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A Psychological Investigation of the Effect of Learning a Foreign Language on the Development of Certain Skills in English

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A PSYCHOLOGICAL INVESTIGATION OF
THE EFFECT OF LEARNING A
FOREIGN LANGUAGE ON THE
DEVELOPMENT OF CERTAIN
SKILLS IN ENGLISH

by

Alan J. Fredian

A Thesis Submitted to the Faculty of the Graduate School
of Loyola University in Partial Fulfillment of
the Requirements for the Degree of
Master of Arts

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LIFE

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CHAPTER I

PURPOSE

The purpose of this study is twofold: first, to investigate the effect of learning a foreign language on the development of certain skills in English; and secondly, to investigate the role of intelligence in that development. Specifically the object is to discover whether previous study of a foreign language facilitates learning of basic English skills, and if it does, whether students of high measured intelligence profit more than do those of lower measured intelligence. Experimental and control groups are used at each of the two intelligence levels. Principles borrowed from psychology are then used to interpret such differences as may be obtained. Current psychological theory suggests that such differences occur.

Experiments dealing with the effects of foreign language study on developing desirable skills in English are not unique in the literature. They do not permit, however, definitive conclusions concerning this phase of human behavior. They differ from this study in that the psychological and statistical aspects do not receive major emphasis.

In addition to the theoretical importance of the question being examined there are practical considerations. For example, it could be useful to the vocational guidance counselor to evaluate an individual's potential

for development of English skills by means of foreign language study. It has been shown also that a foreign language contributes materially to the manual education of the feebleminded. Angiolello¹ points out, for example, that a sample of such subjects were able to learn eighty French words and expressions. A follow up study at the end of a year showed that 100 percent was retained collectively and 90 percent individually. Such satisfactory results supplemented the observation that this experience was genuinely enjoyed by the retarded people in that it disrupted the daily routine of mechanical activities. It is important, however, to explore if such a gain may prove detrimental in other areas of learning, like that of English skills.

That this is a problem about which psychologists have been concerned is attested to by Pillsbury and Meader who write:²

... it becomes necessary for him who would study the nature of language to master first the essentials of psychology. One may, of course, attain a perfect mastery over one's vernacular and may even learn any number of foreign languages without giving a single thought to psychology; but when any question is raised concerning the origin of languages, the growth of language, the interrelations of kindred languages, or even the methods of teaching languages, in a word concerning the nature of language, he who would answer the question must turn preface to the laws in accordance with which all mental activities take place and endeavor to explain the phenomena of language on this basis. In a sense, therefore, general linguistics may be called applied psychology.

1 Paul F. Angiolello, "French for the Feeble-Minded, An Experiment," Modern Language Journal, XXVI, April, 1942, 266-271.

2 Walter B. Pillsbury and Clarence F. Meader, The Psychology of Language, New York, 1928, 18.

CHAPTER II

REVIEW OF LITERATURE

Historical review of the literature verifies the fact that the problem of the effect of foreign language study on the development of skills in one's native tongue has not been neglected. Even though attention has been given repeatedly to an analysis of this question, the nature of the investigations was not, strictly speaking, experimentally oriented in the tradition of scientific methodology. Consequently results and interpretations are contradictory and not too enlightening. Currently, therefore, fundamental issues remain unresolved. A probable reason for this state of affairs is that psychological endeavors have not been attempted in this area within recent decades.

In 1895 Schilling³ reported a universal acceptance of the value of the study of foreign language in abetting a better understanding and thorough mastery of one's native tongue. In reviewing Epstein's work Lentz⁴ indicates, on the other hand, that the study of foreign language actually sets up inter-

³ Hugo K. Schilling, "Educational Value of Modern Languages," Education Review, IX, 1895, 385-390.

⁴ E. Lentz, "Zum psychologischen Problem 'Fremdsprachen und Muttersprache'," Zeitschrift für pädagogische Psychologie und Pathologie, XX, 1919, 409-415.

ference which exerts an adverse influence upon the punctiliousness and clarity of thought in the vernacular. This position is supported by statistical evidence.

