THE LANGUAGE HANDICAP IN SPANISH-AMERICAN CHILDREN
IN INTELLIGENCE AND ACHIEVEMENT

by

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A Thesis
submitted to the faculty of the

Department of Education
in partial fulfillment of
the requirements for the degree of

Master of Arts
in the Graduate College
University of Arizona

1942

Approved
J.F. Walker
Date
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INTRODUCTION

The number of Spanish-American children is increasing at a rapid rate in Arizona and the other southwestern states. In 1908 there were 15,308 bi-lingual children, or 40 percent of all the children enrolled in the schools of Arizona; in 1930 there were 32,268 which was approximately 30 percent of the total enrollment in high, and elementary schools in the state. The increase for the southwestern states is much greater as a group than in Arizona. In 1890, 1.9 percent of the population in these states was Spanish-American; in 1930 it was 9.6 percent. This percentage includes adults as well as children. With these bi-lingual children increasing in number a better understanding of them should be had.

By the school world and by individuals on the outside, the child of Mexican heritage is often considered to be a stupid fellow who should be left to plow the soil and hew the wood. He is accused of having a low mentality and of being so handicapped by being bi-lingual that he is only a burden to the school and to the community. Manuel found the following condition in Texas:

"Most of our Mexicans are of the lower class. They transplant onions, harvest them, etc. The less they know about everything else the better contented they are. You doubtless have heard that ignorance is bliss; it seems that it's so when one has to transplant onions.

"The white people claim that when a Mexican gets a little education he becomes bigoted, wants to become a contractor, etc. This very likely is true."

This is only one example of the prejudice and disregard that so many people have for the Spanish-American.

Most people who have had experience in teaching Mexican children realize that in many instances the parents of the children have little or no interest in their intellectual development although some are anxious for their children to obtain an education. The parents' attitude can be partially explained by the fact that many of the parents are illiterate and do not realize the value of education, and so do not encourage their children to attend school regularly. 3 "Contract" children are not expected either by their own parents, or by the resident people of the community, to go to school until after the beets are cut. Even those people who wish their children to attend school are forced to keep them out during the harvest seasons in order to increase the economic returns of the family. This is

well illustrated by observing the cotton fields of our state during the picking season.

In any study dealing with bi-lingualism it is nearly impossible to isolate the economic and social phase from that of language handicap and we have made no attempt to do so. Before going further it would be fitting to ask this question: Why does the Mexican emigrant hold to his foreign tongue so tenaciously? The answer is self-evident when we consider his social and economic standing. A great percentage of these people are either imported to this country to be exploited by the corporations or they are political refugees. When they come as laborers they are taken to vineyards, cotton fields, beet fields, or lettuce fields and are crowded into tenements and quarters far removed from the native white population. They are not welcomed by any of the other groups. The children are born and reared in these settlements, never coming into contact with the American children until they reach school age. After they have reached school age they are frequently segregated and in many instances never attend a school where the children speak English except while in class. The parents of these children are not encouraged to attend night school and learn our language.

This brief background is given in order to give a slight insight into the social and economic life of the Spanish-American, thereby making the conclusions set
forth more understandable.

Statement of the Problem

The purpose of this study was to make a comparison of the intelligence, non-language, and language quotients, and achievements of children from Spanish-speaking, and English-speaking families in the seventh and eighth grades of the Douglas School.

Delimitation

The study was limited to fifty Spanish-speaking and fifty English-speaking children of the seventh and eighth grades of the Douglas Grammar School.

Terms

For the purpose of this study the following terms will be used synonymously: Spanish-speaking, bi-lingual, Mexican, and Spanish-American when speaking of a child whose home language is other than English. When the words American, or Americans are used they refer to children who speak only English in the home and elsewhere.
CHAPTER II

NEED FOR THE STUDY

As stated previously, Arizona has a great number of bi-lingual children in her schools and there is no indication of their diminishing in the near future. We, as teachers of these children, feel that more could be done for them if the cause of their retardation could be definitely determined. Garretson found from his survey of a small school system that the Mexican child was fourteen months below the average mental development for the American child of the same age and school environment. There are other studies dealing with the language handicap of bi-lingual children, but none has specifically attacked the problem with tools that could measure both the child's language and non-language intelligence quotients. The tests used in the past have all been based upon an understanding of language before a performance could be had. The conclusions reached have therefore been reflective opinions rather than deductions from facts, and for this reason a more controlled study should be made. The California Mental Maturity test which

was used in this study makes possible the use of intelligence quotients based upon language and upon non-language adjustments as well as one made upon a composite of both activities.

The problem of the language handicap has been constantly before the writer for several years as most of his work has been with Spanish-American children. Many have voiced the opinion that retardation is brought about chiefly because of the bi-lingual child's inability to understand the English language. In previous investigations of Spanish-American children by the writer no concrete evidence pointing to the conclusion that language is the chief cause of retardation of the bi-lingual child has been found. From this experience has come this study of the language handicap of Mexican children.

The materials used in this problem were the California Test of Mental Maturity—Intermediate Series, and the Metropolitan Achievement Test—Advanced Battery, Complete; Form B Revised, a test which is recognized as a well standardized instrument for determining grade placement.

The children on whom this test was tried were chosen at random from the seventh and eighth grades of the Douglas Grammar School. The number of boys and girls was divided equally in the two grades. No effort was made to select children on the basis of inferior or superior
ability. The names were taken from the enrollment cards in the office of the Grammar School Principal, the only controlled factors being age and grade. Thirteen years and six months was arbitrarily chosen by the writer as the age of children to be studied and no children were included whose age differed from that more than one year either way.

