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ABSTRACT

In 1986, a study was conducted by the Rancho Santiago Community College District (RSCCD) to evaluate the relationship between reading placement scores and classroom performance. The study sample consisted of students from fall 1985, spring 1986, and fall 1986 who had been tested using the College Board Assessment and Placement Test upon registering. An analysis of the relationship between course grades, the percentage of students who were successful, and placement scores indicated that there was only a modest relationship between placement scores and grades and that a fair number of students who had reading scores below the 25th percentile were successful (grade of "C" or better) in transfer-level courses. These findings suggested that placement scores were not a reliable predictor of classroom success for many courses and challenged the predictive-validity of such measures. A second part of the study utilized a series of discriminant analyses to determine the ability of reading scores to differentiate between successful and unsuccessful students in transfer-level courses. The results showed that only 46% to 79% of the students could be correctly classified on the basis of reading placement scores alone. Based on study findings, it was concluded that the use of cut-off scores was inappropriate since many students who would have been predicted to fail actually earned a grade of "C" or better. An appendix contains a series of tables of individual courses sampled with Spearman correlations and grade distributions. (Author/UCM)

INSTITUTIONAL RESEARCH

CAN READING PLACEMENT SCORES PREDICT CLASSROOM PERFORMANCE? A DISCRIMINANT ANALYSIS

☐ rancho santiago community college district

CAN READING PLACEMENT SCORES PREDICT CLASSROOM PERFORMANCE? A DISCRIMINANT ANALYSIS

Ronald P Kessler, Ph.D.
Institutional Research
May 1987

TABLE OF CONTENTS

CAN READING PLACEMENT SCORES PREDICT CLASSROOM PERFORMANCE?: A DISCRIMINANT ANALYSIS

ABSTRACT

The relationship between Reading placement scores and classroom performance were evaluated in a two-part study using the reading scores on the College Board Assessment and Placement Test (CBAPT). The sample consisted of students from Fall 85, Spring 86, and Fall 86 who had been tested upon registering. The first section of the study delineates the relationship between course grades, the percentage of students who are successful, and placement scores. The results indicate only a modest relationship between placement scores and grades and that a fair number of students who have reading scores below the 25th percentile are successful (grade of "C" or better) in many RSC tranfer level courses. For example, the Spearman correlations ranged from r=.17 in Philosophy 210 to r=.49 in History 101. The findings suggest that placement scores are not a reliable predictor of classroom success for many courses and challenge the predictive-validity of such measures.

The second part of the study utilized a series of discriminant analyses to determine the ability of reading scores to differentiate between successful and unsuccessful students in transfer level courses. The results are consistent with the findings above in that only 46-79% of the students could be correctly classified from the basis of reading placement scores alone. It is argued that the use of cut-off scores would be inappropriate since many students who would have been predicted to fail actually earned a grade of "C" or better.

INTRODUCTION

Statement of the Problem

Recently, the Chancellors office has directed Community Colleges in California to identify predictors of classroom success for transfer level courses. Under new Title V regulations, colleges are now attempting to compile the information necessary to make informed decisions about what types of indicators can reliably predict future success. At RSC, we have attempted to identify the relationship between reading ability and success in transfer courses.

Attempts to determine the relationship between placement scores (primarily reading) have been reported in several studies. MacDougall (1977) reports that the reading test is:

> ...generally valid as an instrument for the measurement of reading skill as it relates to performance at the college. [However] reading levels required for successful completion vary widely between the various courses, disciplines, and departments of the college (p.9).

More recently, Davis (1985) reports that correlations between grades and reading scores are between .16 and .32 . Given the fact that only about 10% of the variability in grades earned is explained/predicted by the placement score, the need for accurate predictors is obvious.

This present investigation was originally designed to provide the RSC counseling staff with an instrument that could be used to counsel incoming students. By using assessment scores, students could be in a better position to make an informed decision about their chances of succeeding in a course given their level of reading. However, the study was expanded to address the Title V issues mentioned above. Thus, there are two major thrusts of this study. Part I has to do with a description of the relationship between reading scores and grades in the courses sampled. Part II addresses the issue of identifying and utilizing minimum reading competency standards in order to predict future success. Specifically, what is the predictive validity of a reading placement

score and what would be the impact of using that score to determine a minimum competency standard?

PART I

METHOD

Procedure

Student grades and assessment scores were compiled from the RSC history file for transfer level courses and analyzed through a series of SPSS programs. The information in the following tables is based upon these statistics from Fall 1985, Spring 1986, and Fall 1986. Also, for the data presented here in Part I, students who received a "D", "W", "NC", or a "Drop" were NOT included because "success" was operationally defined as a grade of "C" or better. Students who were never tested were excluded from all of the following analyses.

The information was evaluated in several ways. Scores on the College Board Assessment and Placement Test (CBAPT) are reported to the college as percentile scores. In the following tables, four ranges of these scores were delineated: 0-25, 26-50, 51-75, and 76+ (all percentiles). Thus, the tables indicate how many (and what percentage) of the successful students in that course had scores in the ranges indicated. It was anticipated that there would be a positive correlation between reading scores and classroom grades.

For each course included in this study, the relationship between reading scores and grades was obtained by computing a Spearman correlation coefficient between the student's grade (A, B, C) and the four categories (0-25, 26-50, etc.). Since the census (at the 4th week of enrollment) for several courses was small, they had to be left out. Some courses were not sampled because not enough students in that course had been tested.

Individual tables for each course sampled are presented in Appendix R. In the lower right-hand corner of each of these tables there is a grade distribution for the course. This indicates the relationship between grade earned and the percentage of students within a range. The grade distribution matrix was evaluated by the Chi-square statistic (X^2) for significance. The results of the matrix are presented in the graph at the left for ease of comparison.

RESULTS

From Table 1-1 it can be seen that for many courses, there is a correlation between the percentile range and course grade. The significant correlations range from .17 to .49 with the average (for all courses sampled) of .22 . The table is designed to show the percentage of successful students who obtained reading scores in the ranges indicated. For instance, if we look at Accounting 101, 19% of those sampled had a reading score of 25 or less (equal to or less than the 25th percentile). Similarly, 26% had a score of 26-50 (26th to 50th percentile) and 25% had scores between 51-75 (51st and 75th percentile). Finally, 30% of the students had scores greater than 76. Data for the remaining courses can be evaluated in the same manner.

At the bottom of the table, the averages for each column are presented. On the average, 16% of those who passed the course had a reading score of 25 or less. Keeping in mind that a reading score of 41 indicates A.A. proficiency, these findings suggest that many students who have minimal reading ability (as measured by the CBAPT) are able to earn a "C" in transfer courses. Of course, there are some classes where this percentage is very small. Notice that in History 118 and 120 only 5-7% of those who passed had low reading scores. Ideally, we would like the percentages to increase as we look across the ranges from left to right. Biology 149 is a good example of this type of trend. Notice that as the reading range increases, so does the percentage of students in each category. In fact, nearly 50% of those who passed had reading scores above 75.

TABLE 1-1

PERCENT OF SUCCESSFUL STUDENTS WITHIN CLASSES SAMPLED

COURSE	Percentile Ranges 0-25	26-50	51-75	76-100	Spearman R	N
ACCOUNTING 101	19	26	25	30	0.09	211
ACCOUNTING 102*	20	22	29	29	0.23	123
ART COURSES*	17	21	26	36	0.20	304
BIOLOGY 109*	12	24	26	38	0.29	215
BIOLOGY 139*	13	13	32	42	0.21	62
BIOLOGY 149*	9	17	25	49	0.37	59
BIOLOGY 239	14	20	33	33	0.19	49
BUSINESS 101	14	23	23	40	0.11	121
BUSINESS 120*	10	30	30	30	0.29	94
CHEMISTRY 209	19	23	21	37	0.11	75
COMMUNICATION 100*	12	31	35	22	0.33	81
COMPUTER SCI. 100*	18	25	24	34	0.43	114
CRIM.JUSTICE 101*	7	29	31	33	0.26	55
EARTH SCI. 110*	9	18	28	45	0.28	89
ECONOMICS 120	10	21	28	40	0.12	145
ECONOMICS 121	16	15	28	41	0.13	67
ELECTRONICS 147	43	21	10	26	-0.09	58
ENGLISH 101*	12	19	27	42	0.36	215
FRENCH 101	25	18	33	24	-0.03	55
GEOGRAPHY 101*	15	21	27	37	0.24	103
HISTORY 101*	13	11	31	45	0.49	55
HISTORY 118*	5	24	31	41	0.24	88
HISTORY 120*	7	14	36	43	0.34	130
HISTORY 122*	31	28	17	24	0.28	86
HISTORY 124	28	35	19	18	0.17	57
HUMANITIES 101*	10	22	27	41	0.33	73
MATH 110*	17	23	26	35	0.17	412
MATH 120	26	21	17	36	0.11	66
MATH 160	20	17	27	36	0.04	92
PHILOSOPHY 106*	12	23	30	35	0.27	244
PHILOSOPHY 210*	15	12	25	48	0.17	176
POLI SCI 101*	14	22	27	37	0.28	550
PSYCHOLOGY 100*	13	24	29	34	0.26	452
SPEECH COMM.101*	19	21	25	35	0.30	636
AVERAGES=======>	16	22	27	36	0.22	159

*Significant Relationship between Grades and Reading Scores

PART II

Procedure

Given the fact we know whether a student was actually successful or not (since we already have their final grade), the purpose of this section was to determine how accurately we could "postdict" or classify a student's outcome if we had indeed used their reading assessment score. For example, let us say that in Course A, 75 of the students were successful ("C" or better) at the end of a given semester. Our concern is, "If all we had were the reading scores, how many of those 75 students would we have predicted to be successful"? If our findings predicted that 65 students should be successful, then our classification rate or "hit-rate" would be 65/75 or 87%.

To address this issue, a series of discriminant analyses were computed. The mathematical objective of a discriminant analysis is to statistically distinguish between two (or more) groups on a number of variables or dimensions. In this study, with only two groups (successful vs. unsuccessful), there is only one variable— namely the reading score. Using a student's reading score, the analyses build the best possible model in an attempt to tell the two groups apart— to be able to discriminate between them. Since there are so many factors/variables which contribute to a person's grade, we would never expect any single score to be able to perfectly differentiate groups (Klecka, 1975). In the following computations, courses within a department were combined in order to obtain an acceptable N for the statistics. Also, these analyses utilized all grades obtained (A-F) in order to increase the variability and provide for a more accurate correlation. Grades of "NC" were recoded to an "F" and "CR" grades became "C".

RESULTS

From Table 2-1, the "hit-rates" for courses vary widely (46%-79%) and, in all cases, the findings are not significant. The data clearly indicates that CBAPT reading scores alone cannot reliably predict student success. In many cases, the ability to accurately predict success is less than chance (50-50). In order to enhance our understanding of the results of a discriminant analysis, consider the following. When we predict a student will be successful and they actually are, then we have a true positive outcome. When we predict failure and a student actually fails that is considered a true negative. In both cases, our predictions are perfect. If, in reality reading scores were perfect predictor, everyone in the sample would fall into one of these two categories. Since that type of outcome is virtually impossible, we must concern ourselves with the "mis-classifications" or "mis-hits".