Similarly the studies of Rosenbaum and Kettelkamp seem contradictory. Eric Rosenbaum⁵ advances several conclusions from his study on transfer between foreign languages. First he points out that there is a positive correlation between the study of a first and the study of a second foreign language; i.e., there is a positive transfer. Contemporary investigators seem to concur with Rosenbaum on this point. Rosenbaum, however, continues that 1) the order in which languages are studied is of no significance; 2) the length of study is more important than intelligence in effecting an adequate transfer; 3) transfer is most predominant in vocabulary. Kettelkamp and others in opposing Rosenbaum with respect to the latter conclusions serve to add to the already existing confusion over interpretation of available findings.

Kettelkamp⁶ would insist that when Latin is studied before French and German, the grades in Latin tend to be higher than those obtained in either of the other two languages. When French is studied before Latin and German, however, Latin and German skills tend to be facilitated in that grades in these languages are higher than those in French. Apparently, it may be concluded that the sequence in which languages are studied is of importance

⁵ Eric Rosenbaum, "The Application of Transfer Between Foreign Languages," Modern Language Journal, XXXIII, April, 1949, 287-294.

⁶ G. C. Kettelkamp, "Student Achievement in Two or More Foreign Languages as Related to Order of Study," The School Review, LIII, December, 1945, 610-614.

but sequential effects are still in need of clarification.

Pentz⁷ would question Rosenbaum's observation that in transfer the length of study is more important than intelligence. In his study, mental alertness and intelligence proved to be factors of much greater importance than "formal preparedness."

Last of all, the observation that transfer is the most predominant in vocabulary seems to be opposed to the data found by Woody.⁸ In his study Woody tested French, Latin, and non-language groups on English vocabulary composed of an equal number of French and non-French derivatives. The non-foreign language group scored highest on the French derivatives even though no significant differences were obtained for the words of non-French derivation.

It can be seen from the above that for every study following one course another can be found which takes the interested reader in another direction.

Of greater value than these studies, perhaps, is one completed by Werner,⁹ who received statewide cooperation. He sought to discover the effect of modern language study on the development of desirable skills in English. It is hereby discussed in detail, since, in essence, it is similar to the

7 James G. Pentz, "Intelligence a Potent Factor in Language Study," Modern Language Journal, XXII, January, 1938, 303.

8 Clifford Woody, "The Influence of the Teaching of First Year French on the Acquisition of English Vocabulary," Studies in Modern Language Teaching, New York, 1930, 149-179.

9 Oscar H. Werner, "The Influence of the Study of Modern Foreign Languages on the Development of Desirable Abilities in English," Studies in Modern Language Teaching, New York, 1930, 99-145.

experimental aspect of this thesis.

In this study Werner used several tests: The Pressey Punctuation Test, The Pressey Sentence Structure Test, Charters Diagnostic Language and Grammar Test, The Monroe Silent Reading Test for high school students, The Thorndike-McCall Reading Scale for college students, and Number Six of the Purdue English Test for Vocabulary. In addition, each student was asked to write a composition before the beginning of testing, and another later in the year when the follow-up tests were to be administered. The tests were given at the beginning and end of a school year.

One thousand one hundred and forty-three Nebraska high school students were grouped on the basis of having studied a foreign language, either classical or modern, and not having studied one at all. The median IQ for the language group was 101.57, and that for the non-language group 97.44. The preponderance of juniors and seniors in the language group, as well as individuals having a higher intelligence, make it rather difficult to interpret the obtained comparative scores. Consequently, care must be taken in evaluating the conclusions to be advanced later in the examination of Werner's study.

The sample of college students consisted of 336 students who were also classified according to the above described principle of division. The median IQ for the language students was 101.98 and that for the non-language students 98.54. The difference in median IQ is not significant.

The first administration of the reading tests showed that the groups did not compare favorably on initial reading ability. Generally, the modern language group scored higher on the reading test at the beginning and, again, higher at the end of the experimental period. Greater improvement, however,

was noted in the non-language group. More specifically, the findings were as follows: 1) The upper quarter of the non-language students and the lower quarter of the modern language group improved the most in reading ability. 2) The same degree of achievement was also observed for the aforesaid groups in silent reading. 3) In reading comprehension, however, high school students and freshman and sophomore language students on the college level excelled significantly. 4) College juniors and seniors in the non-language group performed better on the test than juniors and seniors in the foreign language groups. An interpretation of these results must be made with reservations since no IQ's were available for the upper college classmen.

