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A STUDY OF THE EFFECT OF ATTENDANCE ON ACHIEVEMENT  
OF SELECTED STUDENTS IN A THREE YEAR JUNIOR HIGH SCHOOL

by

William T. Cullen, Jr.

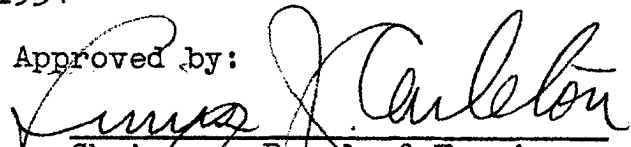
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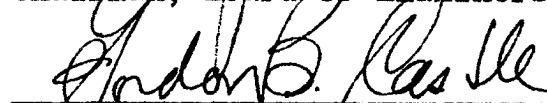
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Master of Education

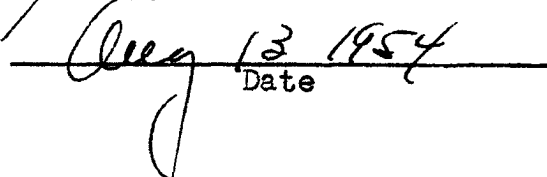
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## Chapter I

### THE PROBLEM AND DEFINITIONS OF TERMS USED

A problem that every teacher and administrator must face is what can and should be done about absences. Gruhn and Douglass say:

Today it is believed that the educational growth of the child in all respects--mental, physical, emotional, moral, and personal--is the concern of the teacher. Furthermore, the teacher is expected to share the responsibility for whatever success or failure the child experiences in his educational program.<sup>1</sup>

The teacher, being held responsible for the entire educational growth of the child, is concerned with absences from the standpoint of "mental, physical, emotional, moral, and personal" effects on the child. He is also confronted with the kind, amount, and effect of make-up work. The administrator is concerned with the cause of absences, truancy, remedies, and records. Since most parents and taxpayers rank academic achievement as the first, if not the only, educational benefit derived from schooling, the question of the effect of absences on academic achievement is worth considering.

#### I. THE PROBLEM

Statement of the problem. The problem with which this study was concerned was to determine the effect of daily

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<sup>1</sup> W. T. Gruhn and H. R. Douglass, The Modern Junior High School (New York: Ronald Press Company, 1947), pp. 381-382.

attendance on academic achievement of selected students in a three-year junior high school employing a general education program.

Delimitations of the study. This study was confined to West Junior High School in Great Falls, Montana. The students involved consisted of the students graduating from this school in the class of "54" who had spent their seventh, eighth, and ninth years of schooling in West Junior High School. Such a limitation of students insured similar, complete, and adequate records for making the study.

Importance of the problem. A common criticism of the public schools has been the lack of academic achievement, particularly in the basic skills. "One of the most frequent charges made against our schools is that today they are no longer teaching fundamentals."<sup>2</sup> In spite of the fact that academic achievement in this school was already above the national norm, it was the primary objective of the school to raise the achievement even higher. If improving attendance would result in raising the academic achievement of the child, an effort in this direction should not be overlooked.

Non-attendance constitutes one of our greatest educational wastes. In the schools of the nation approximately fifteen per cent of the desks and other pupil stations are unoccupied daily. The large financial waste which results from this non-attendance becomes evident when it is realized that the cost of running

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<sup>2</sup> Lyle M. Spencer, "Are We Teaching Only Frills?," Guidance Newsletter, April, 1954, p. 2.



the school is practically the same whether the pupils are in attendance or not.

The greatest loss, however, is not the financial loss to the public. The largest waste is the educational loss to the pupil. A frequent result of non-attendance is pupil failure.<sup>3</sup>

Locale of the study. West Junior High School is located on the west side of Great Falls, Montana. The school, at the time this study was made, drew its students from those homes that were situated on the west side of the Missouri River which flows north bisecting the city. The students came from families which represented practically all the socio-economic groups. They ranged from families living in the Meadow Lark Country Club Addition, which was a restricted building area of fifteen-thousand dollar homes, to the Indian hovels on Hill 57 where entire families lived in one room shacks without the conveniences of running water or electricity. However, the overwhelming number came from the working class of people, "mechanic" being most often mentioned on registration cards as the father's occupation. Most of the families were employed by the Anaconda Copper Mining Company or the Great Northern Railway. Some students were also bussed in from the outlying farm districts.

In this modern day of short working hours and more leisure time it has become the practice of many industries to grant their employees winter vacations. Farming, by the

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<sup>3</sup> Ward G. Reeder, The Fundamentals of Public School Administration (New York: Macmillan Company, 1951), p. 457.

very nature of the industry, is seasonal. Modern transportation has encouraged many farming families to spend a portion of the slack winter months in a warmer climate. An increase in the amount of leisure time that is now available to the working class of people has caused a great increase in recent years of the number of hunting and fishing licenses sold in this state. The emphasis on interscholastic athletics and the distances between towns is another form of recreation that takes people out of the city.

Consequently, many parents requested from the principal excused absences for their children to go on hunting trips, to athletic games and tournaments, or south for a few weeks in the winter. In order to grant intelligently such requests, the principal should have some information as to what type of student, if any, can be absent without affecting achievement, and at what point absences tend to have a negative effect on achievement. He should also have some guide for expending administrative time and effort in keeping up attendance.

The teacher must also have some reliable information so he can intelligently assign and evaluate make-up work in such a way that the extra burden upon the pupil will not have a negative effect and cause him to dislike his school work.

Reeder points out that:

The chief responsibility for securing regular attendance devolves upon the teacher. The teacher is in closer contact with the pupil, and he should therefore know more about the pupil's case than any other person.

The chief responsibility of the teacher for securing excellent attendance is to keep the pupil interested in his school work with the end in view that he will not wish to miss a day of school unless the absence is unavoidable.<sup>4</sup>

Purpose of the study. The purposes of this study were: (1) to determine the effect of absences on academic achievement; (2) to ascertain at what point absences tend to have a negative effect on achievement; (3) to determine the difference in attendance of the top students in achievement with the lower students in achievement; and (4) to suggest what steps can and should be taken to improve achievement with reference to attendance.

## II. DEFINITIONS OF TERMS USED

Academic achievement. Academic achievement is interpreted as comprehensive and detailed knowledge in the common subject fields of language arts, social studies, mathematics, and science as measured by the Stanford Achievement Tests.

### Selected three-year junior high school students.

This term is interpreted as those students who had spent their seventh, eighth, and ninth years of schooling in West Junior High School in Great Falls, Montana. Such a selection was made in order to insure similar, complete, and adequate records for making the study.

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<sup>4</sup> Ibid., p. 457.

General education program. As yet there seems to be no universal agreement as to what general education means. There is, however, increasing agreement among educators as to what constitutes a general education program.<sup>5</sup> It is here interpreted as a program organized around fields of knowledge, in which the material is drawn from all fields and correlated at every feasible point to emphasize relationships and promote meaningful generalizations, consistent attitudes, and critical appreciations.<sup>6</sup> The goal is the preparation of youth to deal with personal and social problems facing all people in a democratic society.<sup>7</sup> "One may conclude that general education should be thought of in terms of outcomes rather than in terms of courses."<sup>8</sup>

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<sup>5</sup> T. R. McConnell, "General Education," Fifty-first Yearbook of the National Society for the Study of Education, Part I, (Chicago: University of Chicago Press, 1952), pp. 3-4.

<sup>6</sup> Ibid., p. 7.

<sup>7</sup> Ibid., p. 4.

<sup>8</sup> Ibid., p. 10.

## Chapter II

### REVIEW OF RELATED LITERATURE

The problem of absenteeism in the schools has been one of which educators have been cognizant for many years. Much has been written on the causes of absences, methods of checking attendance, methods of improving attendance, and the responsibility for school attendance. Since many schools receive funds based on average daily attendance, the problem becomes financial for many administrators. Consequently, much attention has been devoted to it. Many statements have been made about attendance; its legal, sociological, and economic aspects and the effect on the academic achievement of the child. Although there are many opinions and observations of administrators which are well worth considering, the extensive scientific studies concerning the relationship between achievement and attendance are few.<sup>1</sup>

#### I. OPINIONS AND OBSERVATIONS OF ADMINISTRATORS

Raymond Peterson states:

The very existence of individual public schools, in fact of entire school districts, depends entirely upon pupil attendance. Non-attendance is a practical problem that confronts nearly all teachers, supervisors, and administrators. Not only do absentees interfere with regular progress in class work but they achieve less, lose interest, become discouraged, and sometimes become retarded and drop out of school.

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<sup>1</sup> Roy Everett Kyle, "A Case Study of Failures in High School," (Master's thesis, Peabody College for Teachers, Nashville, Tennessee, 1931), p. 14.

Besides the legal and sociological aspects of attendance there is another important phase, the economic loss of non-attendance. Teachers' salaries and administrative expenses go on regardless of absentees. School districts are allocated certain funds based on average daily attendance.<sup>2</sup>

Peterson goes on to list the causes of non-attendance ranking slow progress or lack of achievement seventh.

