

THE UNIVERSITY OF MANITOBA

A VALIDATION STUDY OF THE MINNESOTA  
TEACHER ATTITUDE INVENTORY IN MANITOBA

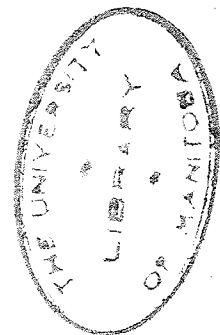
BEING A THESIS SUBMITTED TO THE COMMITTEE  
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James Hardy

A VALIDATION STUDY OF THE MINNESOTA TEACHER  
ATTITUDE INVENTORY IN MANITOBA

James Hardy

M. Ed. Thesis Abstract

Purpose of the Study

The primary purpose of this study is to examine the validity of the Minnesota Teacher Attitude Inventory (1) in order to determine whether or not the application of the Inventory in Manitoba conditions warrant establishing norms for its use in certain local situations. These situations include teacher training institutions and school systems in the Greater Winnipeg area with twenty-eight or more teachers.

The MTAI is designed to predict how well a teacher or prospective teacher will get along with pupils and indirectly how well satisfied he will be as a teacher. In fact, the Inventory is designed to measure a very specific aspect of teaching competence only, namely, teacher-pupil interpersonal relationships, and so it can assess the potential success of candidates in the realm of human relations only.

It is a basic assumption of the MTAI that the ability to get along well with pupils is one of the most important characteristics of a superior teacher. It is also an assumption of the Inventory that the emotionalized attitudes of the pupils toward their teachers are chiefly

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<sup>1</sup> Walter W. Cook, Carroll H. Leeds, and Robert Callis, Minnesota Teacher Attitude Inventory, New York: The Psychological Corporation, 1951.

the result of the teachers' attitudes toward children. Accepting these assumptions, pupil reaction to teachers should provide a very important criterion for validating the MTAI.

The importance of the problem is expressed in the statement that "it is the personality of the teacher that teaches school". In other words it is characteristic of a good teacher to establish and maintain cooperative and harmonious working conditions with his pupils in an atmosphere of mutual respect, sympathetic understanding, and kindness.

A second objective of this study is to determine whether or not any significant relationships exist between teacher attitude toward children and other teacher personal factors such as: age, teaching experience, religion, grade-levels, academic qualifications, intelligence, scholarship - leadership attainment, and professional training in education.

A third objective of this investigation is a thorough study of the MTAI and a complete review of both the literature and original documents related to the Inventory.



### The Population Groups

Five population groups are considered in this study, namely: Grade XII students from the Greater Winnipeg area, Normal School student-teachers, Faculty of Education student-teachers, experienced teachers from the Greater Winnipeg area, and experienced teachers taking 'off-campus' courses in education.

### The Method of Study

The data for these studies were obtained from an extensive testing program of local teacher population groups using random sampling techniques. Control groups were used whenever experimental studies of 'effect' were designed.

### The Treatment of the Data

The techniques of: analysis of variance, critical ratio of differences between means, and product-moment correlation were used in analyzing the data. In order to combine the criterion scores of pupils and advisors, all raw scores were converted into T-scores.

### Major Findings

1. The validity of the MTAI was considered in three separate studies. The obtained correlations of 0.39, 0.56, and 0.45 between student-teachers' MTAI scores and outside criteria indicated with considerable assurance that the MTAI was a valid predictor of how well a candidate would be likely

'to get along' with pupils.

2. The MTAI was found to be a highly reliable instrument. Reliability coefficients of 0.88 and 0.92 were obtained by the test-retest method.

3. From 'biased' and 'faking' studies with student-teachers, the MTAI was found not to be highly susceptible to faking.

4. It was found that pupil reaction could be measured with a high degree of reliability (0.89, 0.91).

5. It was found in this study that the MPAI differentiated significantly high among 'grade-levels' so as to warrant the building of separate norms for each of the following groups:

- (1) Grade XII students.
- (2) Normal School primary student-teachers.
- (3) Normal School elementary student-teachers.
- (4) Normal School secondary student-teachers.
- (5) Faculty of Education student-teachers.
- (6) Experienced primary teachers.
- (7) Experienced elementary teachers.
- (8) Experienced secondary teachers.