On the Pressey Punctuation Test, the high school non-language students were slightly superior to the high school students in the modern language group. The achievement of the high school students having a low measured intelligence in the non-language group on this test, was superior to that of students having a comparable level of intelligence in the language group. Similar conditions prevailed for those students having a high measured intelligence. But, the differences among the non-language and language students having the high IQ were not as marked as in the other groups.

Similar findings were paralleled by the college population. The foreign language groups improved but not to the extent of the non-language groups.

That differences in intelligence may influence the results is once again called to mind. This condition together with the observation that there seems to be other variables affecting the results which need to be controlled, merits serious consideration. The potential of the non-language

groups for improvement is greater; i.e., there may be gross differences in the relative positions on the learning curve for this function. Relative training differences apart from the experiment were not considered; e.g., the non-language students may have studied more English grammar, and because of their lesser linguistic background, may have dwelled on fundamentals longer.

The sentence structure test used by Werner measured the ability to discover or to recognize poor sentence structure. He attributes the initial superiority of the modern language students to their higher mental ability. In the main, neither group, however, manifested more than negligible improvement. Even though the non-language groups fared only slightly better than the language groups, Werner concludes that "the study of a modern foreign language interferes with the development of desirable qualities in sentence structuring."¹⁰

In the Charters Language and Grammar Test the pupil taking the test is to demonstrate his ability to recognize incorrect language, to give correct forms, and to select from a list of rules the one which applies to each particular situation.

The medians on the first administration were not statistically significant, so no valid conclusions may be drawn from the data. The groups which did improve, however, were the high IQ language students and the low IQ non-language students. The only conclusion, which was drawn, pointed to the observation that the ease with which errors in language were detected and

10 Ibid. [i.e., 129]

corrected was proportionate to the level of mental ability.

The grammar aspect of this test requires the pupil to indicate the rule which applies to each of the situations in the above error test. The test endeavors to discover whether the pupil knows the rules in grammar which determine correct language usage. The conclusions from this phase of testing were similar to those on the first part. In both the high school and college groups, mental ability seemed to be an important factor. The high IQ language students gained significantly while the low IQ group in the same category scored lower the second time.

The vocabulary test seemed to have been too difficult for the high school students. The modern language students on the two educational levels, however, did show some improvement in vocabulary. The indicated gain was not statistically significant.

The general conclusions advanced by Werner point out that it is "difficult to defend the gross statement that the study of modern foreign languages will always aid in the development of desirable abilities in English."¹¹ The evidence did indicate, however, that such study does materially aid in the development of speed of reading and reading comprehension, especially in high school students. Modern language study would also seem to contribute to the development of abilities in grammar. But, such study would tend to interfere with the ability to punctuate correctly and discover faulty sentence structure. Finally, it remains rather questionable whether the study of languages aids or hinders the acquisition of vocabulary.

11 Ibid. [i.e., 114]

The major criticism of the above study stems from the lack of experimental controls. In a testing situation as complex as this one, rigid controls are extremely difficult to impose. In spite of the fact that the study suggests that above average mental ability is a requirement in the development of desirable abilities in English in general, it would seem desirable to point out a possible oversight. The evidence suggested that the low IQ modern language group seemed to gain significantly less than their non-language peers. Accordingly, it ought not to be concluded that this group of language students is inhibited, retarded, or confused because of their study of other languages, while the comparable low IQ non-languages group is not so inhibited. It would seem rather, that these difficulties could be explained in terms of principles of learning. Even though the obtained scores for both tests may have been higher for the language groups, relatively greater improvement was observed in the non-language groups. From the principles of learning it might be hypothesized that the language students are at a period of leveling off, or at a plateau, while the non-language students are still accelerating, or improving in the learning of these skills. In short, it might be said that the non-language students have not progressed as far on the learning curve as the language students. Greater improvement, therefore, could be expected.

with respect to the foreign language requirement. The data were analyzed for intelligence by the paired comparison method. In the following table, a comparison of a low IQ in the language group was paired with a person in the other

CHAPTER III

PROCEDURE

The present experiment consisted of administering a test of certain English skills to a group of students who had learned a foreign language, and to a group of students who had not learned a foreign language. The basic skills included vocabulary, spelling, syllabication, and punctuation. It could be hypothesized from the theoretical discussion and criticisms of Chapter II that the students who had learned a foreign language would perform significantly better on a test of English skills than those students who did not have such an experience. It was the intention of the writer to verify experimentally the plausibility of such a hypothesis.