There are two situations which are considered "mis-hits". The first has to do with the situation where we predict success and the student fails. This type of error is called a "false-positive". "Positive" in this case is equated with success. Thus, false-positive is akin to "not successful". In the second case, when we predict failure and the student succeeds, the error is called a "false-negative" or "not unsuccessful". Both types of errors have important implications for this study.

In Tables 2-1 and 2-2, the hit-rates presented reflect both the true positives and true negatives. For example, in Biology courses, it was predicted that 68 of the students would fail (based on reading score). In fact, 114 of them failed. This indicates a true-negative hit-rate of 68/114 or 59.6%. Similarly, it was predicted that 772 would be successful and 1163 actually were. Here, the true-positive hit-rate is 722/1163 or 62% correctly classified. The overall hit-rate is obtained by combining the 790 students (722+68) and dividing by the overall N (1277). The result, which is what is included in the tables, is 790/1277 or 62%. Again, this 62% is the number of students correctly classified and says nothing about the two categories of misses.

Just to round out the picture, it was predicted that 46 of the students would be successful when in fact they were not (false-positive rate of 46/114 or 40%). Finally, 441 were predicted to fail when in fact they were

successful (false-negative rate of 441/1163 or 38%). For our purposes, the false-negative rate is considered the most important. This is the number of students who, by virtue of their reading score, would be viewed as being unsuccessful when in fact they actually passed. This is the group of people who would be affected most if minimum cut-off scores were ever adopted to determine eligibility levels.

TABLE 2-1
Percentage of Students Correctly Classified
Using a Discriminant Function Analysis

Course	N	Hit-Rate
Accounting	517	54.9%
Biology	1277	61.9%
Chemistry	156	54.4%
Communication	125	52.8%
Computer Sci.	398	56.0%
Dance	162	53.7%
Earth Sci.	118	71.1%
Economics	271	61.6%
Electronics	350	46.6%
English	666	55.5%
French	67	55.2%
Fam/Consumer	53	79.2%
Fire Science	1412	59.6%
Geography	147	63.9%
Health-Ed	296	61.4%
History	827	59.8%
Human Develop.	292	58.2%
Math	1035	54.1%
Political Sci.	774	61.7%
Psychology	667	60.1%

On the CBAPT, a score at the 21st percentile qualifies an individual for Reading 090. Scores less than 21 require students to enroll in Reading 080. In order to gain a clearer picture of those who have low reading scores, another set of discriminant analyses were computed for students whose reading score was less than or equal to 21. The ability to correctly classify these students is outlined in Table 2-2. For Biology courses, it can be seen that 143 of those sampled had scores below 21. Within that group, our ability to classify these students was only 54%. Again, these findings indicate that people who have low reading scores do not necessarily fail courses. In some cases the hit-rates were much more respectable. However, notice that in those cases where the percentages are above 70%, the size of the sample is so small that the predictions are unreliable and must be used only as a guideline and be interpreted very cautiously.

TABLE 2-2
Percentage of Students Correctly Classified
With Reading Scores Less than 21

Course	N	Hit-Rate
Accounting	98	51.0%
Biology	143	54.5%
Chemistry	28	42.8%
Communication	9	88.8%
Computer Sci.	66	53.0%
Dance	32	50.0%
Earth Sci.	12	66.6%
Economics	33	72.7%
Electronics	113	61.0%
English	109	49.5%
French	17	64.7%
Fam/Consumer	13	84.6%
Fire Science	140	52.8%
Geography	15	53.3%
Health-Ed	44	54.5%
History	96	51.0%
Human Develop.	87	55.2%
Math	168	51.7%
Political Sci.	88	55.6%
Psychology	86	56.9%

It should be noted that when the analyses were computed without those students who received an "F", or "NC", the predictions did not improve.

RECOMMENDATIONS and CONCLUSIONS

1. The results of this investigation indicate that use of the CBAPT scores for prediction of classroom performance is not justified. Many students (40-55%) who are successful would have been incorrectly classified using reading score data.

2. Several variables need to be combined into a multi-factor model in order to attempt the process of predicting classroom success.

3. If minimum competency levels are indeed pursued, they should be calculated for each type of course within a department. Combining courses within each division would be totally inappropriate and would reduce accuracy in prediction even further.

4. The reliability of the placement scores should be evaluated on the RSC population. Test-retest studies would be imperative before any final decisions can be made.

The results of this investigation supports the view instructors have maintained for some time. That is, numerous factors contribute to the grade obtained in a given course. The ability of any single instrument to predict the complexity of future behavior seems impossible. Our attempts to measure such things as motivation, determination, persistence, and other goal-directed behaviors and attitudes have traditionally been quite modest at best. Again, we are attempting to quantify human characteristics which are difficult to define let alone analyze. Thus, it is imperative that we look towards a multi-dimensional view of behavior and utilize several measures. Finally, the results presented here argue against the use of placement scores as we have them. The results do not demonstrate that reading is unimportant in transfer level courses. The findings only indicate that the scores we have are not particularly important when it comes to predictions.

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APPENDIX R

Tables of Individual Courses Sampled
with
Spearman Corrleations and Grade Distributions

ACCOUNTING 101

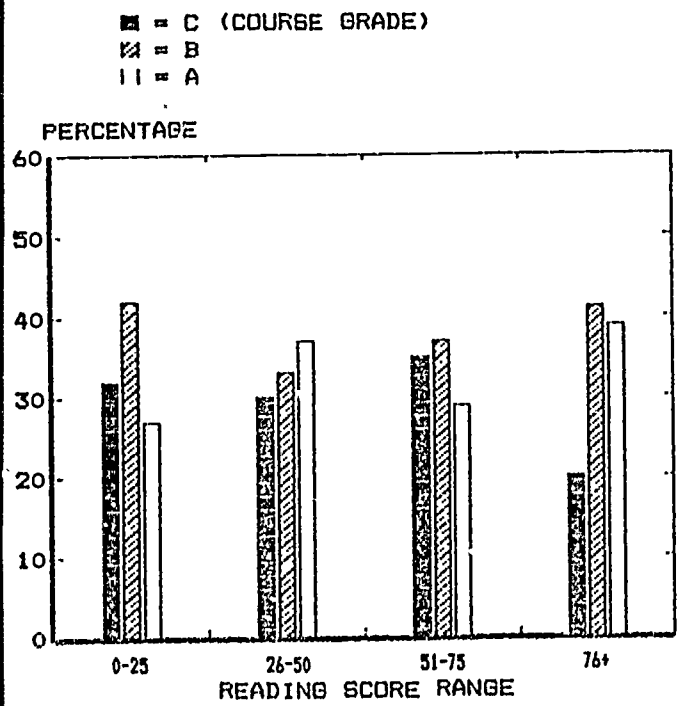
DISTRIBUTION OF SUCCESSFUL STUDENTS WITH READING SCORES IN THE FOLLOWING PERCENTILE RANGES

PERCENTILE RANGES

N	<25	26-50	51-75	76+	Spearman R
211	19% (n=41)	26% (n=54)	25% (n=52)	30% (n=64)	.09

<<==========>> 45% who passed scored below the 50th percentile

<<==========>> 55% who passed scored above the 50th percentile



Grade Distribution Table

Range	Grade C	Grade B	Grade A	X^2
Below 25	32%	42%	26%	4.6ns
26-50	30%	33%	37%	
51-75	35%	37%	28%	
76+	20%	41%	39%	

ACCOUNTING 102

DISTRIBUTION OF SUCCESSFUL STUDENTS WITH READING SCORES IN THE FOLLOWING PERCENTILE RANGES

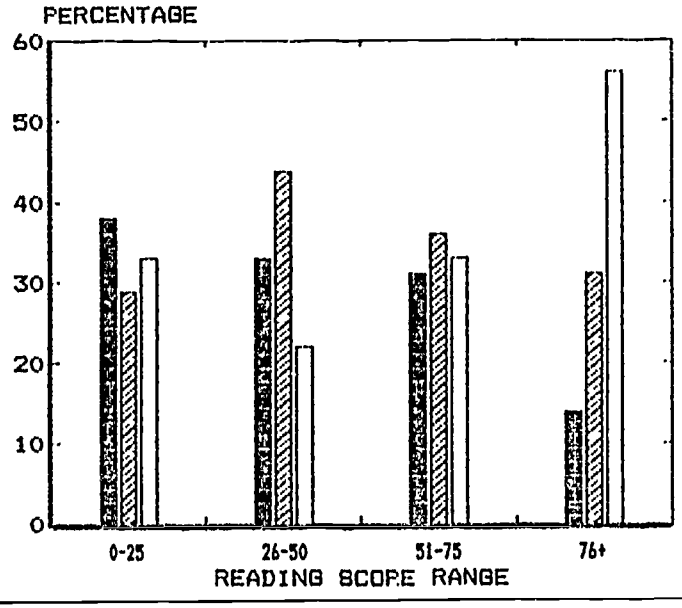
PERCENTILE RANGES

N	<25	26-50	51-75	76+	Spearman R
123	20% (n=24)	22% (n=27)	29% (n=36)	29% (n=36)	.23**

<<==========>> 42% who passed scored below the 50th percentile

<<==========>> 58% who passed scored above the 50th percentile

■ = C (COURSE GRADE)
▨ = B
▯ = A



Grade Distribution Table

Range	Grade C	Grade B	Grade A	X^2
Below 25	38%	29%	33%	9.9ns
26-50	33%	44%	23%	
51-75	31%	36%	33%	
76+	14%	30%	56%	

**p< .01

ART COURSES (ALL)

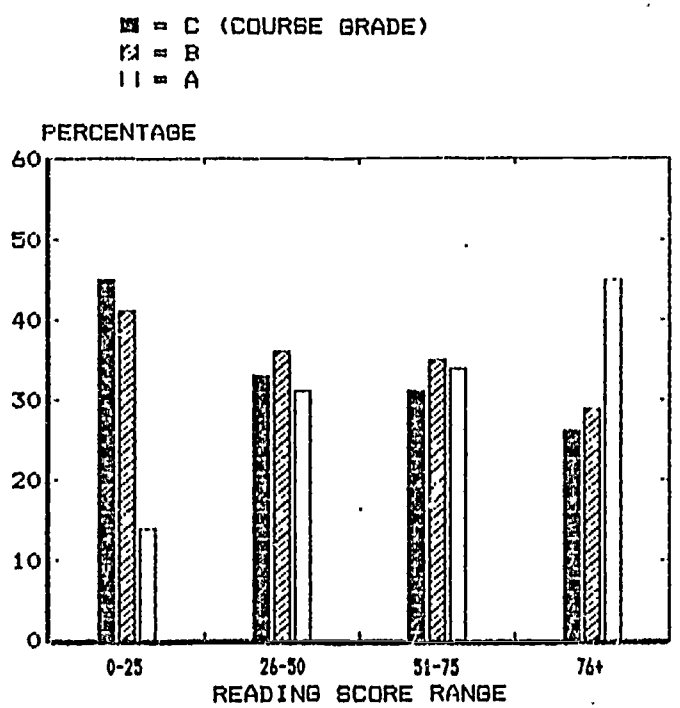
DISTRIBUTION OF SUCCESSFUL STUDENTS WITH READING SCORES IN THE FOLLOWING PERCENTILE RANGES

PERCENTILE RANGES

N	<25	26-50	51-75	76+	Spearman R
304	17% (n=51)	21% (n=64)	26% (n=80)	36% (n=109)	.20***

