



1942

## Determining the Prognostic Value of an Artificial Language Test

Alex Turkatte  
*University of the Pacific*

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DETERMINING THE PROGNOSTIC VALUE  
OF AN  
ARTIFICIAL LANGUAGE TEST

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By  
Alex Turkatte

Pio Vista

1942

A Thesis  
Submitted to the Department of Modern Languages  
College of the Pacific

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In partial fulfillment  
of the  
Requirements for the  
Degree of Master of Arts

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APPROVED

Chairman of the Thesis Committee

*Frederick E. Steinhauser*

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*March 28, 1942.*

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## CHAPTER I

### PURPOSE OF STUDY AND ASSUMPTIONS

The object of the survey about to be described, was to establish the value of the artificial language test as a prognostic basis for language aptitude. Could the artificial language test be a reliable guide for determining a student's linguistic ability? Teachers have long needed something to give them an index to pupil's capabilities so as to meet better their needs in the class room. Counselors have wanted such tests to aid them in directing young people into channels of endeavor where they can best achieve success.

Several years ago an artificial language test put out by Thurstone, of the University of Chicago, was called to my attention by a college professor who was much interested in its worth. This test is one of a series entitled "American Council on Education Psychological Examination for College Freshmen", prepared by L.L. Thurstone and Thelma Gwinn Thurstone. A copy of the artificial language test is included in this thesis.<sup>1</sup> The Stockton Junior College and the

<sup>1</sup> appendix, p. 29

College of the Pacific (both of Stockton, California) had been using it along with the accompanying tests for the sole purpose of measuring general aptitude for college work, and not for determining special abilities. The educator wanted to know whether or not the language test accomplished this purpose assigned it, or whether it actually accomplished more and indicated special aptitude in linguistics. Some teachers had observed what they felt to be a marked positive relationship between the scores of this artificial language test and subsequent student success or failure in languages.

In approaching the problem of language prognosis, I have assumed that language ability is something that can be measured apart from general ability. Language aptitude may be a phase of general aptitude, the general intelligence being comprised of a complexity of special aptitudes of which language is one. From this it may be inferred that a student possessing marked ability in languages may have only average ability in his other subjects, or vice versa. In other words, exceptional language aptitude would not necessarily imply "all around" capability. But, for purposes of this survey, whatever the individual's

language ability, I have considered it a measurable factor capable of being analysed.

With language ability a determinable criterion, how would one go about finding the prognostic value of an artificial language test? The following course seemed logical. First, I would compare the artificial language<sup>1</sup> scores of students with their subsequent language grades. Then I would compare the Test scores of these same students with their subsequent college grade point average.<sup>2</sup> Lastly, I would compare the artificial language scores of these students with the scores made on the remaining part of the entrance examination.

What would this method prove? If the relationship of the Test scores to the language grades were closer than the same Test scores to the general G.P.A., we would conclude that the Test is of greater prognostic value in determining linguistic ability than of indicating general ability. Further study into precise coefficient of correlation would then be in order, especially if there were a significant, or a large contrast between these relationships. On the other hand,

1 Hereafter referred to as the Test.

2 Hereafter abbreviated G.P.A.

if the Test and the general G.P.A. relationship were very close, there would be no need for, or advantage in concerning ourselves with the artificial language as a prognosis test. The special test would be unnecessary, as a general aptitude test would be sufficient for the purpose of prognosis.

## CHAPTER II

## PROCEDURE FOR STUDYING THE QUESTION

In beginning the project, there were various factors to be considered. Needed was a reliable means for selecting and evaluating criteria. I used the material at hand, namely, the records of Stockton Junior College and College of the Pacific Students.

I could not use the scores of all enrolled in the two colleges because some were transfer students who had not taken the entrance tests. Then, many of the students who did take the test had not enrolled in language classes previous to this study, or they were taking their first semester of language and were not far enough along to have received grades. In the second place, many of the students had allowed several years to elapse after taking the Test, thus allowing the possibility of other factors to affect the validity of a conclusion; e.g., change of attitudes, influence of other subjects taken in college. I therefore did not use these scores. Later I discovered that the artificial language test had been removed from all the entrance tests since 1937 !



In order to obviate the difficulties, I selected the records of only those students who, upon taking the Test, immediately enrolled in foreign language classes, a smaller number of cases, to be sure, but with promise of more accurate results.

In all, statistics were gathered on four-hundred and fifty cases. Following is a chart indicating the distribution of these cases according to the subject taken by the student after having received the Test.

TYPE OF LANG. TAKEN	Ancient Lang.	Modern Lang.	Art of Lang.
NUMBER OF CASES	29	374	48

Each of these classifications were studied separately by means of graphs, because of the differences among them. Two of these classifications were found to be complicating, because of their differing characteristics as languages, and because an insufficiency in number of cases prevents reliable conclusions being based upon them. However, I worked with them for whatever trend they might indicate in comparison with the main study of the Modern Language section.

In pursuing the objective of the study, finding the prognostic value of the Thurstones,<sup>1</sup> artificial

1 L.L. Thurstone and Thelma Gwinn Thurstone

language test, I then began making the above mentioned comparisons: Test scores vs. subsequent language grades, Test scores vs. college G.P.A.'s, and Test scores vs. scores on remaining portion of the entrance examination. The results of these contrasts are pictured on graphs in chapters III and IV.