The experimental group was so defined as to include only those students who had studied Spanish, French, German, or Latin for one year. They must have had the two courses of regulation high school English. Students who had any remedial reading courses or the like were disqualified. Seniors and juniors were eliminated since they would have had more than the two stipulated courses in English. The requirements for the control group were similar except with respect to the foreign language requirement. The two groups were equated for intelligence by the paired comparison method; i.e., in matching them, each person of a given IQ in the one group was paired with a person in the other

group with the same IQ. In addition the ratio of females to males was kept constant when it was learned that superior girls tend to excel in linguistic ability.¹²

The experimental group was made up of eighteen high school sophomores from the foreign language classes. The control group was composed of eighteen sophomores from several classes who had not studied a foreign language. These groups of eighteen each will be called on the pages which follow composite groups to distinguish them from the smaller sub-groups separated out on the basis of intelligence level. These will be called subsequently the "high" IQ and the "low" IQ groups. The "high" IQ group had a mean IQ of 113.3 with a standard deviation of 4.57, whereas the "low" IQ group had a mean IQ of 97.08 and a standard deviation of 11.42. The t of 4.58 indicating significance at the one percent level shows us that these groups really differed in intelligence.

The groups were much smaller than intended originally in spite of continued efforts to increase their size. One hundred and twenty-six students were originally tested. Due to the refinements introduced into the experimental design this number was necessarily reduced to that contained in the experimental and control groups; namely, eighteen in each of the composite groups, six cases in each of the "high" IQ groups, and twelve cases in each of the "low" IQ groups.

12 Glenn M. Blair, "Subject Preferences of Mentally Superior and Inferior High School Students," Journal of Educational Research, XXXIII, November, 1939, 89-92.

The size of the groups when separated for two levels of intelligence is admitted to be inadequate by the writer. This condition is partly due to the fact that the selection of subjects was limited to one high school in the Chicago area. Nevertheless, for the sake of systematic and statistical completeness necessary calculations were executed. It is, of course, recognized by this writer that interpretation of the results must be made with such reservations as statistical precepts may demand.

The Kuhlman-Anderson Intelligence Test was used for measuring the level of mental ability.¹³ This test covers the ability range from kindergarten through high school. The various tests are arranged in order of difficulty based upon the median chronological age of the child who is able to pass at least one half of the trials. The test for the different groups are overlapping. The score of an individual is the median of the mental ages earned. The IQ is derived according to the usual formula. The validity of this test is based upon its discriminative capacity; that is, the test distinguishes between the populations at the various grade levels. In as much as grade nine was used in this study the reliability for this level of the test was 0.95. The norms were based upon scores from approximately 30,000 children at the different levels.

The SRA Language Skills¹⁴ test was used to measure the English

13 Oscar Krisen Buros, The Fourth Mental Measurements Yearbook, New Jersey, 1953, 302-303.

14 Marion W. Richardson and Ruth A. Pedersen, Examiner Manual for the SRA Language Skills, Chicago, 1953.

abilities. "The major purpose of this test is to obtain an objective evaluation of those language skills most important for success in stenographic occupations."¹⁵ This test is so designed as to eliminate persons with inadequacies in the usage of the English language.

The test consists of ten practice and eighty-two test questions. The basic skills mentioned above appear in spiral form; i.e., items measuring each skill are presented in blocks on each level of difficulty, so that each skill is being appraised at every level by its own unique set of items. When the answers are marked in the booklet they are automatically transferred to a scoring grid by means of carbon paper. This condition, however, would not lend itself to diagnosis under specific categories which form a vital part of this study. Hence a new scoring stencil was constructed in keeping with the objectives of this investigation in order to ascertain scores in the desired subtest areas.

The items of this test were selected originally through an analysis of subject matter and item analysis. The item analysis was performed on 300 commercial high school juniors and seniors who were divided into three groups of equal size. Items which did not maintain adequate validity throughout all three groups were discarded. The estimated reliability of the test is 0.84.¹⁶

The administration time for this test is twenty minutes. But, for purposes of this study no time limit was fixed, so as to allow everyone to

¹⁵ Ibid.