Common causes for non-attendance are:

- (1.) illness-pupil or member of family
- (2.) dissatisfaction with the school program
- (3.) dislike of individual teachers
- (4.) death in the immediate family
- (5.) broken homes
- (6.) inadequate family income, requiring pupil to work
- (7.) slow progress in school
- (8.) undesirable companions

Teachers and administrators must recognize these causes and take necessary steps to remove them. Recent studies indicating causes for non-attendance additionally denote that:

- (1.) intelligence was not a factor in non-attendance
- (2.) illness was the greatest cause of non-attendance.
- (3.) non-attendance tended to increase with age
- (4.) some months of the year had fewer absences in various locations because of the nature of employment or climatic conditions
- (5.) non-attendance affected the marks of subject achievement
- (6.) there was a difference in the attendance records of pupils of different nationalities
- (7.) the only recommendation for the improvement of the situation, which had really been used to advantage, was the case method of individual adjustment<sup>3</sup>

L. E. Goeden points to the philosophy of non-attendance which implies that students must be present in order to

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<sup>2</sup> Raymond Peterson, "The Administration of Attendance," National Association of Secondary School Principals' Bulletin, 29:105-106, April, 1945.

<sup>3</sup> Ibid., p. 106.

attain an educated status.

"It doesn't matter how fine the curriculum nor how good the teaching staff; if Mary and Jim aren't in school they can't be educated." That is the philosophy at Washington High School, Milwaukee, Wisconsin.<sup>4</sup>

F. B. Dixon puts it this way:

The importance of being in class each day was emphasized recently by a group of teachers working on our Virginia state course of study, by the following quotation: "Missing a lesson is like missing a meal," and others say, "It's worse than that; it's like missing two or three meals."

I am attempting to point up a serious problem facing secondary schools throughout the country. We have so many fine organizations which carry on programs conflicting with class instruction that I am convinced we have too much education in absentia.<sup>5</sup>

The Advisory Education Group of the Metropolitan Insurance Company states that:

The great number of absences is a matter of concern to the parents, to the school administrator, to the teacher--to all who are interested in, and work with, children. All strive together not for record school attendance but for the optimum in student health and happiness which will be reflected in better attendance.

The major causes of absences found in one study of approximately 8,000 pupils were as follows; respiratory diseases, 46 per cent; other communicable diseases, 13 per cent; digestive disturbances, 6 per cent; skin conditions, 5 per cent; injuries, 3 per cent; other medical causes, 14 per cent; non-medical causes, 13 per cent.....

John played truant. Mary's mother kept her home to tend the baby. Phyllis stayed home because her cat was having kittens. George spent a week traveling with his

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<sup>4</sup> L. E. Goeden, "Attendance Is a Philosophy," National Association of Secondary School Principals' Bulletin, 38:80, February, 1954.

<sup>5</sup> F. B. Dixon, "Education in Absentia," School Activities, 23:61, October, 1951.

mother and father. What can we do, or what should we do, about such absences? If absences are the result of social problems, it usually isn't possible for a teacher alone to do much toward solving them. However, it is a responsibility of the school to do what it can in this area in cooperation with the family and with suitable community agencies.<sup>6</sup>

Cubberly points out the negative influence that absences create in the entire school:

The increased regularity of attendance of children enrolled is of itself an important item, as studies have shown a close correlation between retardation and dropping from school on the one hand, and irregular attendance on the other.

Because irregular attendance is such an important cause of retardation and ultimate elimination from school, because the irregular pupil becomes such a drag on the class on account of what he has missed, and because truancy and tardiness are bad habits that tend to undermine the discipline and morale of a school, it is important that the principal give careful attention to the matter of attendance.<sup>7</sup>

Strayer and Englehardt say:

It is very conceivable that differences which may exist in the achievement of children may be attributed in part to the amount of instruction the children have expressed in terms of the number of days school has been attended. The child who for any reason is absent from school 10, 20, 30, or more days of a school year of 200 days, gives his classmates a handicap which can be overcome only with great difficulty. Upon the classroom teacher devolves the duty of sympathetic and constant cooperation with the attendance officers and attendance department, to the end that absence from school will be reduced to a minimum. The wise teacher will develop, on the part of his pupils, an esprit-de-corps which will

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<sup>6</sup> Advisory Group of Metropolitan Insurance Company, "Absent From School Today," Understanding the Child, 19:37-9, April, 1950.

<sup>7</sup> Ellwood P. Cubberly, Public School Administration (New York: Houghton Mifflin Company, 1929), p. 588.



constantly contend for a perfect attendance record.<sup>8</sup>

Woodrow contends that:

The importance of regular attendance is emphasized by all pedagogical retardation. It is obvious that failure to attend school means failure to benefit by the instruction given therein. We do not need statistics to prove that absence from school is an important cause of failure and pedagogical retardation.<sup>9</sup>

## II. SCIENTIFIC STUDIES

Some studies have been made to determine what causes students to do failing work in school. F. C. Borgeson<sup>10</sup> asked over one thousand elementary and secondary school pupils the following question: "What do you consider the causes of failure and poor school work?"

In this group of 1,056 students 440 were junior high school students. Irregular attendance was mentioned by this group of junior high students 86 times and ranked 9th in the causes given for poor work. Lack of attention appears far more frequently than any other factor in the junior high school class.

Margaret M. Walker<sup>11</sup> says in reference to Borgeson's

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<sup>8</sup> George D. Strayer and N. S. Endlehardt, The Classroom Teacher (New York: American Book Company, 1920), pp. 169-170.

<sup>9</sup> Herbert Woodrow, Brightness and Dullness in Children (Philadelphia: J. B. Lippincott and Company, 1919), p. 136.

<sup>10</sup> F. C. Borgeson, "Causes of Failure and Poor School Work Given by Pupil," Education Administration and Supervision, 16:542-48, October, 1930.

<sup>11</sup> Margaret M. Walker, A Study of High School Failures (Scottsdale, Pa.: Mennonite Press, 1935), p. 11.

study:

A somewhat similar study was made in North Fort Worth, Texas, High School where two hundred pupils, who had failed in one or more subjects, were asked to check the causes of failure, while their teachers were asked to do the same. It is interesting to note that both teachers and pupils gave lack of study as the greatest cause.

The following table gives the most important causes listed:

Causes	Pupils	Teachers
(1.) little study in general	70	63
(2.) dislike of subject	73	--
(3.) discouraged	66	--
(4.) previous failure	--	78
(5.) poor effort	58	50
(6.) lack of home study	58	37
(7.) irregular attendance	39	84
(8.) dislike teacher	58	--
(9.) mentally slow	--	58

In this study teachers mention irregular attendance more than twice as often as do the pupils. As in Borgeson's study this bears out the same idea, that pupils do not rank attendance as a very important factor in school success. This would seem to indicate that teachers consider regular attendance a much more important cause of failure than does the pupil.

William C. Coleman<sup>12</sup> in his thesis, "A Job Analysis of the Causes of School Failure," took the various articles dealing with school failures and made a summary of causes listed according to the frequency with which they occur. Some of the conclusions he arrived at are as follows:

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<sup>12</sup> Margaret M. Walker, A Study of High School Failures (Scottsdale, Pa.: Mennonite Press, 1935), p. 12 citing W. C. Coleman, A Job Analysis of the Causes of Failure, Master's thesis, Ohio State University, 1929.

(1.) nearly all cases of habitual failure will be found among the failures of academic subjects

(2.) absence is an important factor causing failure; failing students are absent four times as frequently as passing students

(3.) girls show greater achievement than boys in both failing and passing groups

(4.) failing students lack the motive of a strong vocational objective

(5.) failing students seem to suffer from self-consciousness in recitation and nervousness in exams

(6.) failing students are probably poor readers

Kyle's<sup>13</sup> thesis concludes that low intelligence is the chief cause of failure. He also mentions environment, physical defects, irregular attendance, and poor reading ability as other causes.

Helen Francis Keefe<sup>14</sup> has made a study of failures in grade ten and lists the following specific causes:

(1.) lack of preparation and application

(2.) absence

(3.) lack of study and poor study habits

(4.) home conditions

(5.) pupil-teacher attitude

(6.) physical defects

The following is from G. E. Anspaugh:

Selected pupils from the successive graduating classes during four years at Sullivan High School in Chicago were given a questionnaire in an effort to determine the qualities and activities which distinguish the best graduating students from those who received the lowest marks. About 1,100 students were included in these eight classes, and the questionnaire was filled in by the top-ranking 15 per cent and by the bottom-ranking 15 per cent of each class. Thus about 165 superior students and 165 inferior

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<sup>13</sup> Roy Everett Kyle, "A Case Study of Failures in High School," (Master's thesis, Peabody College for Teachers, Nashville, Tennessee, 1931), p. 85.

<sup>14</sup> Margaret M. Walker, A Study of High School Failures (Scottdale, Pa.: Menmonite Press, 1935), p. 14 citing H. F. Keefe, A Study of the Causes of Failure With Reference to Grade 10, Master's thesis, Boston University, 1932.

students were considered in the study.