### CHAPTER III

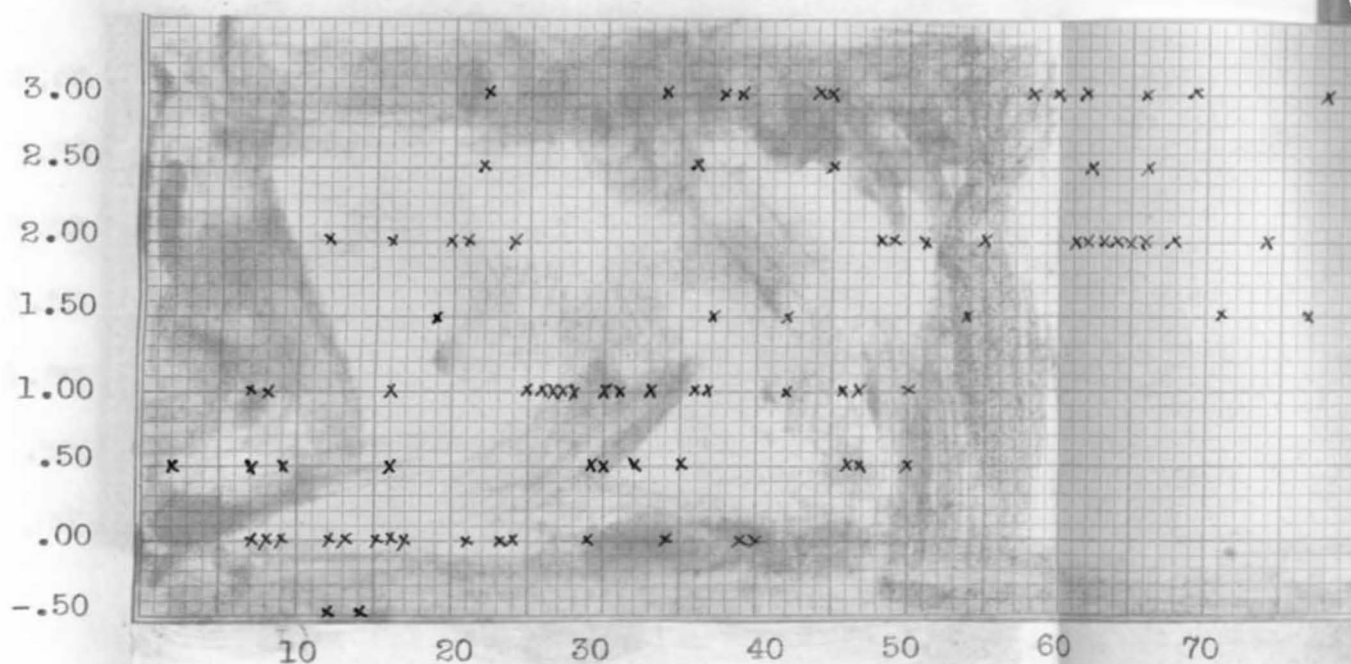
#### PRELIMINARY FINDINGS

Upon gathering data at the beginning of this study, I noticed in certain separate language groups diverging tendencies, which questioned the advisability of immediately correlating the data as the next step. I therefore charted systematically chosen data on scattered graphs to confirm my suspicions and to ascertain whether or not the data would yield favorable fruit. In Graphs I and II lies the answer. My hopes of finding a usable prognosis test seemed not very well substantiated. Yet, the results were not such that further study would appear useless.

Graph I shows the Test scores charted with the language grades. Graph II indicates the same scores charted with the G.P.A.'s. Conclusions and specific interpretations of the graphs follow:

1. Both graphs indicate positive correlation.
2. Graph I does not indicate a higher correlation than graph II; the Test scores and the language grades have no closer relationship than the Test scores and the G.P.A.'s.
3. There is no special advantage in using the Test as a prognostic basis for finding

GRAPH I

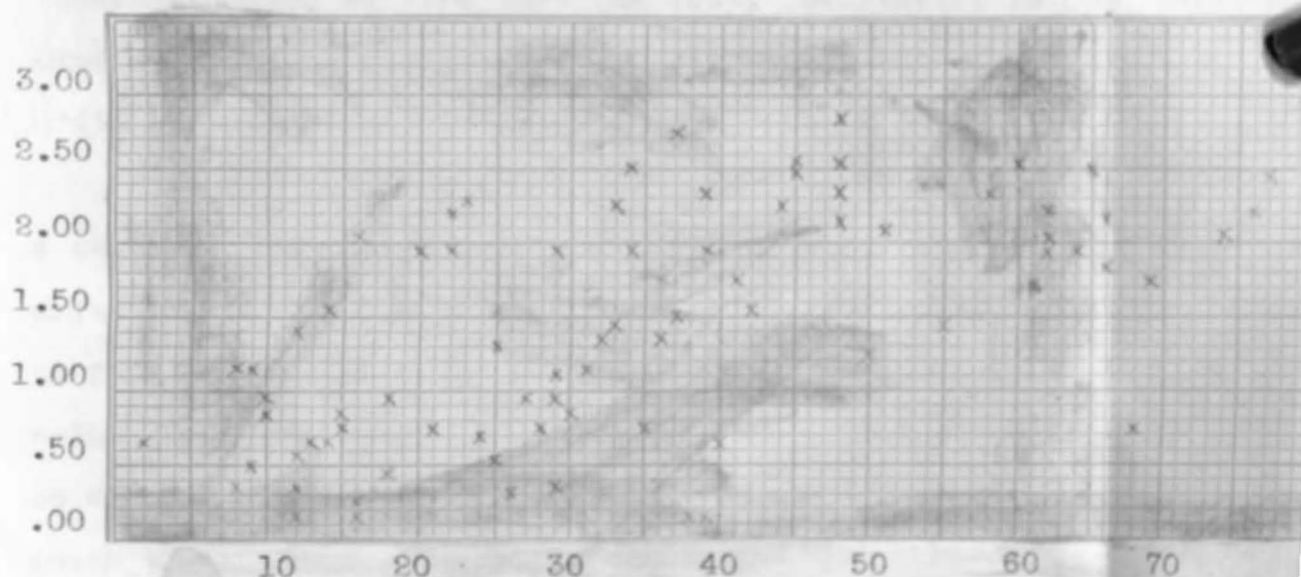


VERTICALLY INDICATED FOREIGN LANGUAGE GRADES  
 COMPARED WITH THURSTONE ARTIFICIAL LANGUAGE TEST  
 SCORES, INDICATED BY THE HORIZONTAL NUMBERS.