TABLE I

COMPARISON OF CHRONOLOGICAL AGE, MENTAL AGE, AND MEAN INTELLIGENCE QUOTIENT OF THE TWO GROUPS

<table>
<thead>
<tr>
<th></th>
<th>N: Chronological Age</th>
<th>Mental Age</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>: Yr. Mo. : I.Q. :   : Yr. Mo. :</td>
<td></td>
</tr>
<tr>
<td>American</td>
<td>50: 13 8 : 101.6 : 13 11</td>
<td></td>
</tr>
<tr>
<td>Sp.-Am.</td>
<td>50: 14 1 : 92.79 : 13 10</td>
<td></td>
</tr>
<tr>
<td>Difference</td>
<td>0 5 : 8.81 : 0 1</td>
<td></td>
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</tbody>
</table>

Both tests were administered in regular class rooms at the Douglas Grammar School. The children had never been taught by the administrator of the test, and so neither the Mexicans nor Americans had any advantage from the point of view of familiarity with the one giving the test. All tests were corrected and rechecked by the writer thereby eliminating any variance caused by subjectivity in scoring.

The conclusions reached through analysis of the test results are generally in full harmony with those
found in other studies although the difference between Mexican and American children was found to be less marked than has frequently been reported.

The Douglas Situation

Douglas is a city of some eight thousand six hundred population and is adjacent to Agua Prieta, Sonora, Mexico. Of the total Douglas population, the Mexican element represents about 39 percent. Douglas School District #27, from which the children of this study were selected consists of the city of Douglas and the immediate vicinity.

The total school population is about 2600 in the high school and elementary schools combined, with the Mexicans representing 51 percent of the total enrollment. In the elementary schools the total enrollment is about 2299, with the Mexicans numbering 1235 or 53 percent of the total grade school population.

All of the schools in Douglas are modern and are well equipped. The housings and equipment for the Spanish-Americans are equal to that for the Americans. There are five ward schools, a grammar school, and a high school. The grammar school handles all of the grade children from the sixth grade through the eighth.

The Spanish-Americans are admitted to school at five and one-half years of age and are placed in the
Americanization class where they are taught English, and from which none are excused. After spending one year in the Americanization class the children are admitted to the first grade and are offered the same training as the Americans.

In Douglas, segregation is practiced up to the sixth grade. When the pupils of the ward schools reach the sixth grade both the Mexicans and Americans are sent to the Grammar School.

The pupils used in this experiment were chosen from the Douglas Grammar School where both Mexicans and Americans are in the same building but are segregated to a large extent into divisions of the same grade although there are classes in which both language groups are together. The total enrollment of the Grammar School is about 650, with the Mexicans representing 61 percent of the pupils. The Bi-linguals are offered the same advantages as are the Americans in curricular and extracurricular activities.
CHAPTER III

PROCEDURE

The tests were administered by the writer in the regular class rooms of the Douglas Grammar School. In presenting the tests to the children, all instructions were given in a careful manner and every effort was made to follow the directions given by the publishers to insure reliable results.

The children were informed that the results of the test were for the purpose of experimentation only and would not be used for the determination of school marks. Every effort was made to have the children work under normal conditions. The writer believes that the results are fair and impartial to both groups. The children were not segregated into racial groups when the tests were administered.

The tests were corrected according to the directions furnished by the publishers and no changes were made in the keys. Great care was taken to eliminate any personal element from entering into the scoring of the tests.

The raw scores made on the California Mental Maturity tests were transferred into mental ages by means of tables provided in the manual and were used to
compute the I. Q.'s. All scores were re-calculated to insure accuracy. In the division of the total mental age by the chronological age, the process was carried to three decimal places and rounded to two places. The intelligence quotients were then tabulated using the total I. Q.'s as the bases for ranking. These quotients are shown in the appendix.

The scores were tabulated from high to low in columns. The mean and median were obtained by grouping the scores into steps of five. In the correlation tables the scores were set up in steps of five except for the achievement scores which were in steps of twenty-five. The achievement scores for the Metropolitan test were totaled and tabulated according to rank rather than according to grade average, as this permitted a wider range and a better step interval to be used in computing the correlations. The correlations were solved by the Pearson product Moment correlation method.

In this experiment, three different intelligence quotients were utilized. They were language, non-language, and total I. Q. which was found by using the complete test. The California Mental Maturity Test, Intermediate Series for grades seven to ten inclusive was used. The test has four distinct divisions, as follows:
A. Memory

This consists of exercises in immediate and delayed recall.

B. Spacial Relationships

Spacial relationship consists of sensing right and left, manipulation of areas, and foresight in spacial situations.

C. Reasoning

This division consists of opposites, similarities, analogies, number series, numerical quantity, and inferences.

D. Vocabulary

Out of the 250 items in the test one hundred required knowledge and use of language and one hundred-fifty were performance or non-language activities. From the total of each of these factors the mental age was found from a table accompanying the test. The intelligence quotients were found by dividing the mental age as found from the non-language factor, the language factors, and the combination of non-language and language factors respectively by the chronological age of the child in months.

