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## A Statistical Comparison of Permanent and In-Transfer Students in Grades Six, Seven, Eight, Nine and Ten of the South Bend School System South Bend, Washington

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A STATISTICAL COMPARISON  
OF PERMANENT AND IN-TRANSFER STUDENTS  
IN GRADES SIX, SEVEN, EIGHT, NINE, AND TEN  
OF THE SOUTH BEND SCHOOL SYSTEM  
SOUTH BEND, WASHINGTON

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A Thesis  
Presented to  
the Graduate Faculty  
Central Washington College of Education

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In Partial Fulfillment  
of the Requirements for the Degree  
Master of Education

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by  
Thomas Edwin Mattoon

August 1956

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APPROVED FOR THE GRADUATE FACULTY

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Grateful appreciation is expressed to the Graduate Faculty of Central Washington College of Education, and to the personnel of the South Bend School System for their cooperation.

to Carolyn

## TABLE OF CONTENTS

CHAPTER	PAGE
I. THE PROBLEM AND DEFINITIONS OF TERMS	
USED . . . . .	1
The problem . . . . .	1
Statement of the problem . . . . .	1
Importance of the study . . . . .	2
Limitations of the investigation . . . . .	3
Administration of the tests . . . . .	3
Number included in the study . . . . .	4
Definitions of terms used . . . . .	4
Permanent students . . . . .	4
In-transfer students . . . . .	4
Setting of the study . . . . .	5
Organization of the succeeding chapters . . . . .	6
II. REVIEW OF RELATED LITERATURE . . . . .	8
Review of literature on relation of	
intelligence to achievement . . . . .	8
Review of literature on relationship of	
intelligence to socio-economic status . . . . .	12

CHAPTER	PAGE
Review of literature on relationship of school achievement to socio-economic status . . . .	15
Review of literature on comparison of permanent students to in-transfer students . . . . .	17
Summary of the chapter . . . . .	18
<b>III. DESCRIPTION OF INSTRUMENTS USED IN</b>	
COLLECTION OF DATA . . . . .	19
Kuhlmann-Anderson Intelligence Tests . . . . .	19
The Coordinated Scales of Attainment . . . . .	21
The Home Index . . . . .	24
Summary of the chapter . . . . .	26
<b>IV. METHOD OF PROCEDURE . . . . .</b>	<b>27</b>
Method of selecting students used in the investigation . . . . .	27
Grade six . . . . .	28
Grade seven . . . . .	28
Grade eight . . . . .	29
Grade nine . . . . .	31
Grade ten . . . . .	31
Results of applied control factors . . . . .	32
In-transfer students . . . . .	36
Permanent students . . . . .	36



CHAPTER

PAGE

Adjustment of scores on the Coordinated Scales	
of Attainment . . . . .	39
Coordinated Scales of Attainment: Test I . . .	41
Coordinated Scales of Attainment: Test II . . .	43
Description and explanation of the formula . . .	45
Summary of the chapter . . . . .	46
V. RESULTS OF THE INVESTIGATION . . . . .	47
Coordinated Scales of Attainment, Test I . . .	47
Spelling . . . . .	47
English . . . . .	48
Reading . . . . .	43
History . . . . .	48
Geography . . . . .	48
Science . . . . .	49
Literature . . . . .	49
Computation . . . . .	49
Problem Reasoning . . . . .	49
Total test median . . . . .	50
Coordinated Scales of Attainment, Test II . . .	50
Spelling . . . . .	52
English . . . . .	52
Reading . . . . .	52

CHAPTER	PAGE
History . . . . .	52
Geography . . . . .	53
Science . . . . .	53
Literature . . . . .	53
Computation . . . . .	53
Problem Reasoning . . . . .	55
Total test median . . . . .	55
Summary of the Chapter . . . . .	55
VI. SUMMARY AND CONCLUSIONS . . . . .	56
Summary . . . . .	56
Coordinated Scales of Attainment: Spelling, Reading, and History . . . . .	57
Coordinated Scales of Attainment: English, Literature, and Problem Reasoning . . . . .	58
Coordinated Scales of Attainment: Geography, Science, and Computation . . . . .	59
Coordinated Scales of Attainment: Total Test Median . . . . .	60
Conclusions . . . . .	61
BIBLIOGRAPHY . . . . .	63
APPENDIX . . . . .	68

## LIST OF TABLES

TABLE	PAGE
I. A Comparison of the Selected In-transfer and Permanent Students of Grade Seven . . . . .	30
II. A Comparison of the Selected In-transfer and Permanent Students of Grade Eight . . . . .	33
III. A Comparison of the Selected In-transfer and Permanent Students of Grade Nine . . . . .	34
IV. A Comparison of the Selected In-transfer and Permanent Students of Grade Ten . . . . .	35
V. Characteristics of the Selected In-Transfer Students . . . . .	37
VI. Characteristics of the Selected Permanent Students . . . . .	38
VII. Means of Control Factors of In-transfer and Permanent Students . . . . .	40
VIII. Comparison of Groups' Means of the First Coordinated Scales of Attainment . . . . .	42
IX. Comparison of Groups' Means of the Second Coordinated Scales of Attainment . . . . .	44
X. Means and Significance of Differences Between Permanent and In-transfer Students on the Coordinated Scales of Attainment, Test I . . . . .	51

TABLE

PAGE

XI.	Means and Significance of Differences Between Permanent and In-transfer Students on the Coordinated Scales of Attainment, Test II . . .	54
-----	---	----

## APPENDIX

TABLE	PAGE
I. Scores of the In-transfer Students on the First Coordinated Scales of Attainment . . . . .	69
II. Scores of the Permanent Students on the First Coordinated Scales of Attainment . . . . .	70
III. Scores of the In-transfer Students on the Second Coordinated Scales of Attainment . . . . .	71
IV. Scores of the Permanent Students on the Second Coordinated Scales of Attainment . . . . .	72
V. Comparison of T-scores of Permanent Students and In-transfer Students Achieved in Spelling in the Coordinated Scales of Attainment, Test I . .	73
VI. Comparison of T-scores of Permanent Students and In-transfer Students Achieved in English in the Coordinated Scales of Attainment, Test I . .	74
VII. Comparison of T-scores of Permanent Students and In-transfer Students Achieved in Reading in the Coordinated Scales of Attainment, Test I . .	75
VIII. Comparison of T-scores of Permanent Students and In-transfer Students Achieved in History in the Coordinated Scales of Attainment, Test I . . . .	76

## TABLE

## PAGE

IX.	Comparison of T-scores of Permanent Students and In-transfer Students Achieved in Geography in the Coordinated Scales of Attainment, Test I . . .	77
X.	Comparison of T-scores of Permanent Students and In-transfer Students Achieved in Science in the Coordinated Scales of Attainment, Test I . . .	78
XI.	Comparison of T-scores of Permanent Students and In-transfer Students Achieved in Literature in the Coordinated Scales of Attainment, Test I . . .	79
XII.	Comparison of T-scores of Permanent Students and In-transfer Students Achieved in Computation in the Coordinated Scales of Attainment, Test I . . .	80
XIII.	Comparison of T-scores of Permanent Students and In-transfer Students in Problem Reasoning in the Coordinated Scales of Attainment, Test I . . .	81
XIV.	Comparison of the Total Test Median T-scores of Permanent Students and In-transfer Students Achieved in the Coordinated Scales of Attainment, Test I . . . . .	82
XV.	Comparison of T-scores of Permanent Students and In-transfer Students Achieved in Spelling in the Coordinated Scales of Attainment, Test II . . .	83

TABLE	PAGE
XVI. Comparison of T-scores of Permanent Students and In-transfer Students Achieved in English in the Coordinated Scales of Attainment, Test II . . .	84
XVII. Comparison of T-scores of Permanent Students and In-transfer Students Achieved in Reading in the Coordinated Scales of Attainment, Test II . . .	85
XVIII. Comparison of T-scores of Permanent Students and In-transfer Students Achieved in History in the Coordinated Scales of Attainment, Test II . . .	86
XIX. Comparison of T-scores of Permanent Students and In-transfer Students Achieved in Geography in the Coordinated Scales of Attainment, Test II . . .	87
XX. Comparison of T-scores of Permanent Students and In-transfer Students Achieved in Science in the Coordinated Scales of Attainment, Test II . . .	83
XXI. Comparison of T-scores of Permanent Students and In-transfer Students Achieved in Literature in the Coordinated Scales of Attainment, Test II . . .	89
XXII. Comparison of T-scores of Permanent Students and In-transfer Students Achieved in Computation in the Coordinated Scales of Attainment, Test II . . .	90

TABLE	PAGE
XXIII. Comparison of T-scores of Permanent Students and In-transfer Students Achieved in Problem Reasoning in the Coordinated Scales of Attainment, Test II. . . . .	91
XXIV. Comparison of the Total Test Median T-scores of Permanent Students and In-transfer Students Achieved in the Coordinated Scales of Attainment, Test II. . . . .	92



## CHAPTER I

### THE PROBLEM AND DEFINITIONS OF TERMS USED

Every school system is concerned with the comparison of its students to students of other school systems. All school systems lose and gain students to and from other schools and, as is often the case, many over-emphasize the grades obtained from the new student's previous school, the pages the new student was last studying in his textbooks, or an unintentional observance of mistakes made by the new student coupled with a tendency to disregard positive academic action; or, other ill-advised methods of comparison which may terminate in misleading conclusions. This can easily result in an unfair and inaccurate judgment of the actual learning which takes place in a school; namely, that the new transfer student has an inferior educational background and cannot be considered equal to permanent students in future academic success.

#### I. THE PROBLEM

Statement of the problem. This investigation is based upon the hypothesis that there is no true difference in academic achievement between two independent groups of students, permanent and in-transfer,

in grades six through ten in the South Bend Schools of South Bend, Washington, when intelligence, age, sex, and socio-economic factors are controlled. The problem, therefore, is to statistically compare these two groups of students, with the aforementioned factors controlled as much as possible.

Importance of the study. Methods of comparison such as those described in the introductory remarks easily justify a statistical investigation. Mere opinion is not accurate enough to be acceptable as being of any value. In the South Bend School System, as in many others, more must be known about its in-transfer students, as well as its permanent students.

To bring the educational process into harmony with individual capacities and limitations, something must be known about the individual's rate and ceiling of growth, his interests and goals, and his habits of adjustment.<sup>1</sup>

This study is not an attempt to furnish a complete answer to the questions posed in the above quotation, but rather it is an endeavor to bring about an increased understanding of permanent students as compared to in-transfer students by attempting to answer two questions: Is there a significant difference in academic achievement, as measured by achievement tests, between these two groups

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<sup>1</sup>Arthur E. Traxler, et al. Introduction to Testing and the Use of Test Results in Public Schools (New York: Harper and Brothers, Publishers, 1953), p. 1.

of students in the South Bend Schools? If so, to what degree? In this study, objective tests were used to furnish the necessary data.

## II. LIMITATIONS OF THE INVESTIGATION

Administration of the tests. The tests used as sources of data were not administered by one person. Each teacher had given the tests to her particular class, and the training each teacher had had varied a great deal. Although a set of directions is included with the Kuhlmann-Anderson Intelligence Test and the Coordinated Scales of Attainment, the conditions under which the tests are given depends to a great extent on the test-giver.

To insure effective use of tests and various instruments, the school must have trained personnel who are acquainted with the nature of these instruments and the techniques of administering, scoring, recording, and interpreting. The misuses that have arisen in connection with educational and psychological tests at the classroom level have frequently been due to the test-user rather than to the tests themselves. Consequently, all teachers should have sufficient training and experience to be able to administer, score, and interpret standardized tests.<sup>2</sup>

It can hardly be expected of a student that he maintain consistent scores in a test, year after year, when the test is given each time by a different person with different training. However, the fact

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<sup>2</sup>W. C. Kvaraceus, "To An Effective Testing Program," School Review, 60:24-9, January, 1952.

that all of the students included in this investigation experienced variety in the administration of the tests may be a compensating factor in itself.

Number included in the study. It is obvious that in an investigation of this type, the broader the sample involved in the study, the less possibility that faulty conclusions are drawn from the results. Due to the difficulties encountered in equating the permanent students with the in-transfer students of the South Bend Schools, each group was eventually reduced to twenty-one students. The small number of students involved in the investigation is somewhat compensated by the near uniformity of the two groups.

### III. DEFINITIONS OF TERMS USED

Permanent students. Permanent students are those students in the investigation who enrolled in the South Bend Schools before the fourth grade and have not passed the tenth; or, to rephrase the statement, permanent students are regarded as those students who enrolled in the South Bend Schools in the first, second, or third grade, and have not yet completed the tenth grade. Permanent students included in this investigation were currently enrolled in grades six through ten.

In-transfer students. In-transfer students are those students who transferred from another school system to the South Bend School

System after the fourth grade and have not completed the tenth grade. In-transfer students included in this investigation were currently enrolled in grades six through ten.

Setting of the study. South Bend is situated near the mouth of the Willapa River, on State Highway 101, about five miles west of Raymond. Due to its location near Willapa Harbor and the surrounding wooded hills, the two main occupations are fishing and logging. The population of the town, approximately 1800, is relatively stable, most movement occurring in the winter when the logging and fishing industries are shut down.

The South Bend School District, Number 118, is made up of one high school and one elementary school. There is a total of twenty-nine certificated personnel, ten in the high school and sixteen in the elementary school in addition to the two principals and the superintendent. There is an enrollment of 174 in the high school and 425 in the elementary school, which indicates a possible enrollment growth in the future in the high school.