Thurstone Language Aptitude as a general

condition. GRAPH II

4. However, the validity of the Test may be  
impaired by unconsidered factors that  
should be searched out.



VERTICALLY INDICATED G.P.A.'S COMPARED WITH  
THURSTONE ARTIFICIAL LANGUAGE TEST SCORES, INDI-  
CATED BY THE HORIZONTAL NUMBERS.

foreign language aptitude as a general practice.

4. However, the validity of the Test may be hampered by unconsidered factors that should be searched out.

## CHAPTER IV

### FURTHER INVESTIGATION

Briefly summarizing the progress of the previous chapters, we find that the Test, of itself, is impractical when used as a prognostic basis in the ordinary college environment.

Assuming, however, that the tendency toward a positive correlation, as indicated in Graph I, might be worthy of further investigation, I set out to find why the test did not prove more prognostically valuable in general. To accomplish this end, I charted other graphs that would include all the modern language cases and would analyse the separate languages within the modern language group.

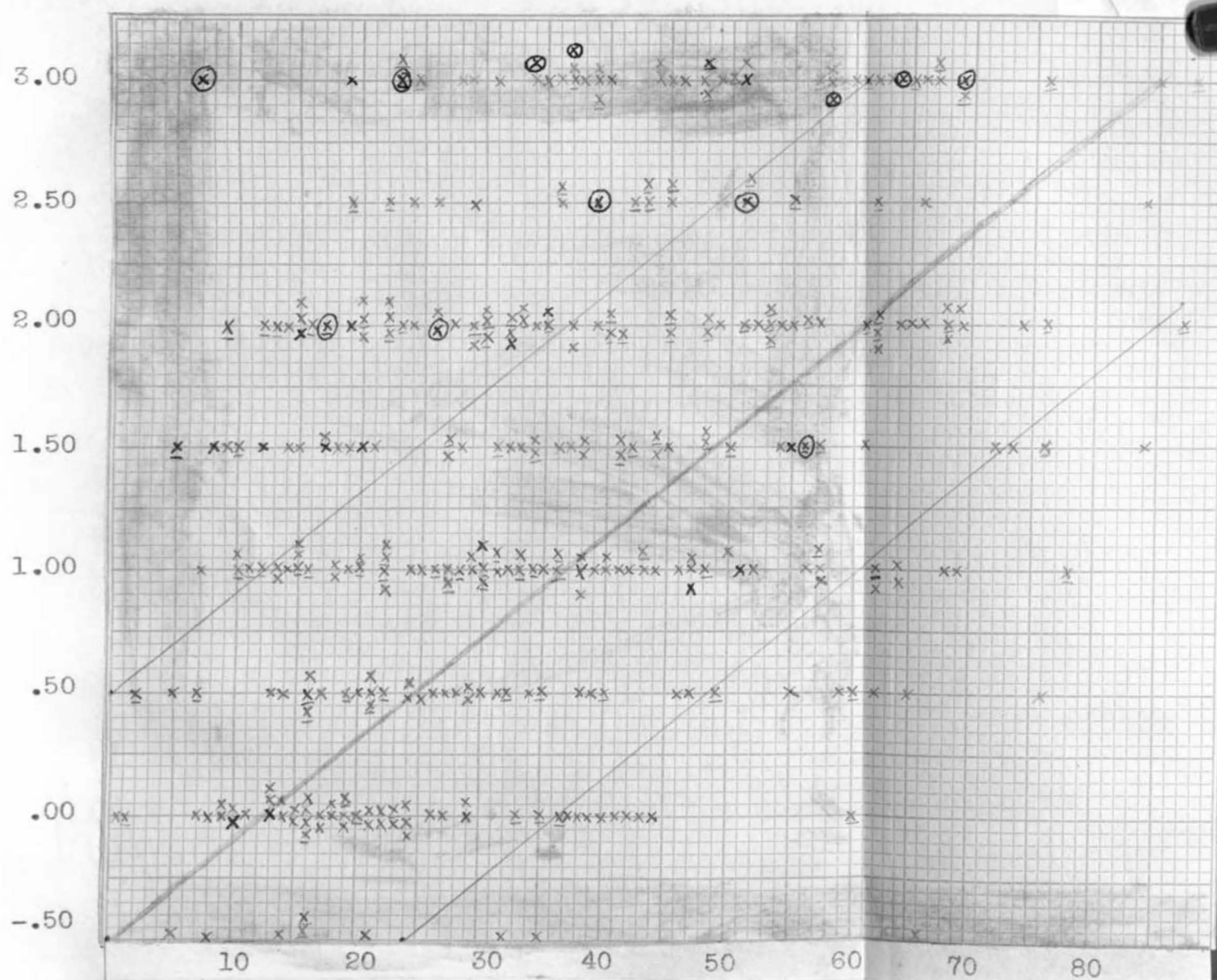
Of the 374 cases in this group,

36	studied Italian,
131	" French,
141	" Spanish, and
66	" German.

The number in each language group seemed large enough to give results adequate for our purposes.



GRAPH IA



VERTICALLY INDICATED FOREIGN LANGUAGE GRADES  
 COMPARED WITH THURSTONE ARTIFICIAL LANGUAGE TEST  
 SCORES, HORIZONTALLY INDICATED. (Note: all modern  
 language cases included).



