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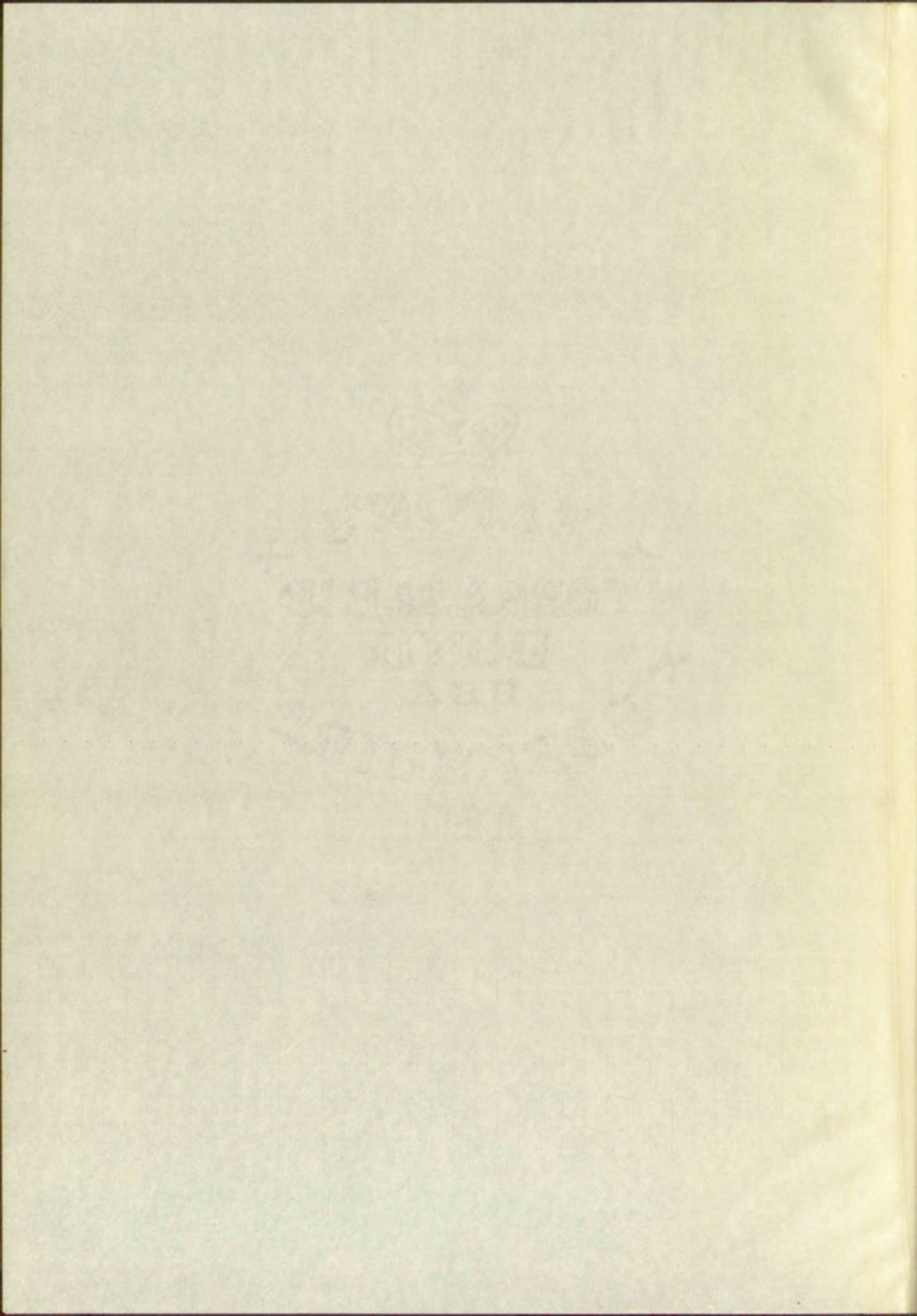


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A STUDY OF THE
BETTS READY TO READ TESTS
THEIR PREDICTIVE VALUES IN DETERMINING READING
ACHIEVEMENT AND THEIR COMPARISON
WITH OTHER PREDICTIVE MEASURES

By

Charles L. Mills

A Thesis

Submitted in partial fulfillment of the
Requirements for the Degree of
Master of Arts in Education

University of New Mexico

1941

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This thesis, directed and approved by the candidate's committee, has been accepted by the Graduate Committee of the University of New Mexico in partial fulfillment of the requirements for the degree of

MASTER OF ARTS

(Signed) George P. Hammond

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CHAPTER I

THE PROBLEM AND DEFINITIONS OF TERMS USED

The ability to read is basic to the acquisition of knowledge in all school subjects. Consequently, classroom teachers have long been interested in what determines readiness for reading, and in tests which will predict reading achievement. Prominent among those which have appeared in recent years is the Betts Ready to Read Tests¹ which in reality are a series of twelve individual vision tests that require expensive equipment, a great deal of time, and a certain amount of technical skill to administer, score, and interpret.

I. THE PROBLEM

Statement of the problem. The purposes of this investigation are (1) to determine the predictive values of the factors of binocular vision in reading readiness, as measured by the Visual Sensation and Perception Tests of Betts Ready to Read Tests, and (2) to compare the relative values of the Betts tests as measures of probable future success in reading with those of other group and individual standardized and non-standardized predictive instruments.

¹ Emmett Albert Betts, Betts Ready to Read Tests (Meadville, Pennsylvania: Keystone View Company, 1936.)

Importance of the problem. The average teacher is confused by the claims being made for the many prognostic tests now being used to predict success in learning to read. Consequently, if this investigation can either prove that the Betts tests are worth the time, expense, and technical training they involve, or that other more simple prognostic tests are equally as good, a great service will have been rendered education.

Delimitation. The scope of this investigation is limited to all regularly enrolled beginning first grade pupils, in the Hobbs, New Mexico, public schools, who were in regular attendance during the school year 1937-1938, regardless of individual differences in home background, mental ability, educational opportunity, physical maturity, general health, chronological age, and psychological factors peculiar to the developmental age of young children.

II. DEFINITIONS OF TERMS USED

Beginning first grade pupils. Beginning first grade pupils are children entering the first grade of the public elementary schools for the first time.

Binocular vision. Throughout the report of this investigation, the term "binocular vision" shall be interpreted as meaning the co-ordinate action of the eyes.

Importance of the problem.

continued by the child with more or less regularity. The tests now being used to produce a more systematic study of the. Consequently, it is this investigation and study of the. the Beta tests are with the Beta tests, the Beta tests. training they receive, or the Beta tests, the Beta tests. tests are given as good, a Beta test will be a Beta. repeated adjustment.

Definition of the problem.

limited to all the Beta tests, the Beta tests, the Beta tests. public, in the Beta tests, the Beta tests, the Beta tests. in the Beta tests, the Beta tests, the Beta tests. regarding the Beta tests, the Beta tests, the Beta tests. mental ability, the Beta tests, the Beta tests, the Beta tests. general health, the Beta tests, the Beta tests, the Beta tests. present to the Beta tests, the Beta tests, the Beta tests.

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Definition of the problem.

investigation, the Beta tests, the Beta tests, the Beta tests. proved as meeting the Beta tests, the Beta tests, the Beta tests.

Prognosis. The term "prognosis" and its derivatives are used in this investigation in referring to the predictive values which certain reading readiness and eye conditions tests possess for indicating future success in reading.

III. SOURCES OF THE DATA

In determining the importance of the factors of binocular vision in reading readiness, 167 beginning first grade pupils enrolled in six classrooms in the Hobbs, New Mexico, public schools during the 1937-1938 term of school were examined individually in September, 1937, by the writer and two assistants on each of the twelve tests included in the Visual Sensation and Perception Tests of the Betts Ready to Read Tests, and rated as passing or failing each test. The data thus secured were used to determine the correlations between the factors of binocular vision in reading readiness and reading achievement.

In comparing the results of the Betts tests of the factors of binocular vision in reading readiness with those of the other predictive instruments administered in September, 1937, to the 167 beginning first grade pupils included in this investigation, the raw scores made by the pupils on these other tests were correlated with the scores on the same measures of reading achievement.

The data used as measures of reading achievement and

for determining the correlations between all predictive instruments included in this study and success in reading consisted of the raw scores made on (1) the Detroit Word Test, (2) the Betts Oculomotor and Perception Habits Tests, Level One, (3) the Metropolitan Achievement Test, Form A, (4) teacher's marks in general scholarship, (5) the Metropolitan Reading Test, Form A, and (6) teacher's marks in reading scholarship in May, 1938.

IV. METHOD OF PROCEDURE

This study was conducted in a normal public school situation, wherein all the variations common to any given school population might be present. Special care was used to preserve the same plan of grouping pupils for instructional purposes and the usual methods of instruction practiced in first grade public school classrooms, by urging that all teachers concerned follow their customary routine of procedures.

In selecting the 167 cases used in this investigation only those pupils were included who (1) were beginning first grade pupils regularly enrolled in the Hobbs, New Mexico, public schools during the 1937-1938 term of school; (2) had no previous public school experience; and (3) were actually in school when the predictive tests were given in September, 1937, and when the achievement measures were administered.

for determining the correlation between the
experiments described in this study and the
conclusion of the two previous studies on the
Test, (2) the degree of change in the
Level One, (3) the relationship between the
(4) teacher's score in general subject and
politeness reading test, and (5) the
reading relationship in the test.

IV. Summary of Results

This study was conducted in a school in the
situation, which is all the variables in the
school population which is the same as the
to preserve the same level of reading in the
which is the same as the level of reading in the
presented in the first study. The results of the
that all teachers reported that the results of the
of improvement.

In collecting the data, the results of the
only these results were the same as the results of the
which are negatively correlated in the first study.
public schools during the 1957-1958 school year.
no previous public school experiment in the same
in school from the previous study. The results of the
1957, and when the achievement was reported in the

V. ORGANIZATION OF REMAINDER OF THESIS

The remainder of this thesis is divided into five chapters. Chapter II presents a review of related literature.

Chapter III is an outline of the procedure followed by the investigator in making this study.

Chapter IV is concerned with a study of the correlation between the binocular factors of reading readiness as determined by the Visual Sensation and Perception Tests of Betts Ready to Read Tests, (administered in the fall of 1937), and success in learning to read as revealed by standardized tests and teacher's marks (administered in the spring of 1938).

Chapter V sets forth a comparative study of the correlation between other standardized reading readiness tests, including teacher's ratings of first grade pupils (administered in the fall of 1937), and reading achievement as revealed by standardized tests and teacher's marks (administered in the spring of 1938).

The final chapter gives a summary of the findings and presents the conclusions of the investigation.

V. SUMMARY OF RESULTS

The investigation of the reaction of the

chlorine. Chapter II describes the experimental

Chapter III is a summary of the results

by the investigator in this field.

Chapter IV is concerned with a study of the

between the chlorine and the reaction

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obtained from the study of the reaction

of 1937.

Chapter V is a summary of the results

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revealed by the study of the reaction

formed in the reaction of 1937.

The final chapter is a summary of the results

presented in the report of the investigation.

CHAPTER II

REVIEW OF RELATED LITERATURE

Many recent investigations of the relationship between reading readiness and reading achievement have been made on the assumption that the co-ordinate visual efficiency or the binocular co-ordination of the eyes is essential to success in learning to read.

I. REVIEW OF RELATED STUDIES

Betts,² who is one of the leaders in the field of visual readiness for reading and who has developed tests to reveal visual defects, states that the binocular co-ordination required in reading was not subject to scientific study until the development of the material on "visual sensation and perception" and "oculomotor habits" used in the Betts Ready to Read Tests. His very excellent description of the tests follows:

The Betts Ready to Read Tests are devised to appraise the co-ordinate action of the eyes. The chief factors contributing to the validity of the tests of visual sensation and perception are: First, each eye is tested

² Emmett Albert Betts, "A Physiological Approach to the Analysis of Reading Disabilities," The Educational Research Bulletin, 13:135-40, 163-74, September 19 and October 17, 1934.

CHAPTER I

REVIEW OF EARLY LITERATURE

Very recent investigations of the relationship between reading readiness and reading achievement have been made on the assumption that the two are related. The majority of the literature of the past few years has been devoted to the study of the relationship between reading readiness and reading achievement.

1. REVIEW OF EARLY LITERATURE

Reading, as one of the basic skills of the school child, is a complex process. It is not only a matter of visual perception but also of intellectual and emotional factors. The child must be able to see the words, understand their meaning, and be motivated to learn. The child must also be able to use the words in a meaningful way. The child must be able to read for pleasure and for information. The child must be able to read for self-expression and for social communication. The child must be able to read for the purpose of learning and for the purpose of enjoying the process of reading.

2. REVIEW OF EARLY LITERATURE

The child's reading readiness is a complex process. It is not only a matter of visual perception but also of intellectual and emotional factors. The child must be able to see the words, understand their meaning, and be motivated to learn. The child must also be able to use the words in a meaningful way. The child must be able to read for pleasure and for information. The child must be able to read for self-expression and for social communication. The child must be able to read for the purpose of learning and for the purpose of enjoying the process of reading.

2. Review of Early Literature
The child's reading readiness is a complex process. It is not only a matter of visual perception but also of intellectual and emotional factors. The child must be able to see the words, understand their meaning, and be motivated to learn. The child must also be able to use the words in a meaningful way. The child must be able to read for pleasure and for information. The child must be able to read for self-expression and for social communication. The child must be able to read for the purpose of learning and for the purpose of enjoying the process of reading.

independently while both eyes are seeing. This is accomplished by a dissociation of the eyes. The eye which is not being tested can look at a blank surface, while the seeing eye is being tested without the subject's awareness of the phenomena. Second, binocular co-ordination which is essential to rapid and efficient reading habits is appraised. Muscle imbalance, near-point and far-point fusion, and stereopsis level are tested. Third, binocular acuity, as well as the acuity of each eye, is tested.³

Wagner,⁴ in investigating the maturation of certain visual functions and the relationship between these functions and success in reading and arithmetic, used the Betts Ready to Read Tests for measuring certain physiological functions of the eye which are related to binocular vision. The tests were given during the last month of the school year to 850 children in grades kindergarten to six, inclusive, of the Syracuse, New York, public schools. The test scores were correlated with teachers' marks for the same year in reading and arithmetic. He concluded:

The differences in visual functioning between good and poor readers are small, and in some cases, perhaps, due to chance. However, the fact that in almost every case the difference favors the good readers supports the general hypothesis that visual inefficiencies, as revealed by the Betts battery, are basically associated

³ Ibid., p. 164.