Absence from school On the average the top 15 per cent of the graduates of the 8 classes studied had been absent from school only about one-fourth as many days as had those in the lowest 15 per cent. Such a result would be expected by all teachers. It should be pointed out, however, that influences other than the fact of absence itself have weight in this connection. Ill health often causes both absence and poor marks; parental indifference might be a common cause of both; and the necessity to earn money might contribute to both absence and poor marks.

Conclusions It seems highly probable that possessing high intelligence, giving extensive service, attending school regularly, restricting dating to eight or ten times a month, not working for pay more than ten hours a week, and engaging in considerable amount of regular homework are conditions having rather high correlations with school marks.

If teachers will adapt their assignments and individual teaching techniques to the intelligence of their pupils, if an extensive school service is provided, if regular attendance is insisted on, if too frequent dating is prevented, if adequate homework is secured, and if excessive working on out-of-school jobs is denied it would appear that the school and the school community will have provided optimum conditions for good school work.<sup>15</sup>

Rowland<sup>16</sup> made a study of fifty failing pupils and compared them with fifty passing pupils. For the promoted pupil he found the following correlations between:

achievement and intelligence	.556 ± .06
attendance and intelligence	.167 ± .09
teachers' marks and intelligence	.791 ± .063
teachers' marks and achievement	.757 ± .042
attendance and achievement	.243 ± .09
attendance and teachers' marks	.283 ± .08

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<sup>15</sup> G. E. Anspaugh, "Qualities Related to High Scholarship in Secondary School," The School Review, 61:337-40, September, 1953.

<sup>16</sup> Henry I. Rowland, "A Study of Failures in Selby County, Tennessee High Schools," (Master's thesis, Peabody College for Teachers, Nashville, Tennessee, 1930), p. 41.

For the failing pupils he found the following coefficients of correlation:

achievement and intelligence	.480 ± .073
attendance and intelligence	-.027 ± .094
teachers' marks and intelligence	.366 ± .083
teachers' marks and achievement	.422 ± .078
attendance and achievement	.029 ± .09
attendance and teachers' marks	.259 ± .09

Rowland found forty-five of the promoted pupils and forty-four of the failures attended school 160 days or more during the school year and that three of the failures were present only 118, 89, and 43 days respectively. He also found the difference between the mean number of days present of the promoted pupils and the corresponding mean of failures to be  $5.5 \pm 1.13$ . Rowland concluded that poor attendance was a factor influencing failure.

Ziegler<sup>17</sup> made a study of 307 pupils in grade 7B of one junior high school in a specific city, using school marks, physical environment, economic status of parents, and distance from school. He found the correlation between school attendance and school marks to be .134. He concluded:

Similar results might be obtained in other communities only under conditions similar to those in that city and school system. Even if conditions differ widely, however, the results should be valuable for purposes of comparison.

All the statistics in regard to school attendance of pupils in grade 7B show a low, positive correlation between school attendance and other elements entering into the lives of these pupils.

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<sup>17</sup> Carl W. Ziegler, Attendance as a Factor in School Progress (New York: Teachers' College, Columbia University, 1928), pp. 37-8.

Although absences are not cited as the only or the most important cause of failure in school work, one would conclude from this survey of related studies that there would be some correlation between achievement and attendance. One would also expect to find that the failing student would be absent much more than the passing student. Intelligence would be expected to have a high correlation with academic success, though it might have little or no correlation with attendance.

Attendance at West Junior High School is not a serious problem; although it is recognized that attendance at this level is probably more of a problem than anywhere in the educational ladder. As Ethel Hembree states it:

The Junior High Schools probably have to deal with this problem more than other schools. The boys and girls are beginning to mature and are growing restless. Many who have been retarded are nearing their sixteenth birthday. Those who have been forced to go through elementary school now find various ways to dodge the classroom.<sup>18</sup>

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<sup>18</sup> Ethel Hembree, "Reducing Absences 30 Per Cent," The Clearing House, September, 1949, p. 8.

## Chapter III

### PRESENTATION AND INTERPRETATION OF DATA

#### I. PROCEDURE

Selecting the students. In conducting this study the seventy-eight students from the graduating class of 1954, who had spent their entire seventh, eighth, and ninth years of schooling in West Junior High School, were selected. This was done in order to secure students who had similar educational opportunities through their junior high school years and on whom similar records and tests would be available.

Determining the I.Q.'s. Since it was realized that the I.Q. would be a factor in achievement, the first step was to determine the I.Q. of the subjects. As part of the testing program at West Junior High School, these students were given the Terman-McNemar Intelligence Test,<sup>1</sup> form C, when they entered the school in the seventh grade. They were also given the Otis Mental Aptitude Test,<sup>2</sup> form B, in April of their ninth grade year. The average of these two test scores was used as it was felt that this would represent a reasonably valid I.Q. of the individual over the period of these three years of schooling.

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<sup>1</sup> Terman-McNemar Intelligence Test, Lewis Terman, Quinn McNemar, World Book Company, Yonkers-on-Hudson, New York, and Chicago, Illinois.

<sup>2</sup> Otis Quick-Scoring Mental Ability Test, Arthur S. Otis, World Book Company, Yonkers-on-Hudson, New York and Chicago, Illinois.

Determining achievement. Achievement was measured, first of all, by grades. As West Junior High School afforded some selectivity on the part of the students as to subjects taken, it was decided, for the sake of uniformity, to consider only those grades received in the required subject fields of language arts, social studies, and mathematics. It might be pointed out that all students took algebra in their ninth year. The alphabetical grades were given a numerical equivalent, A being equal to 1, B-2, C-3, D-4, F-5, and the grade average determined for each pupil for each year.

Because grades, being subject to the whim of the teacher, the personality of the child, and many other outside influences, are not an entirely valid measure of achievement, the scores on the Stanford Achievement Tests<sup>3</sup> were also used. The Stanford Achievement Tests were given in the ninth month of the eighth and ninth years of schooling, form J being used one year and form K the next. No test was given the seventh year as this was the first year the school was in operation and the testing program had not been established. The scores on the Stanford Achievement Tests are interpreted in grade equivalents. The percentile rank and age equivalent are figured from the grade equivalent. The grade equivalent was therefore used as the measure of achievement, thus eliminating further figuring and the possibility of further errors. The

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<sup>3</sup> Stanford Achievement Test, Truman Kelly, Richard Madden, Eric Gardener, Lewis Terman, Giles Ruch, World Book Company, Yonkers-on-Hudson, New York and Chicago, Illinois.



battery median for the test was used. This test covers the areas of (1.) paragraph meaning; (2.) word meaning (the combination of the preceding two gives the reading level); (3.) spelling; (4.) language; (5.) arithmetic reasoning; (6.) arithmetic computation (the combination of the preceding two gives the mathematical ability); (7.) science; and (8.) study skills.

Determining absences. The number of days that the pupil was absent was taken from the attendance files in the principal's office. The number of days absent for each year was given for every pupil, and these were added together, giving the total number of days the student was absent during his junior high school career.

Grouping the data. In order to determine the top fifteen per cent of the group, the results of the ninth year Stanford Achievement Test were used. It was felt that, since this test was given just a week before the students terminated their junior high school careers, it was the most valid measure of their maximum achievement in West Junior High School. These grades were arranged from the highest to the lowest, followed by their I.Q.'s and total number of days absent. (See Table I, p. 20). The top twelve students were taken to represent the top fifteen per cent of the class, the bottom twelve, the lower fifteen per cent. The number of days absent for each of these students was totaled and an average number of days absent for each group determined. The dif-

TABLE I

CASES LISTED ACCORDING TO STANFORD ACHIEVEMENT TEST SCORES SHOWING  
I.Q. AND DAYS ABSENT IN WEST JUNIOR HIGH SCHOOL

Cases above national norm			Cases below national norm				
Grade equiv.	I.Q.	Absence	Grade equiv.	I.Q.	Absence		
1.	12.3	123	18.0	45.	9.8	113	#14.5
2.	12.2	129.5	6.5	46.	9.8	113	28.0
3.	12.0	126	14.0	47.	9.8	96.5	54.0**
4.	11.9	123.5	30.0**	48.	9.6	100.5	28.5
5.	11.9	115.5	47.0**	49.	9.6	104.5	19.5
6.	11.9	111.5	1.0*	50.	9.5	109	3.5*
7.	11.8	124.5	39.5**	51.	9.5	102.5	# 2.5*
8.	11.8	111.5	19.5	52.	9.4	105.5	16.5
9.	11.6	115.5	29.5	53.	9.3	105	12.5
10.	11.6	107.5	33.0**	54.	9.3	92.5	19.0
11.	11.4	114	43.0**	55.	9.1	106	28.0
12.	11.4	119.5	12.5	56.	9.1	103	6.0
13.	11.3	116.5	14.0	57.	9.1	97	5.0
14.	11.3	113.5	2.0*	58.	8.7	103.5	9.5
15.	11.3	118	7.0	59.	8.7	101.5	17.0
16.	11.3	110	6.5	60.	8.5	98.5	8.5
17.	11.2	119	3.5*	61.	8.5	100	3.0*
18.	11.2	109	11.5	62.	8.5	93.5	#15.5
19.	11.2	109	0.0*	63.	8.4	101	14.0
20.	11.2	106.5	29.5	64.	8.4	95.5	#49.5**
21.	11.0	110.5	4.0	65.	8.1	98.5	11.5
22.	11.0	105	5.5	66.	7.9	94	12.5
23.	11.0	101.5	0.0*	67.	7.8	76.5	# 1.0*
24.	10.9	113	46.5**	68.	7.6	87	4.0
25.	10.8	111	12.5	69.	7.6	104	#14.5
26.	10.8	111.5	7.5	70.	7.4	87	27.0
27.	10.7	116.5	36.0**	71.	7.1	89.5	#14.5
28.	10.7	115	16.0	72.	7.1	97	#56.0**
29.	10.7	109.5	5.0	73.	6.8	88.5	25.0
30.	10.7	109	1.5*	74.	6.6	87	# 4.5
31.	10.7	103.5	85.5**	75.	6.3	90	6.0
32.	10.6	100.5	9.0	76.	5.8	80	#15.5
33.	10.5	118	24.5	77.	5.6	85	# 4.0
34.	10.5	111	2.5*	78.	5.2	77.5	#14.0
35.	10.4	103.5	3.0*				
36.	10.4	96.5	10.5				
37.	10.3	116	#21.5				
38.	10.2	99.5	8.5				
39.	10.1	115	24.0				
40.	10.1	108	23.0				
41.	10.1	95	40.0**				
42.	10.1	105	29.5				
43.	10.0	104.5	17.5				
44.	10.0	112	10.0				