Following are items explaining Graph IA:

- I. Language averages from the lowest score,  $-.50$ , to the highest,  $3.00$ , showed a total of  $3.50$  points variation.
- II. The hypothetic perfect correlation line was drawn, and equidistantly on either side was placed an arbitrary line one entire point from the line of perfect correlation. The arbitrary lines were made to afford a basis for comparison with Graph IIA (and others). For convenience, the lines shall be called "A", "B", and "C", reading from top to bottom.
- III. An "x" indicates a case (student) who has studied a foreign language (subsequent to taking the Test).
- IV. Each language is represented in a different color:
 

Black	represents	cases	having	taken	Italian.
Red	"	"	"	"	French.
Blue	"	"	"	"	Spanish.
Green	"	"	"	"	German.
- V. The "x" encircled indicates that the case appears to be of the nationality of the language studied, judging solely by the name of the person. This symbol has been used only with students studying Italian.
- VI. The "x" underlined, "x" or "@", indicates that two or more years of the same language were studied in high school.

## CHAPT IA

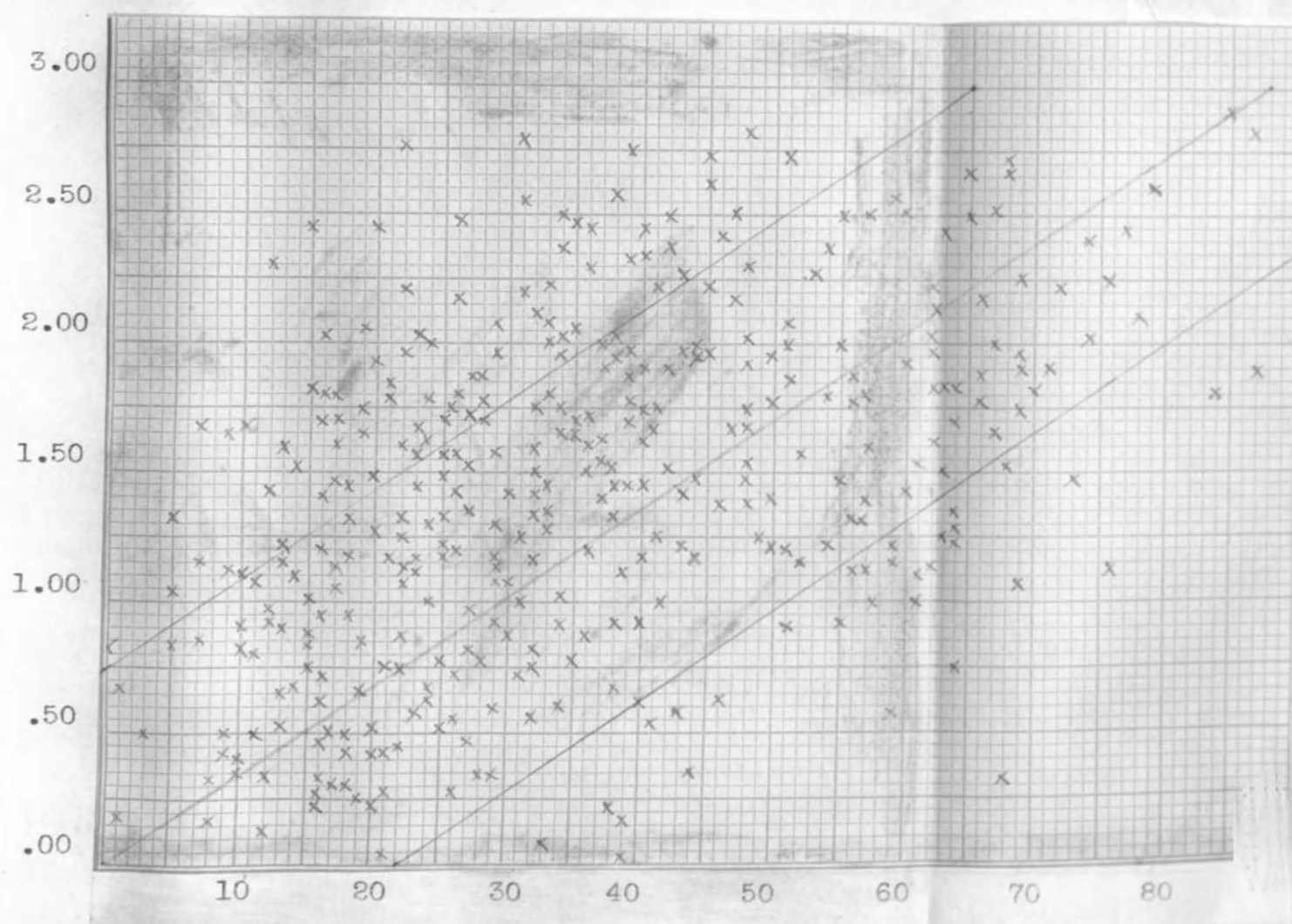
LANGUAGE	Italian	French	Spanish	German	Total
Total	36	131	141	66	374
Above A	25	44	32	10	37
% " "	69.4	33.6	22.7	15.15	29.5
Between A-C	11	77	37	46	231
% " " "	30.6	58.8	26.2	69.7	61.7
Below C	0	10	12	10	32
% " "	0	7.6	8.5	15.15	8.8

COMPARISON OF DISTRIBUTION OF SYMBOLS SHOWN ON  
GRAPH IA

Cases falling above "A" have proportionately low artificial language scores but high language averages. Slightly below one third of all the cases represented are in this area, 29.5% to be exact.

However, considering each language separately shows a totally different picture. In the case of one language, 69.4% fell above "A", the highest percentage group in this area. Contrast with this the percentage in another language; 15.15%, the lowest in the group!