<<==========>>
33% who passed scored below the 50th percentile

<<==========>>
62% who passed scored above the 50th percentile



Grade Distribution Table

Range	Grade C	Grade B	Grade A	X^2
Below 25	45%	41%	14%	15.8**
26-50	33%	36%	31%	
51-75	31%	35%	34%	
76+	26%	29%	45%	

*p< .01

***p< .001

BIOLOGY 109

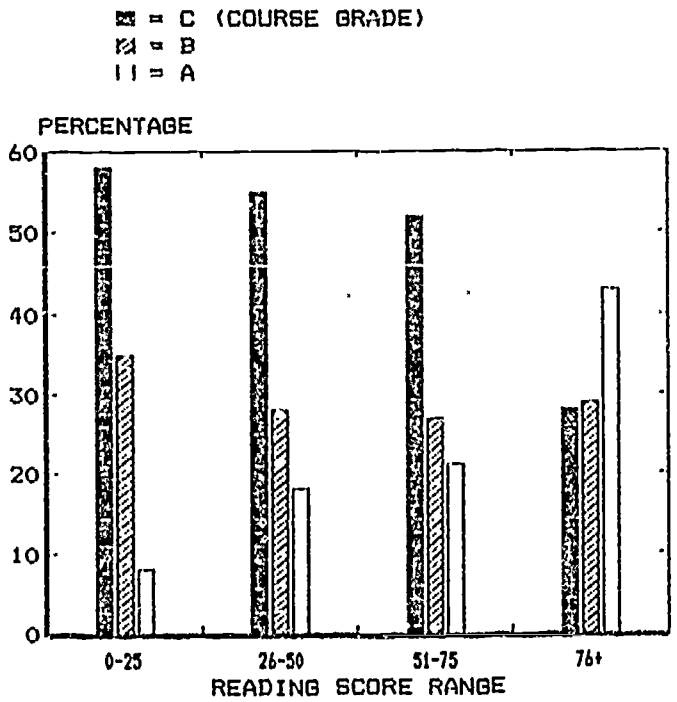
DISTRIBUTION OF SUCCESSFUL STUDENTS WITH READING SCORES IN THE FOLLOWING PERCENTILE RANGES

PERCENTILE RANGES

N	<25	26-50	51-75	76+	Spearman R
215	12% (n=26)	24% (n=51)	26% (n=56)	38% (n=82)	.29***

<<==========>> 36% who passed scored below the 50th percentile

<<==========>> 64% who passed scored above the 50th percentile



Grade Distribution Table

Range	Grade C	Grade B	Grade A	X^2
Below 25	58%	35%	7%	21.7**
26-50	55%	28%	17%	
51-75	52%	27%	21%	
76+	28%	29%	43%	

**p< .01

***p< .001

BIOLOGY 139

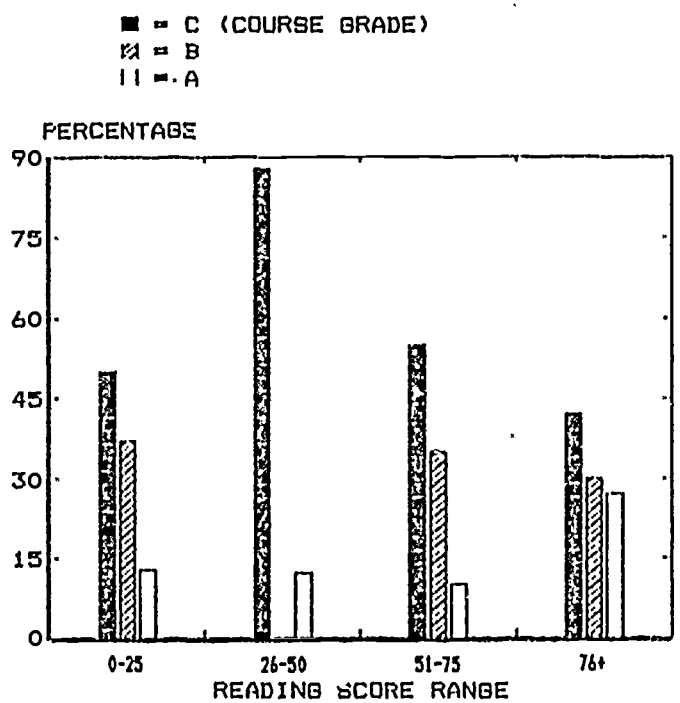
DISTRIBUTION OF SUCCESSFUL STUDENTS WITH READING SCORES IN THE FOLLOWING PERCENTILE RANGES

PERCENTILE RANGES

N	<25	26-50	51-75	76+	Spearman R
62	13% (n=8)	13% (n=8)	32% (n=20)	42% (n=26)	.21*

<<==========>> Only 26% who passed scored below the 50th percentile

<<==========>> 74% who passed scored above the 50th percentile



Grade Distribution Table

Range	Grade C	Grade B	Grade A	X^2
Below 25	50%	38%	12%	7.3ns
26-50	87%	0%	13%	
51-75	55%	35%	10%	
76+	42%	31%	27%	

*p< .05

BIOLOGY 149

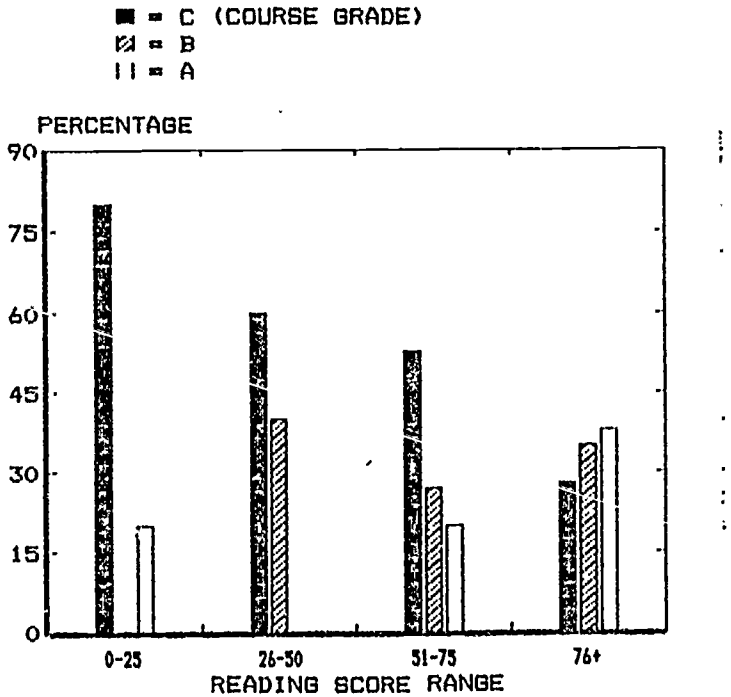
DISTRIBUTION OF SUCCESSFUL STUDENTS WITH READING SCORES IN THE FOLLOWING PERCENTILE RANGES

PERCENTILE RANGES

N	<25	26-50	51-75	76+	Spearman R
59	9% (n=5)	17% (n=10)	25% (n=15)	49% (n=29)	.37**

<<==========>> Only 26% who passed scored below the 50th percentile

<<==========>> 74% who passed scored above the 50th percentile



Grade Distribution Table

Range	Grade C	Grade B	Grade A	X^2
Below 25	80%	0%	20%	10.7ns
26-50	60%	40%	0%	
51-75	53%	27%	20%	
76+	28%	35%	37%	

**p< .01

BIOLOGY 239

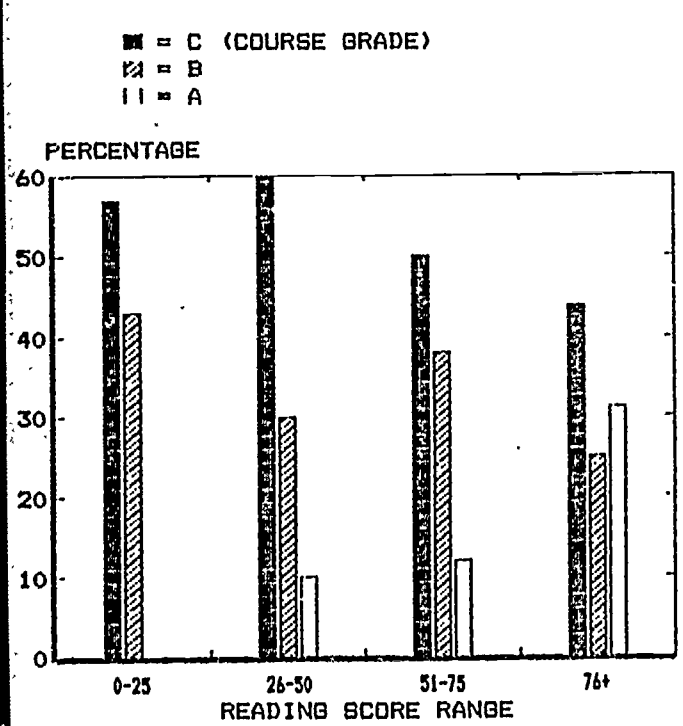
DISTRIBUTION OF SUCCESSFUL STUDENTS WITH READING SCORES IN THE FOLLOWING PERCENTILE RANGES

PERCENTILE RANGES

N	<25	26-50	51-75	76+	Spearman R
49	14% (n=7)	20% (n=10)	33% (n=16)	33% (n=16)	.19

<<==========>>
Only 34% who passed scored below the 50th percentile

<<==========>>
66% who passed scored above the 50th percentile



Grade Distribution Table

Range	Grade C	Grade B	Grade A	X^2
Below 25	57%	43%	0%	4.7ns
26-50	60%	30%	10%	
51-75	50%	38%	12%	
76+	44%	25%	31%	

BUSINESS 101

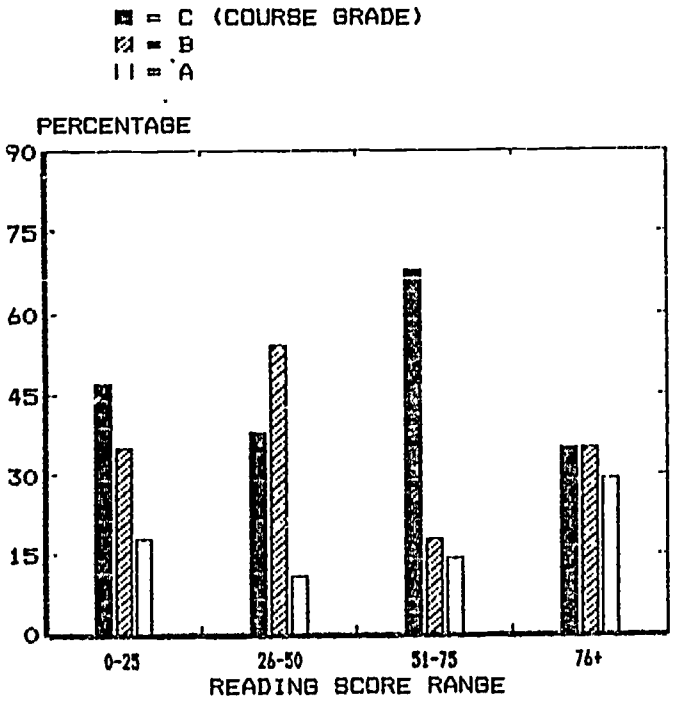
DISTRIBUTION OF SUCCESSFUL STUDENTS WITH READING SCORES IN THE FOLLOWING PERCENTILE RANGES

