

Table E-20

F Test Values for Homogeneity of Variances of Number of Schools Attended for Each Pupil

Commenced program in	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
1958	----	1.40	1.22	
1959	1.02	1.01	----	
1960	1.15	----	----	
				1.19

Table E-21

F Test Values for Homogeneity of Variances of Number of Absences Per Term

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
Commenced program in				
1958	----	2.26	2.18	
1959	1.78	1.22	----	
1960	1.28	----	----	
				1.08

Table E-22

F Test Values for Homogeneity of Variances of Number of Tardies Per Term

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
Commenced program in				
1958	----	22.39	17.17	
1959	1.91	2.92	----	
1960	2.31	----	----	
				4.25

Table E-23

F Test Values for Homogeneity of Variances of Ages

Commenced program in	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
1958	----	1.01	1.02	
1959	1.03	1.02	----	
1960	1.02	----	----	
				1.00

Table E-24

F Test Values for Homogeneity of Variances of Extra-curricular School Activities

Commenced program in	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
1958	----	1.13	1.51	
1959	1.13	1.08	----	
1960	1.44	----	----	
				1.25

Table B-25

F Test Values for Homogeneity of Variances of Community Activities

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
Commenced program in				
1958	----	1.13	1.70	
1959	1.02	1.17	----	
1960	1.07	----	----	
				1.19

Table B-26

F Test Values for Homogeneity of Variances of Number of Siblings

	Persisted to dropped during or at end of MA 1-2	Persisted to dropped during or at end of MA 3-4	Persisted to dropped during or at end of MG 1-2	Persisted to dropped during program
Commenced program in				
1958	----	1.13	1.10	
1959	1.06	1.41	----	
1960	2.47	----	----	
				1.12

Table F-1

6 x 2 Contingency Table for Parents Lived With by Those Who Persisted from the Class of 1958 and Those Who Dropped during or at the End of MG 1-2

	Persisted	Dropped	Total
Both parents	18	19	37
Mother and step-father	0	0	0
Mother	1	1	2
Father and step-mother	0	0	0
Father	1	0	1
Foster parents	0	0	0
Total	20	20	40

Table F-2

6 x 2 Contingency Table for Parents Lived With by Those Who Persisted from the Class of 1958 and Those Who Dropped during or at the End of MA 3-4

	Persisted	Dropped	Total
Both parents	18	19	37
Mother and step-father	0	1	1
Mother	1	0	1
Father and step-mother	0	0	0
Father	1	0	1
Foster parents	0	0	0
Total	20	20	40

Table F-3

6 x 2 Contingency Table for Parents Lived With by Those Who Persisted from the Class of 1959 and Those Who Dropped during or at the End of MA 3-4

	Persisted	Dropped	Total
Both parents	17	16	33
Mother and step-father	0	2	2
Mother	3	2	5
Father and step-mother	0	0	0
Father	0	0	0
Foster parents	0	0	0
Total	20	20	40

Table F-4

6 x 2 Contingency Table for Parents Lived With by Those Who Persisted from the Class of 1959 and Those Who Dropped during or at the End of MA 1-2

	Persisted	Dropped	Total
Both parents	17	16	33
Mother and step-father	0	1	1
Mother	3	2	5
Father and step-mother	0	1	1
Father	0	0	0
Foster parents	0	0	0
Total	20	20	40

Table F-5

6 x 2 Contingency Table for Parents Lived With by Those Who Persisted from the Class of 1960 and Those Who Dropped during or at the End of MA 1-2

	Persisted	Dropped	Total
Both parents	17	19	36
Mother and step-father	2	1	3
Mother	1	0	1
Father and step-mother	0	0	0
Father	0	0	0
Foster parents	0	0	0
Total	20	20	40

Table F-6

6 x 2 Contingency Table for Parents Lived With by Those Who Persisted through January, 1962 and Those Who Dropped during the Program

	Persisted	Dropped	Total
Both parents	52	89	141
Mother and step-father	2	5	7
Mother	5	5	10
Father and step-mother	0	1	1
Father	1	0	1
Foster parents	0	0	0
Total	60	100	160

Table G-1

Means of Total Arithmetic Grade Placement Scores of Iowa Tests of Basic Skills

	Dropped during or at end of MA 1-2	Dropped during or at end of MA 3-4	Dropped during or at end of MG 1-2	Persisted through January, 1962
Commenced program in				
1958	-----	9.855	9.590	9.965
1959	9.265	9.855	-----	9.765
1960	9.175	-----	-----	9.330

Table G-2

Means of Raw Scores on the Iowa Algebra Aptitude Test

	Dropped during or at end of MA 1-2	Dropped during or at end of MA 3-4	Dropped during or at end of MG 1-2	Persisted through January, 1962
Commenced program in				
1958	-----	69.20	70.50	72.25
1959	59.70	62.05	-----	62.20
1960	61.85	-----	-----	64.80

Table G-3

Means of Raw Scores on the Seattle Algebra Test

	Dropped during or at end of MA 1-2	Dropped during or at end of MA 3-4	Dropped during or at end of MG 1-2	Persisted through January, 1962
Commenced program in 1958	-----	32.85	35.10	37.25
1959	31.20	34.60	-----	35.65
1960	30.90	-----	-----	37.95

Table G-4

Means of Raw Scores on the Lankton First Year Algebra Test

	Dropped during or at end of MA 1-2	Dropped during or at end of MA 3-4	Dropped during or at end of MG 1-2	Persisted through January, 1962
Commenced program in 1958	-----	30.10	33.15	38.60
1959	33.10	39.85	-----	40.40
1960	30.85	-----	-----	38.60

Table G-5

Means of Raw Scores from the Section on Ability To Do Quantitative Thinking of the ITED Administered during the Freshman Year