GRAPH IIA



VERTICALLY INDICATED G.P.A.'S COMPARED WITH  
THURSTONE ARTIFICIAL LANGUAGE TEST SCORES, HORI-  
ZONTALLY INDICATED. (Note: all modern language  
cases included).

Between "A" and "C" fell highly corresponding Test scores and language grades; i.e., low scores with low grades and high scores with high language grades. Here again the percentages of the separate language groups varied greatly. The lowest percentage was 30.6%, in the Italian division, and indicates very poor correlation. However, there is a factor which may vindicate the position of the Test as a basis for prognosis. It is believed that many of the students of Italian may have had Italian language home background. In that event, many of the cases falling above "A", except for this background, would possibly have fallen between "A" and "C".

In contrast, the scores of the Spanish and German divisions, 68.8% and 69.7% respectively, indicate a fairly high correlation.

The significance of Graph IA is clarified by its contrast or comparison with Graph IIA. Graph IIA shows the relationship of G.P.A. and Test scores of the same cases (students) used in plotting Graph IA.

Arbitrary lines were drawn to correspond with those of Chart IA and are called "X" and "Z", with the line of perfect correlation, "Y" placed in between. The lines "X", "Y", and "Z" of Graph IIA then correspond with "A", "B", and "C" respectively, of Graph IA. The cases fall-

ing above, between and below the arbitrary lines were then counted and classified into separate groups and compared with the corresponding groups of Graph IA. The results in numbers and percentages are shown in charts.

#### CHAPT IIA

	Graph I No. and percent of scores	Graph II No. and percent of scores
Above Top Arbitrary Line	97 29.5%	84 22.25%
Between Arbitrary Lines	245 61.9%	261 70%
Below Arbitrary Lines	32 8.6%	29 7.75%

#### COMPARATIVE PATINGS OF GRAPHS IA AND IIA



CHART III

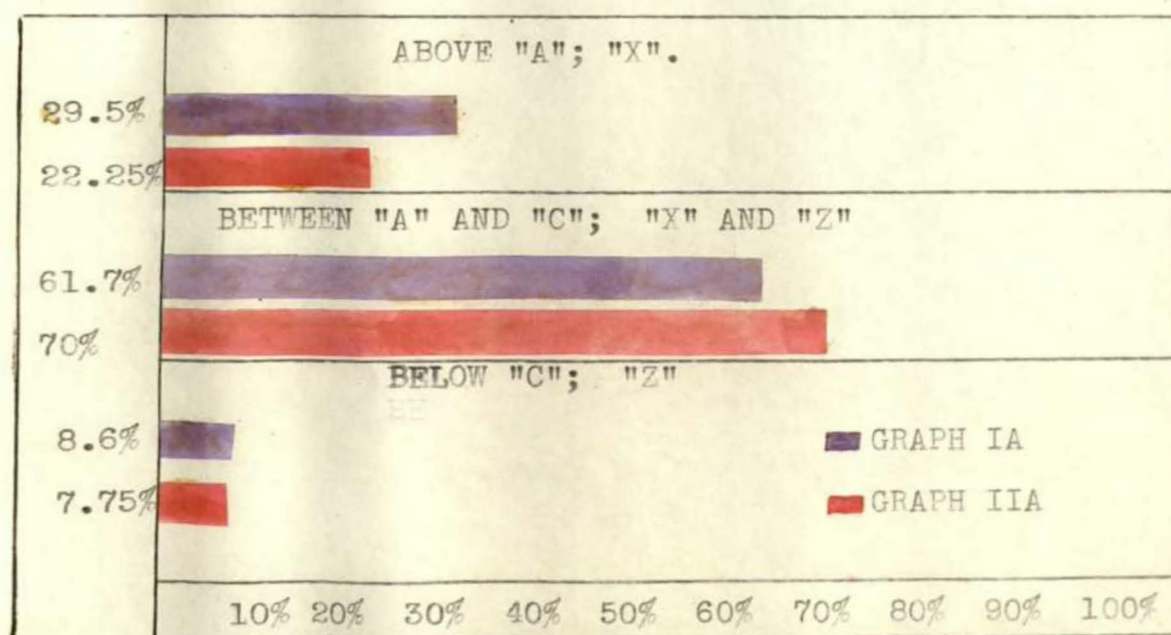
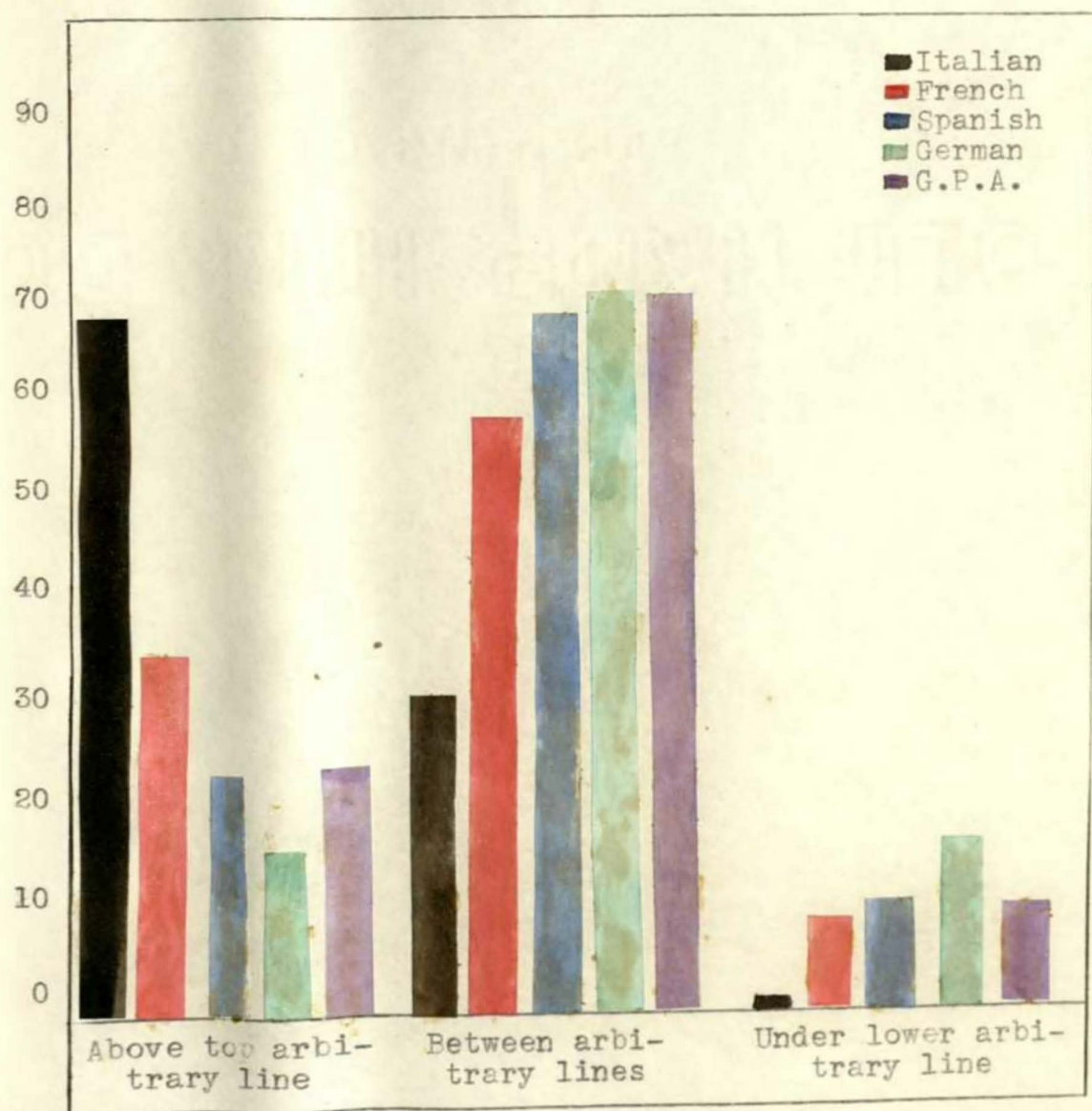