PERCENTILE RANGES

N	<25	26-50	51-75	76+	Spearman R
121	14% (n=17)	23% (n=28)	23% (n=28)	40% (n=48)	.11

<<==========>> 37% who passed scored below the 50th percentile

<<==========>> 63% who passed scored above the 50th percentile



Grade Distribution Table

Range	Grade C	Grade B	Grade A	X^2
Below 25	47%	35%	18%	13.6*
26-50	36%	54%	10%	
51-75	68%	18%	14%	
76+	35%	35%	30%	

*p< .05

BUSINESS 120

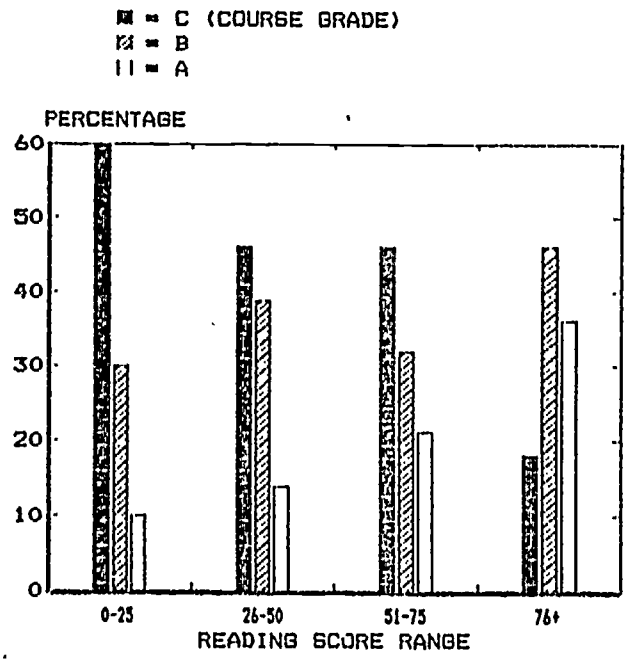
DISTRIBUTION OF SUCCESSFUL STUDENTS WITH READING SCORES IN THE FOLLOWING PERCENTILE RANGES

PERCENTILE RANGES

N	<25	26-50	51-75	76+	Spearman R
94	10% (n=10)	30% (n=28)	30% (n=28)	30% (n=28)	.29**

<<==========>> 40% who passed scored below the 50th percentile

<<==========>> 60% who passed scored above the 50th percentile



Grade Distribution Table

Range	Grade C	Grade B	Grade A	X^2
Below 25	60%	30%	10%	9.7ns
26-50	46%	39%	15%	
51-75	46%	32%	22%	
76+	18%	46%	36%	

**p< .01

CHEMISTRY 209

DISTRIBUTION OF SUCCESSFUL STUDENTS WITH READING SCORES IN THE FOLLOWING PERCENTILE RANGES

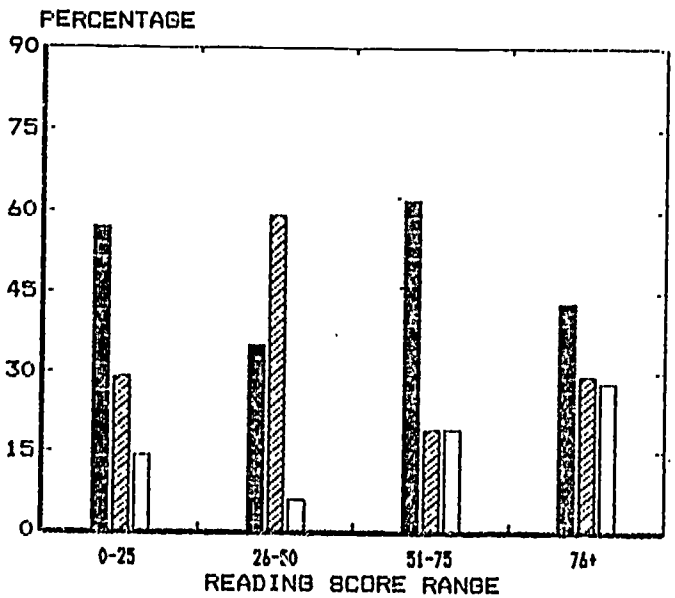
PERCENTILE RANGES

N	<25	26-50	51-75	76+	Spearman R
75	19% (n=14)	23% (n=17)	21% (n=16)	37% (n=28)	.11

<<==========>> 41% who passed scored below the 50th percentile

<<==========>> 59% who passed scored above the 50th percentile

▩ = C (COURSE GRADE)
▨ = B
▥ = A



Grade Distribution Table

Range	Grade C	Grade B	Grade A	X^2
Below 25	57%	29%	14%	9.3ns
26-50	35%	59%	6%	
51-75	63%	18%	19%	
76+	43%	28%	29%	

COMMUNICATIONS 100

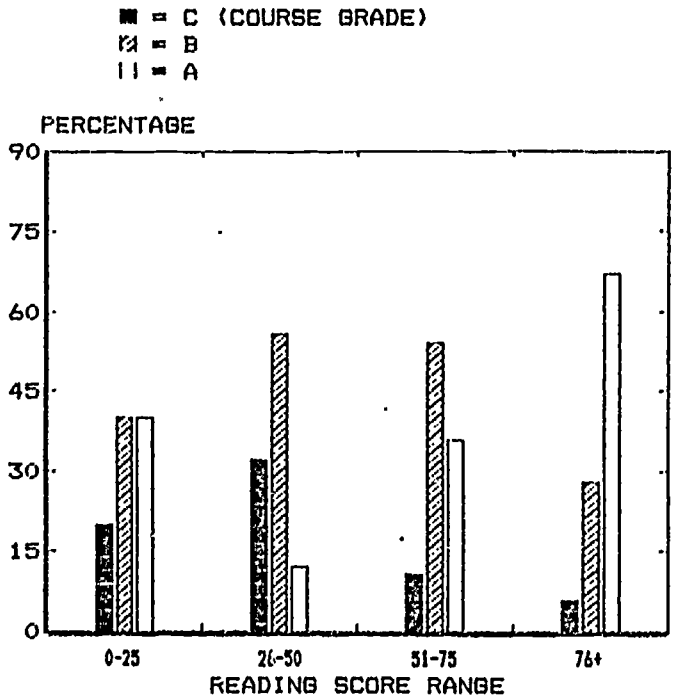
DISTRIBUTION OF SUCCESSFUL STUDENTS WITH READING SCORES IN THE FOLLOWING PERCENTILE RANGES

PERCENTILE RANGES

N	<25	26-50	51-75	76+	Spearman R
81	12% (n=10)	31% (n=25)	35% (n=28)	22% (n=18)	.33***

<<==========>>
43% who passed scored below the 50th percentile

<<==========>>
57% who passed scored above the 50th percentile



Grade Distribution Table

Range	Grade C	Grade B	Grade A	X^2
Below 25	20%	40%	40%	16.3**
26-50	32%	56%	12%	
51-75	10%	54%	36%	
76+	6%	28%	66%	

**p< .01

***p< .001

COMPUTER SCIENCE 100

DISTRIBUTION OF SUCCESSFUL STUDENTS WITH READING SCORES IN THE FOLLOWING PERCENTILE RANGES

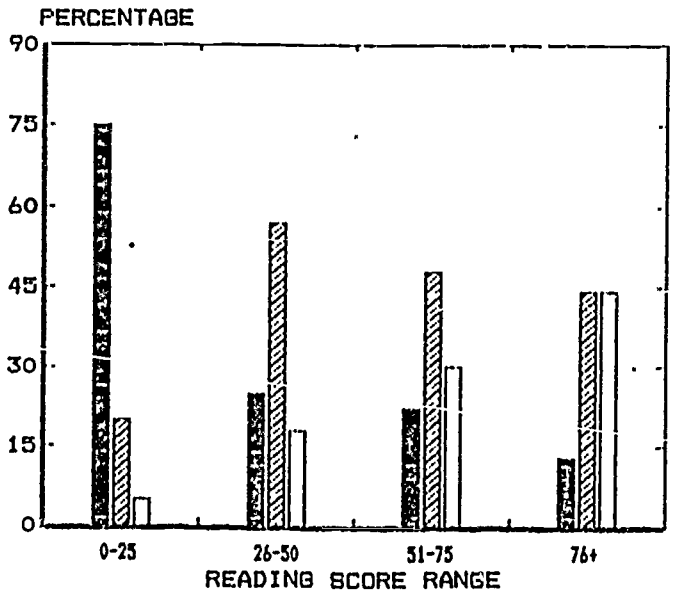
PERCENTILE RANGES

N	<25	26-50	51-75	76+	Spearman R
114	18% (n=20)	25% (n=28)	24% (n=27)	34% (n=39)	.43***

<<==========>>
42% who passed scored below the 50th percentile

<<==========>>
58% who passed scored above the 50th percentile

▩ = C (COURSE GRADE)
▨ = B
▮ = A



Grade Distribution Table

Range	Grade C	Grade B	Grade A	X^2
Below 25	75%	20%	5%	31.0***
26-50	25%	57%	18%	
51-75	22%	48%	30%	
76+	13%	44%	43%	

***p< .001

***p< .001

CRIMINAL JUSTICE 101

DISTRIBUTION OF SUCCESSFUL STUDENTS WITH READING SCORES IN THE FOLLOWING PERCENTILE RANGES

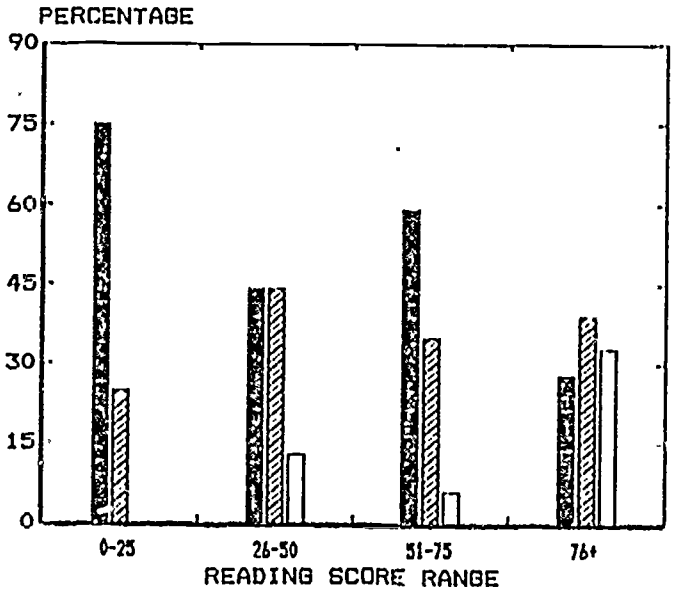
PERCENTILE RANGES

N	<25	26-50	51-75	76+	Spearman R
55	7% (n=4)	29% (n=16)	31% (n=17)	33% (n=18)	.26*

<<==========>> Only 36% who passed scored below the 50th percentile

<<==========>> 64% who passed scored above the 50th percentile

■ = C (COURSE GRADE)
▨ = B
| | = A



Grade Distribution Table

Range	Grade C	Grade B	Grade A	X^2
Below 25	75%	25%	0%	8.1ns
26-50	44%	44%	12%	
51-75	59%	35%	6%	
76+	28%	39%	33%	