\* indicates fifteen per cent absent the least

\*\* indicates fifteen per cent absent the most

# indicates students who failed in one or more subjects

ference between the mean number of days absent for these two groups was 9.00.

Examination of grades indicated that, of this group of seventy-eight students, thirteen students had failed in one or more subjects over the three year period. The number of days these failing students were absent over the three year course was also totaled and an average determined. The same was done for the non-failing students. The average number of days absent for each group is shown in Table II.

TABLE II  
AVERAGE ANNUAL NUMBER DAYS ABSENCE FOR VARIOUS GROUPS

Groups	Averages
All students in the study	17.63
Top fifteen per cent of the cases	24.46
Bottom fifteen per cent of the cases	15.46
Students who received failing marks	17.46
Students who received passing marks	17.67

It might also be mentioned that the fifteen per cent of the students who were absent the most had an achievement average on the Stanford Test of 10.5 while the average or national norm is 9.9; the average I.Q. of this group was 108.5.

Correlating achievement and absences. In order to determine the effect of absences upon achievement the first step was to divide the students into groups according to I.Q. scores. The averages of the two I.Q. test scores ranged from 129.5 to 76.5. These scores were placed in four groupings.

The first group contained those scores ranging from 76.5 through 97, the second from 93.5 through 105, the third from 105.5 through 113, and the fourth from 113.5 through 129.5. This grouping put nineteen in group one, twenty in group two, twenty in group three, and nineteen in group four.

The next step was to determine the correlation between achievement and days absent in the four groups.

C. W. Odell defines correlation in this manner:

Correlation may be defined as the amount of relationship between paired facts or of the tendency of two or more variables, or attributes, to concomitant variation. To study and find it we must have available two measures of each of a number of individuals.<sup>4</sup>

In this case the two measures of the individual are his achievement measured by grades or by scores on the Stanford Achievement Test and his attendance measured by the number of days he was absent from school.

Odell goes on to say:

The coefficient of correlation, often called the product-moment coefficient, is the most commonly used measure of relationship. It is a measure of straight-line relationship of variables, ranging in value from -1.00 for perfect negative relationship through 0.00 for none or pure chance to +1.00 for perfect positive. If each measure in one series is connected with the corresponding one in the other by a uniform first-degree algebraic equation, the coefficient of correlation between the two series is 1.00, + or - according to whether the two series increase together or one increases as the other decreases. Another way of stating this is that two series of data correlate perfectly whenever each item in one can be obtained from the corresponding item in the other by adding or subtracting the same amount, multiplying,

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<sup>4</sup> C. E. Odell, An Introduction to Educational Statistics (New York: Prentice-Hall Inc., 1946), p. 104.

or dividing by the same factor, or any combination thereof, throughout the series.<sup>5</sup>

The method of arriving at the coefficient of correlation was by rank correlation. Odell has this to say about rank correlation:

Rank correlation has been suggested as an easier means of measuring and expressing the relationship between two variables than is product-moment correlation.

In general, rank correlation may be considered an easy approximate method to be employed when the number of cases is so small that the slight difference in reliability between it and product-moment correlation is so much less than the unreliability due to the small number of cases as to be negligible. If the shape of a distribution is rectangular or approximately so, rank correlation is generally the better measure of the relationship existing.

In computing coefficients of rank correlation the better but more difficult method employs the formula  $\rho = 1 - 6\sum D^2 / N(N^2 - 1)$ , in which (Rho) is the coefficient of rank correlation and D the difference in rank, whether positive or negative. The values obtained for  $\rho$  range from +1.00 down to -1.00 and generally are close to those of product-moment  $r$  for the same data.<sup>6</sup>

The formula mentioned by Odell was used and the value of  $\frac{6}{N(N^2 - 1)}$  was taken from his Table XXVII on page 164 of his book.<sup>7</sup> From this formula the coefficient of correlation of achievement and absences was figured for each group for grades seven, eight, and nine using grades as the measure of achievement.

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<sup>5</sup> Ibid., p. 105.

<sup>6</sup> Ibid., pp. 160-62.

<sup>7</sup> Ibid., p. 164.

TABLE III  
RANK SCALE CORRELATION BETWEEN GRADES AND ABSENCES

Group*	Grade 7	Grade 8	Grade 9
1	+ .11	-.24	+ .36
2	-.13	-.20	+ .10
3	+ .25	+ .42	+ .44**
4	-.19	+ .26	+ .61**

\*Group 1 I.Q. scores from 76.5- 97  
 Group 2 I.Q. scores from 98.5-105  
 Group 3 I.Q. scores from 105.5-113  
 Group 4 I.Q. scores from 113.5-129.5

\*\*Reliability significant at the .05 level

The coefficient of correlation was also figured for each group for grades eight and nine using the Stanford Achievement Tests as the measure of achievement.

TABLE IV  
RANK SCALE CORRELATION BETWEEN  
ACHIEVEMENT TEST SCORES AND ABSENCES

Group*	Grade 7	Grade 8	Grade 9
1	-	-.39	-.15
2	-	-.10	+ .24
3	-	-.16	+ .15
4	-	+ .04	+ .38

\* Group 1 I.Q. scores from 76.5- 97  
 Group 2 I.Q. scores from 98.5-105  
 Group 3 I.Q. scores from 105.5-113  
 Group 4 I.Q. scores from 113.5-129.5

As to the significance of the coefficient of correlation Rugg has this to say:

The experience of the writer in examining many correlation tables has led him to regard correlation as "negligible or indifferent when 'r' coefficient of correlation, is less than .15 to .20; as being present but 'low' when 'r' ranges from .20 to .35 or .40; as being 'marked' when 'r' ranges from .35 or .40 to .50 or .60; as being 'high' when it is above .60 or .70." With the present limitations on educational testing, few correlations in testing will run above .70 and it is safe to regard this as a very high coefficient.<sup>8</sup>

In order to test the reliability of the coefficients of correlation the null hypothesis was used. In using Garrett's Table 49, only two of the coefficients of correlation, .44 and .61, had significance at the .05 level.<sup>9</sup>

## II. ANALYSIS OF DATA

An examination of Table I indicates that in West Junior High School there is obviously a high correlation between achievement as measured by the Stanford Achievement Test and intelligence test scores. It will be noted that of the forty-four students who were above the average for their grade level (9.9), only three have an I.Q. of less than a hundred and that these three are in the high nineties.

There seems to be little or no relationship between the number of days absent and achievement. When one notes

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<sup>8</sup> Harold O. Rugg, Statistical Methods Applied to Education (Chicago: Houghton Mifflin Company, 1927), p. 257.

<sup>9</sup> Henry E. Garrett, Statistics in Psychology and Education (New York: Longmans, Green and Co., 1947), p. 299.

that in the top fifteen per cent of the group there are five of the students who ranked among the top twelve as being absent the most, a negative correlation would seem to be expected. In the top fifteen per cent in achievement there is only one student who ranked in the top fifteen per cent in attendance. In the lower fifteen per cent of the group there is only one student who ranked in the upper fifteen per cent for attendance and one who ranked in the bottom fifteen per cent.

Table II appears to indicate that the lower fifteen per cent of the group were kept interested and given the necessary encouragement to keep them in school. This is indicated by their low average number of days absent. Even those students who did failing work had a better average attendance than most students. The top fifteen per cent, by their exceedingly high average number of days absent, would probably demand the most attention. This would seem to indicate a lack of interest on the part of the better students and somewhat of a neglect of their needs on the part of the school and the teachers.

When this group of students was broken up into similar I.Q. groups and a rank scale correlation figured, it was concluded that the further the child progressed through school and the higher his I.Q. group, the more effect absences seemed to have on grades. (See Table III p. 24).