⁴ Guy W. Wagner, "The Maturation of Certain Visual Functions and the Relationship Between These Functions and Success in Reading and Arithmetic," (Psychological Monograph No. 215 Iowa City, Iowa, University of Iowa, 1937), pp. 108-146.

infrequently this is the case. The
accomplished by a dissection of the eye
which is not being performed. It is
while the eye is in the process of
subject's attention. It is a common
occurrence which is caused by an
reflex action. It is a common
point and is a common feature of
test. Third, the eye is a common
of each eye, is tested.

Figure 1, in illustrating the procedure of the

visual function and the relationship of the eye

tion and success in testing and training, it is

easy to find that the relationship of the eye

function of the eye is not a simple one.

The tests were given during the first of the

year to 600 children in grade 1, 2, 3, 4, 5, 6,

and of the seventh, eighth, ninth, and tenth

grades were given with special tests for the

year in reading and arithmetic. The results

The attention in visual function was not

and the results are small. It is a common

use to observe. The results are small and

cause the difference. The results are small

the results are small. The results are small

involved by the results. The results are small

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involved by the results. The results are small

with poor reading at the age levels considered in this study.⁵

Selzer⁶ constructed stereoscopic tests for studying lateral balance and distance fusion, and examined thirty-three poor readers and one hundred unselected school children. Ninety per cent of the poor readers displayed heterophoria, while only nine of the one hundred unselected school children exhibited similar defects. His conclusions were:

Conditions of muscle imbalance and alternating of vision, in addition to a lack of fusion, . . . account for such reading disability as are not accounted for by general mental disability. The lack of visual fusion is due to muscle imbalance that has existed from birth or early infancy.⁷

Witty and Kopel⁸ investigated the relationship between visual defects and reading disability. Their experimental group consisted of the one hundred poorest readers in grades three to six, inclusive, of the Evanston, Illinois, public schools. A control group was selected from the same grades and schools. All children were examined for eye con-

⁵ Ibid., p. 146.

⁶ Charles A. Selzer, "Lateral Dominance and Distance Fusion." (Harvard Monographs in Education, No. 12 Cambridge, Massachusetts: Harvard University Press, 1933), 119 pp.

⁷ Ibid., p. 119.

⁸ Paul A. Witty and David Kopel, "Heterophoria and Reading Disability," Journal of Educational Psychology, 5:222-230, March, 1936.

with poor feeding at the new level, determined by this study.

Further, continued attention to food quantity

feeding habits and physical fitness, and as a result of

three past seasons, the number of children who

been, finally very poor of the past seasons of 1947-48.

again, while only some of the children who

school children exhibited other defects, the percentage

was:

Results of the study indicated that the percentage of children who were malnourished at the end of the study was 10.1% as compared to 15.1% at the beginning of the study. This indicates that the children who were malnourished at the beginning of the study had improved their nutritional status by the end of the study.

Also, the study indicated that the percentage of

children who were malnourished at the beginning of the study

was 15.1% as compared to 10.1% at the end of the study.

In other words, the percentage of children who were malnourished

at the beginning of the study was 15.1% as compared to 10.1%

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In other words, the percentage of children who were malnourished

at the beginning of the study was 15.1% as compared to 10.1%

at the end of the study. This indicates that the children who

dition with the Betts visual tests. An analysis of the data led to the following conclusions:

The cause of reading disability (as an entity) lies in no single visual factor. Every visual (defect) item considered seems to play a relatively negligible role in the attainment of good and poor readers. Nevertheless, normal vision is indubitably essential to maximum attainment. Therefore it is highly desirable that each child, upon entrance to school and at regular intervals thereafter, should receive thorough ophthalmological study. When this attention is not available, the teacher, nurse, or school psychologist will find apparatus such as the Keystone Ophthalmic Telebinocular helpful in isolating quickly many serious visual defects. In every case of reading disability search should be made for visual difficulties. Such information is a vital item in the comprehensive individual diagnosis which should precede remedial endeavor.⁹

Fendrick¹⁰ paired sixty-four poor readers with an equal number of good readers in grades two and three of the New York City schools and tested them for eye condition with the Betts apparatus. The results revealed a lack of relationship between ocular anomalies or deficiencies and the degree of reading disability, except where teaching methods rely preponderantly upon visual techniques. Since most systems for teaching beginning reading stress the ability to make visual discrimination between word forms, Fendrick's conclusion that there is a relationship between eye condition and

⁹ Ibid., p. 230.

¹⁰ Paul Fendrick, "Visual Characteristics of Poor Readers," (Teachers College Contributions to Education, No. 656 New York: Bureau of Publications, Teachers College, Columbia University, 1935), 54 pp.

success in reading where teaching methods rely preponderantly upon visual techniques is significant.

Smith and Jensen¹¹ state that the investigation of the vision of school children began some years ago, but that only recently a movement has been started to make this work usable in determining reading readiness, and that the Betts Ready to Read Tests should have real value in the determination of reading readiness.

Dean¹² states that lack of visual efficiency may be a serious drawback to children in their school work. He found that 10 to 22 per cent of first grade entrants had defective vision, but that, according to present evidence, nervous instability, restlessness, headaches, and other results of visual deficiency do not impair reading efficiency at the first grade level to the extent that prediction of success or failure can be based on the absence or presence of visual defects.

II. SUMMARY

An analysis of the investigations reviewed in this

¹¹ Charles A. Smith and Myrtle R. Jensen, "Educational, Psychological, and Physiological Factors in Reading Readiness, II," Elementary School Journal, 36:683-691, May, 1936.

¹² Charles D. Dean, "Predicting First Grade Reading Achievement," Elementary School Journal, 39:609-616, April, 1939.

chapter reveals contradictory findings regarding the relationship between vision and success in learning to read, both in the light of results and the techniques used to obtain these results. Typical of the two points of view most commonly held are the studies described below.

Wagner,¹³ after using the Betts Ready to Read Tests to examine 850 children in grades kindergarten to six, inclusive, of the Syracuse, New York, public schools during the last month of the school year concluded that the differences in visual functioning between good and poor readers were small, and in some cases, perhaps, due to chance.

On the other side Selzer,¹⁴ after constructing stereoscopic tests for studying lateral eye balance and distance fusion, and examining thirty-three poor readers and one hundred unselected school children, concluded that conditions of muscle imbalance and alternating vision, in addition to a lack of distance fusion, accounts for such reading disabilities as are not accounted for by general mental disability.

These investigations reveal an interest in the physical phenomena of vision on the part of research workers

¹³ Wagner, op. cit., p. 146.

¹⁴ Selzer, op. cit., p. 119.

and a definite need for additional investigations and experiments, which will produce evidence for the determination of proper standards in the field of vision.

and a definite need for additional research and
investigation, which will require a systematic
program of research in the field of biology.

CHAPTER III

THE CONDUCTION OF THE INVESTIGATION

A normal public school population of beginning first grade pupils was selected for this investigation. This group presented within itself all the variations which might be common to any given public school situation. Special care was used to preserve the ordinary plan of grouping pupils and the usual methods of instruction practiced in first grade public school classrooms, by urging that all teachers concerned follow their customary routine of classroom procedures.

I. SELECTION OF CASES

In selecting the 167 cases used in this investigation, only those pupils were included who (1) were beginning first grade pupils regularly enrolled in the Hobbs, New Mexico, public schools during the 1937-1938 term of school; (2) had no previous public school experience; and (3) were actually in attendance when all tests, including both group and individual prognostic and achievement tests, were administered.

II. TESTING PROCEDURE

The prognostic tests used in this study were given in September, 1937. The achievement measures were administered

eight months later to the same pupils in May, 1938.

All group tests were administered by the writer. With the exception of the teacher's rating, all individual tests were given by the investigator and two assistants, each using the same prearranged procedure.

III. BETTS READY TO READ TESTS

Three different batteries of Betts Ready to Read Tests were used in this investigation. First, the Visual Sensation and Perception Tests, which in reality are twelve individual tests, were used as tests of important binocular functions of the eyes. Second, the Word Form and Auditory Span Tests, which are the basic tests of Betts Visual and Auditory Readiness Tests, were used as reading readiness tests. And third, the Oculomotor and Perception Habits Test, Level One, which is designed to measure the individual pupil's habits of word perception and two-eyed reading tendencies as he views the test through the lens system of the Keystone Ophthalmic Telebinocular,¹⁵ was used as a measure of reading achievement.

The Visual Sensation and Perception Tests were administered in September, 1937 for the purpose of determining

¹⁵ Emmett Albert Betts, The Prevention and Correction of Reading Disabilities (Evanston, Illinois: Row, Peterson and Company, 1936), pp. 162-163.

eight months later in the same year, 1953.
All group tests were conducted in the same
With the exception of the "visual" test, all individual
tests were given by the same person and the results
each being the same for each individual.

III. TEST RESULTS

Three different subjects of the same age group
Tests were made in the following order: visual, auditory,
Barnes and Barnes, and the "visual" test.
Twelve individuals in all, were used in each of the three
different functions of the test: visual, auditory,
and Barnes and Barnes, which were the same for all
three visual and auditory tests. The results of the
three different tests, the visual, the auditory, and
Barnes and Barnes test, were as follows: visual, auditory,
and Barnes and Barnes test. The results of the three
tests were as follows: visual, auditory, and Barnes and
Barnes test. The results of the three tests were as
follows: visual, auditory, and Barnes and Barnes test.
The visual test was conducted in the same manner as the
auditory test, and the results were as follows: visual,
auditory, and Barnes and Barnes test.

¹⁰ See also the report of the Committee on the
of the National Academy of Sciences (1953, 1954, 1955,
and 1956).

the value of these vision tests as prognostic tests of reading achievement.

In addition to the various other tests by other authors, the Betts Word Form and Auditory Span Tests of reading readiness were administered in September, 1937.

The Oculmotor and Perception Habits Test, Level One, was given in May, 1938, as an achievement measure for the purpose of determining the correlation between the factors of binocular vision as measured by the Visual Sensation and Perceptions Tests, and this telebinocular test of the efficiency of the eyes in letter, number, and word recognition skills.

IV. OTHER PROGNOSTIC AND ACHIEVEMENT MEASURES USED IN THIS STUDY

For the purpose of comparing the prognostic usefulness of the Visual Sensation and Perception Tests of the Betts Ready to Read Tests with the predictive values of certain commonly used devices for determining reading readiness, (1) Monroe's Reading Aptitude Test, (2) the Metropolitan Readiness Test, (3) Pressey's Primary Classification Test, and (4) Pintner-Cunningham's Primary Mental Test were included in this study as standardized reading readiness tests.

A teacher's rating scale of first grade pupils is

a predictive measure used by all teachers either consciously or unconsciously. Consequently, the writer felt that this investigation would be incomplete without correlating the teacher's rating of the reading readiness of her pupils with reading achievement at the end of the year.

The teacher's rating scale¹⁶ used in this study was co-operatively constructed by the investigator and the six first grade teachers employed in the Hobbs public schools during the 1937-1938 term of school, and used in September, 1937, by the teachers as an objective standard of reference for rating all first grade pupils considered in this study.

Another measuring device used by all teachers to indicate school success or failure is the teacher's marks recorded on the report card. Hence, in keeping with an attempt to make this investigation of as much practical worth as possible, teachers' marks¹⁷ were correlated with each prognostic measure.

Teachers' marks and teachers' rating of first grade pupils were converted into scores by arbitrarily allowing five points for an excellent rating, four points for a good rating, three points for an average rating, two points for a poor rating, and one point for rating of failure on

¹⁶ Cf. post, p. 60, Appendix B.

¹⁷ Cf. post, p. 61, Appendix B.

a productive research tool by which the teacher can
or unconsciously, however, the teacher's role in the
investigation would be to provide the student with the
teacher's review of the research and to provide the
teacher's review of the research.

The teacher's role in the investigation is to
re-organize the material of the investigation and to
first grade teacher's role in the investigation is to
during the 1950-1951 school year, the teacher's role
1951, by the teacher's role in the investigation is to
for testing the first grade teacher's role in the investigation.

Another role of the teacher is to provide the
indicate school progress in the investigation is to
recorded on the teacher's role in the investigation is to
attest to the teacher's role in the investigation is to
with a possible, however, the teacher's role in the investigation is to
each progressive teacher.

Teacher's role in the investigation is to provide the
engine were observed in the investigation is to provide the
five points for the investigation is to provide the
good to the teacher's role in the investigation is to provide the
for a poor result, the teacher's role in the investigation is to provide the

each item so rated. The teacher's rating of first grade pupils contained five separate items, teacher's marks in general scholarship twenty-one items, and teacher's marks in reading scholarship four items.

V. STATISTICAL PROCEDURES

The Bi-Serial Correlation Method¹⁸ was used for finding the correlations between each of the Visual Sensation and Perception Tests of the Betts Ready to Read Tests and the achievement measures used in this study. The pupil's response on each of these tests was simply indicated as passing or failing according to the standards recommended by Betts.¹⁹ Hence, the method of correlation used is identical with that used for correlating the responses a class makes on a certain item of a true false test with their total scores on the same test. This method was not only easier to handle statistically but was perhaps more accurate than the Pearson Product-Moment Method of Correlation²⁰ would have been, because no assumed means were used.

¹⁸ Henry E. Garrett, Statistics in Psychology and Education (New York: Longmans, Green and Company, 1938), p. 367.