*p< .05

EARTH SCIENCE 110

DISTRIBUTION OF SUCCESSFUL STUDENTS WITH READING SCORES IN THE FOLLOWING PERCENTILE RANGES

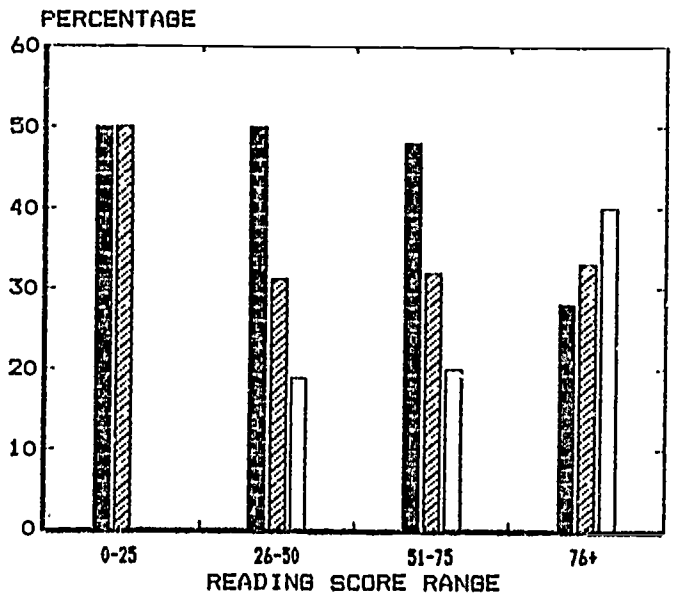
PERCENTILE RANGES

N	<25	26-50	51-75	76+	Spearman R
89	9% (n=8)	18% (n=16)	28% (n=25)	45% (n=40)	.28**

<<==========>> Only 27% who passed scored below the 50th percentile

<<==========>> 73% who passed scored above the 50th percentile

■ = C (COURSE GRADE)
▨ = B
| | = A



Grade Distribution Table

Range	Grade C	Grade B	Grade A	X^2
Below 25	50%	50%	0%	8.8ns
26-50	50%	31%	19%	
51-75	48%	32%	20%	
76+	28%	32%	40%	

**p< .01

ECONOMICS 120

DISTRIBUTION OF SUCCESSFUL STUDENTS WITH READING SCORES IN THE FOLLOWING PERCENTILE RANGES

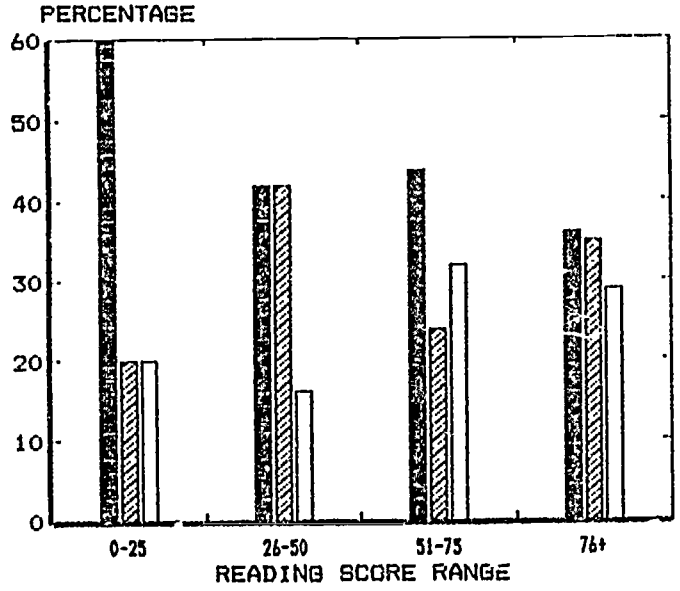
PERCENTILE RANGES

N	<25	26-50	51-75	76+	Spearman R
145	10% (n=15)	21% (n=31)	28% (n=41)	40% (n=58)	.12

<<==========>> 31% who passed scored below the 50th percentile.

<<==========>> 69% who passed scored above the 50th percentile

■ = C (COURSE GRADE)
▨ = B
▮ = A



Grade Distribution Table

Range	Grade C	Grade B	Grade A	X^2
Below 25	60%	20%	20%	6.2ns
26-50	42%	42%	16%	
51-75	44%	24%	32%	
76+	36%	35%	29%	

ECONOMICS 121

DISTRIBUTION OF SUCCESSFUL STUDENTS WITH READING SCORES IN THE FOLLOWING PERCENTILE RANGES

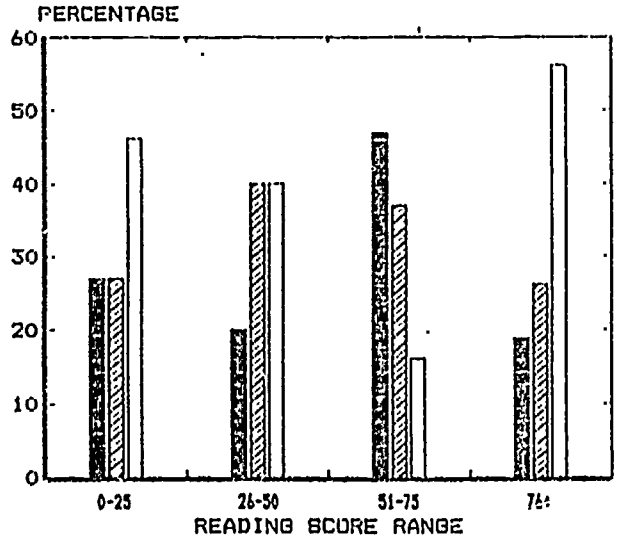
PERCENTILE RANGES

N	<25	26-50	51-75	76+	Spearman R
67	16% (n=11)	15% (n=10)	28% (n=19)	41% (n=27)	.13

<<==========>> 31% who passed scored below the 50th percentile

<<==========>> 69% who passed scored above the 50th percentile

▩ = C (COURSE GRADE)
▨ = B
▮ = A



Grade Distribution Table

Range	Grade C	Grade B	Grade A	X^2
Below 25	27%	27%	46%	8.7ns
26-50	20%	40%	40%	
51-75	47%	37%	16%	
76+	19%	26%	55%	

ELECTRONICS 147

DISTRIBUTION OF SUCCESSFUL STUDENTS WITH READING SCORES IN THE FOLLOWING PERCENTILE RANGES

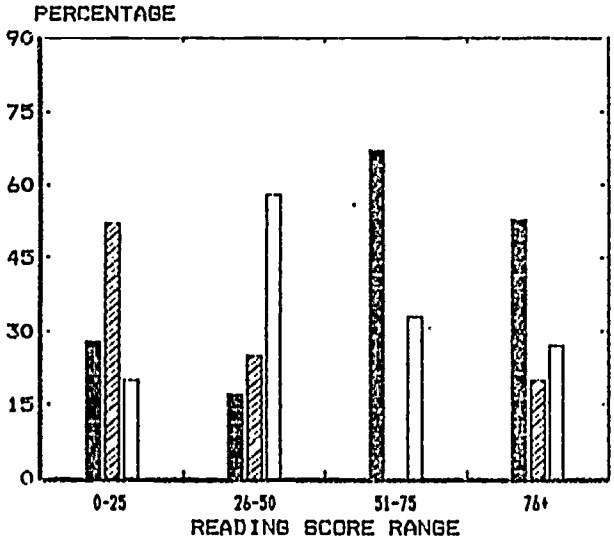
PERCENTILE RANGES

N	<25	26-50	51-75	76+	Spearman R
58	43% (n=25)	21% (n=12)	10% (n=6)	26% (n=15)	-.09

<<==========>> 64% who passed scored below the 50th percentile

<<==========>> 36% who passed scored above the 50th percentile

■ = C (COURSE GRADE)
▨ = B
▮ = A



Grade Distribution Table

Range	Grade C	Grade B	Grade A	X^2
Below 25	28%	52%	20%	14.2*
25-50	17%	25%	58%	
51-75	67%	0%	33%	
76+	53%	20%	27%	

*p< .05

ENGLISH 101

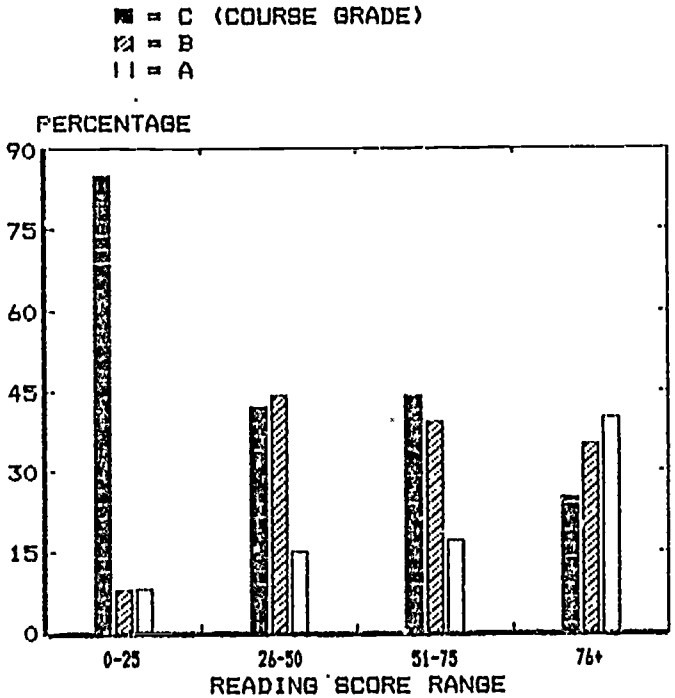
DISTRIBUTION OF SUCCESSFUL STUDENTS WITH READING SCORES IN THE FOLLOWING PERCENTILE RANGES

PERCENTILE RANGES

N	<25	26-50	51-75	76+	Spearman R
215	12% (n=26)	19% (n=41)	27% (n=59)	42% (n=89)	.36***

<<======>> Only 31% who passed scored below the 50th percentile

<<=========>> 69% who passed scored above the 50th percentile



Grade Distribution Table

Range	Grade C	Grade B	Grade A	X^2
Below 25	85%	7%	8%	39.8***
26-50	42%	44%	14%	
51-75	44%	39%	17%	
76+	25%	35%	40%	

***p< .001

***p< .001

FRENCH 101

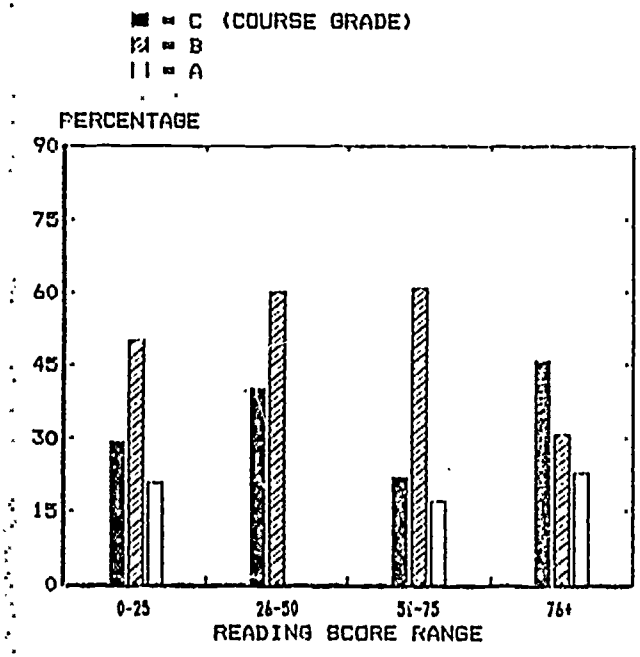
DISTRIBUTION OF SUCCESSFUL STUDENTS WITH READING SCORES IN THE FOLLOWING PERCENTILE RANGES