CHART IIA GRAPHICALLY ILLUSTRATED



CHART IV



PERCENTAGES (INDICATED BY VERTICAL FIGURES) OF THE LANGUAGES COMPARED WITH EACH OTHER AND SEPARATELY WITH G.P.A., ACCORDING TO THEIR DIVISIONS IN GRAPHS IA AND IIA

The language groups are considered as a whole in Charts IIA and III (charts IA and IV consider these languages separately). Groups in Graph IA falling above "A", between "A" and "C", and below "C" are compared with the corresponding groups of cases in Graph IIA. This comparison is very significant, for upon it rests the argument for the thesis study. The comparison clearly demonstrates a slight superiority of the Test to predict general achievement, or G.P.A. over its ability to predict general language success, whereas it should clearly predict the latter.

In Chart IV the languages are compared separately with G.P.A. in relationship to the Test. Again, the showing is not favorable, for the Test displays no marked superiority in predicting success in any one language over its ability to predict general scholastic success. The cases studying German are noted to correlate as highly with the Test scores as the G.P.A. correlated with the same scores. The Spanish cases correlated slightly less than the German. Therefore, it appears futile to link any highly special prognostic value to the Test, especially under the present grading system.

Another factor provoked some speculation; namely, why there was such a variation of correlation tendency among the different languages. The answer was believed



to lie in the differing grading standards of the language instructors. An investigation of the Junior College files revealed that such was the case. The variations in grading corresponded with the findings shown in Graph IA and Charts IA and IV. Following are the grading variations, those that occurred during the semesters covered by the thesis study:

Average grade given by entire school faculty	1.23
Average grade given by Italian instructor	1.91
French instructor	1.66
Spanish instructor	.91
German instructor	1.35

Not all of the language teachers are included here as some of them taught combinations of subjects and consequently their averages would not present a fair showing.

✓

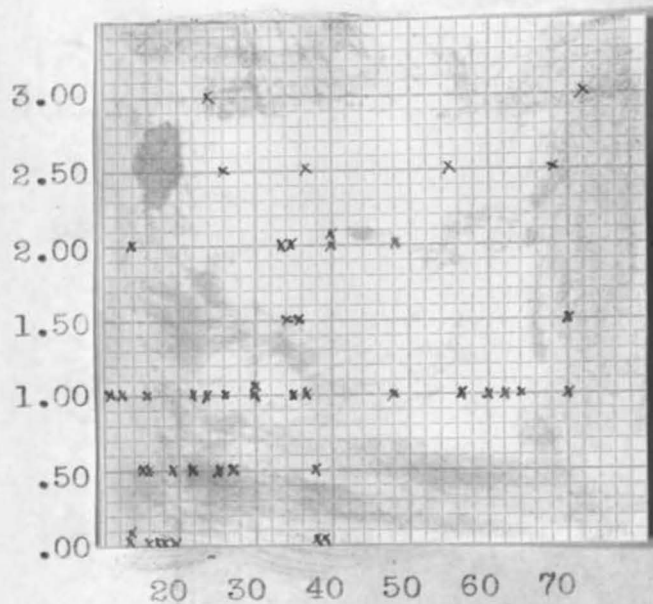
## CHAPTER V

### PARALLEL STUDIES

Certain parallel studies were deemed worthy of being included when the plans for the thesis were first made. They are presented here, not because they alter previous findings, or because they add much to the main study. They are here for the sake of completeness.