The achievement score used, resulted from the use of the Metropolitan Achievement Tests, Advanced Battery—Complete; Form B. This particular form was especially prepared for ascertaining the Achievement of children of the seventh and eighth grades.
The test was divided into nine distinct subjects matter groups as follows:

1. Reading
2. Vocabulary
3. Arithmetic Fundamentals
4. Arithmetic Problems
5. English
   a. Language Usage
   b. Punctuation and Capitalization
   c. Grammar
6. Literature
7. History
8. Geography
9. Spelling

The score for each part of the test was found, these were totaled and transferred into grade achievement derived from the age-grade chart furnished with the test. For the purpose of having more satisfactory variables to work with, the total score was used rather than the derived grade equivalents in finding the correlations.
CHAPTER IV

CORRELATIONS

The results of the tests given to the two groups were satisfactory from a statistical standpoint.

Table II given below will show the means and the differences in the means of the two groups tested.

**TABLE II**

COMPARISON OF MEAN SCORES OF TWO GROUPS

<table>
<thead>
<tr>
<th>Test</th>
<th>:Americans:Span.-Amer.:</th>
<th>Diff.:Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>*CMMT Language</td>
<td>: 102.65 : 92.15 : 10.5 : .90</td>
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</tr>
<tr>
<td>CMMT Non-Language</td>
<td>: 103.65 : 97.55 : 6.10 : .94</td>
<td></td>
</tr>
<tr>
<td>CMMT Total</td>
<td>: 101.6 : 92.79 : 8.81 : .91</td>
<td></td>
</tr>
<tr>
<td>Metro.Achiev.(Grade)</td>
<td>: 8.5 : 8.4 : .1 : .94</td>
<td></td>
</tr>
</tbody>
</table>

*Abbreviation for California Test of Mental Maturity, Intermediate Series.

A study of the results will show that the amount of difference between the groups is relatively constant, the greatest difference being that between the mean I. Q.'s for Language. The reason for this difference can probably be explained by the fact that the Spanish-Americans are less proficient in the use of the English language than are the Americans. The ratio of means of the Spanish-American group to those of the American group show the relative constancy of the superiority of the American group in intelligence and in achievement.
The mean intelligence quotient of the Douglas Bilingual group seems to be from 10 to 14 points higher than that found by some investigators. The difference between these groups in Douglas was 8.81 points in favor of the Anglo-American but Sheldon\(^5\) states that the average Mexican child, in his study, was found to be fourteen months below the normal mental development for American children of the same age and school environment. Expressed as a ratio he found the Mexicans to be .85 as compared with a similar group of American children, their mean score being 89 as compared with 104.80 which was the American mean. As chronological age increases, his study shows that the proportionate differences in mental age between Mexican and American children becomes greater.

Haught\(^6\) found that average Spanish-speaking children have an intelligence quotient of 79 as compared with 100 for the average Anglo child. There are, however, some Spanish children as bright as the very superior Anglo children.

The range in intelligence quotients of the Spanish-American children in Douglas was 37.29, the lowest quotient being 76.07 and the highest 114.36, while the

\(^5\) Sheldon, William H. "The Intelligence of Mexican Children," School and Society, 19; 139-142.

range of the Americans was 68, extending from 71.02 to 139.02. Thus, it seems, that the range of quotients of the American group was nearly twice that of the Spanish-American group.

The greatest difference between the groups was found in the language intelligence quotients where the difference in means was 10.50 points. The smallest difference was found in the non-language quotients where the difference was 6.10, while the difference in the mean total intelligence quotients of the two groups was 8.81 points. This would seem to indicate that the groups are more nearly alike in those factors of intelligence which do not depend upon language than they are in those factors which depend upon the understanding and use of language, but even in non-language IQ's the American children showed definite superiority as a group.

A comparison of the achievement of the two groups, as measured by the Metropolitan Test, shows the Americans to have attained a mean grade score of 8.5 while the mean of the Spanish-Americans was at the grade level 8.4, a difference of one-tenth of a school year. The highest score made by the Americans was 10.6 and by the bilingual group it was 10.1. The lowest score made by the Americans was 7.2 and by the Spanish-Americans 7.1. The range between the high and low scores for the Americans
was 3.4 grades and for the Mexicans it was 3 grades.
This would indicate that the Spanish-Americans were
slightly more homogeneous in their achievement than were
the Americans and their achievement was not greatly in-
fierior to that of the other group.

The intercorrelations of intelligence quotients and
of intelligence quotients with achievement are shown in
Table III and Table IV which follow.

TABLE III

INTERCORRELATIONS IN THE SPANISH-AMERICAN GROUP

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Non-Lang.I.Q.:</td>
<td></td>
<td></td>
<td>.33</td>
<td>.509</td>
</tr>
<tr>
<td>Language I.Q.:</td>
<td>.33</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total I.Q.:</td>
<td></td>
<td></td>
<td>.533</td>
<td>.622</td>
</tr>
<tr>
<td>Achievement</td>
<td></td>
<td></td>
<td>.622</td>
<td></td>
</tr>
</tbody>
</table>

TABLE IV

INTERCORRELATIONS IN AMERICAN GROUP

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Lang.I.Q.:</td>
<td></td>
<td></td>
<td>.636</td>
<td>.61</td>
</tr>
<tr>
<td>Language I.Q.:</td>
<td>.636</td>
<td></td>
<td></td>
<td>.77</td>
</tr>
<tr>
<td>Total I.Q.:</td>
<td></td>
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<td>.786</td>
<td></td>
</tr>
<tr>
<td>Achievement</td>
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<td></td>
<td>.786</td>
<td></td>
</tr>
</tbody>
</table>