PERCENTILE RANGES

N	<25	26-50	51-75	76+	Spearman R
55	25% (n=14)	18% (n=10)	33% (n=18)	24% (n=13)	-.03

<<==========>> 43% who passed scored below the 50th percentile

<<==========>> 57% who passed scored above the 50th percentile



Grade Distribution Table

Range	Grade C	Grade B	Grade A	X^2
Below 25	29%	50%	21%	5.3ns
26-50	40%	60%	0%	
51-75	22%	61%	17%	
76+	46%	31%	23%	

GEOGRAPHY 101

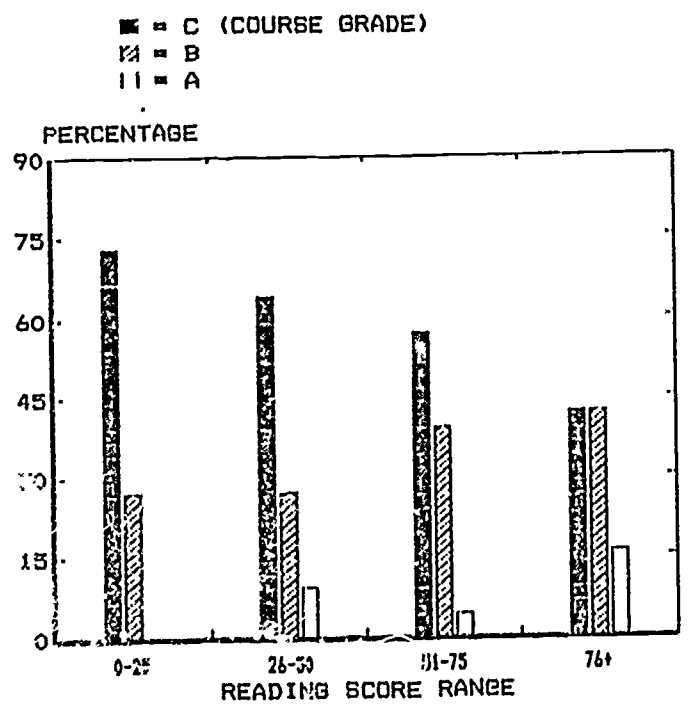
DISTRIBUTION OF SUCCESSFUL STUDENTS WITH READING SCORES IN THE FOLLOWING PERCENTILE RANGES

PERCENTILE RANGES

N	<25	26-50	51-75	76+	Spearman R
103	15% (n=15)	21% (n=22)	27% (n=28)	37% (n=38)	.24**

<<==========>> 36% who passed scored below the 50th percentile

<<==========>> 64% who passed scored above the 50th percentile



Grade Distribution Table

Range	Grade C	Grade B	Grade A	X^2
Below 25	73%	27%	0%	8.0ns
26-50	64%	27%	9%	
51-75	57%	39%	4%	
76+	42%	42%	16%	

**p< .01

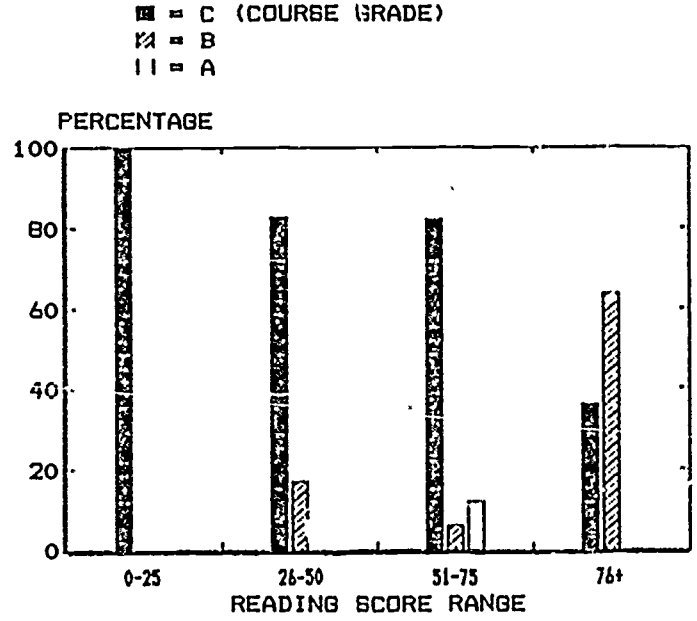
HISTORY 101

DISTRIBUTION OF SUCCESSFUL STUDENTS WITH READING SCORES IN THE FOLLOWING PERCENTILE RANGES

	PERCENTILE RANGES				
N	<25	26-50	51-75	76+	Spearman R
55	13% (n=7)	11% (n=6)	31% (n=17)	45% (n=25)	.49***

<<==========>> Only 24% who passed scored below the 50th percentile

<<==========>> 76% who passed scored above the 50th percentile



Range	Grade Distribution Table Grade C	B	A	X^2
Below 25	100%	0%	0%	24.2***
26-50	83%	17%	0%	
51-75	82%	6%	12%	
76+	36%	64%	0%	

***p< .001

***p< .001

HISTORY 118

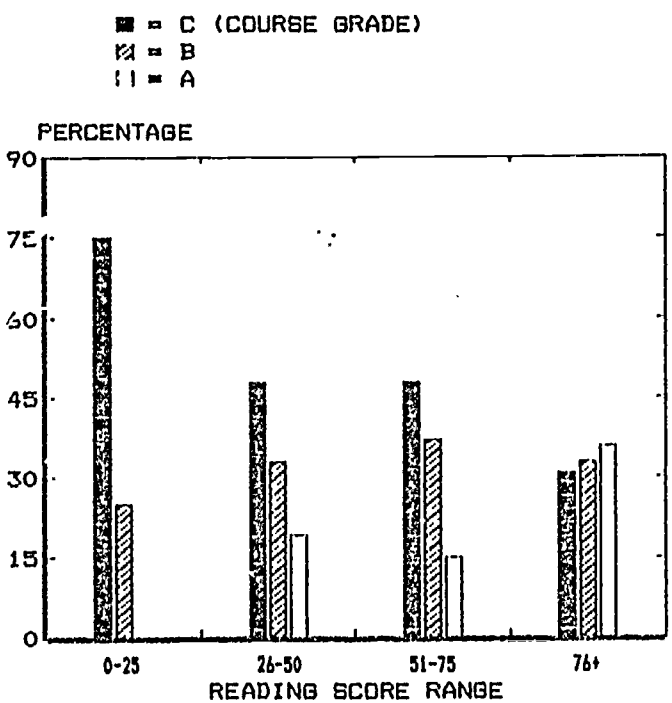
DISTRIBUTION OF SUCCESSFUL STUDENTS WITH READING SCORES IN THE FOLLOWING PERCENTILE RANGES

PERCENTILE RANGES

N	<25	26-50	51-75	76+	Spearman R
88	5% (n=4)	24% (n=21)	31% (n=27)	41% (n=36)	.24**

<<==========>> Only 29% who passed scored below the 50th percentile

<<==========>> 71% who passed scored above the 50th percentile



Grade Distribution Table

Range	Grade C	Grade B	Grade A	X^2
Below 25	75%	25%	0%	7.1ns
26-50	48%	33%	10%	
51-75	48%	37%	15%	
76+	31%	33%	36%	

**p< .01

HISTORY 120

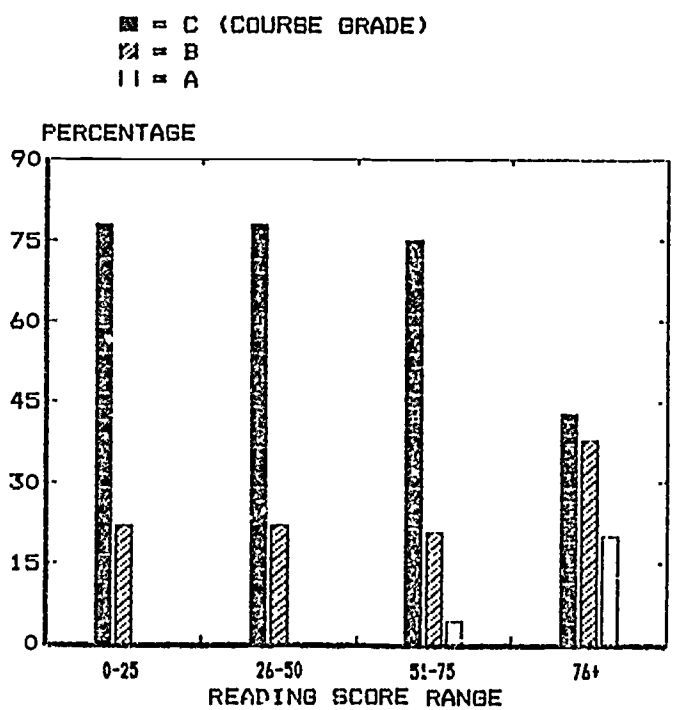
DISTRIBUTION OF SUCCESSFUL STUDENTS WITH READING SCORES IN THE FOLLOWING PERCENTILE RANGES

PERCENTILE RANGES

N	<25	26-50	51-75	76+	Spearman R
130	7% (n=9)	14% (n=18)	36% (n=47)	43% (n=56)	.34***

<<==========>> Only 21% who passed scored below the 50th percentile

<<==========>> 79% who passed scored above the 50th percentile



Grade Distribution Table

Range	Grade C	Grade B	Grade A	X^2
Below 25	78%	22%	0%	17.8**
26-50	78%	22%	0%	
51-75	75%	21%	4%	
76+	43%	38%	19%	

**p< .01

***p< .001

HISTORY 122

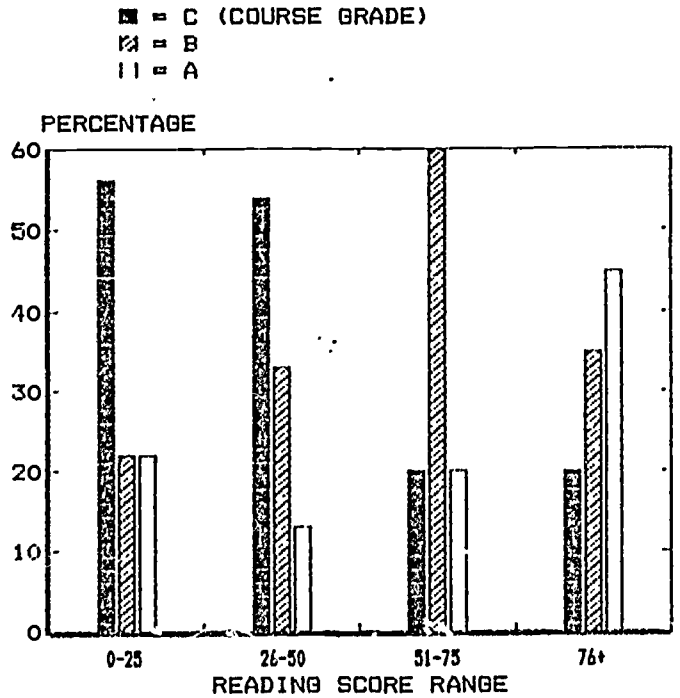
DISTRIBUTION OF SUCCESSFUL STUDENTS WITH READING SCORES IN THE FOLLOWING PERCENTILE RANGES