¹⁶ The test authors do not report which method of computation was used to derive this reliability coefficient.

complete the test.¹⁷ It was observed that the majority of students finished the test in twenty-five minutes.

The first of the four experimentally derived sections deals with vocabulary. Here the testee is to choose from four possibilities the word that means the same or the word that means the opposite of the stimulus word. This section made the control of intelligence imperative.

The next section requires the testee to choose a misspelled word from four possibilities. The area dealing with syllabication requires the pupil to discover the word which is divided incorrectly. In the above three experimental parts the choice of "none of these" is also available to the testee.

The last derived section is on punctuation. Here the testee is to choose what correct marks, if any, should follow words which are underlined in a short paragraph. There are either three or four possibilities from which the subject may choose.

Once the groups had been defined and established, means and standard deviations were computed for the foreign language and non-language students on the SRA Language Skills test in its entirety and its experimentally determined sections. Differences between means for the experimental and control groups were evaluated by means of the t test for small samples.¹⁸ This procedure was followed for the composite "high" IQ and "low" IQ groups.

17 The class period imposed a natural time limit of thirty-five to forty minutes.

18 E. F. Lindquist, A First Course in Statistics, Boston, 1942, 138.

CHAPTER IV

RESULTS

After administration of the SRA Language Skills test data were assembled for analysis and interpretation. The means and standard deviations for the composite, the "high" IQ, and the "low" IQ groups are shown in Table I¹⁹ as they were computed for the whole test and for each of the subtests for the foreign language and the non-language students.

A close examination of Table I reveals that the mean achievement for the foreign language students is higher than that of the non-language students, with the exception of one instance. This exception is found in the "high" IQ group. There it can be seen that the mean achievement on the non-language students is slightly higher on syllabication than that of the language students. The means are 6.66 and 5.83 respectively.

A similar generalization can be made concerning the variability between the foreign language and non-language students. There is only one exception to the finding that the standard deviations for the whole test and for the experimental levels are higher for the foreign language students than for the non-language students. It occurs in the "low" IQ group on punctuation.

19 Table I, page 17.

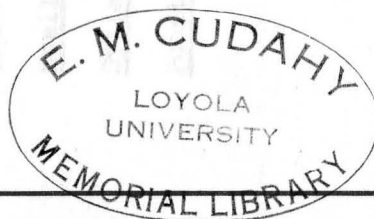


TABLE I

MEANS AND STANDARD DEVIATIONS FOR THE COMPOSITE GROUPS AND FOR THE
 "HIGH" IQ AND "LOW" IQ GROUPS ON THE SRA LANGUAGE SKILLS TEST

Name of Test	Groups											
	Composite (N = 18)				"High" IQ (N = 6)				"Low" IQ (N = 12)			
	Foreign Language		Non- Language		Foreign Language		Non- Language		Foreign Language		Non- Language	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Whole SRA Test	46.55	10.94	36.16	6.97	53.50	10.24	38.66	9.96	43.08	9.55	34.94	4.75
Vocabulary	16.55	5.47	11.44	3.59	19.16	5.08	12.16	4.34	15.25	5.24	11.10	3.10
Spelling	7.72	3.09	5.61	2.00	10.16	3.02	5.83	2.41	6.50	1.89	5.42	1.50
Syllabication	6.00	2.01	5.72	1.73	5.83	1.95	6.66	1.79	6.08	2.15	5.75	1.64
Punctuation	16.27	3.25	13.05	3.00	18.33	2.81	15.66	2.68	15.25	1.32	12.58	2.14

The standard deviation for the non-language students is 2.11 whereas that for the foreign language students is 1.32.

It may be seen that relatively speaking the greatest amount of variability occurs in vocabulary in the three groups. The least amount of variability is found for syllabication in the composite and in the "high" IQ groups only. In the "low" IQ group the least scatter is found for punctuation.

Moreover it can also be seen that differences in dispersion between the "high" IQ group and the "low" IQ group of foreign language students do not follow a uniform pattern. On spelling and punctuation the "high" IQ group is more variable than "low" IQ group. On vocabulary and syllabication there is a reversal in the relative magnitudes of variation for the same groups.