### Minor Findings

1. No significant difference was found to exist between the attitude of Catholics and the Protestants as measured by the MTAI.
2. There appeared to be a positive relationship between scholarship - leadership attainment and MTAI scores. This relationship was found to be significant at the ten per cent level.
3. At the Faculty of Education, there was no relationship found between the intelligence of the student-teacher as measured by the ACE and teacher attitude as measured by the MTAI. The obtained correlation of  $-.14$  was found to be not significantly different from zero.
4. Faculty of Education student-teachers' MTAI scores correlated significantly and negatively with their scores on the Ta scale ( a proposed teacher-attitude scale for the MMPI). This finding provided additional evidence of the validity of the MTAI.
5. The MTAI scores were found to be unaffected by age or teaching experience, indicating that the authors had successfully eliminated those items which would have given weight to experience.

6. The MTAI was found not to discriminate significantly between teachers taking 'off-campus' courses in educational method and theory and teachers from the general population of Greater Winnipeg area.

7. A highly significant difference was observed between teachers who had completed a course in mental hygiene and teachers who had taken other 'off-campus' courses in education. This difference was found significant at the one per cent level.

MINNESOTA TEACHER ATTITUDE INVENTORY

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## CHAPTER I

### INTRODUCTION

#### 1. The Problem And Definition of Terms

The primary purpose of this study was to examine the validity\* of the Minnesota Teacher Attitude Inventory\*\* in Manitoba conditions in order to determine whether or not the application of the Inventory in Manitoba warranted establishing norms for its use in local situations. These situations were to include teacher training institutions and school systems in the Greater Winnipeg area with twenty-eight or more teachers.\*\*\*

The Minnesota Teacher Attitude Inventory was "designed to measure those attitudes of a teacher which predict how well he will get along with pupils in interpersonal relationships, and indirectly how well satisfied he will be with teaching as a vocation."\*\*\*\* Of the many factors essential to teaching success, it was assumed by the authors of the Minnesota Teacher Attitude Inventory that the ability to get along well with pupils

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\* Validity is used here to refer to both relevance and reliability. Relevance relates to the closeness of agreement between what the test actually measures and what it was designed to measure. Reliability relates to the consistency with which the test measures whatever it does measure.

\*\* Walter W. Cock, Carroll H. Leeds, Robert Callis, Minnesota Teacher Attitude Inventory (Form A), New York: Psychological Corporation, 522 Fifth Avenue, New York, 18, N. Y. 1951.

\*\*\* See page 141.

\*\*\*\* Ibid., p. 3.

was one of the most important. It was a basic assumption of this Inventory that teacher attitude toward children in and out of school was an index to the degree of rapport between teacher and pupils in the classroom. It was also assumed by the authors that the emotionalized attitudes of the children toward their teachers were chiefly the result of the teachers' attitudes toward the children. Therefore, pupils' attitude toward teachers provided a very important validating criterion.

Of the many aspects of teacher-pupil relationships, only the expressed attitudes and feelings that teachers and pupils hold toward each other were considered in the study.

The importance of the problem is expressed in the assumption that it is the personality of the teacher that teaches school and that it is the harmonious interaction of personalities which characterizes successful group learning. Accepting this assumption, the problem investigated by the MTAI should be of utmost concern to both the administrators of schools and teacher training institutions.

It cannot be too strongly emphasized that the Minnesota Teacher Attitude Inventory was designed to measure a very specific aspect of teacher competence

only, namely, teacher-pupil interpersonal relationships, and so it is especially important that it be used to assess the potential success of teacher candidates in the realm of human relations only. It would be dangerous if administrators were to use it as an absolute predictor of teacher competence. Such abuse of the Inventory would undoubtedly serve to rob education of worthy teachers.

A secondary objective of this study is to determine whether or not any significant relationships exist between teacher or prospective-teacher attitude toward children and the teacher's other personal factors such as: age, teaching experience, religion, grade level, academic qualifications, and professional training.