¹⁹ Betts, op. cit., pp. 323-350.

²⁰ Harry A. Greene, Workbook in Educational Measurements: Form B (New York: Longmans, Green and Company, 1936), pp. 76-84.

VI. SUMMARY

An unselected public school population of 167 beginning first grade pupils was given the Visual Sensation and Perception Tests of the factors of binocular vision for the purpose of determining the importance of each of these tests as predictive measures of future success in learning to read.

Other predictive measures, including Betts Word Form and Auditory Span Tests, Pressey's Primary Classification Test, the Pintner-Cunningham Primary Mental Test, the Metropolitan Readiness Test, Monroe's reading Aptitude Test, teachers' rating of first grade pupils, and chronological age, were correlated with reading achievement for the purpose of comparison with the Visual Sensation and Perception Tests as to their relative values as reading readiness tests.

The responses to each of the twelve Visual Sensation and Perception Tests were simply classified as passing or failing and correlated with reading achievement by the bi-serial correlation method. The raw scores²¹ of the other predictive measures mentioned above were correlated with reading achievement by the Pearson Product-Moment Correlation Method.

²¹ Cf. post, p. 58, Appendix A.

The Detroit Word Test, the Betts Oculomotor and Perception Habits Test, Level One, the Metropolitan Achievement Test, Form A, teachers' marks in general scholarship, the Metropolitan Reading Test, Form A, and teachers' marks in reading scholarship were used as measures of reading achievement or success in learning to read.

designed to appraise the binocular co-ordination of the eyes under conditions simulating the reading process. (1) appraising the binocular co-ordination of the eyes under such working conditions as reading, blackboard distance, (2) testing each eye separately while both eyes are seeing as habitually, (3) testing the two-eyed visual efficiency as well as the efficiency of each eye.

The purpose of this chapter is to describe each of the twelve Visual Sensation and Perception Tests to present the question each test is designed to outline the nature of a successful reading test to summarize the responses made by the 127 pupils to the tests, and to show the relation of each of the tests with reading achievement.

22 Samuel Albert Betts, The Psychology of Reading Difficulties (Evansston, Illinois: Rand Company, 1928), pp. 153-162 and 223-242.

The details of the case, as far as the evidence goes, are as follows: The patient, a male, aged 45, was admitted to the hospital on the 1st of January, 1925, with a complaint of severe pain in the lower back and legs, which had been present for some time. The pain was described as a burning or scalding sensation, and was aggravated by any movement. The patient had no history of trauma or other disease. The physical examination revealed a severe scoliosis of the spine, with a pronounced curvature to the right. The muscles of the back and legs were atrophied, and the reflexes were exaggerated. The patient was unable to walk, and was confined to his bed. The diagnosis was made on the basis of the physical examination and the history. The treatment consisted of rest, and the administration of analgesics. The patient died on the 15th of January, 1925, after a few days of illness.

DISCUSSION

The case of the patient described above is a typical example of the disease known as "burning feet syndrome". This disease is characterized by a severe pain in the feet, which is described as a burning or scalding sensation. The pain is usually worse at night, and is aggravated by any movement. The disease is most common in the elderly, and is usually associated with a severe scoliosis of the spine. The exact cause of the disease is not known, but it is believed to be due to a disturbance in the metabolism of the nerves. The treatment of the disease is usually unsuccessful, and the patient often dies of complications.

The case of the patient described above is a typical example of the disease known as "burning feet syndrome". This disease is characterized by a severe pain in the feet, which is described as a burning or scalding sensation. The pain is usually worse at night, and is aggravated by any movement. The disease is most common in the elderly, and is usually associated with a severe scoliosis of the spine. The exact cause of the disease is not known, but it is believed to be due to a disturbance in the metabolism of the nerves. The treatment of the disease is usually unsuccessful, and the patient often dies of complications.

CHAPTER IV

THE FACTORS OF BINOCULAR VISION IN READING READINESS

Betts²² states that all tests of the Visual Sensation and Perception Tests of Betts Ready to Read Tests are devised to appraise the binocular or co-ordinate action of the eyes under conditions simulating the reading process by (1) appraising the binocular co-ordination efficiency of the eyes under such working conditions as reading distance and blackboard distance, (2) testing each eye independently while both eyes are seeing as habitually, and (3) determining two-eyed visual efficiency as well as the acuity of each eye.

The purpose of this chapter is briefly to describe each of the twelve Visual Sensation and Perception Tests, to present the question each test is designed to answer, to outline the nature of a successful response in each case, to summarize the responses made by the 167 first grade pupils to the tests, and to show the bi-serial correlation of each of the tests with reading achievement.

²² Emmett Albert Betts, The Prevention and Correction of Reading Difficulties (Evanston, Illinois: Row, Peterson and Company, 1936), pp. 163-164 and 323-350.

I. DOES BINOCULAR VISION EXIST?



In this first test the above picture is viewed through the lens system of the Keystone Ophthalmic Telebinocular. It is designed to secure the immediate interest of the child in the tests and to enable the examiner to detect one-eyed vision.

Normal response. The dog should be seen jumping through the hoop.

Results. All the pupils passed this test, none failed. Consequently no correlations were calculated between the responses on this test and the achievement measures.

II. IS FUSION NORMAL AT BLACKBOARD DISTANCE?



The purpose of this test is to appraise the individual's

I. The first part of the report is devoted to a general survey of the situation in the country.

II. The second part of the report is devoted to a detailed description of the various districts.

In this part of the report, the author describes the various districts in detail, giving a full account of the population, the principal occupations, the principal products, and the principal towns. He also gives a full account of the various districts, giving a full account of the population, the principal occupations, the principal products, and the principal towns.

III. The third part of the report is devoted to a detailed description of the various districts.

IV. The fourth part of the report is devoted to a detailed description of the various districts.

V. The fifth part of the report is devoted to a detailed description of the various districts.



The sixth part of the report is devoted to a detailed description of the various districts.

fusion power for isolated letter-size images at blackboard distance.

Normal performance. Normal eyes will quickly fuse the four balls into three.

Results. Sixty-two passed, 105 failed, and the bi-serial correlation with the various achievement measures were as follows:

Detroit Word Test	Bis _r	.117
Oculmotor and Perception Habits Test, Level one	Bis _r	.093
Metropolitan General Achievement Test	Bis _r	.063
Teachers' Marks, General Scholarship	Bis _r	.099
Metropolitan Reading Achievement Test	Bis _r	.097
Teachers' Marks, Reading Scholarship	Bis _r	.080

III. ARE BOTH EYES EFFICIENT, WORKING TOGETHER?

This is a test of the visual efficiency of both eyes.

Normal performance. Dots appear in each of the signs

before each eye and normally are fused into one dot for each sign. The score increases as the pupil successfully responds as increasingly smaller signs are presented. A score of 100 per cent is considered normal or passing.

Results. One hundred forty-eight made a normal response, nineteen failed, and the bi-serial correlations were as follows:

Detroit Word Test	Bis _r	.201
Oculmotor and Perception Habits Test, Level One	Bis _r	.154
Metropolitan General Achievement Test	Bis _r	.126
Teachers' Marks, General Scholarship	Bis _r	.232
Metropolitan Reading Achievement Test	Bis _r	.152
Teachers' Marks, Reading Scholarship	Bis _r	.184

IV. IS THE LEFT EYE EFFICIENT, BOTH EYES WORKING TOGETHER?



The purpose of this test is to test the sharpness of the vision of the left eye.

Normal performance. There are no dots in the signs before the right eye; therefore, the visual efficiency of the left eye is checked while both eyes are seeing as habitually. The score increases as the pupil successfully responds as increasingly smaller signs are presented. A score of ninety per cent or above is considered normal.

Results. One hundred twenty-six passed this test, forty one failed, and the bi-serial correlations with the six achievement devices used in this investigation were as follows:

Detroit Word Test	Bis _r	.175
Oculmotor and Perception Habits Test, Level one	Bis _r	.129
Metropolitan General Achievement Test	Bis _r	.174
Teachers' Marks, General Scholarship	Bis _r	.185
Metropolitan Reading Achievement Test	Bis _r	.137
Teachers' Marks, Reading Scholarship	Bis _r	.132

V. IS THE RIGHT EYE EFFICIENT,
BOTH EYES WORKING TOGETHER?



The purpose of this test is to check the sharpness

of the vision of the right eye while the left eye is seeing also.

Normal performance. There are no dots in the signs before the left eye; therefore, the visual efficiency of the right eye is checked while the left eye is also seeing. The score increases as the pupil successfully responds as increasingly smaller signs are presented. A score of ninety per cent or above is considered passing.

Results. One hundred fifty three tested normal, fourteen failed, and the bi-serial correlations were as follows:

Detroit Word Test	Bis _r	.111
Oculmotor and Perception Habits Test, Level one	Bis _r	.116
Metropolitan General Achievement Test	Bis _r	.090
Teachers' Marks, General Scholarship	Bis _r	.163
Metropolitan Reading Achievement Test	Bis _r	.094
Teachers' Marks, Reading Scholarship	Bis _r	.165

VI. ARE THE EYES BALANCED VERTICALLY?

This test is designed to determine whether or not the

the eyes function in the same horizontal plane.

Normal performance. If the individual sees the line superimposed upon any part of the ball, his response is considered normal.

Results. One hundred sixty-six passed this test, and only one failed. Consequently, no bi-serial correlations were figured for this test.

VII. HAS DEPTH PERCEPTION BEEN DEVELOPED?



The purpose of this test is to measure the individual's eye co-ordination power.

Normal performance. One of the five figures in each row stands out apparently nearer to the person being examined than do any of the other four figures. The score is the per cent of eye co-ordination for the last row of figures read promptly and correctly. A score of 100 per cent is considered normal.

Results. Only thirty-seven tested normal, and 140 failed. The bi-serial correlations with achievement were as follows:

The eyes function in the same horizontal plane.

Normal performance. If the individual looks up and

superiorly upon any part of the ball, his response is

considered normal.

Results. One hundred sixty-six normal children, aged

only one failed. Consequently, no bilateral coordination

were required for this test.

VII. HAS THE PERSON THE ABILITY TO



The purpose of this test is to measure the individual's

eye co-ordination power.

Normal performance. One of the five fingers in each

row stands out apparently nearer to the person being examined

than do any of the other four fingers. The nearer the per-

cent of eye co-ordination for the test row of fingers, the

promptly and correctly. A score of 100 per cent is considered

normal.

Results. Only thirty-seven tested normal, and 129 failed.

ed. The bilateral coordination with achievement were as follows:

Detroit Word Test	Bis _r	.218
Oculmotor and Perception Habits Test, Level one	Bis _r	.163
Metropolitan General Achievement Test	Bis _r	.209
Teachers' Marks, General Scholarship	Bis _r	.287
Metropolitan Reading Achievement Test	Bis _r	.167
Teachers' Marks, Reading Scholarship	Bis _r	.265

VIII. IS LATERAL EYE BALANCE AT DISTANCE NORMAL?

The purpose of this test is to determine the tendency of the eyes to turn in or out or to remain normally parallel for blackboard distance seeing.

Normal performance. The range of tolerance is to see the pointer somewhere from 7 to 11 inclusive.

Results. One hundred forty-four successfully passed this test, twenty-three failed, and the bi-serial correlations with achievement were as follows:

Detroit Word Test	Bis _r	.080
-------------------	------------------	------

School Year 1935
 School Year 1936
 School Year 1937
 School Year 1938
 School Year 1939
 School Year 1940
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 School Year 2023
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 School Year 2027
 School Year 2028
 School Year 2029
 School Year 2030

VIII. THE STATE OF TEXAS

The State of Texas is a large state with a long history. It is known for its oil and cotton production. The state capital is Austin. The largest city is Houston. The state is known for its cowboy culture and rodeos. The state is also known for its beautiful scenery and outdoor recreation.

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Oculmotor and Perception Habits Test, Level one	Bis _r	.067
Metropolitan General Achievement Test	Bis _r	.002
Teachers' Marks, General Scholarship	Bis _r	.035
Metropolitan Reading Achievement Test	Bis _r	.030
Teachers' Marks, Reading Scholarship	Bis _r	.044

IX. IS LATERAL EYE BALANCE
AT READING DISTANCE NORMAL?



This test is the same as Test VIII except that the slide holder is set at reading distance for this test and at blackboard distance for Test VIII. Its purpose is to determine the tendency of the eyes to turn in or out or to remain normally parallel for reading distance seeing.

Normal performance. The range of tolerance for seeing the pointer is anywhere from 3 to $6\frac{1}{2}$ inclusive.

Results. One hundred sixty-one successfully passed this test, while only six failed. The bi-serial correla-

tions were as follows: ~~results were as follows:~~

Detroit Word Test	Bis _r	-.059
Oculmotor and Perception Habits Test, Level one	Bis _r	-.092
Metropolitan General Achievement Test	Bis _r	-.107
Teachers' Marks, General Scholarship	Bis _r	-.023
Metropolitan Reading Achievement Test	Bis _r	-.117
Teachers' Marks, Reading Scholarship	Bis _r	-.091

X. IS FUSION NORMAL AT READING DISTANCE?

~~THIS TEST AT READING DISTANCE~~



This test provides an index to the individual's fusion ability at reading distance and is not to be confused with Test II, which is used to appraise the individual's fusion power for isolated letter size images.

Normal performance. Normal fusion at reading distance will fuse the four balls into three instantly.

Results. One hundred twelve possessed normal fusion at reading distance, fifty-five did not, and the bi-serial

correlations with achievement were as follows:

Detroit Word Test	Bis _r	.112
Oculmotor and Perception Habits Test, Level one	Bis _r	.090
Metropolitan General Achievement Test	Bis _r	.085
Teachers' Marks, General Scholarship	Bis _r	.096
Metropolitan Reading Achievement Test	Bis _r	.087
Teachers' Marks, Reading Scholarship	Bis _r	.212

XI. IS THERE MINIMUM ACUITY FOR FINE PRINT AT READING DISTANCE?

This test is used to detect errors of focus caused by farsightedness, nearsightedness, and astigmatism which interfere with efficient vision at reading distance.