The most striking fact in these tables is the dif-
ference in the size of the correlation coefficient
between the language and non-language intelligence
quotients of the Spanish-American group in which
r = .33 - .08 and that of the American group in which
r = .636 - .058. It is quite evident that the non-
language ability differs more radically from the language
ability in the Spanish-American group than it does in the
American group, although the correlation between each of
these I. Q.'s with achievement gives more nearly uniform
results in the Spanish-American group where the two
correlations are .509 - .071 and .530 - .069 respectively,
while in the American group they are .61 - .06 and
.77 - .04 respectively. In the Spanish-American group
the use of the combined or total I. Q. raises the correla-
tion with achievement quite materially from r = .509
- .071 to r = .622 - .058 while with the American group
the correlation is raised but slightly from r = .77 - .04
to r - .786 - .036.

It would seem logical to say that this would indi-
cate that if one wishes to use the instrument which is
most predictive of academic achievement with Spanish-
American children he should use an intelligence test which
measures both language and non-language abilities, while
with American children who have a good grasp of the
common language, the purely verbal type of intelligence
test would be almost as satisfactory as the combination
test. When it is realized that the combined test is two
and one-half times as long as the verbal part alone, the
slight effect of the non-language portion upon the predictive value of the test with these American children is quite surprising. Evidently, the non-language ability does not play an important part in academic achievement with those who have no language handicap, but plays a more important part with those who do have such a handicap. This observation is strengthened when resort is had to partial correlation technique, for when, in the Spanish group the non-language factor is held constant, partial correlation between the language I. Q. and achievement becomes $.57 - .06$ as compared with $r = .622 - .058$ while in the American group is it $.627 - .058$ as compared with $.786 - .036$. When language I. Q. is held constant as a correlation factor the partial correlation between non-language and achievement increases slightly from $.33 - .08$ to $.42 - .08$ in the Spanish-American group while it decreases sharply from $.61 - .06$ to $.25 - .09$ in the American group.

This seems to indicate that the language factor plays a much more important part in determining achievement in the group which has no language handicap than it does in the group which is bi-lingual and handicapped in the use of the English language in which its members are forced to carry on their learning efforts.
CHAPTER V

CONCLUSION

The problem of this study was to make a comparison of the intelligence quotients, non-language quotients, language quotients and, achievement of children from Spanish-speaking, and English-speaking families in the seventh and eighth grades in the Douglas School.

It has been found that the Spanish-American has an inferior intelligence quotient as it is measured by language as well as non-language testing devices, in comparison with the Americans, the mean score for the Mexicans being 93 as compared to 102 for the American of the same age and grade group. The mean bi-lingual intelligence quotient found in Douglas is higher than that found by some other writers. This may be because of differences inherent in the tests used or because more intelligent Mexican children are residing in Douglas than in some less desirable communities.

Kinsey\(^7\) found that the Mexicans in the Flagstaff School had an average I. Q. of 87, and the English-speaking children averaged 108. She used the Metropolitan Achievement and Terman Ability tests in her

investigation.

Grath\textsuperscript{8} in his report on 455 Mexicans in grades four to eight in Texas concludes that age for age and grade for grade the Mexican children are inferior to American children in verbal test results. But in non-language test results, the Mexicans are practically equal to the American in I. Q. The verbal test I. Q. for the group of Mexicans was 79.5. This figure has often been obtained before for Mexicans. Grath's finding of a Mean I. Q. of 79.5 may be compared with the 92.79 found in this study, but Grath found the Mexicans to have a non-language intelligence quotient of 100.8 obtained from the Pinter non-language test as compared to 97.55 found in Douglas by using the California Mental Maturity Test. It is possible to conclude from the present results and from those of related studies that Mexicans as a group have a lower measured I. Q. than do the English-speaking Americans of the same age and schooling.

It has been found that achievement of the Spanish-American group is also less than that of the American group, the ratio of their grade achievement to the achievement of the American group being .94 which was the same as the ratio between their mean non-language

I. Q. and that of the English-speaking group but somewhat higher than the ratio of .91 between the total mean I. Q. of the two groups.

Evidence brought out from the correlation coefficients showed that the non-language portion of the California Mental Maturity Test was far more important as an aid to prediction of academic success in the Spanish-American group than it was in the American group, and this was confirmed by the evidence shown by the use of the partial correlation technique.

For this reason it is recommended that for the measurement of Spanish-American children a test should be used which measures both verbal and non-verbal abilities even though the non-verbal portion adds but little to the value of the test when it is used with children whose knowledge of English is adequate.
## APPENDIX

INTELLIGENCE QUOTIENTS, LANGUAGE QUOTIENTS, NON-LANGUAGE QUOTIENTS AND GRADE ACHIEVEMENT OF SPANISH-AMERICAN CHILDREN

<table>
<thead>
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BIBLIOGRAPHY

A. Book

1. Manuel, Herschel T.
   The Education of Mexican and Spanish-Speaking
   Children in Texas,
   The fund for research in social science, The
   University of Texas, 1930.

B. Periodicals

2. Davenport, E. L. and Siblings,
   "Intelligence Quotients of Mexicans"

3. Garretson, O. K.
   "Study of Causes of Retardation among Mexican
   Children in a Small Public School System
   in Arizona."
   Journal of Educational Psychology, Vol. 19,
   31-40, 1928.