One peculiarity of the South Bend School System is the addition, in the ninth grade, of students from Bay Center, a small fishing village approximately fifteen miles from South Bend. Bay Center is a non-high system. It furnishes education for the first eight grades only, then sends its students to South Bend to complete their

high school education. The students from Bay Center have not been included in this investigation in the belief that it would differentiate the South Bend Schools too much from any other schools of its size, which could cause this investigation to lose much of its value. Furthermore, the Bay Center students are a large enough group to justify a separate investigation.

The portion of the testing program of the South Bend School System included in this investigation is systematically staggered. The Kuhlmann-Anderson Intelligence Test is given to students in the third, sixth, and ninth grades. The Coordinated Scales of Attainment is administered each year from fourth grade through the tenth grade. The Home Index is not part of the regular testing program, but was administered only to furnish additional information for this investigation.

#### IV. ORGANIZATION OF THE SUCCEEDING CHAPTERS

Chapter II consists of a review of literature relating to the problem presented in this writing. The related literature is divided into a review of studies of the relationship of intelligence tests to achievement tests, intelligence tests to socio-economic status tests, achievement tests to socio-economic status tests, and previous studies of the relationship of permanent students to in-transfer students.

In Chapter III, descriptions of the Kuhlmann-Anderson Intelligence Test, the Coordinated Scales of Attainment, and Gough's Home Index are presented.

Chapter IV describes the method of selection of the students, the results of the selection, and a description of the statistical handling of the Coordinated Scales of Attainment.

Chapter V deals with the results of the statistical formula applied to the Coordinated Scales of Attainment.

Chapter VI summarizes the findings and presents possible conclusions of the investigation, and offers recommendations for the use of any further investigations in this particular field.

## CHAPTER II

### REVIEW OF RELATED LITERATURE

Much has been written concerning the relation of intelligence tests to achievement tests, intelligence to socio-economic standing in the community, and achievement test scores to socio-economic standing, and it is well to review briefly some of the available literature. A review of what is apparently the only other investigation in the Pacific Northwest on comparison of achievement test scores of permanent students to in-transfer students is also presented.

#### I. REVIEW OF LITERATURE ON RELATION OF INTELLIGENCE TO ACHIEVEMENT

It has been proven rather conclusively in many studies that intelligence tests and achievement tests have a definite positive relationship. In 1927, Kelley published his results of one of the earliest present-day investigations in educational measurement and testing.

Kelley has stated that general intelligence tests and achievement tests overlap to the degree indicated by a correlation coefficient of .90. In general, coefficients of .40 to .60 are found between tested intelligence and academic



achievement, but higher degrees of relationship are sometimes found. When such correlations approach .70 or .80, the intelligence test is looked upon with suspicion by some and may be considered a general scholastic achievement test rather than an intelligence test.<sup>1</sup>

Apparently, results of comparable studies which followed Kelley's yielded much the same information, for it is found that in 1949 Bent and Kronenberg attempt to account for a "lack of perfect correspondence" between intelligence and school grades.

The lack of perfect correspondence between intelligence and marks is due to the fact that one can compensate for a lack of ability by harder work, and because other factors as study habits, reading ability, and past experience also contribute to achievement.<sup>2</sup>

When the California Test Bureau published what it believed to be the correlation between measurements of intelligence and academic success, the correlation was not as high as Kelley's, it also offered sound advice to the investigator using the intelligence quotient of a given age or grade group.

In using mental age or the intelligence quotient in a given age or grade group, the following considerations should be kept in mind: the correlation or relationship between measurements of intelligence and academic success is far from perfect, in some subjects it is only 25 or 30 per cent better than chance. Although students with higher I. Q.'s

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<sup>1</sup>Harry A. Greene, Albert N. Jorgensen, and J. Raymond Gerbeich, Measurement and Evaluation in the Elementary School (New York: Longmans, Green and Company, 1952), p. 205.

<sup>2</sup>Rudyard K. Bent and Henry H. Kronenberg, Principles of Secondary Education (New York: McGraw-Hill Book Company, Inc., 1949), p. 536.

will, in general, do better than those with lower I. Q.'s, if they are about the same age, the teacher should always remember that other factors such as health, previously learned study habits, opportunity, persistence, encouragement, and the like play a large part in achievement.<sup>3</sup>

Lennon conducted an investigation in seventy communities to determine the relationship between intelligence quotients and scores in the Metropolitan Achievement Test. The investigation included grades two through eight or nine, depending on the organization of the system. About two-thirds of the communities had a population of less than ten thousand and were drawn from thirty-six states.

All tests were administered within two months of the opening of schools in the fall of 1946. The figures reported are based on an analysis of a random sample of approximately twenty-five per cent of the total number of cases in each community.

Examination of the data presented in Table 2 indicates that all relationships between intelligence and achievement test scores reported are positive; at grade IV and above, with a few exceptions, they are significantly so. . . . This is entirely in accord with expectation, although the magnitude of the correlations at the lower grades is perhaps not so great as would have been anticipated. The correlations range from .11 between I. Q. and what we have called Arithmetic Fundamentals (really Numbers) at the second grade level, to .36 between I. Q. and Vocabulary score at the eighth grade level; the median value for all correlations is approximately .60, that is to say, in general there is a marked tendency for

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<sup>3</sup>California Test Bureau. "Manual of Directions." The New California Short-Form Test of Mental Maturity Intermediate '47 S-Form (Los Angeles: California Test Bureau, 1947), p. 6.

communities which are above average in I. Q. to be above average also in achievement, as measured by these tests.<sup>4</sup>

According to an investigation by Coleman and Cureton, often there is so little difference between intelligence and achievement tests that they tend to measure many of the same things.

This study indicates that a good school achievement test of reading and arithmetic measures essentially the same combination of functions as a typical group intelligence test, the overlap being on the order of 95 per cent. The proposition is advanced that the school achievement test may well permit better inferences about differences in native capacity than can be made on the basis of the group intelligence test (insofar as there are any differences at all).<sup>5</sup>

A sketch of two investigations in this area is included in a periodical published by the California Test Bureau, which, when viewed with the brief discussions of the preceding paragraphs of this chapter, should make it clear that there is a definite positive correlation between intelligence test scores and achievement test scores.

Finally, Russell . . . , using total Progressive (now California) Achievement Test scores for 335 7th and 8th grade pupils, obtained a correlation of .699 with CTMM (California Test of Mental Maturity) intelligence quotients. Relationships at this level and higher were found by Arnold . . . in his analysis of achievement in high school subjects

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<sup>4</sup>Roger T. Lennon, "The Relation Between Intelligence and Achievement Test Results for a Group of Communities," Journal of Educational Psychology, 41:303, May, 1950.

<sup>5</sup>William Coleman and Edward E. Cureton, "Intelligence and Achievement: The Jangle Fallacy Again," Educational and Psychological Measurement, 14:350, Summer, 1954.

and mental maturity. On the basis of the preceding findings, it is evident that the CTMM possesses a high degree of relationship with reputable achievement tests.<sup>6</sup>

After reviewing some of the literature on the relationship of intelligence tests to achievement tests, it appears reasonably safe to assume that there exists a sufficiently high correlation between the two to justify, or even require, the use of intelligence test scores as a control factor in this investigation.

## II. REVIEW OF LITERATURE ON RELATIONSHIP OF INTELLIGENCE TO SOCIO-ECONOMIC STATUS

The fact that there is a positive relationship between tested intelligence and socio-economic status has long been agreed upon by psychologists and educators. Many reasonably believe that present-day intelligence tests give an advantage to those students of a good background. However, intelligence test scores continue to yield a positive correlation with socio-economic status.

In connection with a survey of the experimentation on this subject Loevinger concludes that  $r = .4$  may be taken to represent the correlation between the test intelligence of children (ages 3 to 18) and the occupations of their fathers.

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<sup>6</sup>California Test Bureau, "California Test of Mental Maturity," Summary of Investigations Number Three (Los Angeles: California Test Bureau, 1956), p. 8.

Honzik has found the relationship between test intelligence and socio-economic indices for children under 3 years to be negligible. At the three-and-one-half-year level a mean coefficient of .25 was obtained. The magnitude of coefficient increased somewhat for successive yearly examinations up to the age of 7, where it stood at about .4. Loevinger estimates that the children of the professional and executive class exceed those of the day laboring class by one and one-half sigmas, the former distributing about a mean corresponding to  $+1\sigma$ ; the latter, to  $-.5\sigma$ . On the new Stanford-Binet these values correspond, to I. Q.'s of 116 and 92 respectively.<sup>7</sup>

An investigation conducted by Davis yielded much the same results as those in the quotation from Stroud, although there is an apparent reluctance by the investigator to accept the validity of intelligence tests in this type of investigation.

I should like to point out that socio-economic factors influence the school's diagnosis of a child's intelligence. According to the present standard intelligence tests, lower-class children at ages 5 to 10 have an average I. Q. which is 8 to 12 points beneath the average I. Q. of the higher socio-economic group. For children of age 14, the present tests define the average I. Q. of the lowest socio-economic group as being 20 to 23 I. Q. points beneath that of the higher occupational groups.<sup>8</sup>

Davis was far from convinced of the reliability of his findings in the above study. Davis continues to be one of those mentioned in the introductory remarks of this section who believe there are many items in intelligence tests which are unfair to the low

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<sup>7</sup>James B. Stroud, Psychology in Education (New York: Longmans, Green and Company, 1950), p. 334.

<sup>8</sup>Allison Davis, "Socio-Economic Influences Upon Children's Learning," School Life, 33:93, March, 1951.

socio-economic extremes.

An extensive project on such cultural differentials in intelligence test items has been in progress for several years at the University of Chicago, under the general direction of Allison Davis. These investigators were of the opinion that most intelligence tests may be unfair to children from the lower socio-economic levels, since many of the test items presuppose information, skills, or interests which favor middle-class children. To obtain evidence for such a hypothesis, a detailed item analysis was conducted on eight widely used group intelligence tests. For each item, the frequencies of current responses by children in higher and lower socio-economic levels were compared.

The test items examined by this method were found to differ widely in the degree to which they favored the higher socio-economic groups. For example, a verbal item requiring knowledge of the word "sonata" was passed by 74 per cent of the high socio-economic group and by only 20 per cent of the low. On the other hand, a pictorial item involving the classification of cutting tools was passed by 71 per cent of the high-status group and 74 per cent of the low-status group. The authors maintain that items with large cultural differentials have no place in intelligence tests and should be systematically weeded out.<sup>9</sup>

Davis has shown that as long as intelligence tests contain items which are more familiar to higher socio-economic levels there will continue to be a positive relationship between intelligence and socio-economic status. It is apparent that there is a positive relationship between intelligence test scores and socio-economic status, even though intelligence tests may contain items which may or may not

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<sup>9</sup>Anne Anastasi, Psychological Testing (New York: The Macmillan Company, 1954), pp. 168-169.

significantly affect the intelligence test scores of the extremes of the socio-economic scale. This positive relationship justifies the use of socio-economic levels as a control factor in this investigation.

### III. REVIEW OF LITERATURE ON RELATIONSHIP OF SCHOOL ACHIEVEMENT TO SOCIO-ECONOMIC STATUS

It is inferred from the known positive relationship between socio-economic status and intelligence test scores, and the relationship between intelligence test scores and achievement test scores, that there is a positive relationship between socio-economic status and school achievement.

Chauncey studied a group of 113 eighth grade and 130 ninth grade pupils. Scores made on the Sims Score Card for Socio-Economic Status had a low, but positive, correlation with those earned on the Stanford Achievement Test.

The results of Chauncey's investigation were also obtained, to a near degree, in an investigation by Shaw. Shaw administered the Stanford Achievement Test, Sims Score Card, and the Otis Self-Administering Intelligence Test to all the pupils in grades four to eight in a city of about 4000 population and obtained evidence of a fairly substantial positive relationship between socio-economic status and academic achievement.

A coefficient of .41 was obtained between the scores on the Sims Score Card and Stanford Achievement E. Q. 's; a weighted average coefficient for the 5 grades of .39 between Stanford Achievement raw scores and Sims scores; and a coefficient of .38 between average marks and Sims scores. With test intelligence partialled out a coefficient of .27 was obtained between Stanford Achievement E. Q. 's and Sims scores.<sup>10</sup>

Another study of this type giving definite evidence of a positive relationship between socio-economic status and achievement is one conducted by Collins and Douglass. The quotation from their study is concerned with the causes and effects of the relationship between the two.

The results of the investigation . . . seem to indicate that the unfavorable home conditions under which pupils of the failure group live are a contributing factor of major importance in their unsatisfactory school work. Among the possible lines of cause and effect may be suggested the following:

1. Homes of these pupils show a general lack of inspiration and encouragement, and this lack reflects itself in the affected school work.
2. Homes do not provide an adequate place for home study.
- .....
5. Lack of proper school materials with which to work, such as books, pencils, and gymnasium equipment, is evident. Home conditions seem definitely responsible for this handicap.<sup>11</sup>

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<sup>10</sup>Duane C. Shaw, "The Relation of Socio-Economic Status to Educational Achievement in Grades Four to Eight," Journal of Educational Research, 37:200, November, 1943.

<sup>11</sup>Joseph Collins and Harl Douglas, "The Socio-Economic Status of the Home as a Factor in Success in the Junior High School," The Elementary School Journal, 38:112, October, 1937.



With the significant correlations obtained between socio-economic status and academic achievement in these investigations, it is clear that pupils from unfavored homes do not do quite so well in school as pupils from favored homes. The relationship, although small but positive, is sufficient reason to use socio-economic status as a third control factor in this study.