Normal performance. The subject should see three lines in each of the test balls, A, D, and E for the left eye, and test balls 1, 4, and 5 for the right eye.

Results. One hundred sixteen passed this test, fifty-

one failed, and the bi-serial correlations were as follows:

Detroit Word Test	Bis _r	.165
Oculmotor and Perception Habits Test, Level one	Bis _r	.235
Metropolitan General Achievement Test	Bis _r	.213
Teachers' Marks, General Scholarship	Bis _r	.268
Metropolitan Reading Achievement Test	Bis _r	.216
Teachers' Marks, Reading Scholarship	Bis _r	.247

XII. IS THERE MINIMUM SHARPNESS OF IMAGE AT DISTANCE?

This test is used to detect errors of focus caused by farsightedness, nearsightedness, and astigmatism which interfere with efficient vision at blackboard distance.

Normal performance. The subject should see three lines in each of the test balls B, C, and F for the left eye, and test balls 2, 3, and 6 for the right eye.

Results. One hundred five made normal responses,

sixty-two failed, and the bi-serial correlations with achievement were as follows:

Detroit Word Test	Bis _r	.114
Oculmotor and Perception Habits Test, Level one	Bis _r	.135
Metropolitan General Achievement Test	Bis _r	.152
Teachers' Marks, General Scholarship	Bis _r	.255
Metropolitan Reading Achievement Test	Bis _r	.156
Teachers' Marks, Reading Scholarship	Bis _r	.236

XIII. SUMMARY

The purpose of this chapter was to determine the correlation between reading achievement and the factors of binocular vision as measured by the Visual Sensation and Perception Tests of the Betts tests. The question presented by Test I, Does binocular vision exist? was answered in the affirmative, as all of the 167 cases were found to possess two-eyed vision. Consequently, this test was not correlated with reading achievement.

The correlation of blackboard distance fusion with reading achievement ranged from .063 with the Metropolitan Achievement Test to .117 with the Detroit Word Test.

The efficiency of both eyes correlated from .126 with the Metropolitan Achievement Test to .232 with teachers'

sixty-two failed, and the 21-second correlation with

achievement were as follows:

1.14	High	Peabody Word Test
1.13	High	Compositor and Perceptual Reading Test, Level One
1.12	High	Metropolitan General Achievement Test
1.11	High	Teachers' Marks, General Scholarship
1.10	High	Metropolitan Reading Achievement Test
1.09	High	Teachers' Marks, Reading Scholarship

XIII. SUMMARY

The purpose of this chapter was to determine the correlation between reading achievement and the factors of binocular vision as measured by the Visual Separation and Perception Tests of the Bells tests. The question presented by Test I, Does binocular vision exist was answered in the affirmative, as all of the 100 cases were found to possess two-eyed vision. Consequently, this test was not correlated with reading achievement. The correlation of blackboard distance found with reading achievement ranged from .085 with the Metropolitan Achievement Test to .117 with the Peabody Word Test. The efficiency of both eyes correlated from .130 with the Metropolitan Achievement Test to .238 with the Peabody

marks in general scholarship, the left eye from .129 with Betts Oculmotor and Perception Habits Test, Level One, to .185 with teachers' marks in general scholarship, and the right eye from .090 with the Metropolitan Achievement Test to .165 with teachers' marks in reading scholarship.

Only one child was found to have vertically imbalanced eyes. Consequently no correlations were made between this test and reading achievement.

The correlation between depth perception or coordination level and reading achievement ranged from .167 with Betts Oculmotor and Perception Habits Test, Level One, to .287 with teachers' marks in general scholarship.

The correlation between reading achievement and lateral eye balance ranged from $-.023$ with teachers' marks in general scholarship to $-.117$ with the Metropolitan Reading Test.

Reading distance fusion correlated with reading achievement from .085 with the Metropolitan Achievement Test to .212 with teachers' marks in reading scholarship.

The correlation between reading achievement and minimum acuity for fine print ranged from .165 with the Detroit Word Test to .268 with teachers' marks in general scholarship, while sharpness of image at blackboard distance ranged from .114 with the Detroit Word Test to .255 with teachers' marks in general scholarship.

marks in general, however, the fact that the
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right eye from 1880 was the same as the
to 1880 with reference to the fact that the
only one with reference to the fact that the

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CHAPTER V

OTHER PROGNOSTIC TESTS USED IN THIS STUDY

Since the value of the Betts vision tests as predictive measures of reading achievement have by the data thus far presented been found open to serious question, the writer felt that if other tests or devices more simple and less expensive were found to be just as effective as the Betts tests, such information would have definite practical value for first grade teachers. Consequently, the writer felt justified in including other group and individual tests of reading readiness in this study.

I. BETTS WORD FORM TEST²³

The purpose of this test is to determine reading readiness by analyzing the individual's ability to discriminate rapidly between (1) long and short words; (2) variations within words having like beginnings and endings; (3) words subject to total reversals; and (4) words, parts of which are subject to reversals.

The Betts Word Form Test was given in September, 1937, and its raw score correlations with reading achievement were as follows:

²³ Betts, op. cit., pp. 314-316.

Detroit Word Test	r	.478 \pm .040
Oculomotor and Perception Habits Test, Level one	r	.384 \pm .042
Metropolitan General Achievement Test	r	.397 \pm .041
Teachers' Marks, General Scholarship	r	.281 \pm .044
Metropolitan Reading Achievement Test	r	.436 \pm .041
Teachers' Marks, Reading Scholarship	r	.374 \pm .042

II. BETTS AUDITORY SPAN TEST²⁴

This test is designed to indicate the tendency of the subject to confuse and reverse letter and word-sounds heard spoken by others.

The Betts Auditory Span Test was also given in September, 1937, and its raw scores were correlated with reading achievement with the following results:

Detroit Word Test	r	.382 \pm .042
Oculomotor and Perception Habits Test, Level one	r	.215 \pm .048
Metropolitan General Achievement Test	r	.413 \pm .041
Teachers' Marks, General Scholarship	r	.293 \pm .044
Metropolitan Reading Achievement Test	r	.376 \pm .042

²⁴ Betts, op. cit., pp. 318-319.

October 1941

October 1941

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Teachers' Marks, Reading Scholarship	r	.348 \pm .043
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III. PRESSEY'S PRIMARY CLASSIFICATION TEST

This test is designed to appraise certain skills or abilities necessary to do first grade work, such as the individual's ability to (1) take directions, (2) classify objects, (3) dot patterns, and (4) locate absurdities.

Pressey's Primary Classification Test was given in September, 1937, and its correlations with reading achievement based on raw scores were as follows:

Detroit Word Test	r	.611 \pm .033
Oculmotor and Perception Habits Test, Level one	r	.404 \pm .041
Metropolitan General Achievement Test	r	.523 \pm .037
Teachers' Marks, General Scholarship	r	.303 \pm .044
Metropolitan Reading Achievement Test	r	.523 \pm .037
Teachers' Marks, Reading Scholarship	r	.409 \pm .041

IV. PINTNER-CUNNINGHAM PRIMARY MENTAL TEST

The purpose of this test, rather widely used with kindergarten, first, and second grade children, is to measure the mental ability of the child through the responses he makes to tests of (1) common observation, (2) aesthetic

Teacher's Manual, Reading
Scholastic

III. PRIMARY READING TEST

This test is designed to measure the child's ability to read at the primary level.

Additional measures to be taken are (1) the child's ability to read at the primary level.

Individual's ability to (2) take the primary reading test.

Objectives (3) are to determine the child's ability to read at the primary level.

Teacher's Manual, Reading

September, 1937, and the corresponding year of the child's birth.

Must be based on the child's ability to read at the primary level.

Teacher's Manual, Reading

Teacher's Manual, Reading

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differences, (3) associated objects, (4) size discrimination, (5) picture parts, and (6) picture completion.

The Pintner-Cunningham Primary Mental Test was also given in September, 1937, and the correlations of the raw scores made on this test with those made on the reading achievement measures were as follows:

Detroit Word Test	r	.597 \pm .034
Oculomotor and Perception Habits Test, Level one	r	.313 \pm .044
Metropolitan General Achievement Test	r	.543 \pm .035
Teachers' Marks, General Scholarship	r	.318 \pm .044
Metropolitan Reading Achievement Test	r	.517 \pm .038
Teachers' Marks, Reading Scholarship	r	.438 \pm .041

V. METROPOLITAN READINESS TEST

This test is a battery of six tests designed to indicate the subject's readiness for reading through an analysis of his responses to a total of 124 items. The pictorial method is applied to all the tests in this battery.

The Metropolitan Readiness Test was administered in September, 1937, and the correlations between the raw scores on this test and those made on the six tests or devices used for measuring success in learning to read were as follows:

Detroit Word Test	r	.683 \pm .028
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difference, (2) amount of work, (3) amount of work.

also, (4) amount of work, (5) amount of work.

The following table shows the results of the work.

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Oculmotor and Perception Habits Test, Level one	r	.507 \pm .037
Metropolitan General Achievement Test	r	.642 \pm .031
Teachers' Marks, General Scholarship	r	.402 \pm .041
Metropolitan Reading Achievement Test	r	.619 \pm .032
Teachers' Marks, Reading Scholarship	r	.504 \pm .039

VI. MONROE'S READING APTITUDE TEST

This battery of tests consists of both group and individual items, and is designed to measure those aptitudes most essential to success in learning to read, namely, visual, auditory, motor, articulation, and language aptitudes.

Monroe's Reading Aptitude Test was administered in September, 1937, and the total raw scores made on the five aptitude tests included in this battery of tests correlated with reading achievement as follows:

Detroit Word Test	r	.481 \pm .040
Oculmotor and Perception Habits Test, Level one	r	.440 \pm .041
Metropolitan General Achievement Test	r	.557 \pm .035
Teachers' Marks, General Scholarship	r	.556 \pm .035
Metropolitan Reading Achievement Test	r	.291 \pm .044
Teachers' Marks, Reading Scholarship	r	.576 \pm .034

VI. TEACHER'S RATING OF FIRST GRADE PUPILS

This rating scale was devised for the purpose of obtaining the objective opinion of classroom teachers of each pupil's readiness for reading in terms of ability to learn, emotional stability, social adjustment, and personal habits of initiative and industry. This is an adaptation of an idea used by Wright²⁵ in his prognostic study of reading readiness.

The correlations between teacher predictions and actual achievements were as follows:

Detroit Word Test	r	.391 \pm .042
Oculomotor and Perception Habits Test, Level one	r	.418 \pm .041
Metropolitan General Achievement Test	r	.397 \pm .042
Teachers' Marks, General Scholarship	r	.542 \pm .035
Metropolitan Reading Achievement Test	r	.409 \pm .041
Teachers' Marks, Reading Scholarship	r	.504 \pm .039

VIII. CHRONOLOGICAL AGE IN MONTHS

The correlations between chronological age and success

²⁵ Wendell William Wright, Reading Readiness-- A Prognostic Study (Bulletin of School of Education, Vol. 12 No. 3, Bloomington, Indiana: Indiana University, 1936), p. 8.

VI. TEACHER'S RATING OF FIRST GRADE PUPILS

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The correlations between teacher predictions and

actual achievements were as follows:

Teacher's Rating of First Grade Pupil	r	Actual Achievement
Teacher's Rating of First Grade Pupil	.351 ± .023	Teacher's Rating of First Grade Pupil
Teacher's Rating of First Grade Pupil	.448 ± .041	Teacher's Rating of First Grade Pupil
Teacher's Rating of First Grade Pupil	.387 ± .042	Teacher's Rating of First Grade Pupil
Teacher's Rating of First Grade Pupil	.543 ± .035	Teacher's Rating of First Grade Pupil
Teacher's Rating of First Grade Pupil	.402 ± .041	Teacher's Rating of First Grade Pupil
Teacher's Rating of First Grade Pupil	.504 ± .039	Teacher's Rating of First Grade Pupil

VIII. CHRONOLOGICAL AGE IN MONTHS

The correlations between chronological age and success

²⁵ Wendell J. Wright, Reading Readiness--A Prognostic Study (Bulletin of Bureau of Education, Vol. 12, No. 3, Bloomington, Indiana: Indiana University, 1932), p. 8.

in reading as indicated by academic achievement were as follows:

Detroit Word Test	r	.106 \pm .050
Oculmotor and Perception Habits Test, Level one	r	-.033 \pm .052
Metropolitan General Achievement Test	r	.028 \pm .052
Teachers' Marks, General Scholarship	r	-.158 \pm .047
Metropolitan Reading Achievement Test	r	.038 \pm .052
Teachers' Marks, Reading Scholarship	r	-.108 \pm .050

IX. SUMMARY

From the standpoint of median correlations the three best predictive instruments were found to be: (1) The Metropolitan Readiness Test with a median correlation of .563 ranged from .402 \pm .041 with teacher's marks in general scholarship to .683 \pm .028 with the Detroit Word Test. (2) The Monroe Reading Aptitude Test with a median correlation of .519 ranged from .291 \pm .044 with the Metropolitan reading Test to .576 \pm .034 with teacher's marks in reading scholarship. (3) The Pintner-Cunningham Primary Mental Test with a median correlation of .478 ranged from .313 \pm .044 with Betts Oculmotor Perception Habits Test, Level One, to .597 \pm .034 with the Detroit Word Test.

in reading as indicated by standard achievement tests as follows:

1.000	1.000	Detroit Word Test
1.000	1.000	Continuator and Repetition Tests
1.000	1.000	Test, Level One
1.000	1.000	Metropolitan General Achievement Test
1.000	1.000	Teachers' Tests, General
1.000	1.000	Scholarship
1.000	1.000	Metropolitan Reading Achievement Test
1.000	1.000	Teachers' Tests, Reading
1.000	1.000	Scholarship

II. SUMMARY

From the standpoint of reading comprehension the three best predictive instruments were found to be (1) The Metropolitan Reading Achievement Test with a median correlation of .55, (2) The Metropolitan General Achievement Test with a median correlation of .53, and (3) The Detroit Word Test with a median correlation of .52. The three best predictive instruments for reading were found to be (1) The Metropolitan Reading Achievement Test with a median correlation of .55, (2) The Metropolitan General Achievement Test with a median correlation of .53, and (3) The Detroit Word Test with a median correlation of .52. The three best predictive instruments for reading were found to be (1) The Metropolitan Reading Achievement Test with a median correlation of .55, (2) The Metropolitan General Achievement Test with a median correlation of .53, and (3) The Detroit Word Test with a median correlation of .52.