A third objective of this study is a thorough re-examination of the Minnesota Teacher Attitude Inventory and a complete review of both the literature and original documents related to the Minnesota Teacher Attitude Inventory. This survey is important and essential to the understanding of the major and subsidiary objectives set forth in this thesis. In spite of the fact that this review is subordinate to the principal purpose of this paper, it is logical and necessary to treat it first.

## 2. Limitations of the Study

Because of time limitations, it was necessary to restrict the present investigation to schools in the Greater Winnipeg area.

In spite of the fact that pupil ratings of teachers was esteemed to be one of the most valuable validating criteria, it was necessary to abandon the plan of having pupils rate their teachers, because the idea met with hostility and opposition from a large number of principals and teachers.

## 3. The Populations

Five populations will be considered in this study, namely, the Grade XII students from the Greater Winnipeg area, the Normal School students from the Province of Manitoba, the Faculty of Education students from the Province of Manitoba, the experienced teachers from the Greater Winnipeg area, and experienced teachers taking 'off-campus' courses in education.

The population of Greater Winnipeg area refers to two urban and eight suburban school systems. Each of these independent systems employs twenty-eight or more teachers. The total population consists of approximately two-thousand teachers employed in one-hundred and fifty schools.

#### 4. Sampling Technique

An attempt will be made to obtain a random sampling of the populations under study. Rand's (24) random numbers will be employed in making the selections.

The Grade XII population will be sampled by random group technique. The two teacher-training institutions will be tested as entire populations.

The one-hundred and fifty schools will be randomly selected and the teachers will be requested to cooperate. In the case of the experienced teachers taking 'off-campus' courses in education, the instructors will be requested to cooperate in making their entire classes available for group testing.

#### 5. Some Basic Statistics

The basic statistical techniques to be used in this study are presented below. For further information the reader is referred to a general text (30) in statistical analysis in education.

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<sup>24</sup> Wilfred J. Dixon and Frank J. Massey, Introduction to Statistical Analysis, New York: McGraw-Hill Book Company, Inc., 1951, pp. 290-294.

<sup>30</sup> E. F. Lindquist, Statistical Analysis in Educational Research, New York: Houghton Mifflin Company, 1940, pp. 51, 57, 92, 97, 215.



Statistical treatment of data. Raw data will be employed in most of the statistical operations. Raw scores will be converted into T-scores in the combination of criterion scores. Classified data will be used in the construction of MTAI norms.

Correlation technique. The product-moment coefficient of correlation technique will be employed. Differences between related correlation coefficients will be tested by the "z" technique.

(a) Product-Moment Coefficient

$$r_{xy} = \frac{\sum xy}{N \sigma_x \sigma_y}$$

(b) "z" Differences for r's

$$(r_x - r_y) < (\sigma_{r_x - r_y}) (2.58)^*$$

\* Significant at 1% level

Difference between groups. Difference between, among, and within groups will be tested by the following procedures: analysis of variance by means of "between-group" to within-group" variance; the "t" - test for difference between means of small samples; and the critical ratio (CR) for differences between means of large samples.

(a) Small Independent Samples

$$t = \frac{M_1 - M_2}{\sqrt{\frac{N_1 \sigma_1^2 + N_2 \sigma_2^2}{N_1 + N_2 - 2} \cdot \frac{N_1 + N_2}{N_1 N_2}}}$$

(b) Small Related Samples

$$t = \frac{M_1 - M_2}{\sqrt{\sum d^2 / N(N-1)}}$$

(c) Large Independent Samples

$$CR = \frac{M_1 - M_2}{\sigma_{M_1 - M_2}}$$

(d) Large Related Samples

$$CR = \frac{M_1 - M_2}{\sqrt{\sigma_{M_1}^2 + \sigma_{M_2}^2 - 2r_{12} \sigma_{M_1} \sigma_{M_2}}}$$

Standard error. All statistical errors in measurements will be calculated in terms of standard errors. Where it is appropriate standard errors will be presented in the tables of the text. The standard errors will also be reported in Appendix A in the footnotes of the raw data tables.