#### IV. REVIEW OF LITERATURE OF COMPARISON OF PERMANENT STUDENTS TO IN-TRANSFER STUDENTS

Although there have been many investigations, as previously described in this chapter, indirectly related to an investigation of this type, there is little literature directly related to a comparison of permanent students to in-transfer students. This review of literature is therefore limited to a study conducted in 1949 by N. M. Downie. In the fall of 1949, Downie administered the intermediate form of the Otis Self-Administering Test of Mental Ability to all children in eighteen classes making up the fifth, sixth, seventh, and eighth grades of the Hermiston, Oregon, School System. The results from Downie's investigation revealed no significant differences between the movers and the non-movers, as Downie named the two groups.

As a result of applying student's t-test as a test of significance, it was found that none of the differences among the various groups was significant. It is also interesting to

notice that the means cluster around the mean of 100 which Otis reported for his standardization groups.

An analysis of the data by grades also showed no significant differences nor trends. In the eighth grades the means for the movers were higher than those of the non-movers. In the seventh grades this pattern was reversed. In the sixth grades those children who had moved one or two times had a higher average score than those who had been in Hermiston all of their academic lives or who had three or more moves. In the fifth grades the group with three or more moves had the lowest mean score.<sup>12</sup>

## V. SUMMARY OF THE CHAPTER

In this chapter, evidence supporting the use of intelligence test scores, achievement test scores, and Cough's Home Index has been presented, as well as a brief review of a similar study conducted in 1949 in the Hermiston, Oregon, School System by Downie.

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<sup>12</sup>N. M. Downie, "A Comparison Between Children Who Have Moved from School to School with Those Who Have Been in Continuous Residence on Various Factors of Adjustment," Journal of Educational Psychology, 44:50-53, January, 1953.

## CHAPTER III

### DESCRIPTION OF INSTRUMENTS USED IN COLLECTION OF DATA

This chapter consists of a description of the three instruments used in the collection of data for this investigation: the Kuhlmann-Anderson Intelligence Test, the Coordinated Scales of Attainment, and Gough's Home Index. The first two are given as part of the South Bend Schools' regular testing program, while the latter was especially administered for use in this investigation.

#### I. KUHLMANN-ANDERSON INTELLIGENCE TESTS

These tests must be carefully administered because each booklet contains a large number of subtests, each of which has short time limits. The tests measure mental development from the age of five to mental maturity. All tests have met certain specific requirements.

The tests measure mental development from the age of five to mental maturity. The discriminative capacity or the ability to make fine discriminations between small increments of mental development is the criterion of validity. All tests have first met specific requirements: (1) critical original selection, (2) avoidance of tests dependent on special training, (3) placing tests dependent on general training in ages where children have had adequate opportunity for such training, (4) retention of those which

discriminate best between unselected successive age-groups, (5) further detailed analysis of test results to substantiate the indication that the tests measure something beyond general training, i. e., that they measure the capacity to acquire it.<sup>1</sup>

Factors affecting reliability have been carefully controlled. The difficulty of the tests at each age has been adjusted to the mental development found there, the different batteries representing the same degree of difficulty at the respective ages at which they are used.

The reliability of the tests at various age levels shows that the results may be used in the guidance of individual pupils. The reliability coefficients were found to be .91 for grade 3, .88 for grade 5, .92 for grade 7, and .95 for grade 9. The standard errors of measurement of about six I. Q. points indicate considerable stability.<sup>2</sup>

Conditions under which children take the tests have been kept as uniform as possible by giving preliminary practice examples and complete directions for each test.

In scoring the Kuhlmann-Anderson tests, the number of correct responses on each test is converted to a mental age by reference to a table of age norms, after which a median mental age

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<sup>1</sup>Oscar J. Kaplan (ed.), Encyclopedia of Vocational Guidance (New York: Philosophical Library, 1948), I, p. 534.

<sup>2</sup>David Segel, "The Kuhlmann-Anderson Intelligence Test," The Fourth Mental Measurements Yearbook, Oscar K. Buros, editor (Highland Park, New Jersey: The Gryphon Press, 1953), p. 405.

for the battery is computed.

The I. Q. is found by dividing median MA by CA. These I. Q. 's are subject to the usual limitations encountered whenever ratio I. Q. 's are employed with a test not specifically designed for I. Q. constancy. Thus in the normative sample, the mean I. Q. 's at different ages vary between 99.5 and 106.4, and the SD's of the I. Q. 's range from 9.5 to 16.1. Reference to these normative data, which are provided in the manual, should be made in evaluating any I. Q. obtained in these tests. Such fluctuations complicate the interpretation of I. Q. 's and, if ignored, may create misleading impressions about an individual's intellectual status.<sup>3</sup>

This scoring procedure is somewhat more difficult and time consuming than that required by most group intelligence tests. The extra time is justified, however, by its validity and reliability.

## II. THE COORDINATED SCALES OF ATTAINMENT

The Coordinated Scales of Attainment were previously called Unit Scales of Attainment, and are published by the Educational Test Bureau. The test yields students' scores in spelling, English, reading, history, geography, science, literature, arithmetic computation, and arithmetic problem reasoning.

The tests seem to have been carefully constructed. The validity of the battery is based upon the expert judgment of subject-matter specialists, analysis of many state and city courses of study, and an item evaluation of the

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<sup>3</sup>Anastasi, op. cit., pp. 210-211.

experimental form. The probable error of measurement of each of the attained scores is less than two score units. The norms were established on a population of 45,299 from schools in forty states.<sup>4</sup>

Reading achievement is measured by the utilization of paragraphs followed by multiple choice questions. "The major emphasis is on reading to grasp the central thought, to note details, and to note meaning of vocabulary in context."<sup>5</sup>

Although the Coordinated Scales of Attainment is, in general, a suitable achievement test in an elementary school testing program, it is apparently the opinion of Alvin W. Schindler, Professor of Education, University of Maryland, that the sections on science, geography, history, and literature leave much to be desired.

Sections on science, geography, history and literature . . . are inferior to the language, reading and arithmetic sections. Part of the inferiority may result from inevitable difficulties in the selection of content. Nevertheless, there is unnecessary reliance on recall of isolated facts. Furthermore, the items call for much information which is unimportant. The literature items refer to important books; nevertheless scores on tests of this kind do not present proof that objectives of literature are being achieved.<sup>6</sup>

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<sup>4</sup>Lavonne A. Hanna, "The Coordinated Scales of Attainment," The Third Mental Measurements Yearbook, Oscar K. Buros, editor (New Brunswick: Rutgers University Press, 1949), pp. 14-15.

<sup>5</sup>Alvin W. Schindler, "The Coordinated Scales of Attainment," The Fourth Mental Measurements Yearbook, Oscar K. Buros, editor (Highland Park, New Jersey: The Gryphon Press, 1953), pp. 17-18.

<sup>6</sup>Ibid., p. 18.

In scoring the Coordinated Scales of Attainment, raw scores are translated into scaled scores so that scores from the different tests are comparable and a profile can be drawn on the Profile of Scores on the back of the test. "An analysis of these tables reveals that changes of 4 to 7 points in the raw score may mean an entire grade difference in grade equivalent or an entire year difference in age equivalent."<sup>7</sup>

On the Profile of Scores the scaled scores may be interpreted as grade equivalents, or into percentiles by use of tables provided in the manual. The grade placement scale is expressed in tenths of a school year.

If the school year is ten months in length, the grade placement at the time of testing is simply the number of months elapsed in the grade. If the school year is more or less than ten months in length, the grade placement at the time of testing is determined by dividing the number of months elapsed in the grade by the total number of months in the school year.<sup>8</sup>

In a summation of the Coordinated Scales of Attainment, perhaps it is best to quote again Schindler, one who found fault with the test. "For an elementary school testing program which stresses

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<sup>7</sup>Ibid.

<sup>8</sup>Educational Test Bureau. "Directions for Administration, Scoring, and Interpretation." Coordinated Scales of Attainment, Battery 8 Form A (Philadelphia: Educational Test Bureau, 1953), p. 13.

information and skill, the Coordinated Scales of Attainment are a good choice. They permit a maximum comparison of scores."<sup>9</sup>

### III. THE HOME INDEX

The Home Index, devised by Harrison G. Gough in 1949, is a relatively new socio-economic inventory. It consists of twenty-one questions; the first twenty questions require a "yes" or "no" response, and the last question, "How many books does your family have?" varies according to the home. The items included in the Home Index are presented below:

- Is there an electric or gas refrigerator in your home?
- Is there a telephone in your house?
- Do you have a bathtub in your home?
- Is your home heated with a central system, such as by a furnace in the basement?
- Does your family have a car?
- Did your mother go to high school?
- Did your mother go to a college or university?
- Did your father go to high school?
- Did your father go to a college or university?
- Do you have a fireplace in your home?
- Do you have a piano in your home?
- Does your family have any servants, such as a cook or maid?
- Does your family leave town every year for a vacation?
- Does your mother belong to any clubs, or organizations, such as study, art, or civic clubs?
- Does your father belong to any civic, study, service, or political clubs, such as the Lions Club, Chamber of Commerce, etc.?

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<sup>9</sup>Alvin W. Schindler, "The Coordinated Scales of Attainment," The Fourth Mental Measurements Yearbook, Oscar K. Buros, editor (Highland Park, New Jersey: The Gryphon Press, 1953), p. 18.



Have you ever had private lessons in music, dancing, art, etc., outside of school?

Do you have your own room at home?

Does your family take a daily newspaper?

Do you belong to any clubs where you have to pay dues?

Does your family have a radio-phonograph combination?

How many books does your family have?<sup>10</sup>

In scoring the first twenty questions, each "yes" response is worth one point; the last question is worth from zero to two points, depending upon the answer.

The score on the Home Index is obtained by counting the number of "yes" responses on the first twenty questions, and then adding extra points according to the following scheme for item 21: no points for having zero through ninety-nine books; one point for having one hundred through four hundred ninety-nine books; and two points for having five hundred or more books. The total range of possible scores is thus from zero through twenty-two.<sup>11</sup>

Reliability of the instrument is indicated by a correlation of .989, which was obtained when the Home Index was given to fifty-five college students; and a coefficient of .74 when a sample of two hundred fifty-two high school students was involved.

The reliability of these twenty-one items, considered as a scale, is suggested by a test-retest correlation on a sample of fifty-five college students of .989. The coefficient calculated by the Kuder-Richardson method on a sample of two hundred fifty-two high school students was .74; this represents a minimum estimate of the internal consistency of the scale.<sup>12</sup>

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<sup>10</sup>Harrison G. Gough, "A Short Social Status Inventory," Journal of Educational Psychology, 40:52-56, January, 1949.

<sup>11</sup>Ibid., p. 54.

<sup>12</sup>Ibid.

Validity of the Home Index was confirmed when a mean of 9.82 and a standard deviation of 4.08 was obtained as the result of a study involving two hundred sixty-one high school students. This was greatly supported when a correlation of .52 and a standard error of .06 was the result of a study using two hundred forty-eight high school students.

The Home Index was also administered to a sample of two hundred sixty-one high school seniors from a small Midwestern city of about 25,000 population, yielding a mean of 9.82 and a standard deviation of 4.08. It was also compared with a personality-status scale in a smaller sample of two hundred forty-eight, giving a correlation of .52, standard error .06, which is almost identical with that obtained between the personality-status scale and the American Home Scale in test samples.<sup>13</sup>

Taking this information into careful consideration, it appears reasonably safe to assume that Gough's Home Index was a valid and reliable source of data in this investigation.

#### IV. SUMMARY OF THE CHAPTER

It has been attempted in this chapter to present sufficient information to acquaint the reader with the three main instruments of the investigation: The Kuhlmann-Anderson Intelligence Test, The Coordinated Scales of Attainment, and Gough's Home Index.

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<sup>13</sup>Ibid., p. 55.

## CHAPTER IV

### METHOD OF PROCEDURE

It is the purpose of Chapter V to present (1) a general description of the grades involved in the study, (2) a description of the two groups of students after the control factors had been applied, (3) the adjustment of the scores on the Coordinated Scales of Attainment, and (4) a detailed description and explanation of the formula which was applied to the scores.

#### I. METHOD OF SELECTING STUDENTS USED IN THE INVESTIGATION

In this section is included a brief general description, before and after the control factors were applied, of grades six, seven, eight, nine, and ten, which were used in this investigation. Tables I, II, III, and IV give a brief perspective of the students selected from each grade. In these four tables are included the student, age enrolled, grade enrolled, sex, Kuhlmann-Anderson Intelligence Quotient, Home Index Score, the age when the first Coordinated Scales of Attainment was given, and the student's age when the second Coordinated Scales of Attainment was given. It was attempted to make the permanent

students correspond, as closely as possible, to the in-transfer students on the basis of grade, intelligence quotient, sex, Gough's Home Index score, and age.

Grade Six. There were forty-two permanent students enrolled in the sixth grade. Of these, nineteen were female and the remaining twenty-three students were male. Nearly all enrolled in the first grade at the age of six. There were four who did not take the Kuhlmann-Anderson Intelligence Test and three who did not take the Home Index. The entire number of permanent students took the Coordinated Scales of Attainment in the fourth grade and all but one took it in the fifth grade.

There were four in-transfer students in the sixth grade. All enrolled in the fifth grade at the age of ten, and all took the Kuhlmann-Anderson Intelligence Test, Coordinated Scales of Attainment in grade five, and the Home Index. However, all four were not present to take the Coordinated Scales of Attainment in the fourth grade, a point which eliminated the sixth grade from any further consideration in this study.