Pressey's Primary Classification Test ranked fourth as a predictive measure, with a median correlation of .466 which ranged from .303 \pm .044 with teachers' marks in general scholarship to .611 \pm .033 with the Detroit Word Test.

The teacher's rating of first grade pupils ranked next, with a median correlation of .414 which ranged from .391 \pm .041 with the Detroit Word Test to .542 \pm .035 with teachers' marks in general scholarship. It ranked ahead of both the Betts Word Form Test and the Betts Auditory Span Test as an instrument for predicting future success in learning to read.

The Betts Word Form Test had a median correlation of .391 with reading achievement, ranging from .261 \pm .044 with teachers' marks in general scholarship to .478 \pm .040 with the Detroit Word Test. The Betts Auditory Span Test had a median correlation of .362 ranging from .215 \pm .048 with Betts Oculomotor and Perception Habits Test, Level One, to .413 \pm .041 with the Metropolitan Achievement Test.

The lowest degrees of correlation between any prognostic test and reading achievement were those between chronological age and reading achievement. Chronological age had a median correlation of $-.072$ ranging from .028 \pm .052 with the Metropolitan Achievement Test to $-.158 \pm .047$ with teachers' marks in general scholarship.

Teacher's primary classification of tests ranged from
 as a predictive measure, with a median correlation of .405
 which ranged from .305 to .495 with teachers' ratings in general
 sensitivity to .615 to .735 with the Detroit Word Test.

The teacher's rating of their grade was the highest
 next, with a median correlation of .415 which ranged from
 .325 to .505 with the Detroit Word Test to .525 to .635 with
 teachers' ratings in general sensitivity. The highest overall of
 both the better word tests and the better ratings was found
 Test as an instrument for predicting future success in
 learning to read.

The better word tests had a median correlation of .415
 with reading achievement, ranging from .315 to .515
 teachers' ratings in general sensitivity to .415 to .515 with
 the Detroit Word Test. The better ratings than word tests had a
 median correlation of .505 ranging from .415 to .595
 Boston Conference and Psychological Tests, ranging from .415
 to .515 with the Metropolitan Achievement Test.

The lowest degree of correlation between the three
 word tests and reading achievement were found for the
 chronological age and reading achievement. Chronological
 age had a median correlation of -.005 ranging from .005
 to .025 with the Metropolitan Achievement Test to -.005
 to .025 with teachers' ratings in general school rating.

CHAPTER VI

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The purposes of this investigation were (1) to determine the predictive values of the factors of binocular vision in reading readiness, as measured by the Visual Sensation and Perception Tests of Betts Ready to Read Tests, and (2) to compare the relative values of the Betts tests as measures of probable future success in reading with those of other group and individual standardized and non-standardized prognostic tests.

I. PROCEDURE

One hundred sixty-seven beginning first grade pupils enrolled in six regular classrooms of the Hobbs, New Mexico, public schools during the 1937-1938 term of school were given prognostic tests in September, 1937, and achievement tests eight months later in May, 1938, in an attempt to compare the usefulness of the Betts Ready to Read Tests with other devices for predicting success or failure in learning to read.

II. THE FACTORS OF BINOCULAR VISION IN READING READINESS

Table I gives a summary of the number who passed

STUDY OF THE EFFECTS OF THE

The purpose of this study was to determine the effect of the treatment of the soil on the growth of the plants. The results of the study are presented in Table I. The data show that the treatment of the soil with the chemical compound resulted in a significant increase in the growth of the plants. The increase was most pronounced in the plants treated with the highest concentration of the compound. The results of the study are presented in Table I.

One of the main objectives of this study was to determine the effect of the treatment of the soil on the growth of the plants. The results of the study are presented in Table I. The data show that the treatment of the soil with the chemical compound resulted in a significant increase in the growth of the plants. The increase was most pronounced in the plants treated with the highest concentration of the compound. The results of the study are presented in Table I.

Table I shows the results of the study. The data indicate that the treatment of the soil with the chemical compound resulted in a significant increase in the growth of the plants. The increase was most pronounced in the plants treated with the highest concentration of the compound. The results of the study are presented in Table I.

TABLE I

RECORD OF 167 PUPILS ON THE BETTS
VISUAL SENSATION AND PERCEPTION TESTS

Test	Purpose	Number passing	Number failing
1.	Does binocular vision exist?	167	0
2.	Is fusion normal at blackboard distance?	62	105
3.	Are both eyes efficient, working together?	148	19
4.	Is the left eye efficient, both eyes working together?	126	41
5.	Is the right eye efficient, both eyes working together?	153	14
6.	Are the eyes balanced vertically?	166	1
7.	Has depth perception been developed?	37	140
8.	Is lateral eye balance at blackboard distance normal?	144	23
9.	Is lateral eye balance at reading distance normal?	161	6
10.	Is fusion normal at reading distance?	112	55
11.	Is there minimum acuity for fine print at reading distance?	116	51
12.	Is there minimum sharpness of image at blackboard distance?	105	62

TABLE I

RECORD OF 147 PUPILS ON THE BETTS
VISUAL SCREENING AND PERCEPTION TESTS

Test	Purpose	Number passing	Number Failing
1. Does binocular vision exist?		147	0
2. Is fusion normal at blackboard distance?		82	103
3. Are both eyes efficient, working together?		146	19
4. Is the left eye efficient, both eyes working together?		136	41
5. Is the right eye efficient, both eyes working together?		133	14
6. Are the eyes balanced vertically?		133	1
7. Has depth perception been developed?		87	143
8. Is lateral eye balance at blackboard distance normal?		144	23
9. Is lateral eye balance at reading distance normal?		141	6
10. Is fusion normal at reading distance?		112	63
11. Is there minimum acuity for fine print at reading distance?		112	21
12. Is there minimum sharpness of image at blackboard distance?		103	33

each of the twelve Betts Visual Sensation and Perception Tests. It will be noted that in only two of the tests were there more children who failed than passed. One hundred forty cases failed the depth perception test, and 105 the blackboard distance fusion test. It will also be noted that all the children were found to possess two-eyed vision, and that only one child had vertically imbalanced eyes.

Table II gives a summary of the bi-serial correlations found to exist between the Betts Visual Sensation and Perception Tests and each of the six measures of reading achievement used in this study.

With the exception of lateral eye balance at reading distance, which had a negative correlation with reading achievement, all the Betts Visual Sensation and Perception Tests were found to have a positive correlation with reading achievement. However, the degree of correlation was less than .200 for five of the tests, and below .288 for all the tests.

Consequently, the relationship between responses made to the Betts Visual Sensation and Perception Tests and later success in reading, as measured by the six reading achievement measures used in this study, is of little or no significance in the light of the findings of this investigation. That is, the degrees of correlation are entirely too low to

each of the twelve Beta Visual Sensation and Perception Tests. It will be noted that in only two of the tests were there more children who failed than passed. One hundred forty cases failed the depth perception test, and 108 the blackboard distance fusion test. It will also be noted that all the children were found to possess two-eyed vision, and that only one child had vertically imbalanced eyes.

Table II gives a summary of the bi-ocular correlation found to exist between the Beta Visual Sensation and Perception Tests and each of the six measures of reading achievement used in this study.

With the exception of lateral eye balance at reading distance, which had a negative correlation with reading achievement, all the Beta Visual Sensation and Perception Tests were found to have a positive correlation with reading achievement. However, the degree of correlation was less than .500 for five of the tests, and below .300 for all the tests.

Consequently, the relationship between responses made to the Beta Visual Sensation and Perception Tests and later success in reading, as measured by the six reading achievement measures used in this study, is of little or no significance in the light of the findings of this investigation. That is, the degrees of correlation are entirely too low to

TABLE II

BI-SERIAL CORRELATIONS BETWEEN THE BETTS VISUAL SENSATION AND PERCEPTION TESTS AND SIX READING ACHIEVEMENT MEASURES

Betts Visual Sensation and Perception Tests	Achievement measures					
	Detroit Word Test	Oculomotor and Perception Habits Test	Metropolitan Achievement Test	Teachers' marks in general scholarship	Metropolitan Reading Test	Teachers' marks in general scholarship
*Does binocular vision exist?						
Is fusion normal at blackboard distance?	.117	.093	.063	.099	.097	.080
Are both eyes efficient, working together?	.201	.154	.126	.232	.152	.184
Is the left eye efficient, both eyes working together?	.175	.129	.174	.185	.137	.132
Is the right eye efficient, both eyes working together?	.111	.116	.090	.163	.094	.165
*Are the eyes balanced vertically?						
Has depth perception been developed?	.218	.163	.209	.287	.167	.265
Is lateral eye balance at blackboard distance normal?	.080	.067	.002	.035	.030	.044
Is lateral eye balance at reading distance normal?	-.059	-.092	-.107	-.073	-.117	-.091
Is fusion normal at reading distance?	.112	.090	.085	.096	.087	.212
Is there minimum acuity for fine print at reading distance?	.165	.235	.213	.268	.216	.247
Is there minimum sharpness of image at blackboard distance?	.114	.135	.152	.255	.156	.236

*This test was not correlated with reading achievement.

REPORT

THE UNIVERSITY OF CHICAGO, CHICAGO, ILL. 60637

DEPARTMENT OF CHEMISTRY

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1961-1962

1962-1963

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1974-1975

1975-1976

indicate that these tests of the factors of binocular vision have any value as reading readiness tests.

III. OTHER PROGNOSTIC TESTS USED IN THIS STUDY

Table III shows the degree of correlation and the probable error of the correlation between the raw scores of each of the eight predictive instruments included in this study for comparison with Betts Visual Sensation and Perception Tests, and the raw scores of each of the six measures of reading achievement.

It will be noted that all the correlations were positive, with the exception of chronological age, which had a slightly negative near-zero correlation with reading achievement. The median correlations of the other seven predictive tests with reading achievements, ranging from .362 for Betts Auditory Span Test to .563 for the Metropolitan Readiness Test, were much higher than the correlations between the Betts Visual Sensation and Perception Tests and reading achievement, which ranged from a near-zero correlation for the eye imbalance tests to a median correlation of only .225 for acuity for fine print at reading distance.

However, the correlations between Betts Word Form and Auditory Span Tests and reading achievement are too low,

indicate that these tests of the degree of reading achievement have any value as reading achievement tests.

III. OTHER PSYCHOMETRIC DATA FROM THE TESTS

Table III shows the degree of correlation between the probable error of the correlation between the tests and of each of the eight predictive instruments between this study for comparison with Table II. The correlation between the tests and the raw scores of each of the eight measures of reading achievement.

It will be noted that all the correlations are positive, with the exception of the correlation between the tests and the slightly negative near-zero correlation between the tests and achievement. The rather correlation of the tests and predictive tests with reading achievement, ranging from .552 for Better Auditory Span Test to .285 for the better Auditory Span Test, were much higher than the correlations between the Better Visual Connection Test and the tests and reading achievement, which ranged from a near-zero correlation for the eye balance test to a correlation of only .285 for the better for the better reading distance.

However, the correlations between tests and the Auditory Span Tests and reading achievement are low.

TABLE III

PEARSON CORRELATIONS BETWEEN THE RAW SCORES OF EIGHT
READING READINESS MEASUREMENTS AND SIX READING ACHIEVEMENT MEASURES

Reading Readiness Tests	Achievement measures					
	Detroit Word Test	Oculmotor and Perception Habits Test, Level one	Metropolitan Achievement Test, Form A	Teachers' marks in general scholarship	Metropolitan Reading Test, Form A	Teachers' marks in general scholarship
Betts Word Form Test	.478±.040	.384±.042	.397±.041	.281±.044	.436±.041	.374±.042
Betts Auditory Span Test	.382±.042	.215±.048	.413±.041	.293±.044	.376±.042	.348±.043
Fressey's Primary Classification Test	.611±.033	.404±.041	.523±.037	.303±.044	.523±.037	.409±.041
Pintner-Cunningham Primary Mental Test	.597±.034	.313±.044	.543±.035	.318±.044	.517±.038	.438±.041
Metropolitan Readiness Test	.683±.028	.507±.037	.642±.031	.402±.041	.619±.032	.504±.039
Monroe's Reading Aptitude Test	.481±.040	.440±.041	.557±.035	.556±.035	.291±.044	.576±.034
Teachers' Rating of First Grade Pupils	.391±.042	.418±.041	.397±.042	.542±.035	.409±.041	.504±.039
Chronological Age in Months	.106±.050	-.033±.052	.028±.052	-.158±.047	.038±.052	-.108±.050

the median correlation being merely .391 for the Word Form Test and .362 for the Auditory Span Test, to justify their usage as tests of reading readiness.

The teachers' rating of first grade pupils, with a median correlation of .414, ranging from .391 \pm .041 with the Detroit Word Test to .542 \pm .035 with teacher marks in general scholarship, indicates that this device has possibilities as an instrument for predicting probable success in learning to read.

Assuming that each of the six measures of reading achievement was of equal value in measuring success in reading, and by finding the median correlation of each prognostic test with the six achievement measures, the eight prognostic tests were found to rank in descending order as tests of reading readiness as follows:

1. The Metropolitan Readiness Test
2. The Monroe Reading Aptitude Test
3. The Pintner-Cunningham Primary Mental Test
4. Pressey's Primary Classification Test
5. Teacher's rating of first grade pupils
6. Betts Word Form Test
7. Betts Auditory Span Test
8. Chronological age

IV. CONCLUSIONS AND INFERENCES

the median correlation being .751 for the first test and .788 for the auditory span test, to justify using as tests of reading the above.