Since the coefficients of correlation arrived at are



not large enough to indicate any definite relationship, either positive or negative, and since only two have enough reliability to be significant, the necessary confidence to make any definite predictions is lacking. However, the coefficients do seem to follow a trend. This trend ranges from negative to positive the further the student goes in school and the higher his I. Q. group. As one goes further in school and the work becomes more specialized, the more important attendance seems to become. The brighter the pupil the more he would benefit from this type of training, while conversely he would lose more by being absent. It is interesting to note that this trend comes sooner and is more pronounced by grades than by the Stanford Achievement Test results. This would seem to agree with Borgerson<sup>10</sup> and Walker<sup>11</sup> that teachers consider absence as a greater factor in school success than does the pupil. Therefore teachers let it influence the grades that they give.

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<sup>10</sup> F. C. Borgerson, "Causes of Failure and Poor School Work Given by Pupil," Educational Administration and Supervision, 16:542-48, October, 1930.

<sup>11</sup> M. M. Walker, A Study of High School Failures (Scottdale, Pa.: Mennonite Press, 1935), p. 11.

## Chapter IV

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

#### I. SUMMARY

The purpose of this study was to determine the effect of attendance on academic achievement in West Junior High School in Great Falls, Montana. Seventy-eight students from the graduating class of 1954 who had spent their seventh, eighth, and ninth year of schooling in West Junior High were selected for the study. These students were placed in four groups according to I.Q.'s and the coefficient of correlation was found using number of days absent and teachers' marks as the two variables or attributes. The coefficient of correlation was also found using days absent and Stanford Achievement Test scores as the attributes. It was found that in grade seven the correlation was "negligible" or "indifferent." While in grades eight and nine there seemed to be a trend from negative correlation for the low I.Q. groups to a positive "marked" or "high" for the higher I.Q. groups. This trend was also evident when the Stanford Tests were used although the coefficients of correlation were not as high. It was also found that the top fifteen per cent of the class was absent an average of 24.46 days for the three year period and the lower fifteen per cent was absent an average of 15.46 days. The difference between the mean number of days absent of the top fifteen per cent and the mean number of days absent of the lower fifteen per cent was 9.00.

## II. CONCLUSIONS

(1.) In terms of this study absences appear to have an effect on achievement. The effect is negligible in the lower grades and becomes more pronounced among students with higher I.Q.'s in the upper grades.

(2.) In West Junior High School in Great Falls, Montana the lower fifteen per cent of the students and those students who received failing marks were absent less than the rest of the students. These students were evidently kept interested and given the necessary encouragement in their school work to keep up their school attendance.

(3.) The top fifteen per cent in achievement had the poorest attendance record.

(4.) There is obviously a high correlation between achievement and intelligence in West Junior High School. There is a high correlation between achievement and attendance among the higher intelligence groups. The top fifteen per cent of the students in achievement are absent the most. Therefore, achievement in West Junior High School can be improved by improving the attendance of those students who are at the top in achievement and intelligence.

## III. RECOMMENDATIONS

(1.) It is recommended that further study be made with reference to the effect of absences on achievement of

students with greater intelligence in the upper grades.

(2.) It is recommended that the present efforts to improve attendance be continued because of the indicated relationship of attendance to marks and achievement.

(3.) The present efforts to encourage the slow learner and keep him interested should be continued.

(4.) The attendance of the better students should be improved through an effort to build the esprit de corps and satisfy more fully the interests of these students. It is felt that the possibilities of more homogeneous grouping should be explored and that the curriculum could be enriched to meet more adequately the needs of the better students in West Junior High School.

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APPENDIX

RANK CORRELATION BETWEEN GRADES AND ATTENDANCE  
 GROUP 1 I.Q. 76.5-97  
 GRADE 7

X	Y	R <sub>x</sub>	R <sub>y</sub>	D	D <sup>2</sup>
2.6	5.5	19	10.5	8.5	72.25
3	0	17	18	- 2	4
3	5.5	17	10.5	6.5	42.25
3	7.5	17	8	9	81
3.3	1	13	16	- 3	9
3.3	5	13	12	1	1
3.3	3.5	13	13	0	0
3.3	28.5	13	1	12	144
3.3	21	13	2	11	121
3.6	1	9	16	- 7	49
3.6	8	9	6.5	2.5	6.25
3.6	19	9	3	6	36
4	.5	5.5	18	-12.5	156.25
4	1	5.5	16	-10.5	110.25
4	10	5.5	5	.5	.25
4	11	5.5	4	1.5	2.25
4.3	3	2	14	-12	144
4.3	8	2	6.5	- 4.5	20.25
4.3	6	2	9	- 7	49
			$\Sigma R_x = 58.5$	$\Sigma R_y = 58.5$	$\Sigma = 1028.00$

$$P = 1 - 6 D^2 / N(N^2 - 1)$$

$$P = 1 - .000877 \times 1028.$$

$$P = 1 - .891556$$

$$P = .108444$$

X = grades  
 Y = absence  
 R<sub>x</sub> = rank of grades  
 R<sub>y</sub> = rank of absence  
 D = difference of ranks  
 D<sup>2</sup> = square of difference

RANK CORRELATION BETWEEN GRADES AND ATTENDANCE  
 GROUP 2 I.Q. 98.5-105  
 GRADE 7

X	Y	R <sub>x</sub>	R <sub>y</sub>	D	D <sup>2</sup>
1.3	15	20	1	19	369
2.3	4	18.5	5.5	13	169
2.3	4.5	18.5	4	14.5	210.25
2.6	0	16.5	18.5	- 2	4
2.6	2	16.5	12.5	4	16
3	0	13	18.5	- 5.5	30.25
3	3	13	9.5	3.5	12.25
3	3	13	9.5	3.5	12.25
3	3	13	9.5	3.5	12.25
3	1	13	15	- 2	4
3.3	0	9	18.5	- 9.5	90.25
3.3	5.5	9	3	6	36
3.3	1	9	15	- 6	36
3.6	12.5	4.5	2	2.5	6.25
3.6	0	4.5	18.5	-14	196
3.6	2	4.5	12.5	- 8	64
3.6	3	4.5	9.5	- 5	25
3.6	3.5	4.5	7	- 2.5	6.25
3.6	4	4.5	5.5	- 1	1
4	1	1	15	-14	196
				$\Sigma 6 = 69.5$	$\Sigma = 1496.00$
				$\Sigma 1 = 69.5$	

$$P = 1 - 6 D^2 / N(N^2 - 1)$$

$$P = 1 - .000752 \times 1496.00$$

$$P = 1 - 1.125092$$

$$P = -.125092$$

X = grades  
 Y = absence  
 R<sub>x</sub> = rank of grades  
 R<sub>y</sub> = rank of absence  
 D = difference of ranks  
 D<sup>2</sup> = square of difference

RANK CORRELATION BETWEEN GRADES AND ATTENDANCE  
 GROUP 3 I.Q. 105.5-113  
 GRADE 7

X	Y	R <sub>x</sub>	R <sub>y</sub>	D	D <sup>2</sup>
1	0	20	19.5	.5	.25
1.3	11.5	19	4.0	15	225.
1.6	0	17.5	19.5	- 2	4
1.6	5	17.5	11.5	6	36
2	16	15.5	1.5	14	196
2	16	15.5	1.5	14	196
2.3	1	13.5	16	- 2.5	6.25
2.3	1	13.5	16	- 2.5	6.25
2.6	1	9.5	16	- 6.5	42.25
2.6	3.5	9.5	14	- 4.5	20.25
2.6	4.5	9.5	13	- 3.5	12.25
2.6	6.5	9.5	9.5	0	0
2.6	6.5	9.5	9.5	0	0
2.6	5	9.5	11.5	- 2.0	4
3	.5	4.5	18	-13.5	182.25
3	7	4.5	8	- 3.5	12.25
3.	11	4.5	5	- .5	.25
3	15	4.5	3	1.5	2.25
3.3	9	2	6	- 4	16
3.6	7.5	1	7	- 6	36
				$\Sigma g = 51.0$	$\Sigma = 997.50$
				$\Sigma 1 = 51.0$	

$$\rho = 1 - 6 D^2 / N(N^2 - 1)$$

$$\rho = 1 - .000752 \times 997.50$$

$$\rho = 1 - .7501200$$

$$\rho = .24988$$

X = grades  
 Y = absence  
 R<sub>x</sub> = rank of grades  
 R<sub>y</sub> = rank of absence  
 D = difference of ranks  
 D<sup>2</sup> = square of difference