Grade Seven. There were forty-one permanent students in the seventh grade, seventeen females and twenty-four males. All had been administered the Kuhlmann-Anderson Intelligence Test, and

the Coordinated Scales of Attainment in the fifth and sixth grades. There were four who did not take the Home Index.

There was a total of six in-transfer students in grade seven. Only two had taken the Kuhlmann-Anderson Intelligence Test, four had taken the Coordinated Scales of Attainment in the fifth grade, and all six had taken the Coordinated Scales of Attainment in the sixth grade. The Home Index was given to five in-transfer students.

Thus, it was possible to use only two in-transfer students from the seventh grade. Two permanent students from the same grade were selected to match the in-transfer students. Table I presents data on these four students.

Grade Eight. There were thirty-seven permanent students in the eighth grade, twenty-one females and sixteen males. All were given the Kuhlmann-Anderson Intelligence Test, and the Coordinated Scales of Attainment in grade seven. One student did not take the Coordinated Scales of Attainment in the fifth grade, and one did not take the Home Index.

There were four in-transfer students in the eighth grade, all of whom had taken the Kuhlmann-Anderson Intelligence Test, and the Coordinated Scales of Attainment in grade seven. Only two were given the Coordinated Scales of Attainment in the fifth grade, and three took the Home Index.

TABLE I  
A COMPARISON OF THE SELECTED IN-TRANSFER  
AND PERMANENT STUDENTS OF GRADE SEVEN

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Student	Age Enrolled	Grade Enrolled	Sex	Kuhlmann- Anderson I. Q.	Home Index	Age of CSA* I	Age of CSA** II
IN-TRANSFER STUDENTS							
F 18	8	4	Female	114	12	10	11
M 2	9	4	Male	102	17	11	12
PERMANENT STUDENTS							
F 5	6	1	Female	116	14	11	12
M 19	6	1	Male	102	10	11	12

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\* Coordinated Scales of Attainment, Test I

\*\* Coordinated Scales of Attainment, Test II

Again, there were only two in-transfer students suitable to the investigation, which made it necessary to use two permanent students to match the in-transfer students. Both groups are shown in Table II.

Grade Nine. There were twenty-six permanent students in the ninth grade, fourteen females and twelve males. All twenty-six students were given the Kuhlmann-Anderson Intelligence Test, the Coordinated Scales of Attainment in grades seven and eight, and the Home Index.

There were thirteen in-transfer students in grade nine. All thirteen were given the Kuhlmann-Anderson Intelligence Test and the Coordinated Scales of Attainment in grade seven. Two did not take the Home Index. The two students who did not take the Home Index were included, however, in order to increase the number of students involved in the investigation.

It was possible to use eleven in-transfer students from the ninth grade in this investigation. The eleven permanent students used to match the in-transfer students were also taken from grade nine. The related characteristics of both groups are presented in Table III.

Grade Ten. There were twenty-seven permanent students in the tenth grade, twenty-five of whom were given the Kuhlmann-

Anderson Intelligence Test. All but one took the Coordinated Scales of Attainment in the seventh grade, and all twenty-seven took the Coordinated Scales of Attainment in grade eight. Four of the permanent students did not take the Home Index; however, one of these was included in the investigation.

There were seven in-transfer students in grade ten. All of them had taken the Kuhlmann-Anderson Intelligence Test and the Home Index. One student did not take the Coordinated Scales of Attainment in either grade seven or grade eight.

It was possible to use six in-transfer students, and, hence, six permanent students from the tenth grade. Both groups are shown in Table IV.

## II. RESULTS OF APPLIED CONTROL FACTORS

It would be well to repeat the control factors used to keep the groups as equal as possible in the investigation, in order to refresh the reader on this point. They are listed in the order in which they were applied to the students of both groups: (1) Grade, (2) Intelligence Quotient, (3) Sex, (4) Gough's Home Index score, and (5) Age.

In grade six, it was found that there were no students suitable for the purposes of this investigation, which eliminated it from any further consideration in this particular investigation.



TABLE II  
A COMPARISON OF THE SELECTED IN-TRANSFER  
AND PERMANENT STUDENTS IN GRADE EIGHT

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Student	Age Enrolled	Grade Enrolled	Sex	Kuhlmann- Anderson I. Q.	Home Index Score	Age of CSA* I	Age of CSA** II
IN-TRANSFER STUDENTS							
F 12	11	5	Female	129	13	11	13
M 4	10	5	Male	88	13	10	12
PERMANENT STUDENTS							
F 22	6	1	Female	125	10	11	13
M 19	6	1	Male	87	8	11	13

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\* Coordinated Scales of Attainment, Test I

\*\* Coordinated Scales of Attainment, Test II

TABLE III  
A COMPARISON OF THE SELECTED IN-TRANSFER  
AND PERMANENT STUDENTS IN GRADE NINE

Student	Age Enrolled	Grade Enrolled	Sex	Kuhlmann- Anderson I. Q.	Home Index Score	Age of CSA* I	Age of CSA** II
IN-TRANSFER STUDENTS							
M 7	10	5	Male	128	13	13	14
F 16	9	4	Female	120		13	14
M 16	11	6	Male	113	15	13	14
M 14	10	5	Male	110	13	13	14
M 3	11	6	Male	110	12	13	14
F 9	11	6	Female	109		13	14
F 19	10	6	Female	107	5	12	13
M 5	11	6	Male	104	17	13	14
F 12	11	6	Female	103	14	13	14
M 18	11	5	Male	94	9	13	14
M 1	10	5	Male	89	6	13	14
PERMANENT STUDENTS							
M 19	6	1	Male	129	12	13	14
F 7	6	1	Female	122	15	13	14
M 4	6	1	Male	113	12	13	14
M 10	6	1	Male	110	11	13	14
M 3	6	1	Male	107	19	13	14
F 1	6	1	Female	109	14	13	14
F 15	6	1	Female	107	12	13	14
M 11	8	2	Male	106	10	14	15
F 18	6	1	Female	103	11	13	14
M 6	6	1	Male	93	10	13	14
M 17	6	1	Male	90	11	13	14

\* Coordinated Scales of Attainment, Test I

\*\* Coordinated Scales of Attainment, Test II

TABLE IV  
A COMPARISON OF THE SELECTED IN-TRANSFER  
AND PERMANENT STUDENTS IN GRADE TEN

Student	Age Enrolled	Grade Enrolled	Sex	Kuhlmann- Anderson I. Q.	Home Index Score	Age of CSA* I	Age of CSA** II
IN-TRANSFER STUDENTS							
M 12	9	4	Male	122	13	13	14
F 17	12	7	Female	116	11	13	14
F 9	9	4	Female	108	7	13	14
F 6	9	4	Female	103	9	13	14
F 2	11	6	Female	100	9	13	14
M 3	11	4	Male	98	9	15	16
PERMANENT STUDENTS							
M 8	6	1	Male	120		13	14
F 8	8	3	Female	114	13	13	14
F 7	6	1	Female	109	9	13	14
F 12	6	1	Female	103	13	13	14
F 13	6	1	Female	99	8	13	14
M 10	6	1	Male	99	8	13	14

\* Coordinated Scales of Attainment, Test I

\*\* Coordinated Scales of Attainment, Test II

In-transfer students. As described in Table V, there was included in this investigation twenty-one in-transfer students, ten female and eleven male. The average "Grade" of the in-transfer students was nine. The average "Age Enrolled" was 10.19 years; and the average "Grade Enrolled" was 5.10. The average Intelligence Quotient from the administration of the Kuhlmann-Anderson Intelligence Test was 107.95. The average Home Index Score was 11.42. The average ages at the time of the first and second administration of the Coordinated Scales of Attainment were 12.57 years and 13.67 years, respectively.

Permanent students. As shown in Table VI, there were ten females and eleven males, a total of twenty-one, in the group of permanent students. This is the same number as the in-transfer group. The average "Grade" of the permanent student group was nine, which is also the same as the average "Grade" of the in-transfer group. The average "Age Enrolled" and "Grade Enrolled," which was supposed to differ from the in-transfer group, was 6.19 years and grade 1.14, as compared to 10.19 years and grade 5.10 of the in-transfer group. The average Intelligence Quotient of the permanent group was 107.76, as measured by the Kuhlmann-Anderson Intelligence Test. This was .19 less than the average Intelligence Quotient of the

TABLE V

## CHARACTERISTICS OF THE SELECTED IN-TRANSFER STUDENTS

Student	Grade	Age Enrolled	Grade Enrolled	Sex	Kuhlmann- Anderson I. Q.	Home Index Score	Age of CSA* I	Age of CSA** II	
F 12	8	11	5	Female	129	13	11	13	
M 7	9	10	5	Male	128	13	13	14	
M 12	10	9	4	Male	122	13	13	14	
F 16	9	9	4	Female	120		13	14	
F 17	10	12	7	Female	116	11	13	14	
F 18	7	8	4	Female	114	12	10	11	
M 16	9	11	6	Male	113	15	13	14	
M 14	9	10	5	Male	110	13	13	14	
M 3	11	11	6	Male	110	12	13	14	
F 9	9	11	6	Female	109		13	14	
F 9	10	9	4	Female	108	7	13	14	
F 19	9	10	6	Female	107	5	12	13	
M 5	9	11	6	Male	104	17	13	14	
F 6	10	9	4	Female	103	9	13	14	
F 12	9	11	6	Female	103	14	13	14	
M 2	7	9	4	Male	102	17	11	12	
F 2	10	11	6	Female	100	9	13	14	
M 3	10	11	4	Male	98	9	15	16	
M 18	9	11	5	Male	94	9	13	14	
M 1	9	10	5	Male	89	6	13	14	
M 4	8	10	5	Male	88	13	10	12	
Total	21	189	214	107	10 Female 11 Male	2267	217	264	287
Mean	9	10.19	5.10		107.95	11.42	12.57	13.67	

\* Coordinated Scales of Attainment, Test I

\*\* Coordinated Scales of Attainment, Test II

TABLE VI

## CHARACTERISTICS OF THE SELECTED PERMANENT STUDENTS

Student	Grade	Age Enrolled	Grade Enrolled	Sex	Kuhlmann-Anderson I. Q.	Home Index Score	Age of CSA* I	Age of CSA** II	
F 22	8	6	1	Female	125	10	11	13	
M 19	9	6	1	Male	129	12	13	14	
M 8	10	6	1	Male	120		13	14	
F 7	9	6	1	Female	122	15	13	14	
F 8	10	8	3	Female	114	13	13	14	
F 5	7	6	1	Female	116	14	11	12	
M 4	9	6	1	Male	113	12	13	14	
M 10	9	6	1	Male	110	11	13	14	
M 8	9	6	1	Male	107	19	13	14	
F 1	9	6	1	Female	109	14	13	14	
F 7	10	6	1	Female	109	9	13	14	
F 15	9	6	1	Female	107	12	13	14	
M 11	9	8	2	Male	106	10	14	15	
F 12	10	6	1	Female	103	13	13	14	
F 18	9	6	1	Female	103	11	13	14	
M 19	7	6	1	Male	102	10	11	12	
F 13	10	6	1	Female	99	8	13	14	
M 10	10	6	1	Male	99	8	13	14	
M 6	9	6	1	Male	93	10	13	14	
M 17	9	6	1	Male	90	11	13	14	
M 19	8	6	1	Male	87	8	11	13	
Total	21	189	130	24	10 Female	2263	230	266	289
					11 Male				
Mean	9	6.19	1.14		107.76	11.50		13.76	
							12.67		

\* Coordinated Scales of Attainment, Test I

\*\* Coordinated Scales of Attainment, Test II

in-transfer group. The average Home Index Score of the permanent students was 11.5, which was .08 larger than the average Home Index Score of the in-transfer group. The average ages at the time of the administration of first and second Coordinated Scales of Attainment were 12.67 years and 13.76 years, respectively. The average age of the permanent group at the time of the administration of the first Coordinated Scales of Attainment was larger by .10 years, and was also larger by .10 years at the time of the administration of the second Coordinated Scales of Attainment. The mean of the "Grade," Kuhlmann-Anderson Intelligence Quotient, Home Index Score, age at the time of the administration of the first Coordinated Scales of Attainment, and age at the time of the administration of the second Coordinated Scales of Attainment, of both groups are shown in Table VII.

### III. ADJUSTMENT OF SCORES ON THE COORDINATED SCALES OF ATTAINMENT

As has been previously explained, each student included in this investigation was administered the Coordinated Scales of Attainment twice, involving a one-year interval. Each student's score in each area, and the median of his scores in all areas were then transformed to a z-score, and then to a T-score.

TABLE VII  
 MEANS OF CONTROL FACTORS OF  
 IN-TRANSFER AND PERMANENT STUDENTS

	Grade	Kuhlmann- Anderson I. Q.	Home Index Score	Age of CSA** I	Age of CSA*** II
In-Transfer Students*	9	107.95	11.42	12.57	13.67
Permanent Students*	9	107.76	11.50	12.67	13.76

\* Both groups included ten females and eleven males.

\*\* Coordinated Scales of Attainment, Test I

\*\*\* Coordinated Scales of Attainment, Test II



The t-test of significance was then applied to the T-scores. The z-score, T-score, and the t-test of significance will be described in detail in another section of this chapter. This section is devoted to the students' original scores, as recorded on the Student's Profile, on the Coordinated Scales of Attainment. For the purpose of clarity, the first Coordinated Scales of Attainment administered to the students will be referred to as Test I, and for the second, Test II.

Coordinated Scales of Attainment: Test I. The scores of the in-transfer students, as recorded on their profile sheets, are shown in Table I, in the Appendix. Table II, in the Appendix, shows the scores of the permanent students, as recorded on their profile sheets.