PERCENTILE RANGES

N	<25	26-50	51-75	76+	Spearman R
86	31% (n=27)	28% (n=24)	17% (n=15)	24% (n=20)	.28**

<<==========>> 59% who passed scored below the 50th percentile

<<==========>> 41% who passed scored above the 50th percentile



Grade Distribution Table

Range	Grade C	Grade B	Grade A	X^2
Below 25	56%	22%	22%	15.2*
26-50	54%	33%	13%	
51-75	20%	60%	20%	
76+	20%	35%	45%	

*p< .05

**p< .01

56

57

HISTORY 124

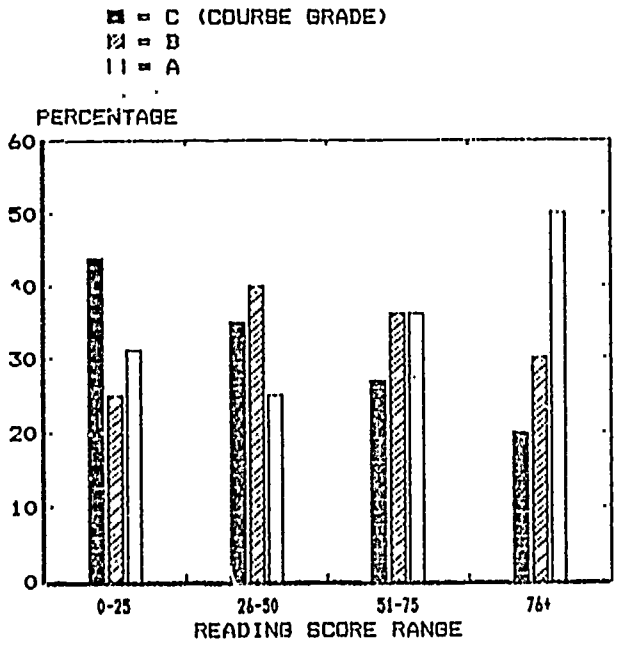
DISTRIBUTION OF SUCCESSFUL STUDENTS WITH READING SCORES IN THE FOLLOWING PERCENTILE RANGES

PERCENTILE RANGES

N	<25	26-50	51-75	76+	Spearman R
57	23% (n=16)	35% (n=20)	19% (n=11)	18% (n=10)	.17

<<==========>> 63% who passed scored below the 50th percentile

<<==========>> 37% who passed scored above the 50th percentile



Grade Distribution Table

Range	Grade C	Grade B	Grade A	X^2
Below 25	41%	33%	26%	3.3ns
26-50	35%	40%	25%	
51-75	27%	36%	34%	
76+	20%	30%	50%	

HUMANITIES 101

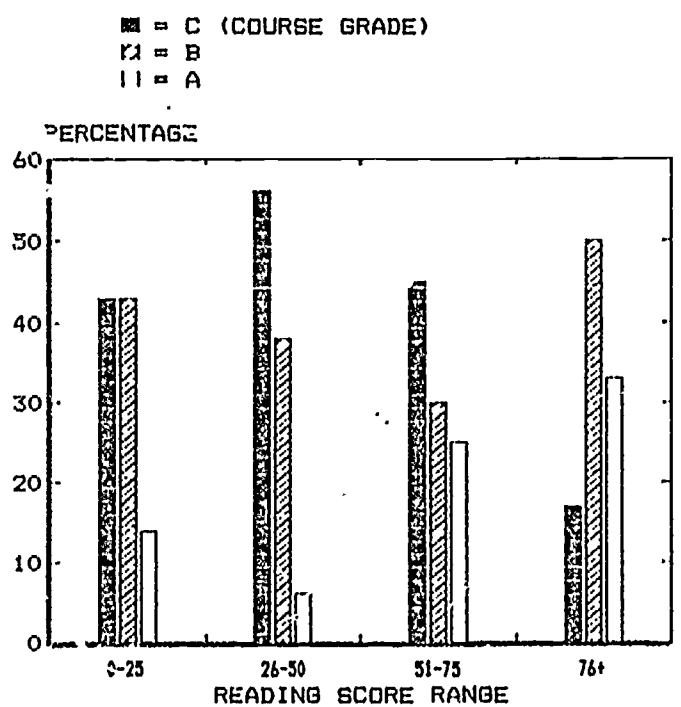
DISTRIBUTION OF SUCCESSFUL STUDENTS WITH READING SCORES IN THE FOLLOWING PERCENTILE RANGES

PERCENTILE RANGES

N	<25	26-50	51-75	76+	Spearman R
73	10% (n=7)	22% (n=16)	27% (n=20)	41% (n=30)	.33**

<<==========>> Only 33% who passed scored below the 50th percentile

<<==========>> 67% who passed scored above the 50th percentile



Grade Distribution Table

Range	Grade C	Grade B	Grade A	X^2
Below 25	43%	43%	14%	10.3ns
26-50	56%	38%	6%	
51-75	45%	30%	25%	
76+	17%	50%	33%	

**p< .01

MATH 110

DISTRIBUTION OF SUCCESSFUL STUDENTS WITH READING SCORES IN THE FOLLOWING PERCENTILE RANGES

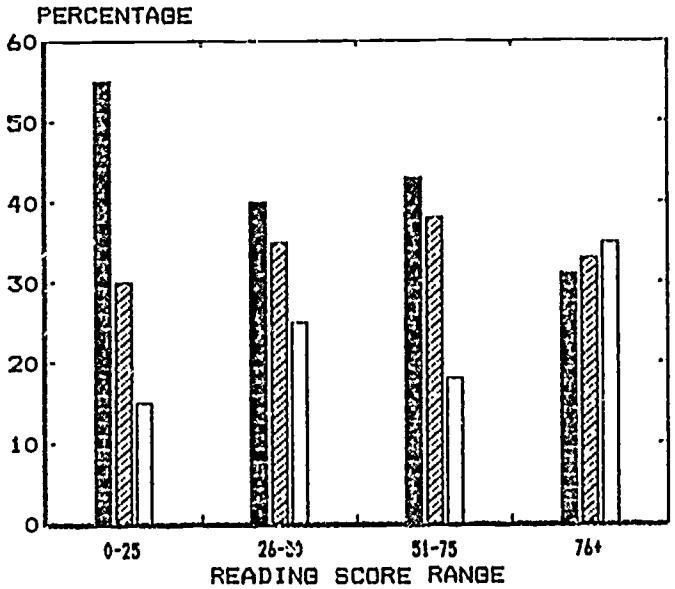
PERCENTILE RANGES

N	<25	26-50	51-75	76+	Spearman R
412	17% (n=69)	23% (n=95)	26% (n=106)	35% (n=142)	.17***

<<==========>> 40% who passed scored below the 50th percentile

<<==========>> 60% who passed scored above the 50th percentile

■ = C (COURSE GRADE)
▨ = B
▮ = A



Grade Distribution Table

Range	Grade C	Grade B	Grade A	X^2
Below 25	55%	30%	15%	19.1**
26-50	40%	35%	25%	
51-75	43%	39%	18%	
76+	31%	34%	35%	

**p< .01

***p< .001

MATH 120

DISTRIBUTION OF SUCCESSFUL STUDENTS WITH READING SCORES IN THE FOLLOWING PERCENTILE RANGES

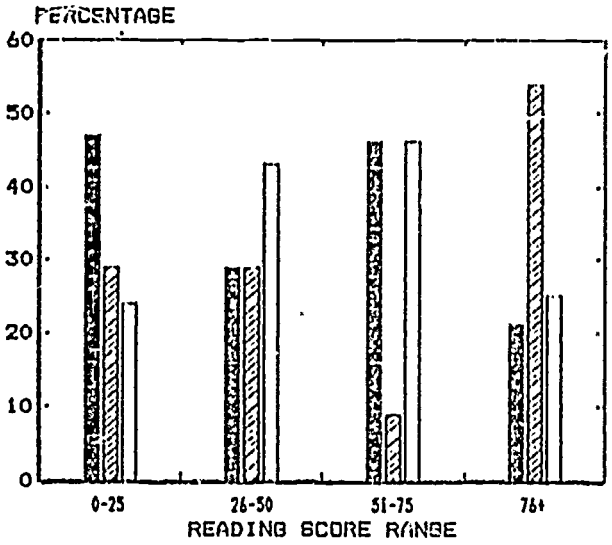
PERCENTILE RANGES

N	<25	26-50	51-75	76+	Spearman R
66	26% (n=17)	21% (n=14)	17% (n=11)	36% (n=24)	.11

<<==========>> 47% who passed scored below the 50th percentile

<<==========>> 53% who passed scored above the 50th percentile

■ = C (COURSE GRADE)
▨ = B
▮ = A



Grade Distribution Table

Range	Grade C	Grade B	Grade A	X^2
Below 25	47%	29%	24%	9.5ns
26-50	29%	29%	42%	
51-75	46%	9%	45%	
76+	21%	54%	25%	

MATH 160

DISTRIBUTION OF SUCCESSFUL STUDENTS WITH READING SCORES IN THE FOLLOWING PERCENTILE RANGES

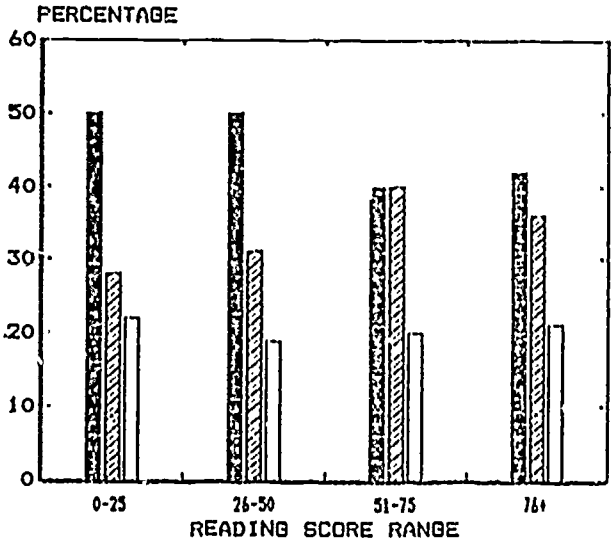
PERCENTILE RANGES

N	<25	26-50	51-75	76+	Spearman R
92	20% (n=18)	17% (n=16)	27% (n=25)	36% (n=33)	.04

<<==========>> 37% who passed scored below the 50th percentile

<<==========>> 63% who passed scored above the 50th percentile

▩ = C (COURSE GRADE)
▨ = B
▥ = A



Grade Distribution Table

Range	Grade C	Grade B	Grade A	X^2
Below 25	50%	28%	22%	<1
26-50	50%	31%	19%	
51-75	40%	40%	20%	
76+	42%	36%	22%	