RANK CORRELATION BETWEEN GRADES AND ATTENDANCE  
 GROUP 4 I.Q. 113.5-129.5  
 GRADE 7

X	Y	R <sub>x</sub>	R <sub>y</sub>	D	D <sup>2</sup>
1	10.5	19	4.5	14.5	210.25
1.3	.5	16.5	17.5	- 1	1
1.3	6	16.5	11.5	5	25
1.3	4	16.5	14	2.5	6.25
1.3	10.5	16.5	4.5	12	144
1.6	8	12	7	5	25
1.6	8	12	7	5	25
1.6	16.5	12	2	10	100
1.6	5	12	13	- 1	1
1.6	17.5	12	1	11	121
2	1	8	16	- 8	64
2	3	8	15	- 7	49
2	6	8	11.5	- 3.5	12.25
2.3	7	5.5	9	- 3.5	12.25
2.3	8	5.5	7	- 1.5	2.25
2.6	6.5	2.5	10	- 7.5	56.25
2.6	.5	2.5	17.5	-15	225
2.6	11.5	2.5	3	- .5	.25
2.6	0	2.5	19	-16.5	272.25
				$\Sigma X = 65.0$	$\Sigma Y = 1352.00$
				$\Sigma 1 = 65.0$	

$$P = 1 - 6 D^2 / N(N^2 - 1)$$

$$P = 1 - .000877 \times 1352$$

$$P = 1 - 1.185704$$

$$P = -.185704$$

X = grades  
 Y = absence  
 R<sub>x</sub> = rank of grades  
 R<sub>y</sub> = rank of absence  
 D = difference of ranks  
 D<sup>2</sup> = square of difference

RANK CORRELATION BETWEEN GRADES AND ATTENDANCE  
 GROUP 1 I.Q. 76.5-97  
 GRADE 8

X	Y	R <sub>x</sub>	R <sub>y</sub>	D	D <sup>2</sup>
3	9	18.5	5.5	13	169
3	2	18.5	14	4.5	20.25
3.3	8	17	7	10	100
3.6	34.5	14	1	13	169
3.6	2.5	14	13	1	1
3.6	3	14	11	3	9
3.6	15	14	2	12	144
3.6	3	14	11	3	9
4	0	9.5	18	- 8.5	72.25
4	0	9.5	18	- 8.5	72.25
4	11	9.5	3.5	6	36
4	9	9.5	5.5	4	16
4.3	11	6	3.5	2.5	6.25
4.3	0	6	18	-12	144
4.3	3	6	11	- 5	25
4.6	5	3.5	8	- 4.5	20.25
4.6	1	3.5	15.5	-12	144
5	3.5	1.5	9	- 7.5	56.25
5	1	1.5	15.5	-14	196
				$\Sigma g = 72.0$	$\Sigma = 1409.50$
				$\Sigma 1 = 72.0$	

$$P = 1 - 6 D^2 / N(N^2 - 1)$$

$$P = 1 - .000877 \times 1409.50$$

$$P = 1 - 1.23613150$$

$$P = -.23613150$$

X = grades  
 Y = absence  
 R<sub>x</sub> = rank of grades  
 R<sub>y</sub> = rank of absence  
 D = difference of ranks  
 D<sup>2</sup> = square of difference

RANK CORRELATION BETWEEN GRADES AND ATTENDANCE  
 GROUP 2 I.Q. 98.5-105  
 GRADE 8

X	Y	R <sub>x</sub>	R <sub>y</sub>	D	D <sup>2</sup>
2.3	2	19.5	15	4.5	20.25
2.3	3.5	19.5	10.5	9	81
2.6	34	18	1	17	289
3	19.5	15	2	13	169
3	4	15	9	6	36
3	2	15	15	0	0
3	0	15	18.5	-3.5	12.25
3	5.5	15	7	8	64
3.3	3	11	12.5	-1.5	2.25
3.3	3.5	11	10.5	.5	.25
3.3	3	11	12.5	-1.5	2.25
3.6	12	6.5	3	3.5	12.25
3.6	6	6.5	5.5	1	1
3.6	5	6.5	8	-1.5	2.25
3.6	2	6.5	15	-8.5	72.25
3.6	6	6.5	5.5	1	1
3.6	9	6.5	4	2.5	6.25
4	0	2.5	18.5	-16	256
4	0	2.5	18.5	-16	256
4.3	0	1	18.5	-17.5	306.25
				$\Sigma g = 66.0$	$\Sigma = 1589.50$
				$\Sigma l = 66.0$	

$$r = 1 - 6 \frac{D^2}{N(N^2 - 1)}$$

$$r = 1 - .000752 \times 1589.50$$

$$r = 1 - 1.105304$$

$$r = -.195304$$

X = grades  
 Y = absence  
 R<sub>x</sub> = rank of grades  
 R<sub>y</sub> = rank of absence  
 D = difference of ranks  
 D<sup>2</sup> = square of difference

RANK CORRELATION BETWEEN GRADES AND ATTENDANCE  
 GROUP 3 I.Q. 105.5-113  
 GRADE 8

X	Y	R <sub>x</sub>	R <sub>y</sub>	D	D <sup>2</sup>
1	0	20	18	2	4
1.3	4.5	19	9	10	100
1.6	1	17.5	13.5	4	16
1.6	0	17.5	18	- .5	.25
2	0	16	18	- 2	4
2.3	13	14	4	10	100
2.3	5.5	14	6	8	64
2.3	3	14	10	4	16
2.6	0	10.5	18	- 7.5	56.25
2.6	2.5	10.5	11	- .5	.25
2.6	.5	10.5	15	- 4.5	20.25
2.6	15	10.5	3	7.5	56.25
3	5	8	7.5	.5	.25
3.3	1	4.5	13.5	- 9	81
3.3	5	4.5	7.5	- 3	9
3.3	15.5	4.5	2	2.5	6.25
3.3	2	4.5	12	- 7.5	56.25
3.3	0	4.5	18	-13.5	182.25
3.3	6	4.5	5	- .5	.25
3.6	16	1	1	0	0
				Σg = 48.5	Σ = 772.50
				Σ1 = 48.5	

$$\rho = 1 - 6 D^2 / N(N^2 - 1)$$

$$\rho = 1 - .000752 \times 772.50$$

$$\rho = 1 - .58092$$

$$\rho = .41908$$

X = grades  
 Y = absence  
 R<sub>x</sub> = rank of grades  
 R<sub>y</sub> = rank of absence  
 D = difference of ranks  
 D<sup>2</sup> = square of difference



RANK CORRELATION BETWEEN GRADES AND ATTENDANCE  
 GROUP 4 I.Q. 113.5-129.5  
 GRADE 8

X	Y	R <sub>x</sub>	R <sub>y</sub>	D	D <sup>2</sup>
1	11.5	18.5	5	13.5	182.25
1	1.5	18.5	15.5	3	9
1.3	6.5	17	11	6	36
1.6	0	16	18.5	- 2.5	6.25
2	4	13.5	13	.5	.25
2	1	13.5	17	- 3.5	12.25
2	12.5	13.5	4	9.5	90.25
2	8	13.5	9.5	4	16
2.3	1.5	9	15.5	- 6.5	42.25
2.3	5	9	12	- 3	9
2.3	11	9	6	3	9
2.3	14.5	9	2	7	49
2.3	8	9	9.5	- .5	.25
2.6	15.5	5	1	4	16
2.6	0	5	18.5	-13.5	182.25
2.6	10	5	7	- 2	4
3	2	2.5	14	-11.5	132.25
3	13	2.5	3	- .5	.25
3.6	8.5	1	8	- 7	49
				$\Sigma g = 50.5$	$\Sigma = 845.50$
				$\Sigma l = 50.5$	

$$\rho = 1 - 6 \frac{D^2}{N(N^2-1)}$$

$$\rho = 1 - .000877 \times 845.50$$

$$\rho = 1 - .7415035$$

$$\rho = .2584965$$

X = grades  
 Y = absence  
 R<sub>x</sub> = rank of grades  
 R<sub>y</sub> = rank of absence  
 D = difference of ranks  
 D<sup>2</sup> = square of difference

RANK CORRELATION BETWEEN GRADES AND ATTENDANCE  
 GROUP 1 I.Q. 76.5-97  
 GRADE 9

X	Y	R <sub>x</sub>	R <sub>y</sub>	D	D <sup>2</sup>
3	4.5	18.5	9	9.5	90.25
3	3	18.5	11	7.5	56.25
3.3	2.5	17	12.5	4.5	20.25
3.6	0	14	18	- 4	16
3.6	5	14	7.5	6.5	42.25
3.6	0	14	18	- 4	16
3.6	2	14	14	0	0
3.6	6	14	5	9	81
4	0	9.5	18	- 8.5	72.25
4	5.5	9.5	6	3.5	12.25
4	1	9.5	15	- 5.5	30.25
4	25	9.5	2	7.5	56.25
4.3	5	5.5	7.5	- 2	4
4.3	.5	5.5	16	-10.5	110.25
4.3	11	5.5	3	2.5	6.25
4.3	3.5	5.5	10	- 4.5	20.25
4.6	2.5	3	12.5	- 9.5	90.25
5	26	1.5	1	.5	.25
5	7.5	1.5	4.	- 2.5	6.25
				$\Sigma R_x = 51.0$	$\Sigma R_y = 730.50$
				$\Sigma 1 = 51.0$	

$$\rho = 1 - 6 \frac{D^2}{N(N^2 - 1)}$$

$$\rho = 1 - .000877 \times 730.50$$

$$\rho = 1 - .6406485$$

$$\rho = + .3593515$$

X = grades  
 Y = absence  
 R<sub>x</sub> = rank of grades  
 R<sub>y</sub> = rank of absence  
 D = difference of ranks  
 D<sup>2</sup> = square of difference