It should be noted that the highest mean grade level of the in-transfer group was in Spelling, 8.03, and the lowest was in Geography, 6.91. The mean grade level of the in-transfer students when Test I was administered was 7.48.

The highest mean grade level of the permanent students was in English, 8.19, and the lowest was in Science, 7.76. The mean grade level of the group when the test was taken was 7.48, exactly the same as the in-transfer group.

A comparison of each group's mean grade level for each area of Test I is found in Table VIII.

TABLE VIII  
 COMPARISON OF GROUPS' MEANS OF THE FIRST  
 COORDINATED SCALES OF ATTAINMENT

	Sp.	Eng.	Rdng.	Hist.	Geog.	Science	Lit.	Comp.	Prob. Rsng.	Median
In-transfer Group	8.03	7.72	7.77	7.36	6.91	7.56	7.53	7.45	7.56	7.55
Permanent Group	7.87	8.19	7.92	7.79	7.82	7.76	7.85	8.05	7.89	7.89

Coordinated Scales of Attainment: Test II. Table III, in the Appendix, shows the scores of the in-transfer students, as recorded on their profile sheet. The scores of the permanent students, as recorded on their profile sheets, are shown in Table IV in the Appendix.

The highest mean grade level of the in-transfer students was in the area of Literature, 9.56, and the lowest mean grade level was in the area of Computation, 8.21. Both areas of the high and low mean grade level of this test were different from those in Test I. The mean grade level of the in-transfer students at the time of the administration of this test was 8.52.

The highest mean grade level of the permanent students was in Science, 9.36, and the lowest was in Computation, 8.63. The mean grade level of the permanent students at the time of the administration of this test was also 8.52.

Table IX gives a comparison of each group's means of the areas of Test II. Two interesting mean scores are presented: first, the lowest mean grade level of the permanent students in Test I was the same area as the highest mean grade level of the same group in Test II, which was Science; second, the lowest mean grade level in Test II of both groups was in the same area, Computation.

TABLE IX

COMPARISON OF GROUPS' MEANS OF THE SECOND  
COORDINATED SCALES OF ATTAINMENT

	Sp.	Eng.	Rdng.	Hist.	Geog.	Science	Lit.	Comp.	Prob. Rsng.	Median
In-transfer Group	9.23	9.03	9.12	8.59	8.52	8.90	9.56	8.21	8.79	8.95
Permanent Group	8.88	9.09	9.18	8.74	8.71	9.36	9.06	8.63	9.26	8.95

#### IV. DESCRIPTION AND EXPLANATION OF THE FORMULA

Since four grade levels were involved in the investigation and the grade equivalent scores were obviously different, standard unit scores were used. This gave each student a score relative to his standing with the mean of his group.

The T-scores were found by first finding the standard deviation. This was done by use of the formula  $s = \sqrt{\frac{\sum (x - M)^2}{N}}$  or, standard deviation equals the square root of the sum of the squared difference of the original score minus the mean, which is in turn divided by the number involved. The standard deviation was then converted to a z-score by the formula  $z = \frac{x - M}{s}$ , or, z-score equals the original score minus the mean of the original scores divided by the standard deviation. The T-score was then found by multiplying ten times the z-score and adding fifty, or  $T = 10z + 50$ .

The t-test of significance was then applied to the T-scores. In finding the significance of the difference of the two means of T-scores in each area, the mean of one group was subtracted from the mean of the other group, and the difference was then divided by the standard error of the mean difference. In formula form, this would be represented by  $t = \frac{M_1 - M_2}{s_{\text{mead}}}$ . Since two independent groups were

involved, the formula for finding standard error of the mean difference was  $\delta_{md} = \sqrt{\delta_{m_1}^2 + \delta_{m_2}^2}$ , or standard deviation of the mean of one group squared and the square root of the sum then taken.

In using the table of values of t, forty degrees of freedom are allowed, or  $N_1 + N_2 - 2$ . It was found that a difference of 2.021 would be required to show a significant difference at the five per cent level of confidence, and 2.704 for significance at the one per cent level of confidence.

## V. SUMMARY OF THE CHAPTER

A general description of the grades involved in the investigation has been presented. This was followed by a description of the in-transfer and permanent groups after the control factors were applied to the grades.

The last two parts of the chapter included a detailed presentation of the scores of the students, as recorded on their profile sheets, in both tests of the Coordinated Scales of Attainment, and a detailed description and explanation of the formula used on the scores.

## CHAPTER V

### RESULTS OF THE INVESTIGATION

In this chapter are presented the mean of the T-scores of both groups in each area of both tests of the Coordinated Scales of Attainment. The mean of the T-scores are accompanied by the results of the application of the t-test of significance in each area of both tests.

#### I. COORDINATED SCALES OF ATTAINMENT, TEST I

T-scores of in-transfer students and permanent students are shown in the Appendix as follows: Spelling, Table V; English, Table VI; Reading, Table VII; History, Table VIII; Geography, Table IX; Science, Table X; Literature, Table XI; Computation, Table XII; Problem Reasoning, Table XIII; and Total Test Median, Table XIV. Table X in this section shows the mean of the T-scores and the significance of the difference of each area of the first test of The Coordinated Scales of Attainment.

Spelling. The mean of the T-scores for the permanent group was 58.38, as compared to 57.85 of the in-transfer group.

When the t-test of significance was applied, a difference of 1.14, favoring the permanent group, was obtained. This was not a significant difference.

English. The mean of the T-scores of the permanent group was 58.48, slightly larger than the 58.35 of the in-transfer group. When the t-test of significance was applied, a difference, favoring the permanent group, of .21, was obtained. This was not a significant difference.

Reading. The mean of the T-scores of the permanent group was 57.11, slightly less than the 58.22 of the in-transfer group. Upon application of the t-test of significance, a difference of 2.12 was obtained favoring the in-transfer group. This was significant at the five per cent level of confidence.

History. The mean of the T-scores of the permanent group was 57.70, as compared to 58.38 of the in-transfer group. Upon application of the t-test of significance, the difference of 1.65 favoring the in-transfer group was found to be of no significance.

Geography. The mean of the T-scores of the permanent group was 57.02, quite a bit less than the 59.36 of the in-transfer group. Following application of the t-test of significance, it was



found that the difference of 4.87, favoring the in-transfer group, was significant beyond the one per cent level of confidence.

Science. The mean of the T-scores of the permanent group was 55.30, as compared to 58.41 of the in-transfer group. Upon use of the t-test of significance, a difference of 6.94, favoring the in-transfer group, was obtained. This was significant well beyond the one per cent level of confidence.

Literature. The mean of the T-scores of the permanent group was 59.93, slightly larger than the 57.90 of the in-transfer group. When the t-test of significance was applied, a difference of 1.93 was found favoring the permanent group. This was of no significant difference.

Computation. The mean of the T-scores of the permanent group was 56.80, slightly less than the 58.27 of the in-transfer group. Upon application of the t-test of significance, a difference of 2.88 was found, favoring the in-transfer group. This was significant beyond the one per cent level of confidence.

Problem Reasoning. The mean of the T-scores of the permanent group was 58.83, as compared to 58.32 of the in-transfer group. When the t-test of significance was applied, there was found

to be a difference of 1.05 favoring the permanent group. This was not a significant difference, however.

Total Test Median. The mean of the T-scores of the permanent group was 57.90, slightly larger than the 57.76 of the in-transfer group. Upon application of the t-test of significance, a difference of .33 favoring the permanent group was obtained. This was not a significant difference.

## II. COORDINATED SCALES OF ATTAINMENT, TEST II

T-scores of in-transfer students and permanent students are shown in the Appendix as follows: Spelling, Table XV; English, Table XVI; Reading, Table XVII; History, Table XVIII; Geography, Table XIX; Science, Table XX; Literature, Table XXI; Computation, Table XXII; Problem Reasoning, Table XXIII; and Total Test Median, Table XXIV. Table XI, in this section, shows the mean of the T-scores and the significance of the difference of each area of the second test of the Coordinated Scales of Attainment.

The mean grade level at which the in-transfer group took the second battery of the Coordinated Scales of Attainment was 8.5238, identical to that of the permanent group. The mean age at which the test was taken was 13.667 years for the in-transfer group and 13.762 years for the permanent group.

TABLE X  
 MEANS AND SIGNIFICANCE OF DIFFERENCES  
 BETWEEN PERMANENT AND IN-TRANSFER STUDENTS  
 ON THE COORDINATED SCALES OF ATTAINMENT, TEST I

Subtest of Test	Group	Number	Mean of T-Scores	M. D.	t	Signifi- cance Level
Spelling	Permanent	21	58.38	.53	1.14	Not sig.
	In-transfer	21	57.85			
English	Permanent	21	58.48	.14	.21	Not sig.
	In-transfer	21	58.35			
Reading	Permanent	21	57.11	1.10	2.12	5%
	In-transfer	21	58.22			
History	Permanent	21	57.70	.68	1.65	Not sig.
	In-transfer	21	58.38			
Geography	Permanent	21	57.02	2.34	4.87	1%
	In-transfer	21	59.36			
Science	Permanent	21	55.30	3.10	6.94	1%
	In-transfer	21	58.41			
Literature	Permanent	21	58.93	1.03	1.98	Not sig.
	In-transfer	21	57.90			
Computa- tion	Permanent	21	56.80	1.47	2.88	1%
	In-transfer	21	58.27			
Problem Reasoning	Permanent	21	58.83	.50	1.05	Not sig.
	In-transfer	21	58.32			
Total Test Median	Permanent	21	57.90	.14	.33	Not sig.
	In-transfer	21	57.76			

Spelling. The mean of the T-scores of the permanent group was 57.55, as compared to the 57.67 of the in-transfer group. When the t-test of significance was applied, a difference of .30 was found, favoring the in-transfer group. The difference was not significant.

English. The mean of the T-scores of the permanent students was 56.42, quite a bit less than the 57.95 of the in-transfer group. Upon application of the t-test of significance, the difference of 2.89 was significant at the one per cent level of confidence in favor of the in-transfer group.

Reading. The mean of the T-scores of the permanent students was 57.65, as compared to 58.65 of the in-transfer group. Upon application of the t-test of significance, a difference of 2.08 was found, favoring the in-transfer group. This was significant at the five per cent level of confidence.

History. The mean of the T-scores of the permanent students was 58.38, slightly larger than the 58.06 of the in-transfer group. Upon application of the t-test of significance a difference of .85 was obtained, favoring the permanent group. This was of no significant difference.

Geography. The mean of the T-scores of the permanent students was 58.64, as compared to 58.26 of the in-transfer group. When the t-test of significance was applied, a difference, favoring the permanent group of .71 was obtained. This was not a significant difference.

Science. The mean of the T-scores of the permanent group was 58.62, slightly larger than the 58.62, slightly larger than the 58.53 of the in-transfer group. Upon application of the t-test of significance, a difference of .20 was found favoring the permanent group. This was not a significant difference.

Literature. The mean of the T-scores for the permanent group was 57.34, as compared to 58.22 of the in-transfer group. Upon application of the t-test of significance, a difference of 2.05 was found favoring the in-transfer group. This difference was significant at the five per cent level of confidence.

Computation. The mean of the T-scores of the permanent group was 56.71, as compared to 57.75 of the in-transfer group. When the t-test of significance was applied, a difference of 2.54 was obtained, favoring the in-transfer group. The difference was significant at the five per cent level of confidence.

TABLE XI  
 MEANS AND SIGNIFICANCE OF DIFFERENCES  
 BETWEEN PERMANENT AND IN-TRANSFER STUDENTS  
 ON THE COORDINATED SCALES OF ATTAINMENT, TEST II

Subtest or Test	Group	Number	Mean of T-scores	M. D.	t	Signifi- cance Level
Spelling	Permanent	21	57.55	.12	.30	Not sig.
	In-transfer	21	57.67			
English	Permanent	21	56.42	1.53	2.89	1%
	In-transfer	21	57.95			
Reading	Permanent	21	57.65	1.00	2.08	5%
	In-transfer	21	58.65			
History	Permanent	21	58.38	.32	.85	Not sig.
	In-transfer	21	58.06			
Geography	Permanent	21	58.64	.38	.71	Not sig.
	In-transfer	21	58.26			
Science	Permanent	21	58.62	.09	.20	Not sig.
	In-transfer	21	58.53			
Literature	Permanent	21	57.34	.87	2.05	5%
	In-transfer	21	58.22			
Computa- tion	Permanent	21	56.71	1.05	2.54	5%
	In-transfer	21	57.75			
Problem Reasoning	Permanent	21	57.31	1.07	2.34	5%
	In-transfer	21	58.38			
Total Test Median	Permanent	21	57.56	1.44	3.98	1%

Problem Reasoning. The mean of the T-scores of the permanent group was 57.31, as compared to 58.38 of the in-transfer group. Upon application of the t-test of significance, a difference was found of 2.34 favoring the in-transfer group. The difference was significant at the five per cent level of confidence.

Total Test Median. The mean of the T-scores of the permanent group was 57.56, noticeably less than the 59.00 of the in-transfer group. Upon application of the t-test of significance, a difference was found of 3.98 favoring the in-transfer group. This difference was significant beyond the one per cent level of confidence.

### III. SUMMARY OF THE CHAPTER

It has been the purpose of the chapter to present the means of the T-scores, the differences following application of the t-test of significance, and the significance of the differences, in each area of both tests of the Coordinated Scales of Attainment of the permanent group and the in-transfer group.