PHILOSOPHY 106

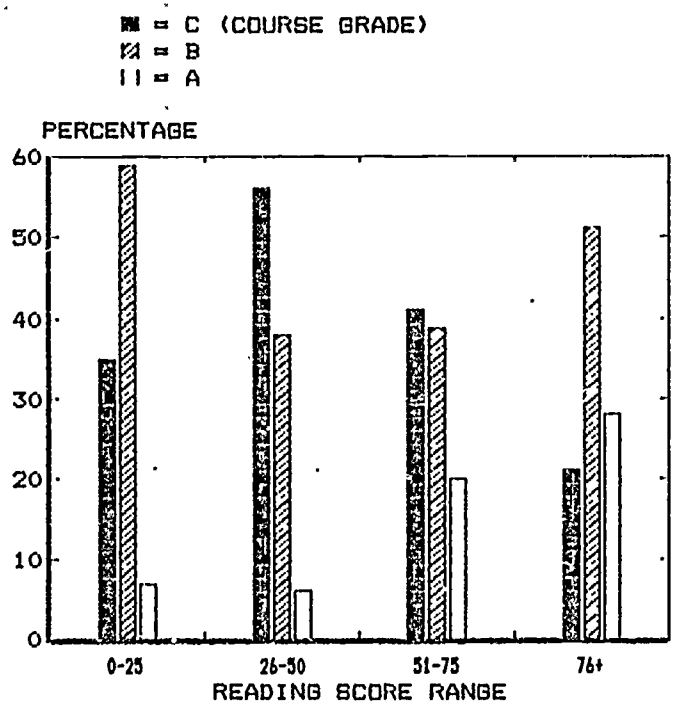
DISTRIBUTION OF SUCCESSFUL STUDENTS WITH READING SCORES IN THE FOLLOWING PERCENTILE RANGES

PERCENTILE RANGES

N	<25	26-50	51-75	76+	Spearman R
244	12% (n=29)	23% (n=55)	30% (n=74)	35% (n=86)	.27***

<<==========>> 35% who passed scored below the 50th percentile

<<==========>> 65% who passed scored above the 50th percentile



Grade Distribution Table

Range	Grade C	Grade B	Grade A	X^2
Below 25	35%	59%	6%	26.7***
26-50	56%	38%	6%	
51-75	41%	39%	20%	
76+	21%	51%	28%	

***p< .001

***p< .001

PHILOSOPHY 210

DISTRIBUTION OF SUCCESSFUL STUDENTS WITH READING SCORES IN THE FOLLOWING PERCENTILE RANGES

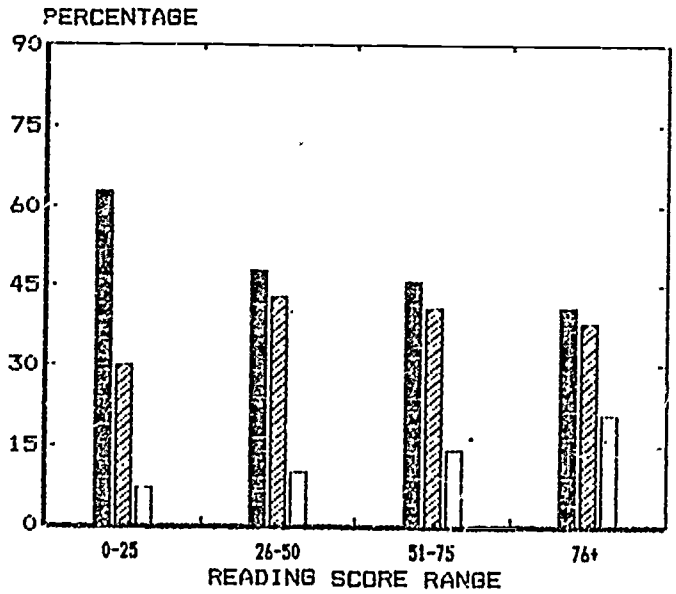
PERCENTILE RANGES

N	<25	26-50	51-75	76+	Spearman R
176	15% (n=27)	12% (n=21)	25% (n=44)	48% (n=84)	.17**

<<==========>> Only 27% who passed scored below the 50th percentile

<<==========>> 73% who passed scored above the 50th percentile

▩ = C (COURSE GRADE)
▨ = B
▮ = A



Grade Distribution Table

Range	Grade C	Grade B	Grade A	X^2
Below 25	63%	30%	7%	6.5ns
26-50	48%	43%	9%	
51-75	46%	41%	13%	
76+	41%	38%	21%	

**p< .01

POLITICAL SCIENCE 101

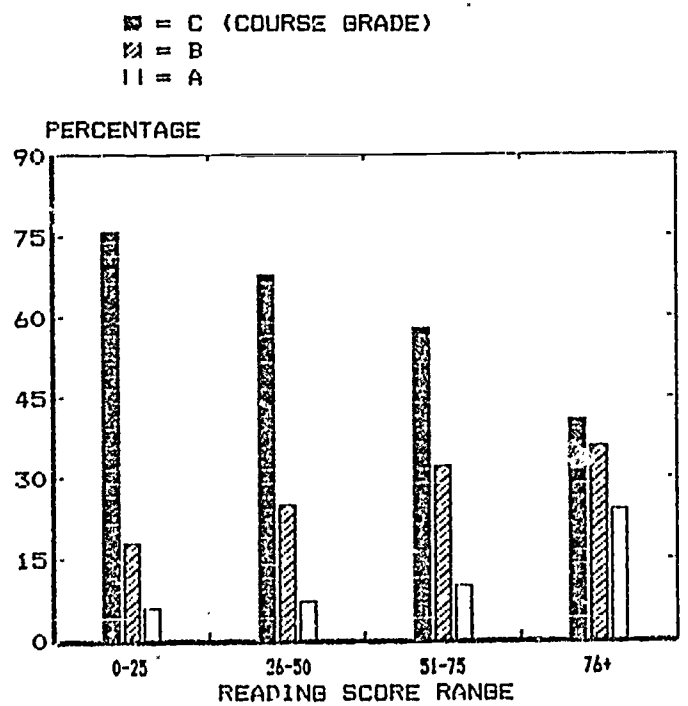
DISTRIBUTION OF SUCCESSFUL STUDENTS WITH READING SCORES IN THE FOLLOWING PERCENTILE RANGES

PERCENTILE RANGES

N	<25	26-50	51-75	76+	Spearman R
550	14% (n=79)	22% (n=118)	27% (n=150)	37% (n=203)	.28***

<<==========>> 36% who passed scored below the 50th percentile

<<==========>> 64% who passed scored above the 50th percentile



Grade Distribution Table

Range	Grade C	Grade B	Grade A	X^2
Below 25	76%	13%	6%	47.1***
26-50	68%	25%	7%	
51-75	58%	32%	10%	
76+	41%	36%	23%	

***p< .001

***p< .001

PSYCHOLOGY 100

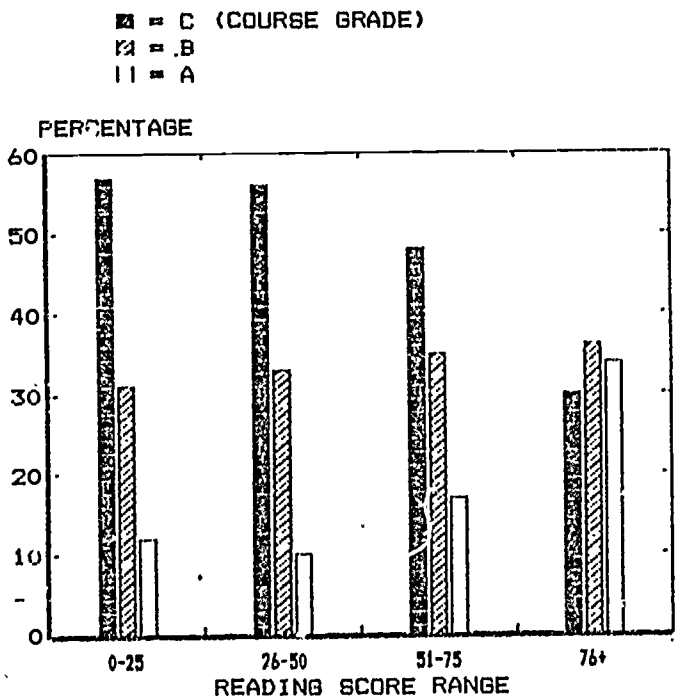
DISTRIBUTION OF SUCCESSFUL STUDENTS WITH READING SCORES IN THE FOLLOWING PERCENTILE RANGES

PERCENTILE RANGES

N	<25	26-50	51-75	76+	Spearman R
452	13% (n=61)	24% (n=106)	29% (n=129)	34% (n=156)	.26***

<<==========>> Only 37% who passed scored below the 50th percentile

<<==========>> 63% who passed scored above the 50th percentile



Grade Distribution Table

Range	Grade C	Grade B	Grade A	X^2
Below 25	57%	31%	12%	35.7***
26-50	57%	33%	10%	
51-75	48%	35%	17%	
76+	30%	36%	34%	

***p< .001

***p< .001

SPEECH 101

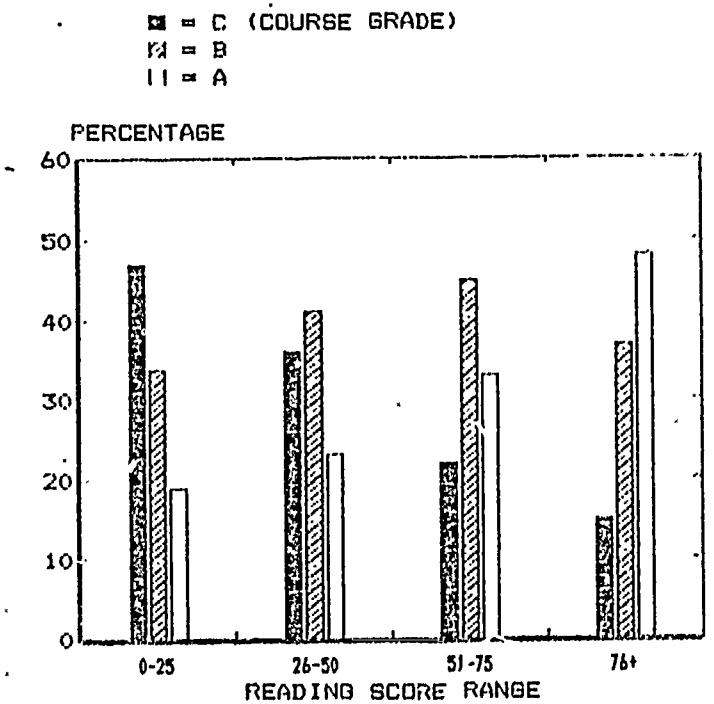
DISTRIBUTION OF SUCCESSFUL STUDENTS WITH READING SCORES IN THE FOLLOWING PERCENTILE RANGES

PERCENTILE RANGES

N	<25	26-50	51-75	76+	Spearman R
636	19% (n=120)	21% (n=139)	25% (n=157)	35% (n=220)	.30***

<<==========>> 40% who passed scored below the 50th percentile

<<==========>> 60% who passed scored above the 50th percentile



Grade Distribution Table

Range	Grade C	Grade B	Grade A	X^2
Below 25	47%	34%	19%	62.3***
26-50	36%	41%	23%	
51-75	22%	45%	33%	
76+	15%	37%	48%	

***p< .001

***p< .001