RANK CORRELATION BETWEEN GRADES AND ATTENDANCE  
 GROUP 2 I.Q. 98.5-105  
 GRADE 9

X	Y	R <sub>x</sub>	R <sub>y</sub>	D	D <sup>2</sup>
2	0	20	19.5	.5	.25
2.6	36.5	18.5	1	17.5	306.25
2.6	.5	18.5	18	.5	.25
3	10	16	3	13	169
3	9	16	4	12	144
3	2	16	15	1	1
3.3	4	13.5	9	4.5	20.25
3.3	0	13.5	19.5	- 6	36
3.6	12.5	9.5	2	- 7.5	56.25
3.6	2	9.5	15	- 5.5	30.25
3.6	5.5	9.5	7	- 2.5	6.25
3.6	8	9.5	5	- 4.5	20.25
3.6	1	9.5	17	- 7.5	56.25
3.6	3	9.5	11.5	- 2	4
4	2.5	4.5	13	- 8.5	72.25
4	2	4.5	15	-10.5	110.25
4	3	4.5	11.5	- 7	49
4	7.5	4.5	6	- 1.5	2.25
4.3	3.5	2	10	- 8	64
4.6	5	1	8	- 7	49
				$\Sigma g = 63.5$	$\Sigma = 1197.00$
				$\Sigma 1 = 63.5$	

$$P = 1 - 6 D^2 / N(N^2 - 1)$$

$$P = 1 - .000752 \times 1197.00$$

$$P = 1 - .900144$$

$$P = .099856$$

X = grades  
 Y = absence  
 R<sub>x</sub> = rank of grades  
 R<sub>y</sub> = rank of absence  
 D = difference of ranks  
 D<sup>2</sup> = square of difference

RANK CORRELATION BETWEEN GRADES AND ATTENDANCE  
 GROUP 3 I.Q. 105.5-113  
 GRADE 9

X	Y	R <sub>x</sub>	R <sub>y</sub>	D	D <sup>2</sup>
1	1	20	15	5	25
1.3	3.5	18.5	9	9.5	90.25
1.3	1.5	18.5	12	6.5	42.25
1.6	0	17	19	- 2	4
2.3	1	16	15	1	1
2.6	4	11.5	7.5	4	16
2.6	15.5	11.5	1	10.5	110.25
2.6	0	11.5	19	- 7.5	56.25
2.6	1	11.5	15	- 3.5	12.25
2.6	3	11.5	10	1.5	2.25
2.6	4	11.5	7.5	4	16
2.6	7.5	11.5	5	6.5	42.25
2.6	0	11.5	19	- 7.5	56.25
3	8	6.5	3.5	3	9
3	1	6.5	15	- 8.5	72.25
3.3	9	3.5	2	1.5	2.25
3.3	1	3.5	15	-11.5	132.25
3.3	2	3.5	11	- 7.5	56.25
3.3	8	3.5	3.5	0	0
3.6	6	1	6	- 5	.25
				$\Sigma g = 53.0$	$\Sigma = 746.25$
				$\Sigma 1 = 53.0$	

$$\rho = 1 - 6 D^2 / N(N^2 - 1)$$

$$\rho = 1 - .000752 \times 746.25$$

$$\rho = 1 - .56118$$

$$\rho = .43882$$

X = grades  
 Y = absence  
 R<sub>x</sub> = rank of grades  
 R<sub>y</sub> = rank of absence  
 D = difference of ranks  
 D<sup>2</sup> = square of difference

RANK CORRELATION BETWEEN GRADES AND ATTENDANCE  
 GROUP 4 I.Q. 113.5-129.5  
 GRADE 9

X	Y	R <sub>x</sub>	R <sub>y</sub>	D	D <sup>2</sup>
1	1	18	17.5	.5	.25
1	0	18	19	- 1	1
1	1	18	17.5	.5	.25
1.3	3	16	13	3	9
1.6	16.5	14.5	3	11.5	132.25
1.6	2	14.5	15	-.5	.25
2	4	12	11.5	.5	.25
2	4	12	11.5	.5	.25
2	5	12	9	3	9
2.3	9	10	5	5	25
2.6	5.5	8	8	0	0
2.6	2	8	15	- 7	49
2.6	20	8	2	6	36
3	8	4.5	6	- 1.5	2.25
3	4.5	4.5	10	- 5.5	30.25
3	2	4.5	15	-10.5	110.25
3	12	4.5	4	.5	.25
3.3	22.5	2	1	1	1
4	6.5	1	7	- 6	36
				$\Sigma R_x = 32.0$	$\Sigma R_y = 442.50$
				$\Sigma 1 = 32.0$	

$$\rho = 1 - 6 D^2 / N(N^2 - 1)$$

$$\rho = 1 - .000877 \times 442.50$$

$$\rho = 1 - .3886625$$

$$\rho = .6113375$$

X = grades  
 Y = absence  
 R<sub>x</sub> = rank of grades  
 R<sub>y</sub> = rank of absence  
 D = difference of ranks  
 D<sup>2</sup> = square of difference

RANK CORRELATION BETWEEN  
 STANFORD ACHIEVEMENT TEST AND ATTENDANCE  
 GROUP 1 I.Q. 76.5-97  
 GRADE 8.

X	Y	R <sub>x</sub>	R <sub>y</sub>	D	D <sup>2</sup>
10.7	2	19	14	5	25
9.8	8	18	7	11	121
9.1	34.5	17	1	16	256
8.4	3	15.5	11	4.5	20.25
8.4	9	15.5	5.5	10	100
8.3	9	14	5.5	8.5	72.25
8.2	11	13	3.5	9.5	90.25
7.9	11	12	3.5	8.5	72.25
7.8	3	11	11	0	0
7.6	5	10	8	2	4
7.0	0	9	18	-9	81
6.7	3	8	11	-3	9
6.6	0	7	18	-11	121
6.3	2.5	6	13	-7	49
6.2	0	5	18	-13	169
6.1	1	4	15.5	-11.5	132.25
5.8	15	3	2	1	1
4.8	3.5	2	9	-7	49
4.4	1	1	15.5	-14.5	210.25
				$\Sigma 8 = 76.0$	$\Sigma = 1582.50$
				$\Sigma 1 = 76.0$	

$$\rho = 1 - 6 D^2 / N(N^2 - 1)$$

$$\rho = 1 - .000877 \times 1582.50$$

$$\rho = 1 - 1.3878525$$

$$\rho = -.387852$$

X = achievement test score  
 Y = absence  
 R<sub>x</sub> = rank of test scores  
 R<sub>y</sub> = rank of absence  
 D = difference of ranks  
 D<sup>2</sup> = square of difference

RANK CORRELATION BETWEEN  
STANFORD ACHIEVEMENT TEST AND ATTENDANCE  
GROUP 2 I.Q. 98.5-105  
GRADE 8

X	Y	R <sub>x</sub>	R <sub>y</sub>	D	D <sup>2</sup>
10.7	3	20	12.5	7.5	56.25
10.1	0	19	18.5	.5	.25
9.6	2	18	15	3	9.00
9.4	19.5	16.5	2	14.5	210.25
9.4	34	16.5	1	15.5	240.25
9.2	3.5	15	10.5	4.5	20.25
8.8	5	13.5	8	5.5	30.25
8.8	4	13.5	9	4.5	20.25
8.7	12	12	3	9	81.00
8.6	6	10	5.5	4.5	20.25
8.6	0	10	18.5	- 8.5	72.25
8.6	3.5	10	10.5	- .5	.25
8.5	2	8	15	- 7	49
8.4	0	6	18.5	-12.5	156.25
8.4	2	6	15	- 9	81
8.4	5.5	6	7	- 1	1
8.1	9	4	4	0	0
7.9	3	3	12.5	- 9.5	90.25
7.8	6	2	5.5	- 3.5	12.25
7.6	0	1	18.5	-17.5	306.25
			$\Sigma R_x = 69.0$	$\Sigma R_y = 69.0$	$\Sigma D^2 = 1456.50$

$$\rho = 1 - 6 D^2 / N(N^2 - 1)$$

$$\rho = 1 - .000752 \times 1456.50$$

$$\rho = 1 - 1.095288$$

$$\rho = -.095288$$

X = achievement test score  
Y = absence  
R<sub>x</sub> = rank of test scores  
R<sub>y</sub> = rank of absence  
D = difference of ranks  
D<sup>2</sup> = square of difference

RANK CORRELATION BETWEEN  
STANFORD ACHIEVEMENT TEST AND ATTENDANCE  
GROUP 3 I.Q. 105.5-113  
GRADE 8

X	Y	R <sub>x</sub>	R <sub>y</sub>	D	D <sup>2</sup>
10.9	16	20	1	19	361.0
10.8	4.5	19	9	10	100.0
10.7	15	18	3	15	225.0
10.6	0	17	18	- 1	1
10.5	0	16	18	- 2	4
10.4	3	14.5	10	4.5	20.25
10.4	6	14.5	5	9.5	90.25
10.1	2	13	12	1	1
10.0	0	11.5	18	- 6.5	42.25
10.0	5	11.5	7.5	4	16
9.6	15.5	10	2	8	64
9.5	0	9	18	- 9	81
9.3	1	7.5	13.5	- 6	36
9.3	.5	7.5	15	- 7.5	56.25
9.2	13	6	4	2	4
9.1	5.5	5	6	- 1	1
8.9	0	4	18	-14	196
8.8	1	2.5	13.5	-11	121
8.8	5	2.5	7.5	-5	25
8.5	2.5	1	11	-10	100
				$\Sigma g = 73.0$	$\Sigma = 1545.00$
				$\Sigma 1 = 73.00$	

$$\rho = 1 - 6 D^2 / N(N^2 - 1)$$

$$\rho = 1 - .000752 \times 1545$$

$$\rho = 1 - 1.161840$$

$$\rho = -.161840$$

X = achievement test score  
Y = absence  
R<sub>x</sub> = rank of test scores  
R<sub>y</sub> = rank of absence  
D = difference of ranks  
D<sup>2</sup> = square of difference