## CHAPTER VI

### SUMMARY AND CONCLUSIONS

#### I. SUMMARY

This investigation was concerned with the comparison of permanent students to in-transfer students, based upon the hypothesis that there was no difference of academic achievement, as measured by two batteries of the Coordinated Scales of Attainment, between the permanent group and the in-transfer group. The investigation took place in the South Bend School System of South Bend, Washington.

It was decided to match, as nearly as possible, two groups, permanent and in-transfer, by grade, Intelligence Quotient, sex, Gough's Home Index score, and age, in that order of importance. Both the permanent group and the in-transfer group were limited to twenty-one students, ten female and eleven male, a rather small number, but sufficiently large for the purposes of this investigation. Students eventually selected for the investigation were taken from grades seven through ten, the mean grade of both groups being nine.

The mean Intelligence Quotient, as measured by the Kuhlmann-Anderson Intelligence Test, of the permanent group was 107.76, as compared to 107.95 of the in-transfer group. Socio-



economic factors, as measured by Gough's Home Index, yielded a mean of 11.50 for the permanent group, a score slightly larger than the 11.42 of the in-transfer group. The mean age of the permanent students at the time the first battery of the Coordinated Scales of Attainment was taken was 12.67 years, as compared to 12.57 years of the in-transfer group. At the time the second battery of the Coordinated Scales of Attainment was administered, the mean age of the permanent students was 13.76 years, as compared to 13.67 years for the in-transfer group. The two independent groups, permanent and in-transfer, were matched as closely as possible, as indicated by the above figures.

Coordinated Scales of Attainment: Spelling, Reading, and History. In comparing the subtests after completion of the administration of both batteries of the Coordinated Scales of Attainment, it was found that in three areas, or subtests, the two groups had maintained their relative position: Spelling, Reading, and History.

Upon application of the t-test of significance to the Spelling subtest of the first battery of the Coordinated Scales of Attainment, a difference of 1.14 was obtained, favoring the permanent group. In the second battery, a difference of .30 was found, favoring the in-transfer group. Neither difference was of significance, however.

Upon application of the t-test of significance to the Reading subtest of the first battery of the Coordinated Scales of Attainment, a difference of 2.12 was found, favoring the in-transfer group. In the second battery, a difference of 2.08 was found, favoring the in-transfer group. Both differences were significant at the five per cent level of confidence.

Upon application of the t-test of significance to the History subtest of the first battery of the Coordinated Scales of Attainment, a difference of 1.65 was obtained, favoring the in-transfer group. In the second battery, a difference of .85 was obtained, favoring the permanent group. Differences obtained in both batteries were not significant.

Coordinated Scales of Attainment: English, Literature, and Problem Reasoning. Three areas, or subtests, increased in differences from the first battery to the second: English, Literature, and Problem Reasoning.

Upon application of the t-test of significance to the English subtest of the first battery of the Coordinated Scales of Attainment, a difference of .21 was found, favoring the permanent group. This was of no significance. In the second battery, however, a difference of 2.89 was obtained, favoring the in-transfer group. This was significant beyond the one per cent level of confidence.

Upon application of the t-test of significance to the Literature subtest of the first battery of the Coordinated Scales of Attainment, a difference of 1.98 was found, favoring the permanent group. This difference was not significant, however. In the second battery, a difference of 2.05 was obtained, favoring the in-transfer group. The difference was significant at the five per cent level of confidence.

Following application of the t-test of significance to the Problem Reasoning subtest of the first battery of the Coordinated Scales of Attainment, a difference of 1.05 was found, favoring the permanent group. The difference was not significant. In the second battery, however, a difference of 2.34 was obtained, favoring the in-transfer group. This was significant at the five per cent level of confidence.

Coordinated Scales of Attainment: Geography, Science, and Computation. The differences in three areas decreased in significance from the first battery to the second.

Upon application of the t-test of significance to the Geography subtest of the first battery of the Coordinated Scales of Attainment, a difference of 4.87 was obtained, favoring the in-transfer group. The difference was significant at the one per cent level of

confidence. In the second battery a difference was found of .71, favoring the permanent group. The difference was not significant.

Upon application of the t-test of significance to the Science subtest of the first battery of the Coordinated Scales of Attainment, a difference of 6.94 was obtained, favoring the in-transfer group. This was significant well beyond the one per cent level of confidence. In the second battery, a difference of .20 was found, favoring the permanent group. The difference was not significant.

Following application of the t-test of significance to the Computation subtest of the first battery of the Coordinated Scales of Attainment, a difference of 2.88 was found, favoring the in-transfer group. This was significant at the one per cent level of confidence. In the second battery, a difference of 2.54 was found, favoring the in-transfer group. This was significant at the five per cent level of confidence.

Coordinated Scales of Attainment: Total Test Median.

Upon application of the t-test of significance to the Total Test Median of the first battery of the Coordinated Scales of Attainment, a difference of .33 was obtained, favoring the permanent group. The difference was not significant. In the second battery, a difference of 3.98 was obtained, favoring the in-transfer group. The difference was significant at the one per cent level of confidence.

## II. CONCLUSIONS

It is evident that the in-transfer group received higher scores than did the permanent group, in most of the areas measured by the Coordinated Scales of Attainment. It is reasonably safe to conclude that this was affected by what is apparently a superior educational background in most of the areas tested by the Coordinated Scales of Attainment, particularly in Reading.

The belief is held by many teachers that in-transfer students are inferior to permanent students. This has apparently been disproved, in the South Bend School System, at least, on the basis of the results of the investigation. The results of this investigation indicate that in-transfer students in the South Bend School System are, at the least, equal to permanent students, if not superior to them in some areas. The results of the investigation are supported by what is apparently the only other one of its kind in the Pacific Northwest: Downie's study of permanent and in-transfer students in the Hermiston, Oregon, School System in 1949, the results of which indicated that there were no significant differences between the two groups.

Since the results of the investigation presented in the preceding pages are so contrary to popular opinion, there is justification for further research in this area in the South Bend School

System, another school system, or on a state-wide basis. If the results of the investigation which has been presented in this thesis are consistent with any future ones, there is also ample justification for state-wide curricula study.

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APPENDIX

TABLE I

## SCORES OF THE IN-TRANSFER STUDENTS

## ON THE FIRST COORDINATED SCALES OF ATTAINMENT

Student	Sp.	Eng.	Rdng.	Hist.	Geog.	Science	Lit.	Comp.	Prob. Rsng.	Median
F12	7.3	8.2	8.6	8.2	7.2	5.9	8.5	7.3	7.4	7.3
M7	9.9	10.6	9.7	9.6	9.0	9.9	10.0	10.1	10.2	9.9
M12	9.3	10.4	10.2	6.7	9.2	9.0	7.5	9.4	10.2	9.3
F16	7.5	9.8	8.3	8.2	8.4	8.9	9.3	9.7	8.3	8.4
F17	8.7	11.1	10.2	6.3	5.8	8.6	6.7	8.2	9.8	8.6
F18	7.4	5.1	5.9	6.3	4.7	4.8	6.4	5.3	4.6	5.3
M16	9.9	9.0	9.4	9.3	9.1	8.7	9.4	6.9	8.3	9.1
M14	10.1	10.2	9.7	8.5	8.3	9.7	9.3	9.3	10.2	9.7
M3	7.6	6.2	9.7	10.6	9.1	8.5	10.8	9.1	8.3	9.1
F9	3.6	8.8	8.0	6.9	5.0	7.6	7.1	7.7	7.3	7.6
F9	10.1	8.4	9.2	7.3	8.4	8.3	8.3	5.8	6.8	8.3
F19	6.4	7.0	7.1	6.7	5.4	6.7	7.9	7.7	5.9	6.7
M5	8.7	6.8	8.0	5.5	5.0	8.3	7.3	7.1	6.9	7.1
F6	7.9	7.9	9.6	7.1	8.1	8.4	7.9	8.3	8.4	8.1
F12	7.9	7.6	5.5	7.2	5.7	8.1	7.7	9.3	6.7	7.6
M2	8.4	5.7	6.5	9.1	8.9	6.0	6.5	6.2	6.6	6.5
F2	7.2	9.4	7.8	6.7	5.5	7.5	5.1	6.8	7.0	7.0
M3	8.5	6.4	3.7	6.5	5.2	7.9	6.3	6.2	6.2	6.3
M18	7.5	6.6	8.0	6.1	6.2	6.4	6.9	7.1	8.6	6.9
M1	5.3	3.9	3.9	6.1	6.4	5.0	5.5	5.0	6.4	5.3
M4	4.5	3.1	4.2	5.7	4.5	4.6	3.8	3.9	4.7	4.5
MEAN	8.033	7.7238	7.7714	7.3619	6.9095	7.5619	7.5333	7.4476	7.5619	7.5524

TABLE II  
 SCORES OF THE PERMANENT STUDENTS  
 ON THE FIRST COORDINATED SCALES OF ATTAINMENT

Student	Sp.	Eng.	Rdng.	Hist.	Geog.	Science	Lit.	Comp.	Prob. Rsng.	Median
F22	6.5	6.2	7.4	8.6	7.0	7.0	9.3	6.2	7.6	7.0
M19	9.5	9.2	10.6	9.1	9.5	9.1	9.9	10.5	10.2	9.5
M8	9.8	9.6	9.0	8.3	11.1	8.8	8.3	8.2	9.8	9.0
F7	9.3	9.8	8.5	7.6	7.8	9.1	9.6	9.2	7.3	9.1
F8	8.7	9.1	7.6	6.7	7.2	8.7	6.3	7.1	6.8	7.2
F5	8.2	9.1	7.5	6.1	7.5	7.8	7.7	8.0	9.4	7.8
M4	8.4	9.8	7.8	9.1	8.3	9.1	9.4	8.7	9.8	9.1
M10	7.2	6.0	8.3	8.2	6.9	7.0	7.5	7.1	8.3	7.2
M8	8.9	10.2	7.6	8.8	9.4	8.1	9.9	9.4	9.4	9.4
F1	8.9	9.2	8.7	8.6	8.4	7.7	9.6	9.1	7.1	8.6
F7	8.5	11.0	9.0	7.5	7.5	8.7	9.5	7.5	7.2	8.5
F15	7.8	9.6	7.6	7.7	7.8	8.3	9.7	8.7	7.3	7.8
M11	6.6	8.8	8.0	8.6	8.3	8.3	7.1	9.1	10.2	8.3
F12	6.1	8.9	8.0	7.5	7.2	6.3	6.3	7.4	7.0	7.2
F18	10.3	9.6	8.3	9.4	9.0	8.1	7.3	10.3	8.9	8.9
M19	6.2	7.1	7.0	9.1	7.7	6.8	6.9	7.9	9.1	7.7
F13	7.8	6.1	8.4	7.1	7.5	7.0	5.5	8.0	8.2	7.5
M10	6.7	4.9	8.6	7.5	8.1	8.4	5.9	7.8	6.4	7.5
M6	9.5	8.6	7.1	6.7	7.2	8.7	8.7	7.5	5.9	7.5
M17	4.0	6.2	6.6	7.3	6.5	5.9	4.7	8.7	7.7	6.5
M19	6.3	2.9	4.7	4.0	4.4	4.0	5.8	2.6	4.5	4.4
MEAN	7.8667	8.1857	7.9191	7.7857	7.8238	7.7571	7.8524	8.0476	8.0048	7.8905

TABLE III

SCORES OF THE IN-TRANSFER STUDENTS  
ON THE SECOND COORDINATED SCALES OF ATTAINMENT

Student	Sp.	Eng.	Rdng.	Hist.	Geog.	Science	Lit.	Comp.	Prob. Rsnng.	Median
F12	9.5	11.1	11.0	8.5	9.0	9.4	9.9	8.1	8.8	9.4
M7	11.1	9.5	11.9	10.3	10.3	10.8	11.4	10.9	10.6	10.8
M12	10.4	10.4	9.9	10.1	9.9	10.1	9.3	11.6	11.6	10.1
F16	8.7	8.1	9.9	9.5	9.9	8.8	10.8	7.4	9.4	9.4
F17	10.0	10.2	10.2	8.2	9.1	8.5	9.9	9.9	10.7	9.9
F18	8.8	7.4	7.1	7.5	8.4	6.8	8.7	7.1	6.2	7.4
M16	11.1	11.4	9.8	10.0	11.4	10.8	11.1	8.7	9.4	10.8
M14	10.8	9.5	10.6	9.5	10.4	10.4	10.5	9.0	10.4	10.4
M3	9.2	8.8	11.1	10.2	10.3	11.2	11.7	9.7	11.0	10.3
F9	9.0	9.9	10.6	9.0	9.4	9.4	9.7	8.1	9.0	9.4
F9	10.8	9.8	9.8	9.9	9.9	9.8	9.5	7.2	8.5	9.8
F19	8.3	9.2	8.8	7.9	7.0	7.4	9.7	7.8	7.4	7.9
M5	9.0	9.4	9.3	8.7	9.2	10.0	11.1	8.2	7.4	9.2
F6	8.5	9.6	7.9	7.9	5.7	7.9	7.5	9.3	11.0	7.9
F12	9.2	7.7	7.6	8.2	8.3	9.8	8.5	8.3	9.6	8.3
M2	9.0	5.8	7.7	8.9	9.2	6.8	9.5	6.4	6.9	7.7
F2	8.9	8.3	7.9	7.6	7.1	8.2	7.9	7.4	5.0	7.9
M3	8.5	8.0	7.9	8.2	5.3	8.1	7.1	7.4	7.3	7.9
M18	9.0	10.6	10.1	8.2	8.7	9.4	10.8	7.9	9.2	9.4
M1	6.8	5.9	5.3	5.9	5.2	5.6	7.4	6.2	7.8	6.8
M4	7.2	9.1	7.2	6.1	5.2	7.6	8.7	5.8	7.4	7.2
MEAN	9.2286	9.0333	9.1238	8.5857	8.5191	8.8952	9.5571	8.2095	8.7905	8.9476