4. Grath, T. R.
   "Race Psychology,"
   The Psychological Bulletin, Vol. 22, 343-346,
   June 1925.

5. Grath, T. R.
   "The Intelligence of Mexican School Children."
   School and Society, Vol. 27, 791-794, 1928.

   "The Intelligence and Achievement of Mexican
   Children in the United States."
   Journal of Abnormal and Social Psychology,
   29:222-9.

7. Haught, B. F.
   "The Language Difficulty of Spanish-American
   Children."

8. Hoffman, N. H.
   "The Measurement of Bi-lingual Background."
   Teachers' College Record, 37:65-6, 1935.
"The Real Intelligence of the Mexican Child."  

10. Kelley, Victor H.  
"The Reading Abilities of Spanish and English-Speaking Pupils."  

11. Manuel, H. T.  
"The Educational Problem Presented by the Spanish-Speaking Child of the Southwest."  
School and Society, 40:692-5.

12. Mitchell, A. J.  
"The Effect of Bi-lingualism in the Measurement of Intelligence,"  

13. Pintner, Rudolph  
"The Influence of Language Background on Intelligence Tests."  

14. Pintner, Rudolph, and Leller, Ruth  
"Intelligence Tests of Foreign Children."  

15. Rigg, Melvin  
"Some Further Data on the Language Handicap."  
Journal of Educational Psychology, 19:252-6, 1928.

16. Rodee, Nona  
"Teaching Beginners to Speak English," 1923.

17. Sanchez, George T.  
"The Intelligence of Mexican Children."  
School and Society, 19:139-142.

18. Sheldon, W. H.  
"The Intelligence of Mexican Children."  
School and Society, Vol. 19, 139-142, 1924.

19. Walters, Fred C.  
"Language Handicap and Stanford Revision of the Binet-Simon Tests."  
Journal of Educational Psychology, 15:276-284.
C. Bulletins

20. "A Study of Bi-lingual Children."
   Bulletin No. 15, 1937, United States Department
   of Education.

21. Paschal and Sullivan
   "Influence in the Mental Development of Mexican
   Children."
   Monograph Comparative Psychology, Bulletin No. 3,
   1935.

22. Reynolds, Annie
   "The Education of Spanish-Speaking Children in
   Five Southwestern States."
   Department of Interior Publication, Bulletin
   No. 11, 1933.

D. Unpublished Materials

23. Blackburn, Robert D.
    The Language Handicap of Spanish-American Children.
    Unpublished Master's Thesis, University of Arizona,
    Tucson, Arizona, 1939.

24. Drake, Rollin H.
    A Comparative Study of the Mentality and
    Achievement of Mexican and White Children.
    Unpublished Master's Thesis, University of Southern
    California, Los Angeles, California, 1927.

25. Johnston, Charles R.
    Correlation Between Intelligence and Reading
    Achievement With Particular Reference to
    Certain Social Factors.
    Unpublished Master's Thesis, University of
    Arizona, Tucson, Arizona, 1938.

26. Kinsey, Laura
    A Comparison of the Achievement of American and
    Mexican 7th and 8th grade Pupils.
    Unpublished Master's Thesis, University of

27. Peake, George Joseph
    Relative Achievement of English-Speaking and
    Spanish-Speaking Children.
    Unpublished Master's Thesis, University of
    Arizona, Tucson, Arizona, 1931.
CALIFORNIA TEST OF MENTAL MATURITY — INTERMEDIATE SERIES
Devised by Elizabeth T. Sullivan, Willis W. Clark, and Ernest W. Tiegs

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5. Delayed Recall 20 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
B. Spacial Relationships 45 8 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
6. Sensing Right and Left* 20 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
7. Manipulation of Areas* 15 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
8. Foresight in Spacial Sit'ns* 10 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
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9. Opposites* 15 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
10. Similarities* 15 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
11. Analogies* 15 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
12. Number Series* 15 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
13. Numerical Quantity* 15 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
14. Numerical Quantity 15 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
15. Inference 15
D. 16. Vocabulary 50
E. Total Mental Factors 250
(F + A + B + C + D)
F. Language Factors 100
(G + 14 + 15 + 16)
G. Non-Language Factors 150
(E + F)
H. Chronological Age
I. Actual Grade Placement

SUMMARY OF DATA

<table>
<thead>
<tr>
<th>Score</th>
<th>M. A.</th>
<th>C. A.</th>
<th>I. Q.</th>
</tr>
</thead>
</table>

Copyright, 1937, by E. T. Sullivan, Willis W. Clark, and Ernest W. Tiegs
Published by California Test Bureau
3636 Beverly Boulevard, Los Angeles, California
TEST 1.
Directions: In each group of letters and numbers, put a circle around the letters and numbers in the second row that are the same as those in the first row of the group.

A.

<table>
<thead>
<tr>
<th>D</th>
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<tr>
<td>V</td>
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3. | C | D | 5 | S | X | B | R | P | U |
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4. | M | O | 3 | A | C | S | F | G |
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5. | X | F | 6 | C | B | E | H | L | S |
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6. | P | Q | 8 | V | K | H | A | O | 3 |
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7. | E | S | L | R | J | H | 7 | M | 9 |
|---|---|---|---|---|---|---|---|---|

8. | W | Y | 5 | 0 | Q | C | P | 3 | X |
|---|---|---|---|---|---|---|---|---|

9. | T | B | S | R | V | D | 6 | 8 | 0 |
|---|---|---|---|---|---|---|---|---|

10. | M | T | N | W | K | 4 | E | Z | L |

Test 1. Score (number right) ...........................................
TEST 2.