	Dropped during or at end of MA 1-2	Dropped during or at end of MA 3-4	Dropped during or at end of MG 1-2	Persisted through January, 1962
Commenced program in				
1958	-----	61.95	61.05	68.00
1959	56.30	60.55	-----	61.90
1960	57.10	-----	-----	62.35

Table G-6

Means of Raw Composite Scores from the ITED Administered during the Freshman Year

	Dropped during or at end of MA 1-2	Dropped during or at end of MA 3-4	Dropped during or at end of MG 1-2	Persisted through January, 1962
Commenced program in				
1958	-----	60.60	63.30	65.50
1959	58.70	58.65	-----	60.05
1960	56.95	-----	-----	62.60

Table G-7

Means of Raw Scores from the Section on Ability To Do Quantitative Thinking of the ITED Administered during the Junior Year

	Dropped during or at end of MA 1-2	Dropped during or at end of MA 3-4	Dropped during or at end of MG 1-2	Persisted through January, 1962
Commenced program in				
1958	-----	56.75	59.00	65.20
1959	-----	-----	-----	-----
1960	-----	-----	-----	-----

Table G-8

Means of Raw Composite Scores from the ITED Administered during the Junior Year

	Dropped during or at end of MA 1-2	Dropped during or at end of MA 3-4	Dropped during or at end of MG 1-2	Persisted through January, 1962
Commenced program in				
1958	-----	58.70	61.40	64.90
1959	-----	-----	-----	-----
1960	-----	-----	-----	-----

Table G-9

Means of Raw Scores from the
Quantitative Section of the SCAT

	Dropped during or at end of MA 1-2	Dropped during or at end of MA 3-4	Dropped during or at end of MG 1-2	Persisted through January, 1962
Commenced program in				
1958	-----	58.40	58.80	63.95
1959	57.20	59.40	-----	62.15
1960	-----	-----	-----	-----

Table G-10

Means of Raw Total Scores from the SCAT

	Dropped during or at end of MA 1-2	Dropped during or at end of MA 3-4	Dropped during or at end of MG 1-2	Persisted through January, 1962
Commenced program in				
1958	-----	59.25	59.80	63.15
1959	58.30	59.70	-----	60.50
1960	-----	-----	-----	-----

Table G-11

Means of High School Mathematics G.P.A.s

	Dropped during or at end of MA 1-2	Dropped during or at end of MA 3-4	Dropped during or at end of MG 1-2	Persisted through January, 1962
Commenced program in				
1958	----	2.44	2.63	3.12
1959	2.95	2.35	----	2.60
1960	3.15	----	----	2.20

Table G-12

Means of High School Total G.P.A.s

	Dropped during or at end of MA 1-2	Dropped during or at end of MA 3-4	Dropped during or at end of MG 1-2	Persisted through January, 1962
Commenced program in				
1958	----	3.34	3.13	3.40
1959	3.20	3.07	----	3.10
1960	2.87	----	----	2.82

Table G-13

Means of Eighth Grade Mathematics Grades

	Dropped during or at end of MA 1-2	Dropped during or at end of MA 3-4	Dropped during or at end of MG 1-2	Persisted through January, 1962
Commenced program in				
1958	----	3.01	3.32	3.26
1959	2.60	3.25	----	3.40
1960	2.50	----	----	3.00

Table G-14

Means of Number of Ns in Eighth Grade Mathematics

	Dropped during or at end of MA 1-2	Dropped during or at end of MA 3-4	Dropped during or at end of MG 1-2	Persisted through January, 1962
Commenced program in				
1958	----	0.00	0.00	0.00
1959	0.00	0.00	----	0.00
1960	0.00	----	----	0.00

Table G-15

Means of Eighth Grade G.P.A.s

	Dropped during or at end of MA 1-2	Dropped during or at end of MA 3-4	Dropped during or at end of MG 1-2	Persisted through January, 1962
Commenced program in				
1958	----	3.19	3.08	2.96
1959	3.22	3.51	----	3.26
1960	3.12	----	----	3.27

Table G-16

Means of Total High School and Eighth Grade Mathematics G.P.A.s

	Dropped during or at end of MA 1-2	Dropped during or at end of MA 3-4	Dropped during or at end of MG 1-2	Persisted through January, 1962
Commenced program in				
1958	-----	2.735	2.790	3.180
1959	2.810	2.800	-----	2.850
1960	2.825	-----	-----	2.600

Table G-17

Means of Number of Schools Attended for Each Pupil

	Dropped during or at end of MA 1-2	Dropped during or at end of MA 3-4	Dropped during or at end of MG 1-2	Persisted through January, 1962
Commenced program in				
1958	----	2.65	3.00	3.25
1959	2.75	2.75	----	2.70
1960	3.00	----	----	3.20

Table G-18

Means of Ages

	Dropped during or at end of MA 1-2	Dropped during or at end of MA 3-4	Dropped during or at end of MG 1-2	Persisted through January, 1962
Commenced program in				
1958	-----	13.00	13.00	13.25
1959	13.00	13.00	-----	13.00
1960	13.50	-----	-----	13.00

Table G-19

Means of Ratings of Extra-curricular School Activities

	Dropped during or at end of MA 1-2	Dropped during or at end of MA 3-4	Dropped during or at end of MG 1-2	Persisted through January, 1962
Commenced program in				
1958	----	1.60	1.35	1.70
1959	2.15	1.90	----	1.95
1960	1.90	----	----	2.35

Table G-20

Means of Ratings of Community Activities

	Dropped during or at end of MA 1-2	Dropped during or at end of MA 3-4	Dropped during or at end of MG 1-2	Persisted through January, 1962
Commenced program in				
1958	----	1.65	1.31	1.75
1959	2.06	1.95	----	2.05
1960	1.91	----	----	2.00

Table H-1

Cumulative Frequency Distribution Table for Failures in High School Mathematics Courses by Those Who Persisted from the Class of 1958 and Those Who Dropped during or at the End of MG 1-2