TABLE IV  
 SCORES OF THE PERMANENT STUDENTS  
 ON THE SECOND COORDINATED SCALES OF ATTAINMENT

Student	Sp.	Eng.	Rdng.	Hist.	Geog.	Science	Lit.	Comp.	Prob. Rsng.	Median
F22	9.5	10.9	8.6	7.5	9.2	8.7	8.3	7.8	9.4	8.7
M19	10.6	10.6	11.3	10.0	10.2	11.4	10.2	11.5	10.8	10.6
M8	10.6	10.2	9.6	10.2	9.9	10.4	10.7	10.5	9.4	10.2
F7	10.2	9.9	10.3	8.6	9.7	8.8	11.7	8.8	9.8	9.7
F3	10.2	9.4	9.9	10.2	10.1	7.9	8.5	8.9	8.9	9.4
F5	9.0	9.2	8.9	8.8	8.2	8.0	9.6	7.9	8.7	8.8
M4	8.9	9.5	10.3	10.3	9.9	10.8	8.8	8.6	10.2	9.9
M10	8.0	5.7	8.3	7.6	7.2	9.8	8.8	7.6	8.8	8.0
M8	8.7	8.6	9.8	9.5	10.9	10.2	7.7	8.8	10.2	9.5
F1	10.2	9.0	10.6	9.5	9.9	11.0	9.4	8.8	8.8	9.5
F7	9.1	9.6	9.7	9.1	8.1	8.5	9.1	9.6	8.7	9.1
F15	8.9	9.5	10.3	8.9	9.4	11.0	11.7	8.0	9.4	9.4
M11	8.3	9.5	8.6	8.7	7.9	10.2	8.5	9.0	10.4	8.7
F12	6.5	11.4	7.9	7.4	5.7	7.7	8.3	3.5	7.7	7.7
F18	10.0	11.2	9.8	9.5	10.2	11.2	9.4	9.9	11.8	10.0
M19	8.0	9.0	8.4	7.3	7.4	7.8	8.4	8.5	8.7	8.4
F13	9.4	9.2	7.9	7.2	7.9	8.1	8.7	8.3	9.4	8.3
M10	8.6	8.1	9.7	10.3	6.9	9.2	9.5	8.7	8.1	8.7
M6	10.2	9.7	9.9	8.7	10.7	10.4	9.7	8.1	9.4	9.7
M17	5.0	7.9	3.3	7.5	8.4	9.4	7.7	8.1	9.4	8.1
M19	6.5	2.7	4.6	6.7	5.2	6.0	5.5	5.4	6.4	5.5
MEAN	8.8762	9.0857	9.1762	8.7381	8.7143	9.3571	9.0571	8.6333	9.2571	8.9476



TABLE V  
 COMPARISON OF T-SCORES  
 OF PERMANENT STUDENTS AND IN-TRANSFER STUDENTS  
 ACHIEVED IN SPELLING  
 IN THE COORDINATED SCALES OF ATTAINMENT, TEST I

<u>Permanent Students</u>		<u>In-Transfer Students</u>	
<u>Student</u>	<u>T-Score</u>	<u>T-Score</u>	<u>Student</u>
F 22	58.933	55.093	F12
M19	60.675	62.963	M7
M8	62.636	58.796	M12
F7	59.368	53.704	F16
F8	55.447	54.630	F17
F5	52.179	54.398	F18
M4	53.486	62.963	M16
M10	54.357	64.352	M14
M3	56.754	53.009	M3
F1	56.754	53.935	F9
F7	54.139	63.452	F9
F15	50.436	61.343	F19
M11	58.279	54.630	M5
F12	61.547	50.926	F6
F18	65.904	50.926	F12
M19	60.893	52.546	M2
F13	50.436	55.787	F2
M10	57.625	53.241	M3
M6	60.675	53.704	M18
M17	75.272	68.982	M1
M19	60.240	74.537	M4
MEAN	58.3826	57.8484	MEAN

TABLE VI  
 COMPARISON OF T-SCORES  
 OF PERMANENT STUDENTS AND IN-TRANSFER STUDENTS  
 ACHIEVED IN ENGLISH  
 IN THE COORDINATED SCALES OF ATTAINMENT, TEST I

<u>Permanent Students</u>		<u>In-transfer Students</u>	
<u>Student</u>	<u>T-Score</u>	<u>T-Score</u>	<u>Student</u>
F22	59.879	52.215	F12
M19	55.046	63.378	M7
M8	57.036	62.447	M12
F7	58.031	59.657	F16
F8	54.549	65.703	F17
F5	54.549	62.204	F18
M4	58.031	55.936	M16
M10	60.874	61.517	M14
M8	60.021	57.088	M3
F1	55.046	55.006	F9
F7	64.001	53.154	F9
F15	57.036	53.367	F19
M11	53.056	54.297	M5
F12	53.554	50.820	F6
F18	57.036	50.576	F12
M19	55.402	59.413	M2
F13	60.377	57.796	F2
M10	66.347	56.157	M3
M6	52.061	55.227	M18
M17	59.879	67.785	M1
M19	76.297	71.506	M4
MEAN	58.4813	59.3452	MEAN

TABLE VII  
 COMPARISON OF T-SCORES  
 OF PERMANENT STUDENTS AND IN-TRANSFER STUDENTS  
 ACHIEVED IN READING  
 IN THE COORDINATED SCALES OF ATTAINMENT, TEST I

<u>Permanent Students</u>		<u>In-transfer Students</u>	
<u>Student</u>	<u>T-Score</u>	<u>T-Score</u>	<u>Student</u>
F22	54.676	54.062	F12
M19	74.153	59.454	M7
M8	59.738	61.905	M12
F7	55.234	52.591	F16
F8	52.874	61.905	F17
F5	53.775	59.174	F18
M4	51.073	57.983	M16
M10	53.432	59.454	M14
M8	52.874	59.454	M3
F1	57.036	51.120	F9
F7	59.738	57.003	F9
F15	52.874	53.291	F19
M11	50.729	51.120	M5
F12	50.729	58.964	F6
F18	53.432	61.135	F12
M19	58.280	56.233	M2
F13	54.333	50.140	F2
M10	56.135	69.958	M3
M6	57.379	51.120	M18
M17	61.883	68.778	M1
M19	79.001	67.507	M4
MEAN	57.1132	58.2167	MEAN

TABLE VIII  
 COMPARISON OF T-SCORES  
 OF PERMANENT STUDENTS AND IN-TRANSFER STUDENTS  
 ACHIEVED IN HISTORY  
 IN THE COORDINATED SCALES OF ATTAINMENT, TEST I

<u>Permanent Students</u>		<u>In-transfer Students</u>	
<u>Student</u>	<u>T-Score</u>	<u>T-Score</u>	<u>Student</u>
F22	56.620	56.162	F12
M19	60.685	66.457	M7
M8	54.181	54.867	M12
F7	51.510	56.162	F16
F8	58.827	57.808	F17
F5	63.705	57.808	F18
M4	60.685	64.251	M16
M10	53.368	58.368	M14
M8	58.246	73.810	M3
F1	56.620	53.396	F9
F7	52.323	50.455	F9
F15	50.697	54.867	F19
M11	56.620	63.691	M5
F12	52.323	51.926	F6
F18	63.124	51.191	F12
M19	60.685	62.780	M2
F13	55.575	54.867	F2
M10	52.323	56.338	M3
M6	58.827	59.279	M18
M17	53.949	59.279	M1
M19	80.778	62.220	M4
MEAN	57.6786	58.3801	MEAN

TABLE IX  
 COMPARISON OF T-SCORES  
 OF PERMANENT STUDENTS AND IN-TRANSFER STUDENTS  
 ACHIEVED IN GEOGRAPHY  
 IN THE COORDINATED SCALES OF ATTAINMENT, TEST I

<u>Permanent Students</u>		<u>In-transfer Students</u>	
<u>Student</u>	<u>T-Score</u>	<u>T-Score</u>	<u>Student</u>
F22	56.386	51.719	F12
M19	62.994	62.370	M7
M8	75.397	63.553	M12
F7	50.185	58.819	F16
F8	54.836	56.565	F17
F5	52.510	63.074	F18
M4	53.691	62.961	M16
M10	57.161	58.228	M14
M8	62.219	62.961	M3
F1	54.467	61.299	F9
F7	52.510	58.819	F9
F15	50.185	58.932	F19
M11	53.691	61.299	M5
F12	54.836	57.044	F6
F18	59.118	57.157	F12
M19	50.960	61.778	M2
F13	52.510	58.340	F2
M10	52.141	60.116	M3
M6	54.836	54.198	M18
M17	60.262	53.015	M1
M19	<u>76.541</u>	<u>64.258</u>	M4
MEAN	57.0208	59.3574	MEAN

TABLE X  
 COMPARISON OF T-SCORES  
 OF PERMANENT STUDENTS AND IN-TRANSFER STUDENTS  
 ACHIEVED IN SCIENCE  
 IN THE COORDINATED SCALES OF ATTAINMENT, TEST I

<u>Permanent Students</u>		<u>In-transfer Students</u>	
<u>Student</u>	<u>T-Score</u>	<u>T-Score</u>	<u>Student</u>
F22	56.057	60.792	F12
M19	60.743	65.182	M7
M8	58.343	59.338	M12
F7	60.743	58.689	F16
F8	57.543	56.741	F17
F5	50.343	67.935	F18
M4	60.743	57.390	M16
M10	56.057	63.884	M14
M8	52.743	56.092	M3
F1	50.457	50.247	F9
F7	57.543	54.793	F9
F15	54.343	55.597	F19
M11	54.343	54.793	M5
F12	61.657	55.442	F6
F18	52.743	53.494	F12
M19	57.657	60.142	M2
F13	56.057	50.402	F2
M10	55.143	52.195	M3
M6	57.543	57.545	M18
M17	64.857	66.636	M1
M19	80.057	69.233	M4
MEAN	55.3034	58.4077	MEAN

TABLE XI  
 COMPARISON OF T-SCORES  
 OF PERMANENT STUDENTS AND IN-TRANSFER STUDENTS  
 ACHIEVED IN LITERATURE  
 IN THE COORDINATED SCALES OF ATTAINMENT, TEST I

<u>Permanent Students</u>		<u>In-transfer Students</u>	
<u>Student</u>	<u>T-Score</u>	<u>T-Score</u>	<u>Student</u>
F22	58.827	55.823	F12
M19	62.485	64.860	M7
M8	52.729	50.201	M12
F7	60.656	60.643	F16
F8	59.466	55.020	F17
F5	50.929	56.827	F18
M4	59.437	61.245	M16
M10	52.149	60.643	M14
M8	62.485	69.679	M3
F1	60.656	52.610	F9
F7	60.046	54.619	F9
F15	61.266	52.209	F19
M11	54.588	51.406	M5
F12	59.466	52.209	F6
F18	53.368	51.004	F12
M19	55.807	56.225	M2
F13	64.344	64.659	F2
M10	61.905	57.430	M3
M6	55.168	53.815	M18
M17	69.222	62.249	M1
M19	62.515	72.490	M4
MEAN	58.9292	57.8984	MEAN

TABLE XII  
 COMPARISON OF T-SCORES  
 OF PERMANENT STUDENTS AND IN-TRANSFER STUDENTS  
 ACHIEVED IN COMPUTATION  
 IN THE COORDINATED SCALES OF ATTAINMENT, TEST I

<u>Permanent Students</u>		<u>In-transfer Students</u>	
<u>Student</u>	<u>T-Score</u>	<u>T-Score</u>	<u>Student</u>
F22	61.548	50.895	F12
M19	65.328	66.075	M7
M8	50.953	61.833	M12
F7	57.203	63.651	F16
F8	55.923	54.560	F17
F5	50.298	63.016	F18
M4	54.078	53.319	M16
M10	55.923	61.227	M14
M8	58.453	60.014	M3
F1	56.578	51.530	F9
F7	53.423	59.986	F9
F15	54.078	51.530	F19
M11	56.578	52.107	M5
F12	54.048	55.166	F6
F18	64.078	61.227	F12
M19	50.923	57.561	M2
F13	50.298	53.925	F2
M10	51.548	57.561	M3
M6	53.423	52.107	M18
M17	54.078	64.834	M1
M19	84.048	71.501	M4
MEAN	56.8004	58.2679	MEAN



TABLE XIII  
 COMPARISON OF T-SCORES  
 OF PERMANENT STUDENTS AND IN-TRANSFER STUDENTS  
 ACHIEVED IN PROBLEM REASONING  
 IN THE COORDINATED SCALES OF ATTAINMENT, TEST I

<u>Permanent Students</u>		<u>In-transfer Students</u>	
<u>Student</u>	<u>T-Score</u>	<u>T-Score</u>	<u>Student</u>
F22	52.831	50.993	F12
M19	65.351	66.185	M7
<b>M8</b>	62.554	66.185	M12
F7	54.929	54.528	F16
F8	58.425	63.731	F17
F5	59.757	<b>68.171</b>	F18
M4	62.554	54.528	M16
M10	52.064	66.185	M14
M8	59.757	54.528	M3
F1	56.327	51.607	F9
F7	55.628	54.674	F9
F15	54.929	60.196	F19
M11	65.351	54.061	M5
F12	57.027	55.142	F6
F18	56.260	55.288	F12
M19	57.659	55.901	M2
F13	51.365	53.447	F2
M10	61.222	58.355	M3
M6	65.719	56.369	M18
M17	52.132	57.128	M1
M19	<u>74.509</u>	<u>67.558</u>	M4
MEAN	58.8262	58.3219	MEAN