Directions: In each row put an X on the line under the object that is named. Then write the number of the object you mark, on the line to the right.
TEST 3.

Directions: Start at the first arrow at A and draw a line to each number when called. Try to keep within the black lines. Do B in the same way.
**TEST 4.**

**Directions:** Listen to the pairs of words that will be read to you. The first word of each pair will be repeated and you are to remember what they went with. Find the object. Put an X on the line under it and put the number of the object you mark on the line to the right.

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<thead>
<tr>
<th>1</th>
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<td>K</td>
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<td>Q</td>
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<th>2</th>
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<tr>
<td>V</td>
<td>W</td>
<td>X</td>
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</table>

<table>
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<tr>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
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<tbody>
<tr>
<td>Y</td>
<td>Z</td>
<td></td>
</tr>
</tbody>
</table>

**Test 4. Score (number right)..............................................................................**
Directions: Put a circle around the letter R in all rights. Put a circle around the letter L in all lefts.

---

TEST 6.

Test 6. Score (number right) .......

(Tell 5 is on page 16.)
**TEST 7.**

Directions: In each row find a drawing that is either the same drawing or different views of the first drawing. Put an X on the line under this drawing and put the number of the drawing you mark on the line to the right.
Directions: Begin at the arrow in drawing A. Draw a line to show the path you would take through all the drawings so as to finish at the arrow in drawing 10.
TEST 9.

Directions: In each row there is one object that represents the opposite of the first object. Put an X on the line under it and put the number of the object you mark on the line to the right.
TEST 10.

Directions: The first three objects in each row are alike in some way. Find another object in the same row that belongs with them. Put an X on the line under it and put the number of the object you mark on the line to the right.

[Diagram of objects with numbers]
TEST 11.

Directions: In each row the first object is related to the second. Find an object that goes with the third object in the same way. Put an X on the line under it and put the number of the object you mark on the line to the right.
**TEST 12.**

**Directions:** In each row of numbers below, there is one that is wrong. Find this wrong number and draw a line under it. Then write it on the line to the right.

<table>
<thead>
<tr>
<th>Sample:</th>
<th>2</th>
<th>4</th>
<th>6</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>11</td>
<td>9</td>
<td>8</td>
<td>7</td>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>

A. 12 10 8 7 6 4  
B. 19 16 13 11 10 7 4  
C. 1 5 9 13 15 17  
D. 4 5 7 8 10 11 12 13  
E. 2 4 5 7 8 9 10 11 13 14  
F. 0 7 14 19 24 27 29 30 31  
G. 20 17 15 14 11 9 8 7 5 3 2  
H. 21 20 18 15 14 12 10 9 8 6 3  
I. 2 3 5 8 12 17 22 23 30  
J. 20 18 19 17 18 16 17 14 15 16

Go right on with the following until told to stop. In each row of numbers below, the numbers grow larger or smaller in a regular series of whole numbers. Supply the missing numbers and also write them on the line to the right.

<table>
<thead>
<tr>
<th>Sample:</th>
<th>2</th>
<th>4</th>
<th>7</th>
<th>9</th>
<th>12</th>
<th>14</th>
<th>17</th>
<th>19</th>
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<tr>
<td></td>
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<td></td>
<td></td>
<td>19</td>
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</tr>
</tbody>
</table>

K. 1 4      10       19  
L. 2        8        32    
M. 44 37    16        2    
N. 6        28       50    72  
O. 83 70    44        5   

**TEST 13.**

**Directions:** In each problem you are to find a certain number of coins to make a certain amount of money. Put the number of coins required under the name of the coin.

<table>
<thead>
<tr>
<th>Samples</th>
<th>2 coins—10 cents</th>
<th>4 coins—21 cents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>cent</td>
<td>nickel</td>
</tr>
<tr>
<td>A. 2 coins—15 cents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. 5 coins—18 cents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. 8 coins—25 cents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. 6 coins—34 cents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E. 5 coins—47 cents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F. 6 coins—59 cents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G. 4 coins—86 cents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H. 7 coins—98 cents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I. 5 coins—61 cents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J. 6 coins—70 cents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K. 7 coins—79 cents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L. 8 coins—$1.19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M. 8 coins—$1.48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N. 9 coins—$2.82</td>
<td></td>
<td></td>
</tr>
<tr>
<td>O. 11 coins—$4.36</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Directions: Work these problems. Write the letter of the answer on the line to the right.

0. If you earn $5.00 and spend $3.00, how many dollars will you have left?
   Ans.: a $1.00 b $2.00 c $3.00 d $5.00 b 0

1. If a freight train travels at the rate of 20 miles an hour, how many miles will it travel in 4 hours?
   Ans.: a 5 b 24 c 80 d 60 1

2. How many lemons can you buy for 15 cents at the rate of 4 for 5 cents?
   Ans.: a 9 b 12 c 15 d 60 2

3. On a road map each one-half inch represents 20 miles. How many miles are represented by 5 inches?
   Ans.: a 10 b 20 c 100 d 200 3

4. Large envelopes that sell for 3 cents each can be had for 30 cents a dozen. How much is saved when bought by the dozen?
   Ans.: a 10c b 6c c 2½c d 9c 4

5. How many one-inch cubes can be placed in a box 5 inches long, 4 inches wide, and 3 inches high?
   Ans.: a 12 b 23 c 60 d 100 5