According to Table II²⁰ differences between compared means are generally significant. It has already been pointed out that the mean achievement for the foreign language and non-language students was generally higher for the former than for the latter, except in one case. That exception, however, is highly insignificant. The t test for the difference between the means of the non-language students and the foreign language students in the "high" IQ group on syllabication is significant on the 0.90 level of confidence which is of course very low. The difference between means for syllabication for the composite group and the "low" IQ group is also relatively insignificant. In the one instance the difference is significant only at the 0.20 level of confidence, and in the other instance at the 0.70 level of confidence. In one

20 Table II, page 19.

TABLE II

LEVELS OF CONFIDENCE IN COMPARING ACHIEVEMENT OF THE FOREIGN
LANGUAGE ON THE SRA TEST WITH THE ACHIEVEMENT
OF THE NON-LANGUAGE GROUP

Name of Test	Groups					
	Composite (N = 18)		"High" IQ (N = 6)		"Low" IQ (N = 12)	
	<u>t</u>	<u>p</u>	<u>t</u>	<u>p</u>	<u>t</u>	<u>p</u>
Whole SRA Test	3.31	.01	2.34	.05	2.52	.02
Vocabulary	3.21	.01	2.34	.05	2.27	.05
Spelling	2.36	.05	2.51	.05	1.50	.20*
Syllabication	1.38	.20*	.222	.90*	.405	.70*
Punctuation	3.01	.01	1.34	.30*	3.53	.01

* Not significant

other instance, and that is for spelling in the "low" IQ group, the difference between means is not too significant.

A further observation that can be made from an inspection of Table II is that the differences between means are relatively more significant in the "low" IQ group than in the "high" IQ group.

The SEA language skills test was administered to a group of high school students who had learned a foreign language and a group of high school students who had not had such an experience. These groups were categorized as a "high" IQ matched group and a "low" IQ matched group. Means and standard deviations were computed and compared for each of these groups on the SEA language skills test and on the Stanford-Binet test of intelligence. The SEA language skills test consists of tests of vocabulary, spelling, punctuation, and pronunciation.

The results show that the mean score for the foreign language groups on all the tests is higher than that of the non-language groups on all but one instance. This exception is found in the "high" IQ matched group on spelling. In the main test of the means are significantly different and higher for the foreign language groups. The variability is also greater for the foreign language groups than for the non-language groups with one exception. In the "low" IQ matched group on punctuation the standard deviation is higher

CHAPTER V

SUMMARY AND CONCLUSIONS

The purpose of this thesis was to investigate the effect of learning a foreign language on the development of certain skills in English, and to investigate the influence of intelligence on that development.

The SRA Language Skills test was administered to a group of high school sophomores who had learned a foreign language and a group of high school sophomores who had not had such an experience. These groups were categorized as a composite group matched for intelligence regardless of level, a "high" IQ matched group, and a "low" IQ matched group. Means and standard deviations were computed and compared for each of these groups on the whole SRA Language Skills test and on the experimentally established subtests of vocabulary, spelling, syllabication, and punctuation.

The results show that the mean achievement for the foreign language groups on all the tests is higher than that of the non-language groups in all but one instance. This exception is found in the "high" IQ matched group on syllabication. In the main most of the means are significantly different and higher for the foreign language groups. The variability is also greater for the foreign language groups than for the non-language groups with one exception. In the "low" IQ matched group on punctuation the standard deviation is higher

for the non-language students.

Although a more thorough discussion of the results follows, a general conclusion, for purposes of this summary, is in order. The greater variability in favor of the foreign language groups indicates that there are factors other than intelligence which influence the results. These factors are the experiences of learning a foreign language.

In reviewing the results it has been noted that differences were more significant for the "low" IQ group than for the "high" IQ group. It should be remembered, however, that the number of subjects in these groups was not equal. There were twice as many students in the "low" IQ group as in the other group. The small number of cases in the "high" IQ group necessarily reduced the number of "degrees of freedom" in the computation of the t ratio. Therefore, while data of this study suggest that level of intelligence (within the normal range) is not too significant a factor in the development of English language skills, that conclusion can not be stated positively or emphatically.