The teachers' rating of their own pupils' reading achievement was of equal value in computing the median correlation of .714, resulting from .751 for the first test and .788 for the auditory span test. The Pearson Word Test is .705 with a correlation of .714 in general achievement, indicating that it is as good as the other tests as an instrument for predicting reading achievement in learning to read.

Assuming that each of the six measures of reading achievement was of equal value in computing the median correlation, and by finding the median correlation of each test with the six achievement measures, the eight prognostic tests were found to rank in descending order as tests of reading readiness as follows:

1. The Metropolitan Reading Scale
2. The Kountz Reading Achievement Test
3. The Lintner-Dunningham Reading Test
4. Teacher's Rating of First Grade Pupils
5. Teacher's Rating of First Grade Pupils
6. First Word Test
7. Pattern Auditory Span Test
8. Chronological Age

IV. CONCLUSIONS AND RECOMMENDATIONS

The writer has drawn the following conclusions and inferences from the findings of this investigation:

1. With all the correlations between the Betts Visual Sensation and Perception Tests of the factors of binocular vision and reading achievement being below .288 for all tests, the writer concludes that the Betts Visual Sensation and Perception Tests of the co-ordinate actions of the eyes cannot, therefore, be used as criteria for determining reading readiness.

2. While the median correlation between reading achievement and the vision tests of eye co-ordination or depth perception, visual acuity for fine print, two-eyed visual efficiency, and distance sharpness of image were approximately .200, all the correlations are too low to indicate that any of the Betts Visual Sensation and Perception Tests have any value as predictive measures of success in reading.

3. The near-zero correlations of the eye imbalance tests, both lateral and vertical, with reading achievement were the most insignificant of any of the vision test correlations.

4. The teachers' rating of first grade pupils, with a median correlation of .414 with the six achievement measures, with individual correlations ranging from .391 with the Detroit Word Test to .542 with teacher's marks in

The writer has given the following results:

1. The results of the study of the following factors:

(a) The effect of the following factors:

(b) The effect of the following factors:

(c) The effect of the following factors:

(d) The effect of the following factors:

(e) The effect of the following factors:

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(v) The effect of the following factors:

(w) The effect of the following factors:

(x) The effect of the following factors:

(y) The effect of the following factors:

(z) The effect of the following factors:

general scholarship, seems to warrant further investigation as to the possibilities of a teacher's rating scale, when used under careful supervision, as a practical, inexpensive test of reading readiness.

5. The median correlation between each prognostic test and the six achievement measures with which it was correlated shows that the Metropolitan Readiness Test with a median correlation of .563, the Monroe Reading Aptitude Test with a median correlation of .519, the Pintner-Cunningham Primary Mental Test with a median correlation of .478, and Pressey's Primary Classification Test with a median correlation of .466, have the highest correlations with reading achievement of all the predictive instruments used in this study.

6. The median correlation between reading achievement and the Betts Word Form Test was .391, and the median correlation between reading achievement and the Betts Auditory Span Test was .362. These correlations are both so low as to indicate that neither of these individual tests is a valid criterion of reading readiness.

7. The slightly negative, near-zero correlation between chronological age and reading achievement suggests that chronological age is not a valid criterion of reading readiness.

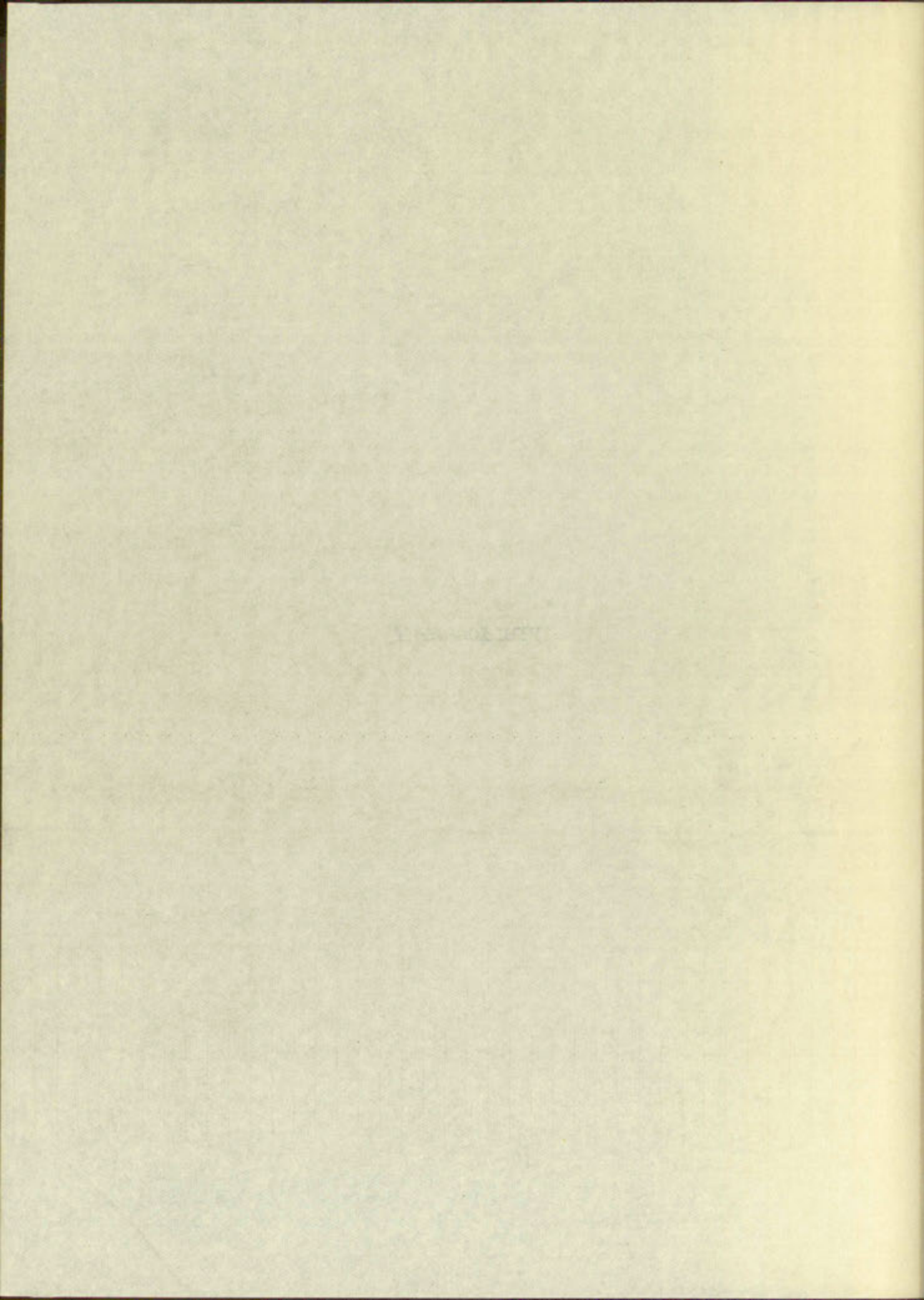
V. RECOMMENDATIONS

The writer makes the following recommendations for further study and investigation:

1. That further study be made of the relation between reading achievement and vision tests of eye co-ordination or depth perception, visual acuity for fine print at reading distance, two-eyed visual efficiency, and sharpness of image at blackboard distance. The present study merely considers each tendency or factor as passing or failing. It is also the opinion of the writer that the tests used for such study would need to be more interesting and better adapted to the age of beginning first grade children and easier to score than the Betts Vision Tests.

2. That the possibilities of the average classroom teacher's ability to rate, under careful supervision, the reading readiness of beginning first grade children be determined through further study and investigation involving a large number of teachers in many different kinds of situations.

BIBLIOGRAPHY



BIBLIOGRAPHY

A. BOOKS

- Betts, Albert Emmett, The Prevention and Correction of Reading Difficulties. Evanston, Illinois: Row, Peterson and Company, 1936. 402 pp.
- Garrett, Henry E., Statistics in Psychology and Education. New York: Longmans, Green and Company, 1938. 493 pp.
- Greene, Harry A., Workbook in Educational Measurements, Form B. New York: Longmans, Green and Company, 1936. 156 pp.

B. PERIODICAL ARTICLES

- Betts, Albert Emmett, "A Physiological Approach to the Analysis of Reading Disabilities," The Educational Research Bulletin, 13:135-40, 163-74, September 19, and October 17, 1934.
- Dean, Charles D., "Predicting First Grade Reading Achievement," Elementary School Journal, 39:609-616, April, 1939.
- Smith, Charles A., and Myrtle R. Jensen, "Educational, Psychological, and Physiological Factors of Reading Readiness, Part II," Elementary School Journal, 36:683-691, May, 1936.
- Witty, Paul A., and David Kopel, "Heterophoria and Reading Disability," Journal of Educational Psychology, 5:222-230, March, 1936.

C. PARTS OF SERIES

- Fendrick, Paul, Visual Characteristics of Poor Readers. Teachers College Contribution, No. 656. New York: Teachers College, Columbia University, 1935. 54 pp.
- Selzer, Charles A., Lateral Dominance and Distance Fusion. Harvard Monograph in Education, No. 12. Cambridge, Massachusetts: Harvard University Press, 1933. 119 pp.

Wagner, Guy W., The Maturation of Certain Visual Functions and the Relationship Between These Functions and Success in Reading and Arithmetic. Psychological Monograph, No. 215. Iowa City, Iowa: University of Iowa, 1937. pp. 108-146.

Wright, Wendell William, Reading Readiness - - A Prognostic Study. Bulletin of the School of Education, Vol. 12, No. 3. Bloomington, Indiana: Indiana University, 1936. 46 pp.

REPORT OF THE
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APPENDIX A

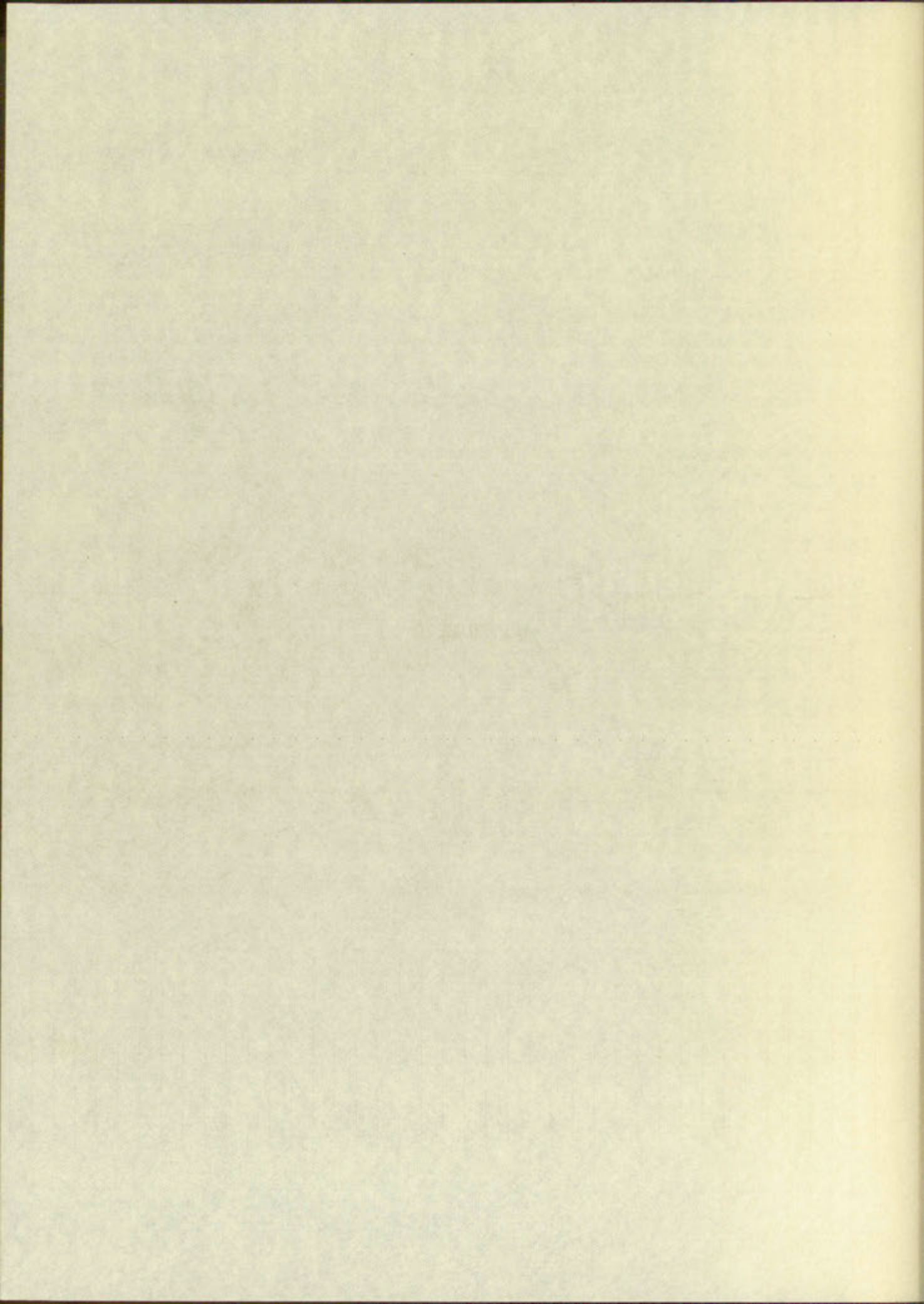


TABLE IV

ARITHMETIC MEANS AND STANDARD DEVIATIONS OF RAW SCORES
OF PROGNOSTIC MEASURES USED IN THIS INVESTIGATION

Test	Arithmetic Means	Standard Deviations
Betts Word Form Test	18.880	5.180
Betts Auditory Span Test	13.090	4.092
Pressley's Primary Classification Test	26.555	14.215
Pintner-Cunningham's Primary Mental Test	32.826	8.186
Metropolitan Readiness Test	82.994	16.416
Monroe's Reading Aptitude Test	47.305	19.141
Teachers' Rating of First Grade Pupils	16.898	3.864
Chronological Age (C. A.)	76.856	4.897
Mental Age (M. A.)	84.395	10.956
Intelligence Quotient (I. Q.)	108.359	15.296