	High School Math. Course Failures 0	1
$S_{20_1}(X)$	$\frac{19}{20}$	$\frac{20}{20}$
$S_{20_2}(X)$	$\frac{19}{20}$	$\frac{20}{20}$
$S_{n_1}(X) - S_{n_2}(X)$	0	0

Table H-2

Cumulative Frequency Distribution Table for Failures in High School Mathematics Courses by Those Who Persisted from the Class of 1958 and Those Who Dropped during or at the End of MA 3-4

	High School Math. Course Failures 0	1
$S_{20_1}(X)$	$\frac{19}{20}$	$\frac{20}{20}$
$S_{20_2}(X)$	$\frac{20}{20}$	$\frac{20}{20}$
$S_{n_1}(X) - S_{n_2}(X)$	$\frac{1}{20}$	0

Table H-3

Cumulative Frequency Distribution Table for Failures in High School Mathematics Courses by Those Who Persisted from the Class of 1959 and Those Who Dropped during or at the End of MA 3-4

	High School Math. Course Failures	
	0	1
$S_{20_1}(X)$	$\frac{20}{20}$	$\frac{20}{20}$
$S_{20_2}(X)$	$\frac{20}{20}$	$\frac{20}{20}$
$S_{n_1}(X) - S_{n_2}(X)$	0	0

Table H-4

Cumulative Frequency Distribution Table for Failures in High School Mathematics Courses by Those Who Persisted from the Class of 1959 and Those Who Dropped during or at the End of MA 1-2

	High School Math. Course Failures	
	0	1
$S_{20_1}(X)$	$\frac{20}{20}$	$\frac{20}{20}$
$S_{20_2}(X)$	$\frac{20}{20}$	$\frac{20}{20}$
$S_{n_1}(X) - S_{n_2}(X)$	0	0

Table H-5

Cumulative Frequency Distribution Table for Failures in High School Mathematics Courses by Those Who Persisted from the Class of 1960 and Those Who Dropped during or at the End of MA 1-2

	High School Math. Course Failures 0	1
$S_{20_1}(X)$	$\frac{18}{20}$	$\frac{20}{20}$
$S_{20_2}(X)$	$\frac{20}{20}$	$\frac{20}{20}$
$S_{n_1}(X) - S_{n_2}(X)$	$\frac{2}{20}$	0

Table H-6

Cumulative Frequency Distribution Table for Failures in High School Mathematics Courses by Those Who Persisted through January, 1962 and Those Who Dropped during the Program

	High School Math. Course Failures 0	1
$S_{60}(X)$	$\frac{57}{60}$	$\frac{60}{60}$
$S_{100}(X)$	$\frac{99}{100}$	$\frac{100}{100}$
$S_{n_1}(X) - S_{n_2}(X)$	.04	.00

Table H-7

Cumulative Frequency Distribution Table for Total Failures in High School Courses by Those Who Persisted from the Class of 1958 and Those Who Dropped during or at the End of MG 1-2

	High School Course Failures		
	0	1	2
$S_{20_1}(X)$	$\frac{18}{20}$	$\frac{19}{20}$	$\frac{20}{20}$
$S_{20_2}(X)$	$\frac{19}{20}$	$\frac{19}{20}$	$\frac{20}{20}$
$S_{n_1}(X) - S_{n_2}(X)$	$\frac{1}{20}$	0	0

Table H-8

Cumulative Frequency Distribution Table for Total Failures in High School Courses by Those Who Persisted from the Class of 1958 and Those Who Dropped during or at the End of MA 3-4

	High School Course Failures		
	0	1	2
$S_{20_1}(X)$	$\frac{18}{20}$	$\frac{19}{20}$	$\frac{20}{20}$
$S_{20_2}(X)$	$\frac{20}{20}$	$\frac{20}{20}$	$\frac{20}{20}$
$S_{n_1}(X) - S_{n_2}(X)$	$\frac{2}{20}$	$\frac{1}{20}$	0

Table H-9

Cumulative Frequency Distribution Table for Total Failures in High School Courses by Those Who Persisted from the Class of 1959 and Those Who Dropped during or at the End of MA 3-4

	High School Course Failures 0	1	2
$S_{20_1}(X)$	$\frac{20}{20}$	$\frac{20}{20}$	$\frac{20}{20}$
$S_{20_2}(X)$	$\frac{20}{20}$	$\frac{20}{20}$	$\frac{20}{20}$
$S_{n_1}(X) - S_{n_2}(X)$	0	0	0

Table H-10

Cumulative Frequency Distribution Table for Total Failures in High School Courses by Those Who Persisted from the Class of 1959 and Those Who Dropped during or at the End of MA 1-2

	High School Course Failures 0	1	2
$S_{20_1}(X)$	$\frac{20}{20}$	$\frac{20}{20}$	$\frac{20}{20}$
$S_{20_2}(X)$	$\frac{20}{20}$	$\frac{20}{20}$	$\frac{20}{20}$
$S_{n_1}(X) - S_{n_2}(X)$	0	0	0

Table H-11

Cumulative Frequency Distribution Table for Total Failures in High School Courses by Those Who Persisted from the Class of 1960 and Those Who Dropped during or at the End of MA 1-2

	High School Course Failures 0	1	2
$S_{20_1}(X)$	$\frac{19}{20}$	$\frac{20}{20}$	$\frac{20}{20}$
$S_{20_2}(X)$	$\frac{17}{20}$	$\frac{20}{20}$	$\frac{20}{20}$
$S_{n_1}(X) - S_{n_2}(X)$	$\frac{2}{20}$	0	0

Table H-12

Cumulative Frequency Distribution Table for Total Failures in High School Courses by Those Who Persisted through January, 1962 and Those Who Dropped during the Program

	High School Course Failures 0	1	2
$S_{60}(X)$	$\frac{57}{60}$	$\frac{59}{60}$	$\frac{60}{60}$
$S_{100}(X)$	$\frac{96}{100}$	$\frac{99}{100}$	$\frac{100}{100}$
$S_{n_1}(X) - S_{n_2}(X)$	.01	.01	.00