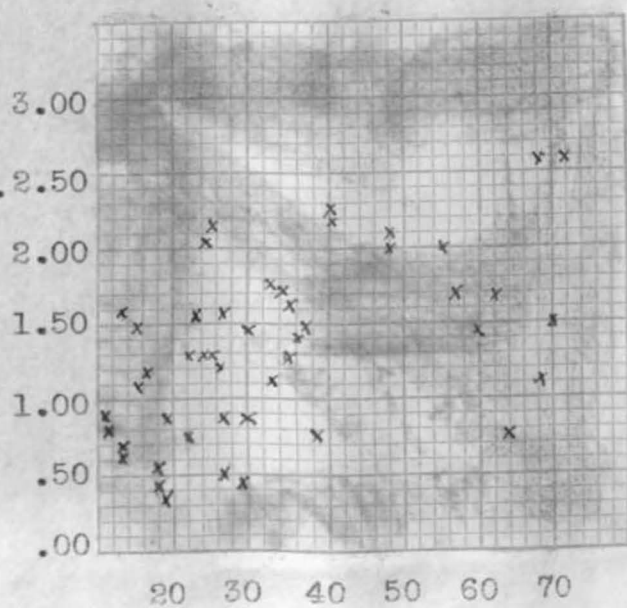
Statistics were gathered on a number of students who had studied a course based upon ancient and modern languages, entitled "Art of Language". Although the number of cases, forty-eight in all, were not considered sufficient to produce results acceptable as reliable, they are here considered for possible new tendencies they might show. The cases were compared in graphs, as in the main study, showing relationships first between the Test scores and the "Art of Language" grades and then between the scores and general achievement.

The two graphs display a much higher correlation between the Test scores and general success, but no satisfactory reason for this can be offered. There appear to be no other tendencies worthy of note.

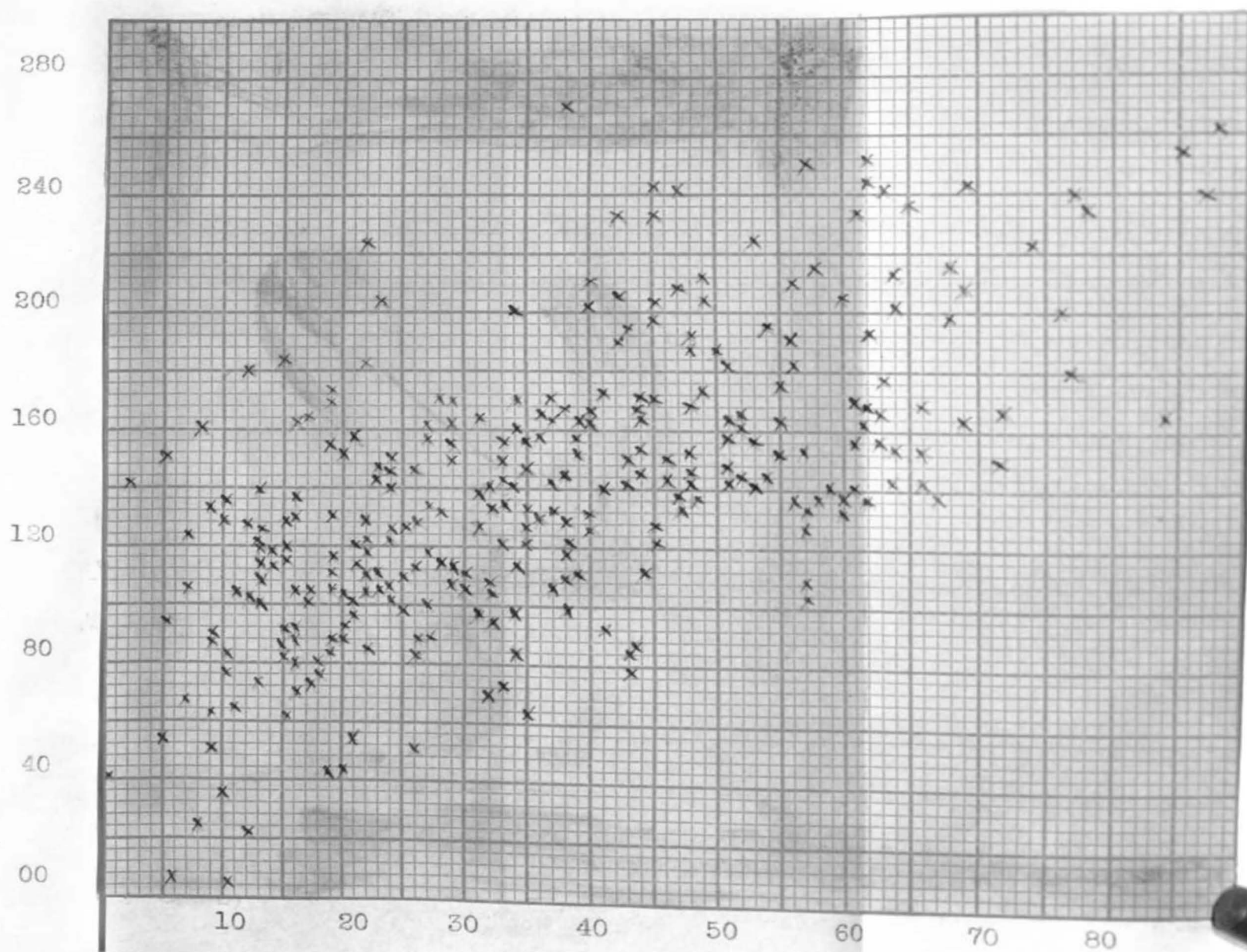


GRAPH III  
COMPARISON OF "ART OF  
LANGUAGE" AVERAGES IN  
VERTICAL COLUMN AND  
TEST SCORES

GRAPH IV  
COMPARISON OF TOTAL GPA.  
IN VERTICAL COLUMN, WITH  
THE TEST SCORES



GRAPH V



COMPARISON OF THE TEST SCORES (HORIZONTAL  
FIGURES) WITH THE SCORES ON REMAINING PORTIONS OF  
THURSTONE ENTRANCE TESTS

In the above comparison of Test scores with the scores of the rest of the Thurstone entrance tests, it is interesting to observe that a very high correlation exists.