TABLE V

ARITHMETIC MEANS AND STANDARD DEVIATIONS OF RAW SCORES
OF ACHIEVEMENT MEASURES USED IN THIS INVESTIGATION

Test	Arithmetic Means	Standard Deviations
Detroit Word Test	19.419	9.545
Oculmotor and Perception Habits Test, Level one	66.174	24.408
Metropolitan Achievement Test	98.491	30.023
Teachers' Marks, General Scholarship	73.928	11.578
Metropolitan Reading Achievement Test	48.776	19.575
Teachers' Marks, Reading Scholarship	13.832	2.847

TABLE V

ATTACHED NAME AND STANDARD DEVIATIONS OF NEW COURSES
ON ADJUSTMENT RESOURCES USED IN THIS INVESTIGATION

Test	Adjusted Means	Standard Deviations
Verbal Test	19.419	2.343
Quantitative and Language Habit Test, Level one	28.174	24.408
Verbal and Language Test	28.491	30.022
Teachers' Work, General Scholarship	28.923	11.372
Metropolitan Reading Achievement Test	28.972	12.242
Teachers' Work, Reading Scholarship	29.232	2.247

TABLE VI

RAW SCORES MADE BY EACH PUPIL ON EACH MEASURE USED IN THIS STUDY

BETTS VISUAL SEGREGATION AND PERCEPTION TESTS	OTHER PROGNOSTIC TESTS USED IN THIS STUDY		ACTIVATION TESTS USED IN THIS STUDY	
	Betts Word Form Test	Betts Auditory Span Test Pressey's Primary Classification Test Plattner-Cunningham Primary Mental Test Metropolitan Reading Aptitude Test Teacher's Rating of First Grade Pupils Chronological age in months Mental age in months Intelligence quotient (I.Q.)	Detroit Word Test	Outmotor and Perception Habits Test, Level one Metropolitan General Achievement Test Teacher's Marks, General Scholarship Metropolitan Reading Achievement Test Teacher's Marks, Reading Achievement Test
Does binocular vision exist?				
Is fusion normal at reading distance?				
Are both eyes efficient working together?				
Is the left eye efficient, both eyes working together?				
Is the right eye efficient, both eyes working together?				
Are the eyes balanced vertically?				
Has depth perception been developed?				
Is lateral eye balance at reading distance normal?				
Is fusion normal at reading distance?				
Is there minimum sharpness of image at distance?				

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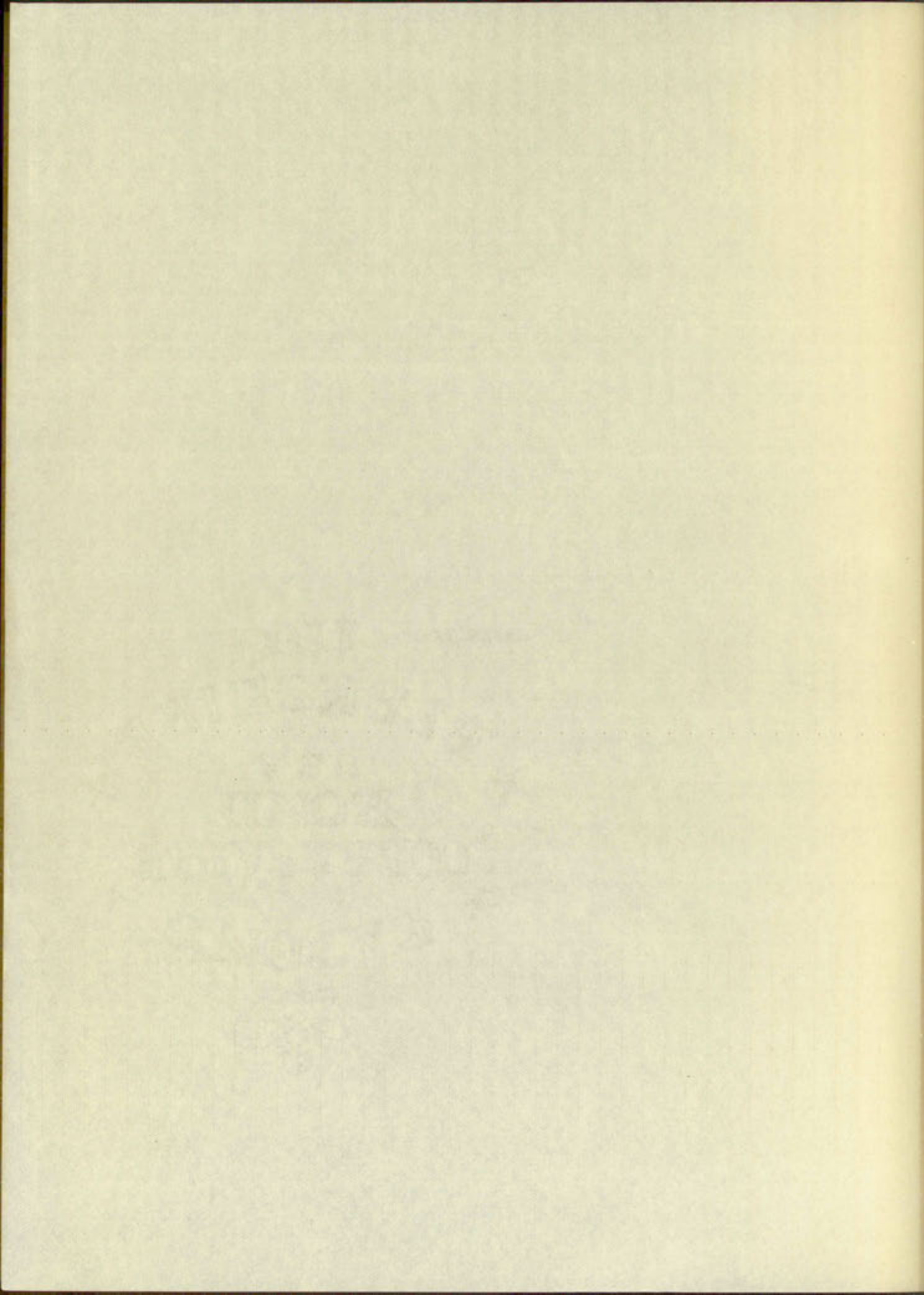
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APPENDIX B

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Name of pupil _____ School _____
 Date _____ Sex _____ Teacher _____
 "Note" Check the division in which you think the pupil should be classified.

Social Adaptation

Excellent	Good	Average	Poor	Failing
Plays well with others				Interferes and is rough with others
Un-obtrusive				Shows off
Un-selfish and popular				Selfish and unpopular
Is at ease with teacher and group				Is timid and self conscious
Obedient, keeps order				Dis-obedient, creates confusion
Is usually mature				Is very im-mature, baby-ish

Personal Characteristics

Excellent	Good	Average	Poor	Failing
Independent, has initiative				Dependent, must be directed
Energetic, gives sustained attention				Lethargic, in-attentive, lazy
Persistent, imaginative				Gives up easily; un-imaginative
Careful, neat, quiet				Careless, messy, noisy
Purposeful, questioning				Aimless, in-curious
Not destructive or wasteful				Destructive and wasteful
Stable and self confident				Confused and uncertain

Emotional Stability

Excellent	Good	Average	Poor	Failing
Cheerful, non variable mood				Grave, variable mood
Not nervous or self conscious				Nervous, self conscious, excitable
Deliberative, controls tears				Impulsive, cries easily
Is a good sport, controls temper				Is stubborn and sulky, shows temper
Enjoys school				Is bored and afraid
Spontaneous and venturesome				Restrained and timid
Patient and forgiving				Impatient and revengeful

Ability to Learn

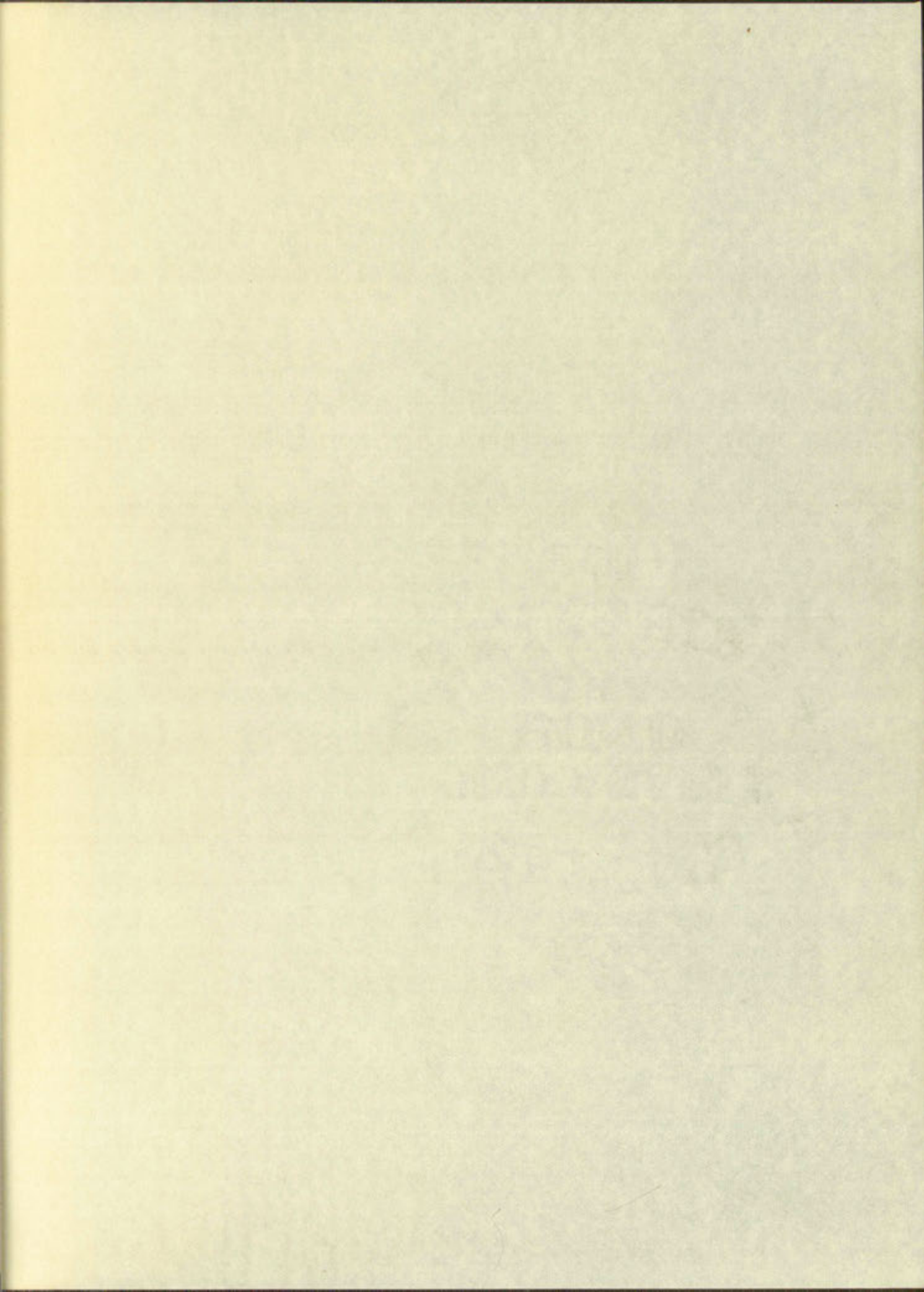
Excellent	Good	Average	Poor	Failing
Quick and bright				Very slow and dull
Stable and mature				Confused, uncertain, baby-ish
Excellent background of experiences				Poor background of experiences
Fine attitude toward learning				Poor attitude toward learning
Proper attitude toward effort				Wrong attitude toward effort
Good health				Physical health undermined
Has good learning habits				Has poor learning habits