RANK CORRELATION BETWEEN  
STANFORD ACHIEVEMENT TEST AND ATTENDANCE  
GROUP 4 I.Q. 113.5-129.5  
GRADE 8

X	Y	R <sub>x</sub>	R <sub>y</sub>	D	D <sup>2</sup>
12.2	6.5	19	11	8	64
11.7	8	18	9.5	8.5	72.25
11.6	11	16.5	6	10.5	110.25
11.6	1.5	16.5	15.5	1	1
11.4	1.5	15	15.5	-.5	.25
11.3	12.5	14	4	10	100
11.2	4	13	13	0	0
11.1	1	12	17	-5	25
10.7	13	10.5	3	7.5	56.25
10.7	8	10.5	9.5	1	1
10.5	11.5	9	5	4	16
10.4	14.5	8	2	6	36
10.2	8.5	6.5	8	-1.5	2.25
10.2	2	6.5	14	-7.5	56.25
10.1	10	4.5	7	-2.5	6.25
10.1	0	4.5	18.5	-14	196
9.8	5	3	12	-9	81
9.7	0	2	18.5	-16.5	272.25
9.6	15.5	1	1	0	0
				$\Sigma g = 56.5$	$\Sigma = 1096.00$
				$\Sigma l = 56.5$	

$$\rho = 1 - 6 D^2 / N(N^2 - 1)$$

$$\rho = 1 - .000877 \times 1096$$

$$\rho = 1 - .961192$$

$$\rho = .038808$$

X = achievement test score  
Y = absence  
R<sub>x</sub> = rank of test scores  
R<sub>y</sub> = rank of absence  
D = difference of ranks  
D<sup>2</sup> = square of difference

RANK CORRELATION BETWEEN  
STANFORD ACHIEVEMENT TEST AND ATTENDANCE  
GROUP 1 I.Q. 76.5-97  
GRADE 9

X	Y	R <sub>x</sub>	R <sub>y</sub>	D	D <sup>2</sup>
10.4	3	19	11	8	64
10.1	2.5	18	12.5	5.5	30.25
9.8	25	17	2	15	225
9.3	4.5	16	9	7	49
9.1	2	15	14	1	1
8.5	2.5	14	12.5	1.5	2.25
8.4	7.5	13	4	9	81
7.9	6	12	5	7	49
7.8	0	11	18	-7	49
7.6	3.5	10	10	0	0
7.4	5	9	7.5	1.5	2.25
7.1	26	7.5	1	6.5	42.25
7.1	11	7.5	3	4.5	20.25
6.8	0	6	18	-12	144
6.6	.5	5	16	-11	121
6.3	1	4	15	-11	121
5.8	5.5	3	6	-3	9
5.6	0	2	18	-16	256
5.2	5	1	7.5	-6.5	42.25
			$\Sigma R_x = 66.5$	$\Sigma R_y = 1308.50$	
			$\Sigma 1 = 66.5$		

$$r = 1 - 6 D^2 / N(N^2 - 1)$$

$$r = 1 - .000877 \times 1308.50$$

$$r = 1 - 1.1475545$$

$$r = -.1475545$$

X = achievement test score  
Y = absence  
R<sub>x</sub> = rank of test scores  
R<sub>y</sub> = rank of absence  
D = difference of ranks  
D<sup>2</sup> = square of difference

RANK CORRELATION BETWEEN  
 STANFORD ACHIEVEMENT TEST AND ATTENDANCE  
 GROUP 2 I.Q. 98.5-105  
 GRADE 9

X	Y	R <sub>x</sub>	R <sub>y</sub>	D	D <sup>2</sup>
11.0	.5	19.5	18	1.5	2.25
11.0	0.0	19.5	19.5	0	0
10.7	36.5	18	1	17	289
10.6	2	17	15	2	4
10.4	3	16	11.5	4.5	20.25
10.2	0	15	19.5	- 4.5	20.25
10.1	9	14	4	10	100
10.0	10	13	3	10	100
9.6	2	11.5	15	- 3.5	12.25
9.6	12.5	11.5	2	9.5	90.25
9.5	2.5	10	13	- 3	9
9.3	5.5	9	7	2	4
9.1	1	8	17	- 9	81
8.7	7.5	6.5	6	.5	.25
8.7	3.5	6.5	10	- 3.5	12.25
8.5	3	4.5	11.5	- 7	49
8.5	2	4.5	15	-10.5	110.25
8.4	8	3	5	- 2	4
8.1	4	2	9	- 7	49
7.6	5	1	8	- 7	49
				$\Sigma 8 = 57.0$	$\Sigma = 1006.00$
				$\Sigma 1 = 57.0$	

$$P = 1 - 6 D^2 / N(N-1)$$

$$P = 1 - .000752 \times 1006.00$$

$$P = 1 - .756512$$

$$P = .243488$$

X = achievement test score  
 Y = absence  
 R<sub>x</sub> = rank of test scores  
 R<sub>y</sub> = rank of absence  
 D = difference of ranks  
 D<sup>2</sup> = square of difference

RANK CORRELATION BETWEEN  
 STANFORD ACHIEVEMENT TEST AND ATTENDANCE  
 GROUP 3 I.Q. 105.5-113  
 GRADE 9

X	Y	R <sub>x</sub>	R <sub>y</sub>	D	D <sup>2</sup>
11.9	1	20	15	5	25
11.8	3.5	19	9	10	100
11.6	8	18	3.5	14.5	210.25
11.3	1.5	17	12	5	25
11.2	0	15	19	- 4	16
11.2	9	15	2	13	169
11.2	4	15	7.5	7.5	56.25
10.9	15.5	13	1	12	144
10.8	1	11.5	15	- 3.5	12.25
10.8	0	11.5	19	- 7.5	56.25
10.7	1	9.5	15	- 5.5	30.25
10.7	1	9.5	15	- 5.5	30.25
10.5	1	8	15	- 7	49
10.1	2	7	11	- 4	16
10.0	3	6	10	- 4	16
9.8	8	4.5	3.5	1	1
9.8	6	4.5	6	- 1.5	2.25
9.5	0	3	19	- 1.6	256
9.4	7.5	2	5	- .3	9
9.1	4	1	7.5	- 6.5	42.25
				$\Sigma X = 68.0$	$\Sigma Y = 1266.00$
				$\Sigma 1 = 68.0$	

$$\rho = 1 - 6 D^2 / N(N^2 - 1)$$

$$\rho = 1 - .000752 \times 1266.00$$

$$\rho = 1 - .952032$$

$$\rho = .147968$$

X = achievement test score  
 Y = absence  
 R<sub>x</sub> = rank of test scores  
 R<sub>y</sub> = rank of absence  
 D = difference of ranks  
 D<sup>2</sup> = square of difference

RANK CORRELATION BETWEEN  
 STANFORD ACHIEVEMENT TEST AND ATTENDANCE  
 GROUP 4 I.Q. 113.5-129.5  
 GRADE 9

X	Y	R <sub>x</sub>	R <sub>y</sub>	D	D <sup>2</sup>
12.3	1	19	17.5	1.5	2.25
12.1	1	18	17.5	.5	.25
12.0	0	17	19	- 2	4
11.9	5	15.5	9	6.5	42.25
11.9	20	15.5	2	13.5	182.25
11.8	12	14	4	10	100
11.6	4	13	11.5	1.5	2.25
11.4	4	11.5	11.5	0	0
11.4	22.5	11.5	1	10.5	110.25
11.3	2	9	15	- 6	36
11.3	4.5	9	10	- 1	1
11.3	2	9	15	- 6	36
11.2	2	7	15	- 8	64
11.0	3	6	13	- 7	49
10.7	8	4	6	- 2	4
10.7	9	4	5	- 1	1
10.7	16.5	4	3	1	1
10.5	5.5	2	8	- 6	36
10.3	6.5	1	7	- 6	36
				$\Sigma D = 45.0$	$\Sigma D^2 = 707.50$
				$\Sigma X = 45.0$	

$$r = 1 - \frac{6 \Sigma D^2}{N(N^2 - 1)}$$

$$r = 1 - \frac{6 \times 707.50}{20(20^2 - 1)}$$

$$r = 1 - .6214775$$

$$r = .3785225$$

X = achievement test score  
 Y = absence  
 R<sub>x</sub> = rank of test scores  
 R<sub>y</sub> = rank of absence  
 D = difference of ranks  
 D<sup>2</sup> = square of difference