Table H-13

Cumulative Frequency Distribution Table for Total Number of Ns in the Eighth Grade Received by Those Who Persisted from the Class of 1958 and Those Who Dropped during or at the End of MG 1-2

	Number of Ns in the Eighth Grade			
	0	1	2	3
$S_{20_1}(X)$	$\frac{17}{20}$	$\frac{19}{20}$	$\frac{19}{20}$	$\frac{20}{20}$
$S_{20_2}(X)$	$\frac{14}{20}$	$\frac{18}{20}$	$\frac{20}{20}$	$\frac{20}{20}$
$S_{n_1}(X) - S_{n_2}(X)$	$\frac{3}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	0

Table H-14

Cumulative Frequency Distribution Table for Total Number of Ns in the Eighth Grade Received by Those Who Persisted from the Class of 1958 and Those Who Dropped during or at the End of MA 3-4

	Number of Ns in the Eighth Grade			
	0	1	2	3
$S_{20_1}(X)$	$\frac{17}{20}$	$\frac{19}{20}$	$\frac{19}{20}$	$\frac{20}{20}$
$S_{20_2}(X)$	$\frac{18}{20}$	$\frac{19}{20}$	$\frac{20}{20}$	$\frac{20}{20}$
$S_{n_1}(X) - S_{n_2}(X)$	$\frac{1}{20}$	0	$\frac{1}{20}$	0

Table H-15

Cumulative Frequency Distribution Table for Total Number of Ns in the Eighth Grade Received by Those Who Persisted from the Class of 1959 and Those Who Dropped during or at the End of MA 3-4

	Number of Ns in the Eighth Grade 0	1	2	3
$S_{20_1}(X)$	$\frac{18}{20}$	$\frac{20}{20}$	$\frac{20}{20}$	$\frac{20}{20}$
$S_{20_2}(X)$	$\frac{16}{20}$	$\frac{19}{20}$	$\frac{19}{20}$	$\frac{20}{20}$
$S_{n_1}(X) - S_{n_2}(X)$	$\frac{2}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	0

Table H-16

Cumulative Frequency Distribution Table for Total Number of Ns in the Eighth Grade Received by Those Who Persisted from the Class of 1959 and Those Who Dropped during or at the End of MA 1-2

	Number of Ns in the Eighth Grade 0	1	2	3	...	13
$S_{20_1}(X)$	$\frac{18}{20}$	$\frac{20}{20}$	$\frac{20}{20}$	$\frac{20}{20}$	...	$\frac{20}{20}$
$S_{20_2}(X)$	$\frac{15}{20}$	$\frac{17}{20}$	$\frac{18}{20}$	$\frac{19}{20}$	...	$\frac{20}{20}$
$S_{n_1}(X)-S_{n_2}(X)$	$\frac{3}{20}$	$\frac{3}{20}$	$\frac{2}{20}$	$\frac{1}{20}$	...	0

Table H-17

Cumulative Frequency Distribution Table for Total Number of Ns in the Eighth Grade Received by Those Who Persisted from the Class of 1960 and Those Who Dropped during or at the End of MA 1-2

	Number of Ns in the Eighth Grade							
	0	1	2	3	4	5	6	7
$S_{20_1}(X)$	$\frac{16}{20}$	$\frac{19}{20}$	$\frac{19}{20}$	$\frac{19}{20}$	$\frac{19}{20}$	$\frac{20}{20}$	$\frac{20}{20}$	$\frac{20}{20}$
$S_{20_2}(X)$	$\frac{16}{20}$	$\frac{17}{20}$	$\frac{17}{20}$	$\frac{18}{20}$	$\frac{18}{20}$	$\frac{18}{20}$	$\frac{19}{20}$	$\frac{20}{20}$
$S_{n_1}(X)-S_{n_2}(X)$	$\frac{0}{20}$	$\frac{2}{20}$	$\frac{2}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{2}{20}$	$\frac{1}{20}$	0

Table H-18

Cumulative Frequency Distribution Table for Total Number of Ns in the Eighth Grade Received by Those Who Persisted through January, 1962 and Those Who Dropped during the Program

	Number of Ns in the Eighth Grade									
	0	1	2	3	4	5	6	7	...	13
$S_{60}(X)$	$\frac{51}{60}$	$\frac{58}{60}$	$\frac{58}{60}$	$\frac{59}{60}$	$\frac{59}{60}$	$\frac{60}{60}$	$\frac{60}{60}$	$\frac{60}{60}$	...	$\frac{60}{60}$
$S_{100}(X)$	$\frac{79}{100}$	$\frac{90}{100}$	$\frac{94}{100}$	$\frac{97}{100}$	$\frac{97}{100}$	$\frac{97}{100}$	$\frac{98}{100}$	$\frac{99}{100}$	...	$\frac{100}{100}$
$S_{n_1}(X)-S_{n_2}(X)$	.06	.07	.03	.01	.01	.03	.02	.01	...	.00

Table H-19

Cumulative Frequency Distribution Table for Number of Siblings of Those Who Persisted from the Class of 1958 and Those Who Dropped during or at the End of MG 1-2

	Number of Siblings					
	0	1	2	3	4	5
$S_{20_1}(X)$	$\frac{2}{20}$	$\frac{11}{20}$	$\frac{16}{20}$	$\frac{18}{20}$	$\frac{20}{20}$	$\frac{20}{20}$
$S_{20_2}(X)$	$\frac{1}{20}$	$\frac{11}{20}$	$\frac{18}{20}$	$\frac{19}{20}$	$\frac{19}{20}$	$\frac{20}{20}$
$S_{n_1}(X)-S_{n_2}(X)$	$\frac{1}{20}$	0	$\frac{2}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	0

Table H-20

Cumulative Frequency Distribution Table for Number of Siblings of Those Who Persisted from the Class of 1958 and Those Who Dropped during or at the End of MA 3-4