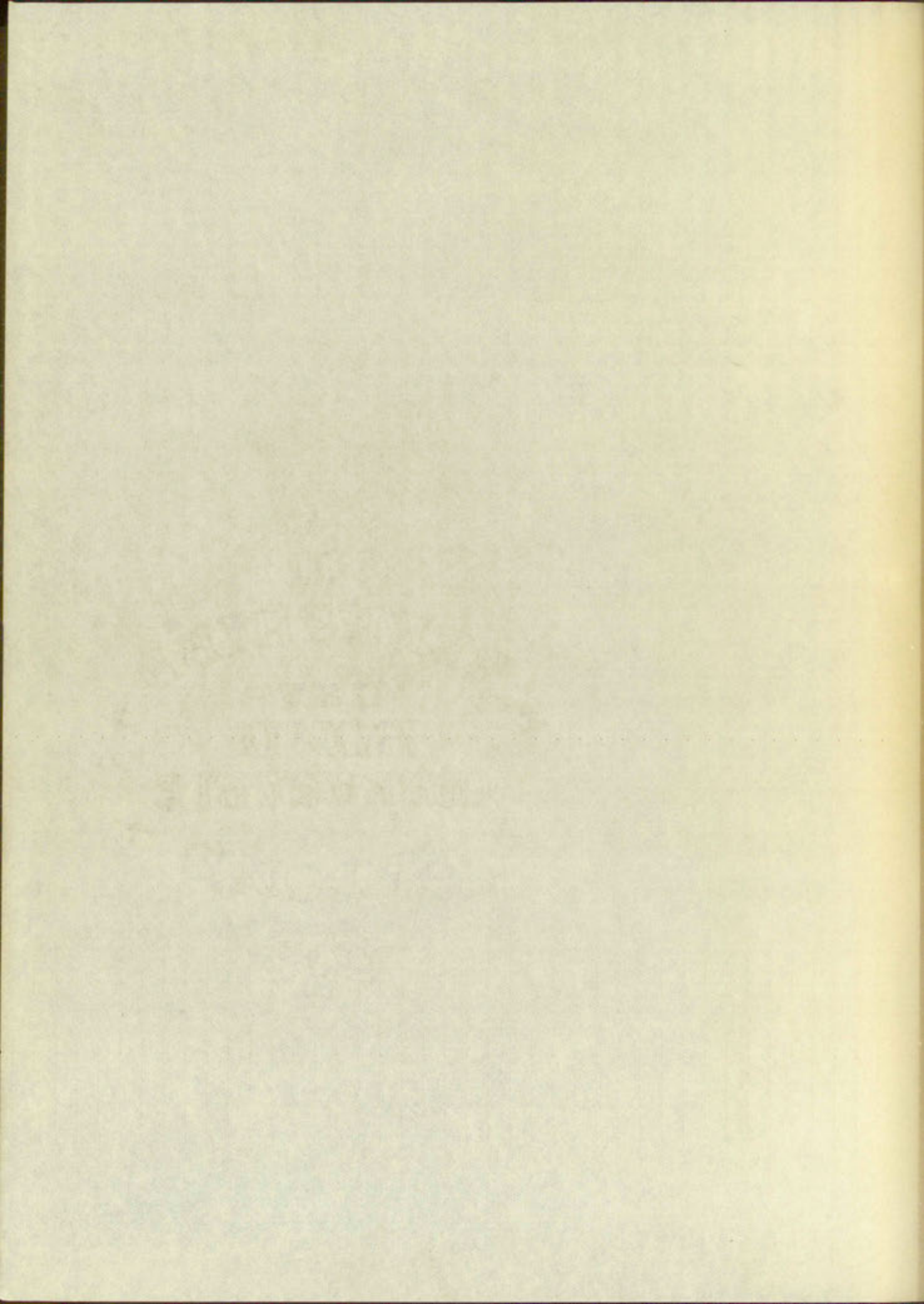
Reading Readiness

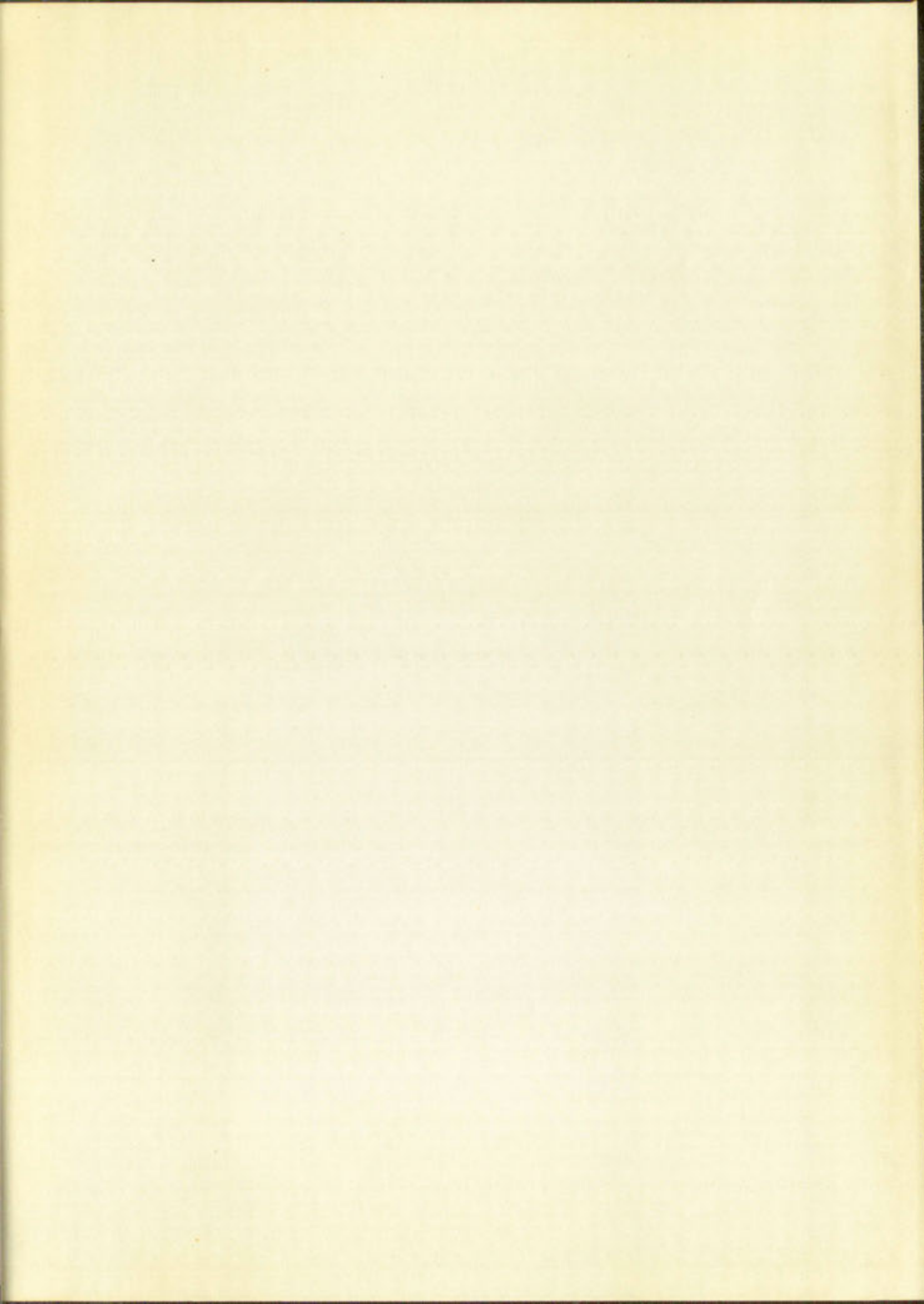
Excellent	Good	Average	Poor	Failing
Wants to learn to read				Not interested in learning to read
Has good speaking vocabulary				Poor speaking vocabulary, "baby talk"
Shows much interest in telling stories, in being told stories, in being read to				Shows little or no interest in stories and pictures
Excellent motor control, pure laterality				Poor motor control, mixed laterality
Remembers word forms, sees and uses relationships, thinks abstractly				Cannot remember word forms, see, or use relationships
Good experiential background				Poor experiential background
Good vision and hearing				Poor vision and hearing

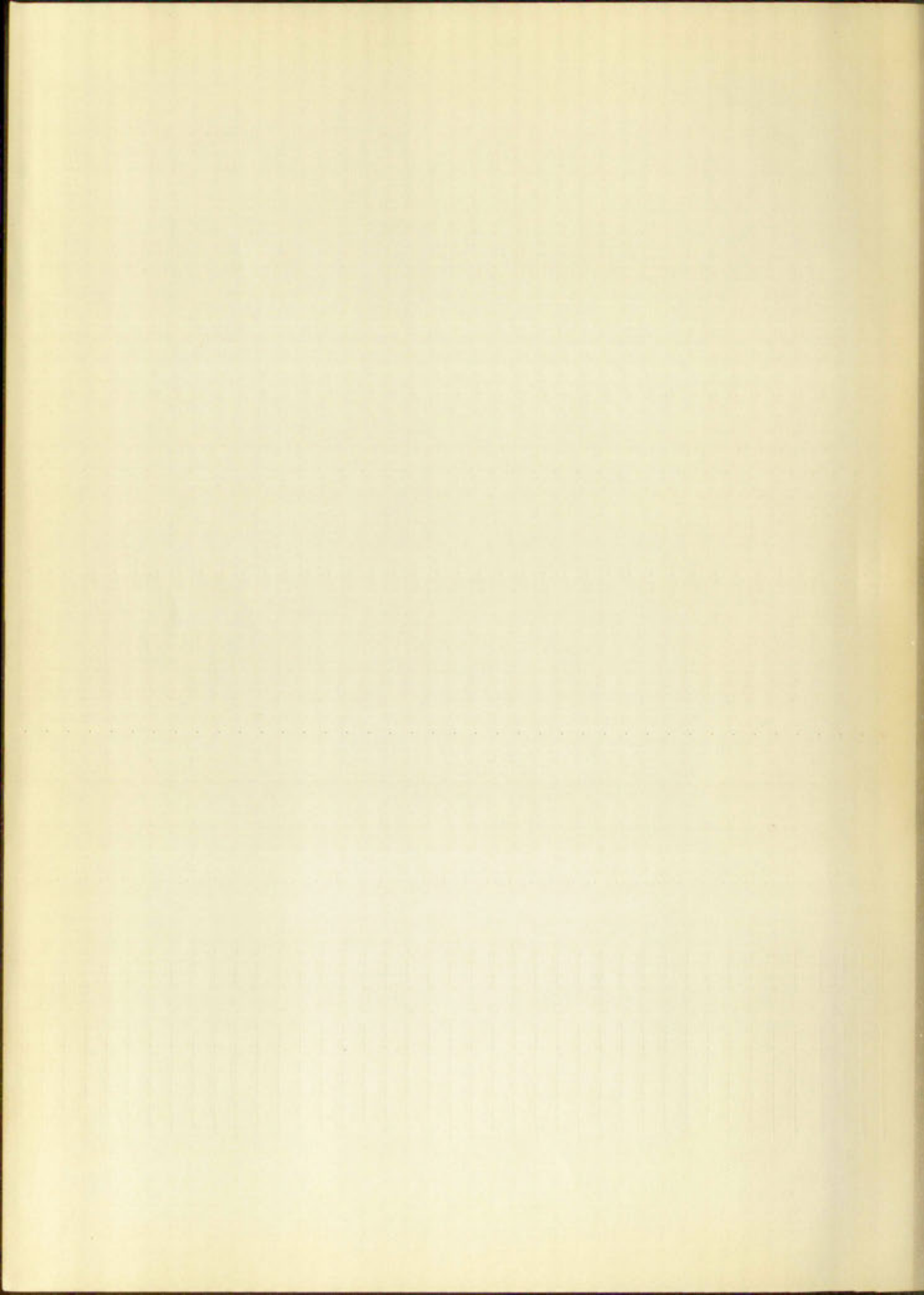
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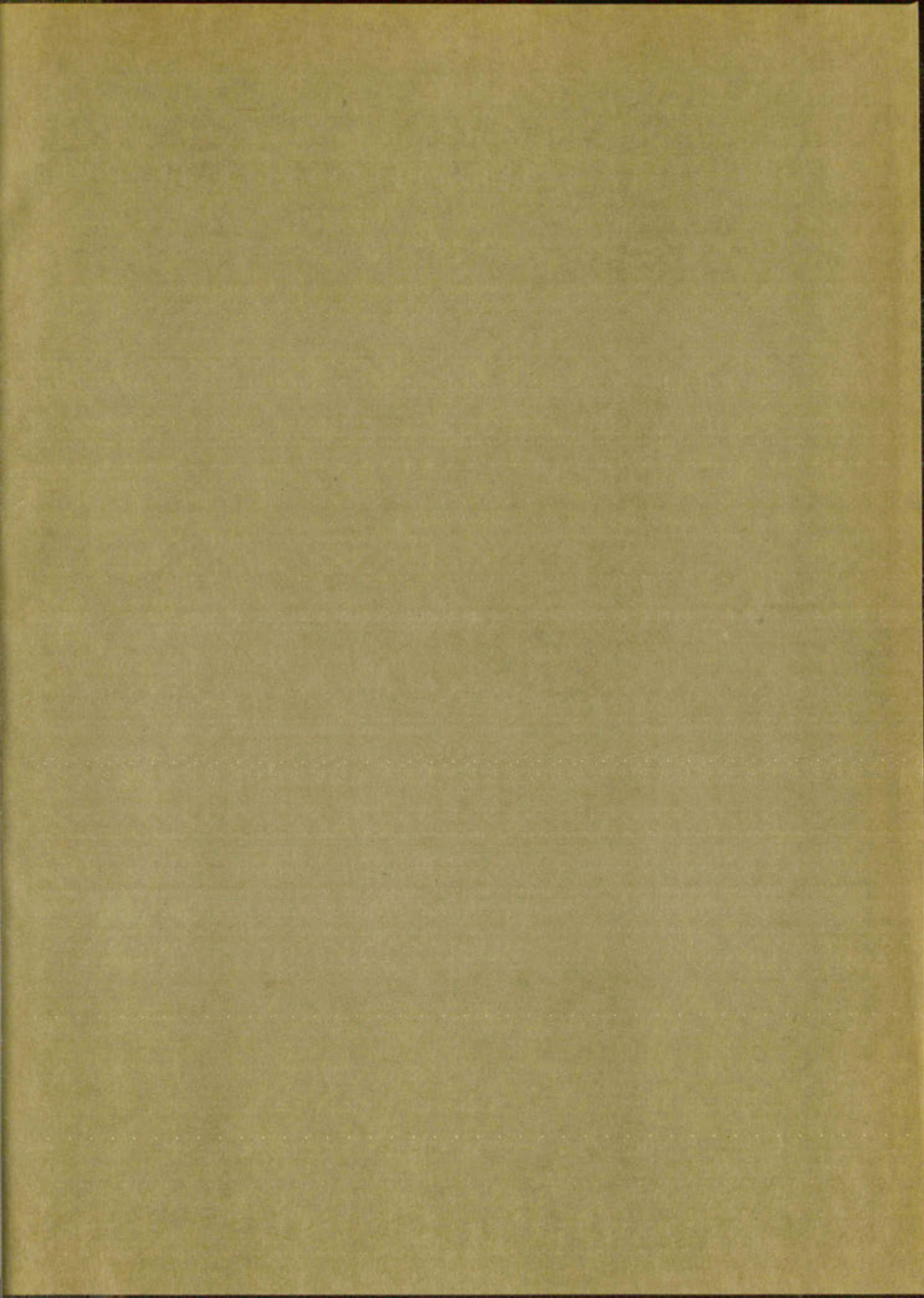
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