According to the results obtained, foreign language study has no effect, relatively speaking, on syllabication. Werner's findings²¹ on this point are similar. A probable reason for this condition is the dependence of syllabication on the articulation of sounds and academic achievement in English. Little transfer value may be derived from foreign language study to such an operation.

The foreign language groups performed significantly better on the

21 Werner, "The Influence of the Study of Modern Foreign Languages on the Development of Desirable Abilities in English," Studies in Modern Language Teaching, 99-115.

tests than the non-language groups. Exceptions are found in the composite group on syllabication, in the "high" IQ group on syllabication and punctuation, and in the "low" IQ group on spelling and syllabication. The above comments on group size seem to apply to the t derived from the "high" IQ group on punctuation. The level of confidence here is 0.30, whereas, in the other two larger groups the 0.01 level of confidence is attained. These findings are different from those obtained by Werner²² on punctuation. The relatively insignificant difference on spelling in the "low" IQ group may, in part, be attributed to the articulation of sounds or even to the confusion of sounds introduced by the foreign language. This requires further study as an experimental variable.

Differences in dispersion do not follow a uniform pattern in the "high" IQ and the "low" IQ groups. The former is more variable on spelling and punctuation, while the latter is more variable on vocabulary and syllabication. Highest variability, however, is consistently found in vocabulary. This result seems to be due to the learning of new words and meanings in the study of a foreign language which tend to complement one's native vocabulary. In addition, relative differences may be attributed to the interaction of intelligence and foreign language study.

The general conclusion of this thesis is that the learning of a foreign language does aid in the development of certain skills in English, and that individuals with low measured intelligence may accrue these benefits as well as do individuals with high measured intelligence.

22 Ibid. [i.e., 126]

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APPENDIX I

TABLE III

SCORES OF THE FOREIGN LANGUAGE STUDENTS* ON THE SRA
LANGUAGE SKILLS TEST AND ON THE SUBTESTS

N	KA IQ	SRA SKILLS TOTAL	VOCABULARY	SPELLING	SYLLABICATION	PUNCTUATION
	POSSIBLE	82	28	16	14	24
1	119	62	23	16	5	18
2	115	62	26	9	7	20
3	111	48	15	9	7	17
4	110	62	21	12	8	21
5	108	53	19	7	6	21
6	105	34	11	8	2	13
7	104	59	23	11	8	17
8	104	40	12	10	5	13
9	104	50	19	5	6	20
10	101	63	26	9	9	19
11	100	41	15	6	5	15
12	94	39	10	6	5	18
13	93	28	7	3	3	15
14	92	38	12	4	6	16
15	92	34	12	6	4	12
16	92	45	18	6	7	14
17	90	38	13	5	5	15
18	89	42	16	7	10	9

* Includes composite, "high" IQ, and "low" IQ groups.

TABLE IV

SCORES OF THE NON-LANGUAGE STUDENTS* ON THE SRA LANGUAGE
SKILLS TEST AND ON THE SUBTESTS

N	KA IQ	SRA SKILLS TOTAL	VOCABULARY	SPELLING	SYLLABICATION	PUNCTUATION
	POSSIBLE	82	28	16	14	24
1	119	49	18	5	9	17
2	115	35	12	5	8	10
3	111	44	12	7	8	17
4	110	50	17	10	5	18
5	108	25	8	6	4	17
6	105	29	6	2	6	15
7	104	42	15	6	8	13
8	104	35	11	5	5	14
9	104	30	11	4	5	10
10	101	36	15	3	5	13
11	100	39	11	8	9	11
12	94	27	6	6	5	10
13	93	34	12	2	4	16
14	92	41	11	7	7	15
15	92	39	15	8	7	9
16	92	29	9	5	3	12
17	91	36	12	6	5	13
18	88	31	5	5	6	15

* Includes composite, "high" IQ, and "low" IQ groups.

5/24/68
Date

Edward P. Davis
Signature of Director

APPROVAL SHEET

The thesis submitted by Alan J. Fredian has been read and approved by three members of the Department of Psychology.

The final copies have been examined by the director of the thesis and the signature which appears below verifies the fact that any necessary changes have been incorporated, and that the thesis is now given final approval with reference to content, form, and mechanical accuracy.

The thesis is therefore accepted in partial fulfillment of the requirements for the Degree of Master of Arts.

5/26/54
Date

Edmund P. Marx
Signature of Adviser