	Number of Siblings					
	0	1	2	3	4	5
$S_{20_1}(X)$	$\frac{2}{20}$	$\frac{11}{20}$	$\frac{16}{20}$	$\frac{18}{20}$	$\frac{20}{20}$	$\frac{20}{20}$
$S_{20_2}(X)$	$\frac{5}{20}$	$\frac{9}{20}$	$\frac{17}{20}$	$\frac{19}{20}$	$\frac{20}{20}$	$\frac{20}{20}$
$S_{n_1}(X)-S_{n_2}(X)$	$\frac{3}{20}$	$\frac{2}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	0	0

Table H-21

Cumulative Frequency Distribution Table for Number of Siblings of Those Who Persisted from the Class of 1959 and Those Who Dropped during or at the End of MA 3-4

	Number of Siblings					
	0	1	2	3	4	5
$S_{20_1}(X)$	$\frac{4}{20}$	$\frac{14}{20}$	$\frac{17}{20}$	$\frac{18}{20}$	$\frac{19}{20}$	$\frac{20}{20}$
$S_{20_2}(X)$	$\frac{3}{20}$	$\frac{12}{20}$	$\frac{18}{20}$	$\frac{20}{20}$	$\frac{20}{20}$	$\frac{20}{20}$
$S_{n_1}(X)-S_{n_2}(X)$	$\frac{1}{20}$	$\frac{2}{20}$	$\frac{1}{20}$	$\frac{2}{20}$	$\frac{1}{20}$	0

Table H-22

Cumulative Frequency Distribution Table for Number of Siblings of Those Who Persisted from the Class of 1959 and Those Who Dropped during or at the End of MA 1-2

	Number of Siblings					
	0	1	2	3	4	5
$S_{20_1}(X)$	$\frac{4}{20}$	$\frac{14}{20}$	$\frac{17}{20}$	$\frac{18}{20}$	$\frac{19}{20}$	$\frac{20}{20}$
$S_{20_2}(X)$	$\frac{3}{20}$	$\frac{13}{20}$	$\frac{17}{20}$	$\frac{18}{20}$	$\frac{19}{20}$	$\frac{20}{20}$
$S_{n_1}(X)-S_{n_2}(X)$	$\frac{1}{20}$	$\frac{1}{20}$	0	0	0	0

Table H-23

Cumulative Frequency Distribution Table for Number of Siblings of Those Who Persisted from the Class of 1960 and Those Who Dropped during or at the End of MA 1-2

	Number of Siblings						
	0	1	2	3	4	5	6
$S_{20_1}(X)$	$\frac{1}{20}$	$\frac{8}{20}$	$\frac{11}{20}$	$\frac{17}{20}$	$\frac{19}{20}$	$\frac{19}{20}$	$\frac{20}{20}$
$S_{20_2}(X)$	$\frac{4}{20}$	$\frac{13}{20}$	$\frac{16}{20}$	$\frac{20}{20}$	$\frac{20}{20}$	$\frac{20}{20}$	$\frac{20}{20}$
$S_{n_1}(X)-S_{n_2}(X)$	$\frac{3}{20}$	$\frac{5}{20}$	$\frac{5}{20}$	$\frac{3}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	0

Table H-24

Cumulative Frequency Distribution Table for Number of Siblings of Those Who Persisted through January, 1962 and Those Who Dropped during the Program

	Number of Siblings						
	0	1	2	3	4	5	6
$S_{60}(X)$	$\frac{7}{60}$	$\frac{33}{60}$	$\frac{44}{60}$	$\frac{53}{60}$	$\frac{58}{60}$	$\frac{59}{60}$	$\frac{60}{60}$
$S_{100}(X)$	$\frac{16}{100}$	$\frac{58}{100}$	$\frac{86}{100}$	$\frac{96}{100}$	$\frac{98}{100}$	$\frac{100}{100}$	$\frac{100}{100}$
$S_{n_1}(X)-S_{n_2}(X)$	.04	.03	.13	.08	.01	.02	.00

Table H-25

Cumulative Frequency Distribution Table for Number of Absences Per Term for Those Who Persisted from the Class of 1958 and Those Who Dropped during or at the End of MG 1-2

	Number of Absences Per Term											
	.10-.29	.30-.49	.50-.69	.70-.89	.90-109	110-129	130-149	150-169	170-189	190-209	...	270-289
$S_{20_1}(X)$	$\frac{3}{20}$	$\frac{10}{20}$	$\frac{12}{20}$	$\frac{14}{20}$	$\frac{15}{20}$	$\frac{17}{20}$	$\frac{18}{20}$	$\frac{19}{20}$	$\frac{20}{20}$	$\frac{20}{20}$	...	$\frac{20}{20}$
$S_{20_2}(X)$	$\frac{1}{20}$	$\frac{3}{20}$	$\frac{4}{20}$	$\frac{8}{20}$	$\frac{13}{20}$	$\frac{14}{20}$	$\frac{14}{20}$	$\frac{18}{20}$	$\frac{18}{20}$	$\frac{19}{20}$	...	$\frac{20}{20}$
$S_{n_1}(X)-S_{n_2}(X)$	$\frac{2}{20}$	$\frac{7}{20}$	$\frac{8}{20}$	$\frac{6}{20}$	$\frac{2}{20}$	$\frac{3}{20}$	$\frac{4}{20}$	$\frac{1}{20}$	$\frac{2}{20}$	$\frac{1}{20}$	...	0

Table H-26

Cumulative Frequency Distribution Table for Number of Absences Per Term for Those Who Persisted from the Class of 1958 and Those Who Dropped during or at the End of MA 3-4