6. If you had 20 words in spelling and were marked 90%, how many words did you spell correctly?
   Ans.: a 1 b 11 c 18 d 19 6

7. How many 1½ cent stamps would you give in even exchange for 30 one-half cent stamps?
   Ans.: a 10 b 15 c 20 d 45 7

8. A ball team played 25 games and won 7 games more than it lost. How many games did it win?
   Ans.: a 7 b 9 c 16 d 18 8

9. How many sheets of paper 7 inches by 10 inches can you cut from a sheet of paper 21 inches by 30 inches?
   Ans.: a 3 b 6 c 9 d 34 9

10. How much will picture molding for a room 15 feet by 16 feet cost at 10 cents a foot?
    Ans.: a $3.10 b $6.20 c $30.00 d $24.00 10

11. 2½ times what number equals 40?
    Ans.: a 16 b 8 c 15 d 17 11

12. If a cubical block of ice 5 inches square weighs 6½ pounds, how many pounds will a cubical block 10 inches square weigh?
    Ans.: a 12½ b 11¼ c 50 d 100 12

13. What is the number which if multiplied by 2 is 4 less than 3 times 6?
    Ans.: a 6 b 7 c 14 d 8 13

14. Jim says his age is ¼ of his uncle's, and that their ages together total 40 years. How many years difference is there between Jim's and his uncle's age?
    Ans.: a 10 b 20 c 24 d 30 14

15. A tank is fed by two pipes, one of which can fill it in 2 hours, and the other in 3 hours. A third pipe can empty it in 1 hour. If the tank is full and all three pipes are opened and operating to full capacity, how many hours will it take to empty the tank?
    Ans.: a 2 b 4 c 5 d 6 15
TEST 15.

Directions: Read each group of statements and draw a line under the correct logical answer. Write the number of this answer on the line to the right.

0. All four-footed creatures are animals. All horses are four-footed. Therefore
   1 Creatures other than horses can walk
   2 All horses can walk
   3 All horses are animals

1. Mr. X is an aviator. Mr. X is scout-master for his home town. Therefore
   1 Aviators make good scout-masters
   2 One aviator is a scout-master
   3 Scout-masters make good aviators

2. Three boys are on a mountain trail. Dick is farther up the trail than Dan. Frank is farther up than Dick. Which boy is in the middle position on the trail?
   1 Dick
   2 Dan
   3 Frank

3. No human beings are exempt from accidents. Automobile drivers are human beings. Therefore
   1 No human being is dependable
   2 No automobile drivers are exempt from accidents
   3 Few human beings make safe automobile drivers

4. If he remains with his friend he will suffer loss, and if he leaves his friend he will suffer loss; but he must remain with his friend or leave him. Therefore
   1 He should remain with his friend
   2 It takes courage to leave a friend
   3 He will suffer loss

5. All squares have four equal sides. This figure does not have four equal sides. Therefore
   1 It is a circle
   2 It is not a square
   3 It is either a triangle or a rectangle

6. He is either foreign-born or a native. But, he is not foreign-born. Therefore
   1 He is a voter
   2 He is a native
   3 He is a soldier

7. Pine Street is parallel to River Drive. River Drive is parallel to Cypress Street. Therefore
   1 Pine Street is east of River Drive
   2 Cypress Street crosses Pine Street
   3 Pine Street is parallel to Cypress Street

8. Either your sister is more intelligent than you, or as intelligent, or less intelligent. But, your sister is not more intelligent, nor is she less intelligent. Therefore
   1 Your sister is less intelligent than you
   2 Your sister is as intelligent as you
   3 Your sister is more intelligent than you

9. Jim has a better batting average than Ed. Ed has a better batting average than Bill. Which has the best batting average?
   1 Jim
   2 Bill
   3 Ed

10. A weighs less than B. B weighs less than C. Therefore
    1 B weighs more than C
    2 A's weight is equal to B's and C's
    3 A weighs less than C

11. The box contains either gold or silver or crystal. It does not contain silver. Therefore
    1 It contains crystal
    2 It contains either gold or crystal
    3 The conclusion is uncertain

12. If he is to keep his place on the team he must avoid disputes with the captain and the coach. But, he will not avoid disputes with the captain, or he will not avoid disputes with the coach. Therefore
    1 He will not remain on the team
    2 He will lose in popularity with the school
    3 He may have a reasonable complaint

13. If the claim is unjust, refusal to permit its discussion before the Student Council is unwise. If the claim is just, refusal is inexcusable. But, the claim is either unjust or it is just. Therefore
    1 The refusal is justified
    2 The refusal is being discussed freely
    3 The refusal is either unwise or inexcusable

14. A's house is situated northeast of B's. B's house is situated northeast of C's. Therefore
    1 A's house is situated nearest to C
    2 C's house is nearer to A's house than to B's
    3 A's house is situated to the northeast of C's

15. W is between X and Y. X is between Y and Z. Therefore
    1 W is not between Y and Z
    2 W is between X and Z
    3 W is nearer to X than to Z
TEST 16.