thesis

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## CHAPTER VI

## SUMMARY

From the preliminary studies, we have concluded that the correlation tendencies represented in Graphs I and II are not sufficiently high. This conclusion is carried out by the fact that the scattered graphs do not show an appreciable concentration of cases along the lines that would indicate satisfactory correlations. By "satisfactory correlations" is meant correlations sufficiently reliable to be used as a prognostic basis.

Since it was assumed that more information of value might be gleaned from these statistics in the preliminary studies, other graphs, more analytical and inclusive, were then made. These latter graphs, IA and IIA, brought out some interesting points.

First of all, the languages differed considerably among themselves in their abilities to correlate with the Test. The variations appeared to range from either a very poor or negative correlation, demonstrated in comparing the Italian student grade success, to a very clearly positive, though not sufficiently high, correlation. This latter type is illustrated by the Ger-

man cases. It was not judged sufficiently high in correlation tendency, because 30.30%<sup>1</sup> of the cases fell in areas of very low correlation. Even so, the German section is the only one that appears to equal the correlation between total scholastic success in college and the Test scores.

A further inquiry into the grading averages of the language teachers bore out the identical contrasts demonstrated in Graph IA and Charts IA and IV. The grading averages of the instructors varied fully one grade point, from 1.91 to .91, during a semester covered by the study and showed similar variations other semesters.

In conclusion, the Test has demonstrated a definite prognostic tendency. However, in consideration of the present subjective grading system, the Test, when used by itself, is unable to qualify as a satisfactorily reliable basis for predicting grades.

1 30.30% is a total of the 15.15% above "A" and 15.15% below "C" in Graph IA.

APPENDIX

c

The 16

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## Artificial Language

Read the vocabulary and rules of the artificial language given below. Do not try to memorize the vocabulary or forms but consult them freely while translating the sentences on the following page.

### VOCABULARY

I.....	ar	is.....	janho
me.....	arku	act.....	chelo
he.....	eg	characterize.....	blibo
him.....	egku	energize.....	tucdo
that.....	ip	succeed.....	holgo

### RULES

PLURALS:	Add "mo." Only nouns and pronouns have plurals.
PAST TIME:	Place "de" before the verb.
FUTURE TIME:	Place "si" before the verb.
NOUNS:	Substitute "ig" for "o" ending of verb.
ADJECTIVES:	Substitute "ur" for "o" ending of verb.
ADVERBS:	Substitute "ap" for "o" ending of verb.

### EXAMPLES

we.....	armo
acted.....	dechelo
will act.....	sichelo
action.....	chelig
active.....	chelur
actively.....	chelap

### DIRECTIONS

All the words in sentence A below are correctly translated, so plus signs (+) have been put in each column at the right, thus, +, +, +. The first word in sentence B is wrong. A minus sign (-) in column 1 at the right indicates that "they" is wrong. It is not the translation of "eg." The second and third words are correctly translated so plus signs (+) are placed in columns 2 and 3.

SENTENCES	TRANSLATIONS	1	2	3
A. That was characteristic	Ip dejanho blibur	...+...	...+...	...+...
B. Eg sijanho chelur	They will be active	...-...	...+...	...+...

Go through the sentences on the next page, marking a (+) sign at the right for words correctly translated and a (-) sign for words incorrectly translated.

Go to the next page. Do not wait for any signal.

SENTENCES	TRANSLATIONS	1	2	3
1. That is energy	Ip janho tucdo			
2. Eg dejanho tucdur	He will be energetic			
3. They acted successfully	Armo dechelo holgur			
4. Holgig janho chelig	Success is action			
5. Energy will be successful	Tucdig siblibo holgap			
6. Tucdig blibo chelig	Success characterizes action			
7. Energetic characters succeed	Tucdurmo blibig holgo			
8. Ip tucdig siholgo	That energy will succeed			
9. Action characterized us	Holgig deblibo armo			
10. Ip cheligmo holgo	Those actions succeeded			
11. They acted energetically	Egmo dechelo tucdig			
12. Holgo blibig chelo	Successful characters act			
13. Success energized him	Holgig detucdo egku			
14. Chelur blibig holgomo	Active characters succeed			
15. They will act successfully	Egmo sichelap tucdap			
16. Ip deblibo egkumo	That will characterize them			
17. Success characterizes energy	Tucdig chelo holgap			
18. Armo sijnho holgurmo	We shall be successful			
19. Energy acts successfully	Holgig blibo tucdig			
20. Egmo chelo tucdap	They acted energetically			
21. He succeeded characteristically	Eg siholgo blibap			
22. Holgo situcdo egkumo	Success will energize them			
23. Energy is active	Tucdig janho chelur			
24. Eg deblibo arku	That characterized him			
25. Those actions succeed	Ipmo chelurmo holgo			
26. Tucdur blibigmo holgo	Energetic characters act			
27. I shall act energetically	Ar dechelo tucdap			
28. Holgig detucdo ar	Successes energized me			
29. Energetic action succeeds	Tucdo chelig holgomo			
30. Holgurmo cheligmo tucdo	Successful actions energize			

Stop here. Wait for further instructions.