	Number of Absences Per Term										
	0-.19	.20-.39	.40-.59	.60-.79	.80-.99	1.00-1.19	1.20-1.39	1.40-1.59	1.60-1.79	1.80-1.99	2.00-2.19
$S_{20_1}(X)$	$\frac{2}{20}$	$\frac{8}{20}$	$\frac{12}{20}$	$\frac{12}{20}$	$\frac{15}{20}$	$\frac{15}{20}$	$\frac{18}{20}$	$\frac{19}{20}$	$\frac{19}{20}$	$\frac{20}{20}$	$\frac{20}{20}$
$S_{20_2}(X)$	$\frac{2}{20}$	$\frac{4}{20}$	$\frac{9}{20}$	$\frac{9}{20}$	$\frac{10}{20}$	$\frac{11}{20}$	$\frac{13}{20}$	$\frac{13}{20}$	$\frac{15}{20}$	$\frac{17}{20}$	$\frac{20}{20}$
$S_{n_1}(X)-S_{n_2}(X)$	0	$\frac{4}{20}$	$\frac{3}{20}$	$\frac{3}{20}$	$\frac{5}{20}$	$\frac{4}{20}$	$\frac{5}{20}$	$\frac{6}{20}$	$\frac{4}{20}$	$\frac{3}{20}$	0

Table H-27

Cumulative Frequency Distribution Table for Number of Absences Per Term for Those Who Persisted from the Class of 1959 and Those Who Dropped during or at the End of MA 3-4

	Number of Absences Per Term									
	0-.39	.40-.79	.80-1.19	1.20-1.59	1.60-1.99	2.00-2.39	2.40-2.79	2.80-3.19	3.20-3.59	4.40-4.79
$S_{20_1}(X)$	$\frac{3}{20}$	$\frac{11}{20}$	$\frac{12}{20}$	$\frac{15}{20}$	$\frac{17}{20}$	$\frac{18}{20}$	$\frac{19}{20}$	$\frac{19}{20}$	$\frac{19}{20}$ ...	$\frac{20}{20}$
$S_{20_2}(X)$	$\frac{2}{20}$	$\frac{9}{20}$	$\frac{13}{20}$	$\frac{16}{20}$	$\frac{18}{20}$	$\frac{18}{20}$	$\frac{18}{20}$	$\frac{19}{20}$	$\frac{20}{20}$ ...	$\frac{20}{20}$
$S_{n_1}(X)-S_{n_2}(X)$	$\frac{1}{20}$	$\frac{2}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	0	$\frac{1}{20}$	0	$\frac{1}{20}$ ...	0

Table H-28

Cumulative Frequency Distribution Table for Number of Absences Per Term for Those Who Persisted from the Class of 1959 and Those Who Dropped during or at the End of MA 1-2

	Number of Absences Per Term								
	0-.39	.40-.79	.80-1.19	1.20-1.59	1.60-1.99	2.00-2.39	2.40-2.79	...	4.40-4.79
$S_{20_1}(X)$	$\frac{3}{20}$	$\frac{11}{20}$	$\frac{12}{20}$	$\frac{15}{20}$	$\frac{17}{20}$	$\frac{18}{20}$	$\frac{19}{20}$	...	$\frac{20}{20}$
$S_{20_2}(X)$	$\frac{6}{20}$	$\frac{10}{20}$	$\frac{15}{20}$	$\frac{16}{20}$	$\frac{16}{20}$	$\frac{20}{20}$	$\frac{20}{20}$	...	$\frac{20}{20}$
$S_{n_1}(X)-S_{n_2}(X)$	$\frac{3}{20}$	$\frac{1}{20}$	$\frac{3}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{2}{20}$	$\frac{1}{20}$	...	0

Table H-29

Cumulative Frequency Distribution Table for Number of Absences Per Term for Those Who Persisted from the Class of 1960 and Those Who Dropped during or at the End of MA 1-2

	Number of Absences Per Term									
	0-.39	.40-.79	.80-1.19	1.20-1.59	1.60-1.99	2.00-2.39	2.40-2.79	2.80-3.19	...	4.00-4.39
$S_{20_1}(X)$	$\frac{6}{20}$	$\frac{10}{20}$	$\frac{13}{20}$	$\frac{14}{20}$	$\frac{17}{20}$	$\frac{18}{20}$	$\frac{19}{20}$	$\frac{19}{20}$	...	$\frac{20}{20}$
$S_{20_2}(X)$	$\frac{4}{20}$	$\frac{10}{20}$	$\frac{14}{20}$	$\frac{15}{20}$	$\frac{16}{20}$	$\frac{18}{20}$	$\frac{19}{20}$	$\frac{20}{20}$	...	$\frac{20}{20}$
$S_{n_1}(X)-S_{n_2}(X)$	$\frac{2}{20}$	0	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	0	0	$\frac{1}{20}$	...	0

Table H-30

Cumulative Frequency Distribution Table for Number of Absences Per Term for Those Who Persisted through January, 1962 and Those Who Dropped during the Program

	Number of Absences Per Term											
	0-.39	.40-.79	.80-1.19	1.20-1.59	1.60-1.99	2.00-2.39	2.40-2.79	2.80-3.19	3.20-3.59	3.60-3.99	4.00-4.39	4.40-4.79
$S_{60}(X)$	$\frac{17}{60}$	$\frac{33}{60}$	$\frac{40}{60}$	$\frac{48}{60}$	$\frac{54}{60}$	$\frac{56}{60}$	$\frac{58}{60}$	$\frac{58}{60}$	$\frac{58}{60}$	$\frac{58}{60}$	$\frac{59}{60}$	$\frac{60}{60}$
$S_{100}(X)$	$\frac{24}{100}$	$\frac{50}{100}$	$\frac{68}{100}$	$\frac{79}{100}$	$\frac{87}{100}$	$\frac{96}{100}$	$\frac{97}{100}$	$\frac{99}{100}$	$\frac{100}{100}$	$\frac{100}{100}$	$\frac{100}{100}$	$\frac{100}{100}$
$S_{n_1}(X)-S_{n_2}(X)$	.04	.05	.01	.01	.03	.03	.00	.02	.03	.03	.02	.00