Directions: Draw a line under the word which means the same or about the same as the first word. Write the number of this word on the line to the right, as:

0. blossom 1 tree 2 vine 3 flower 4 garden 3 0
1. strange 1 real 2 tell 3 certain 4 unknown 1
2. reply 1 news 2 answer 3 note 4 open 2
3. liberty 1 benefit 2 seize 3 freedom 4 aid 3
4. assist 1 consent 2 help 3 agreement 4 overlook 4
5. admire 1 defend 2 protect 3 approve 4 agree 5
6. aim 1 offer 2 apply 3 haste 4 end 6
7. esteem 1 reject 2 estimate 3 exceed 4 respect 7
8. acquire 1 agree 2 conduct 3 obtain 4 conflict 8
9. counsel 1 glory 2 advice 3 certain 4 unknown 1
10. ample 1 season 2 plentiful 3 alive 4 autumn 10
11. amaze 1 agree 2 betray 3 surprise 4 contrary 11
12. oppress 1 promise 2 imitate 3 crowd 4 burden 12
13. liberal 1 lonely 2 generous 3 learned 4 real 13
14. predatory 1 wandering 2 stationary 3 plundering 4 lasting 14
15. obstinate 1 obedient 2 headstrong 3 satisfactory 4 saucy 15
16. eternal 1 worthy 2 brief 3 endless 4 native 16
17. fugitive 1 fester 2 accident 3 saddle 4 runaway 17
18. legend 1 ancient 2 legion 3 story 4 leisure 18
19. entreat 1 refuse 2 plead 3 repair 4 reform 19
20. notable 1 terrible 2 brilliant 3 severe 4 famous 20
21. diminish 1 obtain 2 repeat 3 reduce 4 plentiful 21
22. envious 1 amiable 2 jealous 3 boisterous 4 enormous 22
23. prophecy 1 suggestion 2 premium 3 substance 4 prediction 23
24. corrode 1 collect 2 disintegrate 3 applaud 4 blame 24
25. invariably 1 probably 2 sometimes 3 always 4 motionless 25

26. detect 1 remove 2 discover 3 overtake 4 apply 26
27. reluctantly 1 gladly 2 instantly 3 certainly 4 unwillingly 27
28. inefficient 1 inevitable 2 prudent 3 incompetent 4 unrighteous 28
29. facetious 1 active 2 fragile 3 humorous 4 inventive 29
30. ambiguous 1 thoughtful 2 doubtful 3 responsible 4 confident 30
31. utilize 1 harmonize 2 identify 3 use 4 invite 31
32. dejected 1 involved 2 disheartened 3 weighty 4 destroyed 32
33. dexterity 1 affection 2 advantage 3 safety 4 skill 33
34. defer 1 affirm 2 delay 3 confer 4 ordain 34
35. deride 1 advance 2 encourage 3 ennable 4 ridicule 35
36. concede 1 overrule 2 engage 3 allow 4 endeavor 36
37. invoke 1 hover 2 imitate 3 ask 4 invest 37
38. coerce 1 varnish 2 adverse 3 treasures 4 compel 38
39. tarnish 1 frighten 2 blacken 3 lament 4 torment 39
40. antecedent 1 actual 2 pretended 3 previous 4 genuine 40
41. disparage 1 divert 2 discredit 3 deprive 4 divide 41
42. impervious 1 empty 2 injurious 3 impenetrable 4 important 42
43. deleterious 1 harmful 2 particular 3 tardy 4 just 43
44. presage 1 wisdom 2 precedent 3 foretell 4 promote 44
45. surfeit 1 excess 2 excel 3 survey 4 feature 45
46. vertigo 1 greenish 2 truth 3 strength 4 giddiness 46
47. quondam 1 quota 2 survivor 3 former 4 future 47
48. mandible 1 handcuff 2 jaw 3 law 4 forceful 48
49. odium 1 favor 2 blame 3 smell 4 poem 49
50. chuff 1 peevish 2 churl 3 cliff 4 laugh 50

Test 16. Score (number right) ___________
Directions: Read the following and draw a line under the correct answer. Put the number of this answer on the line to the right.

0. The story read to you a little while ago was about

1. The name of the story was

2. The party was traveling to

3. The camp was
1. Near the river 2. Near the ocean 3. In the mountains 4. On the plains 3

4. The party was preparing to take the
1. Southern trail 2. The central trail 3. The northern trail 4. The shortest trail 4

5. The party broke camp
1. At noon 2. Near sundown 3. In the winter 4. At sunrise 5

6. The leader of the party was worried about
1. The horses 2. The food supply 3. The wagon wheels 4. The Indians 6

7. The members selected to leave the party were

8. Those selected to make the journey on foot were given a small supply of

9. The goodbyes of their relatives and friends were

10. The foot travelers were also given to carry with them

11. They were given enough ammunition for

12. They met a deer on their journey on the
1. Fifth day 2. First day 3. Last day 4. Second day 12

13. The foot travelers left their weapon
1. Near the slain deer 2. Standing against a tree 3. On a pile of rocks 4. In the branches of a tree 13

14. On the last day of the trip the foot travelers

15. They became sick from eating

16. When the settler saw the stranger on the height above the settlement he
1. Beckoned him to come down 2. Made a camp for his sick comrades 3. Sent a boy up the trail 4. Send two men up the trail 16

17. The rescuing party brought the sick foot travelers to camp
1. On their shoulders 2. On stretchers 3. On horses 4. In a wagon 17

18. The foot travelers reached their destination in
1. The early spring 2. The summer 3. The late spring 4. The early fall 18

19. On reaching the settlement they found that their families and friends traveling by wagon had
1. Arrived two days before 2. Arrived the same day 3. Not arrived yet 4. Sent word that they were safe 19

20. The wagon train
1. Arrived three months later 2. The story did not say 3. Arrived one month later 4. Never reached the settlement 20

Test 5. Score (number right)