TABLE XIV

COMPARISON OF THE TOTAL TEST MEDIAN T-SCORES  
OF PERMANENT STUDENTS AND IN-TRANSFER STUDENTS  
ACHIEVED IN THE COORDINATED  
SCALES OF ATTAINMENT, TEST I

<u>Permanent Students</u>		<u>In-transfer Students</u>	
<u>Student</u>	<u>T-Score</u>	<u>T-Score</u>	<u>Student</u>
F22	57.547	51.729	F12
M19	63.640	66.080	M7
M8	59.403	61.970	M12
F7	60.250	55.806	F16
F8	55.852	57.176	F17
F5	50.767	55.427	F18
M4	60.250	60.600	M16
M10	55.852	64.710	M14
M3	62.792	60.600	M3
F1	56.013	50.326	F9
F7	55.165	55.121	F9
F15	50.767	55.838	F19
M11	60.250	53.099	M5
F12	55.852	53.751	F6
F18	58.555	50.326	F12
M19	51.614	57.208	M2
F13	53.309	53.783	F2
M10	53.309	58.578	M3
M6	53.309	54.468	M18
M17	61.784	65.427	M1
M19	<u>79.581</u>	<u>70.907</u>	M4
MEAN	57.8981	57.7586	MEAN

TABLE XV  
 COMPARISON OF T-SCORES  
 OF PERMANENT STUDENTS AND IN-TRANSFER STUDENTS  
 ACHIEVED IN SPELLING  
 IN THE COORDINATED SCALES OF ATTAINMENT, TEST II

<u>Permanent Students</u>		<u>In-transfer students</u>	
<u>Student</u>	<u>T-Score</u>	<u>T-Score</u>	<u>Student</u>
F22	54.322	52.402	F12
M19	61.971	66.561	M7
M8	61.971	60.367	M12
F7	59.193	54.678	F16
F8	59.193	56.827	F17
F5	50.860	53.793	F18
M4	50.165	66.561	M16
M10	56.085	63.907	M14
M8	51.224	50.253	M3
F1	59.193	52.023	F9
F7	51.554	63.907	F9
F15	50.165	58.217	F19
M11	54.001	52.023	M5
F12	66.501	56.448	F6
F18	57.804	50.253	F12
M19	56.085	52.023	M2
F13	53.633	52.908	F2
M10	51.918	56.448	M3
M6	59.193	52.023	M18
M17	76.918	71.492	M1
M19	66.501	67.952	M4
MEAN	57.5460	57.6698	MEAN

TABLE XVI  
 COMPARISON OF T-SCORES  
 OF PERMANENT STUDENTS AND IN-TRANSFER STUDENTS  
 ACHIEVED IN ENGLISH  
 IN THE COORDINATED SCALES OF ATTAINMENT, TEST II

<u>Permanent Students</u>		<u>In-transfer students</u>	
<u>Student</u>	<u>T-Score</u>	<u>T-Score</u>	<u>Student</u>
F22	59.702	64.059	F12
M19	58.098	53.175	M7
M8	55.959	59.297	M12
F7	54.355	56.349	F16
F8	51.681	57.937	F17
F5	50.611	61.111	F18
M4	52.216	66.100	M16
M10	68.105	53.175	M14
M8	52.597	51.587	M3
F1	50.458	55.896	F9
F7	52.750	55.215	F9
F15	52.216	51.134	F19
M11	52.216	52.494	M5
F12	62.376	53.855	F6
F18	61.306	59.070	F12
M19	50.458	71.995	M2
F13	50.611	54.989	F2
M10	55.271	57.030	M3
M6	53.285	60.658	M18
M17	56.341	71.315	M1
M19	84.148	50.454	M4
MEAN	56.4171	57.9474	MEAN

TABLE XVII  
 COMPARISON OF T-SCORES  
 OF PERMANENT STUDENTS AND IN-TRANSFER STUDENTS  
 ACHIEVED IN READING  
 IN THE COORDINATED SCALES OF ATTAINMENT, TEST II

<u>Permanent Students</u>		<u>In-transfer Students</u>	
<u>Student</u>	<u>T-Score</u>	<u>T-Score</u>	<u>Student</u>
F22	54.175	61.581	F12
M19	65.390	67.137	M7
M8	53.071	54.791	M12
F7	53.144	54.791	F16
F8	55.245	56.643	F17
F5	52.002	62.493	F18
M4	58.144	54.174	M16
M10	56.349	59.112	M14
M8	54.520	62.199	M3
F1	60.317	59.112	F9
F7	53.796	54.174	F9
F15	58.144	51.999	F19
M11	54.175	51.088	M5
F12	59.248	57.554	F6
F18	54.520	59.406	F12
M19	55.625	58.789	M2
F13	59.248	57.554	F2
M10	53.796	57.554	M3
M6	55.245	56.026	M18
M17	56.349	73.604	M1
M19	83.161	61.875	M4
MEAN	57.6507	58.6503	MEAN

TABLE XVIII  
 COMPARISON OF T-SCORES  
 OF PERMANENT STUDENTS AND IN-TRANSFER STUDENTS  
 ACHIEVED IN HISTORY  
 IN THE COORDINATED SCALES OF ATTAINMENT, TEST II

<u>Permanent Students</u>		<u>In-transfer Students</u>	
<u>Student</u>	<u>T-Score</u>	<u>T-Score</u>	<u>Student</u>
F22	60.766	50.708	F12
M19	60.973	64.168	M7
M8	62.712	62.515	M12
F7	51.201	57.556	F16
F8	62.712	53.188	F17
F5	50.054	58.973	F18
M4	63.582	61.688	M16
M10	59.897	57.556	M14
M8	56.625	63.341	M3
F1	56.625	53.424	F9
F7	53.147	60.862	F9
F15	51.408	55.667	F19
M11	50.033	50.945	M5
F12	61.636	55.667	F6
F18	53.625	53.188	F12
M19	62.505	52.597	M2
F13	63.375	58.146	F2
M10	63.582	53.188	M3
M6	50.033	53.188	M18
M17	60.766	72.196	M1
M19	67.723	70.543	M4
MEAN	53.3300	58.0621	MEAN

TABLE XIX  
 COMPARISON OF T-SCORES  
 OF PERMANENT STUDENTS AND IN-TRANSFER STUDENTS  
 ACHIEVED IN GEOGRAPHY  
 IN THE COORDINATED SCALES OF ATTAINMENT, TEST II

<u>Permanent Students</u>		<u>In-transfer Students</u>	
<u>Student</u>	<u>T-Score</u>	<u>T-Score</u>	<u>Student</u>
F22	53.094	52.614	F12
M19	59.463	59.679	M7
M8	57.552	57.505	M12
F7	56.278	57.505	F16
F8	58.826	53.157	F17
F5	53.276	50.647	F18
M4	57.552	65.657	M16
M10	59.645	60.223	M14
M8	63.922	59.679	M3
F1	57.552	54.788	F9
F7	53.913	57.505	F9
F15	54.368	58.256	F19
M11	55.187	53.701	M5
F12	69.199	65.321	F6
F18	59.463	51.191	F12
M19	58.371	53.701	M2
F13	55.187	57.712	F2
M10	61.556	67.495	M3
M17	52.002	68.038	M1
M19	<u>72.384</u>	<u>68.038</u>	M4
MEAN	58.6399	58.2569	MEAN

TABLE XX  
 COMPARISON OF T-SCORES  
 OF PERMANENT STUDENTS AND IN-TRANSFER STUDENTS  
 ACHIEVED IN SCIENCE  
 IN THE COORDINATED SCALES OF ATTAINMENT, TEST II

<u>Permanent Students</u>		<u>In-transfer Students</u>	
<u>Student</u>	<u>T-Score</u>	<u>T-Score</u>	<u>Student</u>
F22	54.628	53.411	F12
M19	64.387	62.870	M7
M8	57.344	58.140	M12
F7	53.923	50.644	F16
F8	60.261	52.671	F17
F5	59.557	64.157	F18
M4	60.161	62.870	M16
M10	53.119	60.167	M14
M8	55.936	65.573	M3
F1	61.570	53.411	F9
F7	56.036	56.113	F9
F15	61.570	60.103	F19
M11	55.936	57.465	M5
F12	61.670	56.725	F6
F18	62.978	56.113	F12
M19	60.966	64.157	M2
F13	58.853	54.698	M3
M6	57.344	53.411	M18
M17	50.030	72.265	M1
M19	<u>73.642</u>	<u>58.752</u>	M4
MEAN	58.6199	58.5281	MEAN



TABLE XXI  
 COMPARISON OF T-SCORES  
 OF PERMANENT STUDENTS AND IN-TRANSFER STUDENTS  
 ACHIEVED IN LITERATURE  
 IN THE COORDINATED SCALES OF ATTAINMENT, TEST II

<u>Permanent Students</u>		<u>In-transfer Students</u>	
<u>Student</u>	<u>T-Score</u>	<u>T-Score</u>	<u>Student</u>
F22	55.608	52.578	F12
M19	58.466	63.856	M7
M8	62.170	51.933	M12
F7	69.577	59.345	F16
F8	54.127	52.573	F17
F5	54.022	56.445	F18
M4	51.904	61.601	M16
M10	51.904	57.089	M14
M8	60.053	66.112	M3
F1	52.540	51.074	F9
F7	50.032	50.430	F9
F15	69.577	51.074	F19
M11	54.127	61.601	M5
F12	55.603	65.467	F6
F18	52.540	57.948	F12
M19	54.867	50.430	M2
F13	52.645	62.460	F2
M10	53.281	68.475	M3
M6	54.762	59.345	M18
M17	60.053	66.219	M1
M19	76.349	56.445	M4
MEAN	57.3434	58.2145	MEAN

TABLE XXII  
 COMPARISON OF T-SCORES  
 OF PERMANENT STUDENTS AND IN-TRANSFER STUDENTS  
 ACHIEVED IN COMPUTATION  
 IN THE COORDINATED SCALES OF ATTAINMENT, TEST II

<u>Permanent Students</u>		<u>In-transfer Students</u>	
<u>Student</u>	<u>T-Score</u>	<u>T-Score</u>	<u>Student</u>
F22	57.184	50.761	F12
M19	74.713	68.684	M7
M8	66.092	73.545	M12
F7	51.437	55.622	F16
F8	52.299	61.739	F17
F5	56.322	57.705	F18
M4	50.287	53.406	M16
M10	58.908	55.489	M14
M8	51.437	60.351	M3
F1	51.437	50.761	F9
F7	58.334	57.011	F9
F15	55.460	52.844	F19
M11	53.161	50.066	M5
F12	51.199	57.573	F6
F18	60.920	50.628	F12
M19	51.149	62.566	M2
F13	52.873	55.622	F2
M10	50.575	55.622	M3
M6	54.597	52.149	M18
M17	54.597	63.955	M1
M19	77.873	66.733	M4
MEAN	56.7050	57.7539	MEAN

TABLE XXIII  
 COMPARISON OF T-SCORES  
 OF PERMANENT STUDENTS AND IN-TRANSFER STUDENTS  
 ACHIEVED IN PROBLEM REASONING  
 IN THE COORDINATED SCALES OF ATTAINMENT, TEST II

<u>Permanent Students</u>		<u>In-transfer Students</u>	
<u>Student</u>	<u>T-Score</u>	<u>T-Score</u>	<u>Student</u>
F22	51.287	50.055	F12
M19	63.900	60.460	M7
M8	51.287	66.240	M12
F7	54.891	53.523	F16
F8	53.217	61.038	F17
F5	55.019	64.974	F18
M4	58.495	53.523	M16
M10	54.118	59.304	M14
M8	58.495	62.772	M3
F1	54.118	51.211	F9
F7	55.019	51.679	F9
F15	51.287	53.038	F19
M11	60.296	58.038	M5
F12	64.028	62.772	F6
F18	72.909	54.679	F12
M19	55.019	60.928	M2
F13	51.287	71.910	F2
M10	60.424	58.616	M3
M6	51.287	52.367	M18
M17	51.287	55.725	M1
M19	<u>75.740</u>	<u>58.038</u>	M4
MEAN	57.3052	58.3757	MEAN

TABLE XXIV

COMPARISON OF THE TOTAL TEST MEDIAN T-SCORES  
OF PERMANENT STUDENTS AND IN-TRANSFER STUDENTS  
ACHIEVED IN THE COORDINATED  
SCALES OF ATTAINMENT, TEST II

<u>Permanent Students</u>		<u>In-transfer Students</u>	
<u>Student</u>	<u>T-Score</u>	<u>T-Score</u>	<u>Student</u>
F22	52.293	53.708	F12
M19	65.300	65.183	M7
M8	61.596	59.446	M12
F7	56.967	53.708	F16
F8	54.189	57.806	F17
F5	51.367	62.685	F18
M4	58.819	65.183	M16
M10	58.774	61.905	M14
M8	55.115	61.085	M3
F1	55.115	53.708	F9
F7	51.411	56.987	F9
F15	54.189	53.587	F19
M11	52.293	52.069	M5
F12	51.552	58.587	F6
F18	59.744	55.308	F12
M19	55.070	60.226	M2
F13	55.996	58.587	F2
M10	52.293	58.587	M3
M6	56.967	53.708	M18
M17	57.848	67.603	M1
M19	81.922	64.325	M4
MEAN	57.5629	58.9996	MEAN