Table H-31

Cumulative Frequency Distribution Table for Number of Tardies Per Term for Those Who Persisted from the Class of 1958 and Those Who Dropped during or at the End of MG 1-2

	Number of Tardies Per Term									
	0-.09	.10-.19	.20-.29	.30-.39	.40-.49	.50-.59	.60-.69	.70-.79	...	1.90-1.99
$S_{20_1}(X)$	$\frac{12}{20}$	$\frac{13}{20}$	$\frac{16}{20}$	$\frac{16}{20}$	$\frac{16}{20}$	$\frac{17}{20}$	$\frac{18}{20}$	$\frac{19}{20}$	...	$\frac{20}{20}$
$S_{20_2}(X)$	$\frac{9}{20}$	$\frac{15}{20}$	$\frac{17}{20}$	$\frac{20}{20}$	$\frac{20}{20}$	$\frac{20}{20}$	$\frac{20}{20}$	$\frac{20}{20}$	...	$\frac{20}{20}$
$S_{n_1}(X)-S_{n_2}(X)$	$\frac{3}{20}$	$\frac{2}{20}$	$\frac{1}{20}$	$\frac{4}{20}$	$\frac{4}{20}$	$\frac{3}{20}$	$\frac{2}{20}$	$\frac{1}{20}$	...	0

Table H-32

Cumulative Frequency Distribution Table for Number of Tardies Per Term for Those Who Persisted from the Class of 1958 and Those Who Dropped during or at the End of MA 3-4

	Number of Tardies Per Term									
	0-.09	.10-.19	.20-.29	.30-.39	.40-.49	.50-.59	.60-.69	.70-.79	...	1.90-1.99
$S_{20_1}(X)$	$\frac{12}{20}$	$\frac{13}{20}$	$\frac{16}{20}$	$\frac{16}{20}$	$\frac{16}{20}$	$\frac{17}{20}$	$\frac{18}{20}$	$\frac{19}{20}$	...	$\frac{20}{20}$
$S_{20_2}(X)$	$\frac{16}{20}$	$\frac{18}{20}$	$\frac{19}{20}$	$\frac{20}{20}$	$\frac{20}{20}$	$\frac{20}{20}$	$\frac{20}{20}$	$\frac{20}{20}$	...	$\frac{20}{20}$
$S_{n_1}(X)-S_{n_2}(X)$	$\frac{4}{20}$	$\frac{5}{20}$	$\frac{3}{20}$	$\frac{4}{20}$	$\frac{4}{20}$	$\frac{3}{20}$	$\frac{2}{20}$	$\frac{1}{20}$	...	0

Table H-33

Cumulative Frequency Distribution Table for Number of Tardies Per Term for Those Who Persisted from the Class of 1959 and Those Who Dropped during or at the End of MA 3-4

	Number of Tardies Per Term					
	0-.09	.10-.19	.20-.29	.30-.39	.40-.49	.50-.59
$S_{20_1}(X)$	$\frac{14}{20}$	$\frac{18}{20}$	$\frac{18}{20}$	$\frac{18}{20}$	$\frac{18}{20}$	$\frac{20}{20}$
$S_{20_2}(X)$	$\frac{15}{20}$	$\frac{18}{20}$	$\frac{20}{20}$	$\frac{20}{20}$	$\frac{20}{20}$	$\frac{20}{20}$
$S_{n_1}(X)-S_{n_2}(X)$	$\frac{1}{20}$	0	$\frac{2}{20}$	$\frac{2}{20}$	$\frac{2}{20}$	0

Table H-34

Cumulative Frequency Distribution Table for Number of Tardies Per Term for Those Who Persisted from the Class of 1959 and Those Who Dropped during or at the End of MA 1-2

	Number of Tardies Per Term							
	0-.09	.10-.19	.20-.29	.30-.39	.40-.49	.50-.59	...	1.10-1.19
$S_{20_1}(X)$	$\frac{14}{20}$	$\frac{18}{20}$	$\frac{18}{20}$	$\frac{18}{20}$	$\frac{18}{20}$	$\frac{20}{20}$	...	$\frac{20}{20}$
$S_{20_2}(X)$	$\frac{17}{20}$	$\frac{19}{20}$	$\frac{19}{20}$	$\frac{19}{20}$	$\frac{19}{20}$	$\frac{19}{20}$	...	$\frac{20}{20}$
$S_{n_1}(X)-S_{n_2}(X)$	$\frac{3}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	...	0

Table H-35

Cumulative Frequency Distribution Table for Number of Tardies Per Term for Those Who Persisted from the Class of 1960 and Those Who Dropped during or at the End of MA 1-2

	Number of Tardies Per Term											
	0-.09	.10-.19	.20-.29	.30-.39	.40-.49	.50-.59	.60-.69	.70-.79	.80-.89	.90-.99	1.00-1.09	...2.00-2.09
$S_{20_1}(X)$	$\frac{16}{20}$	$\frac{17}{20}$	$\frac{17}{20}$	$\frac{19}{20}$	$\frac{19}{20}$	$\frac{19}{20}$	$\frac{19}{20}$	$\frac{19}{20}$	$\frac{19}{20}$	$\frac{19}{20}$	$\frac{19}{20}$...	$\frac{20}{20}$
$S_{20_2}(X)$	$\frac{15}{20}$	$\frac{16}{20}$	$\frac{16}{20}$	$\frac{17}{20}$	$\frac{17}{20}$	$\frac{18}{20}$	$\frac{19}{20}$	$\frac{19}{20}$	$\frac{19}{20}$	$\frac{19}{20}$	$\frac{20}{20}$...	$\frac{20}{20}$
$S_{n_1}(X) - S_{n_1}(X)$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{2}{20}$	$\frac{2}{20}$	$\frac{1}{20}$	0	0	0	0	$\frac{1}{20}$...	0

Table H-36

Cumulative Frequency Distribution Table for Number of Tardies Per Term for Those Who Persisted through January, 1962 and Those Who Dropped during the Program

	Number of Tardies Per Term										
	0-.19	.20-.39	.40-.59	.60-.79	.80-.99	1.00-1.19	1.20-1.39	1.40-1.59	1.60-1.79	1.80-1.99	2.00-2.19
$S_{60}(X)$	$\frac{48}{60}$	$\frac{53}{60}$	$\frac{56}{60}$	$\frac{58}{60}$	$\frac{58}{60}$	$\frac{58}{60}$	$\frac{58}{60}$	$\frac{58}{60}$	$\frac{58}{60}$	$\frac{59}{60}$	$\frac{60}{60}$
$S_{100}(X)$	$\frac{86}{100}$	$\frac{96}{100}$	$\frac{97}{100}$	$\frac{98}{100}$	$\frac{98}{100}$	$\frac{100}{100}$	$\frac{100}{100}$	$\frac{100}{100}$	$\frac{100}{100}$	$\frac{100}{100}$	$\frac{100}{100}$
$S_{n_1}(X) - S_{n_2}(X)$	-.06	.08	.04	.01	.01	.03	.03	.03	.03	.02	.00

Table I-1

Contingency Table for Number of Part-time Jobs Held by Those Who Persisted from the Class of 1958 and Those Who Dropped during or at the End of MG 1-2

	Persisted	Dropped	Total
Job	4	4	8
No job	16	16	32
Total	20	20	40

Table I-2

Contingency Table for Number of Part-time Jobs Held by Those Who Persisted from the Class of 1958 and Those Who Dropped during or at the End of MA 3-4

	Persisted	Dropped	Total
Job	4	6	10
No job	16	14	30
Total	20	20	40

Table I-3

Contingency Table for Number of Part-time Jobs Held by Those Who Persisted from the Class of 1959 and Those Who Dropped during or at the End of MA 3-4

	Persisted	Dropped	Total
Job	8	0	8
No job	12	20	32
Total	20	20	40

Table I-4

Contingency Table for Number of Part-time Jobs Held by Those Who Persisted from the Class of 1959 and Those Who Dropped during or at the End of MA 1-2

	Persisted	Dropped	Total
Job	8	3	11
No job	12	17	29
Total	20	20	40

Table I-5

Contingency Table for Number of Part-time Jobs Held by Those Who Persisted from the Class of 1960 and Those Who Dropped during or at the End of MA 1-2

	Persisted	Dropped	Total
Job	3	3	6
No job	17	17	34
Total	20	20	40

Table I-6

Contingency Table for Number of Part-time Jobs Held by Those Who Persisted through January, 1962 and Those Who Dropped during the Program

	Persisted	Dropped	Total
Job	15	16	31
No job	45	84	129
Total	60	100	160

Table I-7

2 x 2 Contingency Table for Parents Lived With by Those Who Persisted from the Class of 1958 and Those Who Dropped during or at the End of MG 1-2

	Persisted	Dropped	Total
Both parents	18	19	37
Others	2	1	3
Total	20	20	40

Table I-8

2 x 2 Contingency Table for Parents Lived With by Those Who Persisted from the Class of 1958 and Those Who Dropped during or at the End of MA 3-4

	Persisted	Dropped	Total
Both parents	18	19	37
Others	2	1	3
Total	20	20	40

Table I-9

2 x 2 Contingency Table for Parents Lived With by Those Who Persisted from the Class of 1959 and Those Who Dropped during or at the End of MA 3-4

	Persisted	Dropped	Total
Both parents	17	16	33
Others	3	4	7
Total	20	20	40

Table I-10

2 x 2 Contingency Table for Parents Lived With by Those Who Persisted from the Class of 1959 and Those Who Dropped during or at the End of MA 1-2

	Persisted	Dropped	Total
Both parents	17	16	33
Others	3	4	7
Total	20	20	40

Table I-11

2 x 2 Contingency Table for Parents Lived With by Those Who Persisted from the Class of 1960 and Those Who Dropped during or at the End of MA 1-2

	Persisted	Dropped	Total
Both parents	17	19	36
Others	3	1	4
Total	20	20	40

Table I-12

2 x 2 Contingency Table for Parents Lived With by Those Who Persisted through January, 1962 and Those Who Dropped during the Program

	Persisted	Dropped	Total
Both parents	52	89	141
Others	8	11	19
Total	60	100	160

Table I-13

Contingency Table for Sex of Those Who Persisted from the Class of 1958 and Those Who Dropped during or at the End of MG 1-2

	Persisted	Dropped	Total
Male	15	6	21
Female	5	14	19
Total	20	20	40

Table I-14

Contingency Table for Sex of Those Who Persisted from the Class of 1958 and Those Who Dropped during or at the End of MA 3-4

	Persisted	Dropped	Total
Male	15	5	20
Female	5	15	20
Total	20	20	40

Table I-15

Contingency Table for Sex of Those Who Persisted from the Class of 1959 and Those Who Dropped during or at the End of MA 3-4

	Persisted	Dropped	Total
Male	11	4	15
Female	9	16	25
Total	20	20	40

Table I-16

Contingency Table for Sex of Those Who Persisted from the Class of 1959 and Those Who Dropped during or at the End of MA 1-2

	Persisted	Dropped	Total
Male	11	6	17
Female	9	14	23
Total	20	20	40

Table I-17

Contingency Table for Sex of Those Who Persisted from the Class of 1960 and Those Who Dropped during or at the End of MA 1-2

	Persisted	Dropped	Total
Male	7	10	17
Female	13	10	23
Total	20	20	40

Table I-18

Contingency Table for Sex of Those Who Persisted through January, 1962 and Those Who Dropped during the Program

	Persisted	Dropped	Total
Male	33	31	64
Female	27	69	96
Total	60	100	160