Levels of confidence (1, 34). For the purpose of this study, the one per cent level will be considered significant in the case of the studies concerned with consistency, and the five per cent level will be considered significant in the case of the studies concerned with relevance.

6. A Breakdown of the Problem

Investigation of the following problems will be pursued.

Major problems.

- (a) Is the Minnesota Teacher Attitude Inventory a valid predictor of how well a teacher will get along with pupils?
- (b) Does the Minnesota Teacher Attitude Inventory discriminate significantly high among the following categories to justify the building of individual norms:

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<sup>1</sup> Lindquist, op. cit. (30), p. 16.

<sup>34</sup> Henry E. Garrett, Statistics in Psychology and Education, third edition, New York: Longmans, Green and Company, January, 1947, pp. 187- 88.

Grade XII students; Normal School students; Faculty of Education students; primary, elementary, and secondary teachers in the Greater Winnipeg area.

Minor problems.

- (a) Is there a significant relationship between teacher or prospective-teacher attitude toward children and other teacher personal factors?
- (b) What can be learned from a résumé of the history and recent studies related to the use of the MTAI?

7. Source of Data

The data will be obtained from the following sources:

- (a) A thorough study of the Minnesota Teacher Attitude Inventory and a complete review of the documents and works related to the MTAI.
- (b) The administration of the MTAI to random samples of Grade XII students and teachers from the Greater Winnipeg area.

- (c) The administration and readministration of the MTAI to the students at the teacher training institutions.
- (d) The administration of the MTAI to experienced teachers taking 'off-campus' courses in education.
- (e) The construction of a pupil rating scale and the administration of it to pupils in regard to their student-teachers.
- (f) Obtaining ratings on the student-teachers from their advisors.
- (g) Obtaining personal data on the student-teachers on record at the teacher training institutions.

8. Plan of Procedure

The investigations will be pursued in the following order:

- (a) Correlations of student-teachers' MTAI scores with pupils' ratings and advisors' ratings in order to obtain an estimate of the reliability of the Inventory.

- (b) Correlation of the student-teachers' MTAI scores (obtained from test and retest procedure) in order to obtain an estimate of the reliability of the MTAI.
- (c) The administration and readministration of the MTAI under standard and faking instructions respectively to test the susceptibility of the Inventory to faking.
- (d) A study to determine whether or not relationships exist between MTAI scores and other teacher personal factors such as: age, teaching experience, religion, grade-level, academic qualifications, and professional courses in education.
- (e) An analysis of the MTAI scores from the entire testing program in order to determine if there is justification for establishing norms for the different classifications such as 'grade-level', educational qualifications, and teaching experience.
- (f) The findings and their interpretations.

## CHAPTER II

### A HISTORY OF THE MINNESOTA TEACHER ATTITUDE INVENTORY

Nearly a decade ago Dr. Carroll Leeds wrote:

Considering the vast amount of educational research that has been carried on in recent years, it is rather surprising that one very important problem in the educational process has almost escaped the critical attention of investigators. This is the problem of relationship between teacher and pupil, or the more specific phase of this relationship as manifested in the personal interaction of teacher and pupil in the classroom. Unfortunately, there are far too many classrooms today in which social atmosphere is little above the level of barbarism with reference to teacher-pupil interaction. Pupils are treated with little respect, discipline problems rob the teacher of energy needed elsewhere, and classrooms are governed by individuals who are seriously maladjusted in personality ... Granting for the moment, the importance of the problem, it would seem that an instrument designed to measure certain aspects of teacher-pupil interaction would prove of great value in the hands of educators and school administrators. The construction of such an instrument is the purpose of this study.<sup>1</sup>

In fact the formal study of the problem has its very beginning in Leeds' attempt to construct an instrument to measure teacher attitude as it concerns the interpersonal relations of teachers and pupils. It is also a fact, that, since Leeds' pioneering effort, all serious attempts to advance the science of measuring teacher attitude or potential teacher-pupil relations have been noticeably limited to studies on or with the Minnesota Teacher Attitude Inventory.

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<sup>1</sup> Carroll H. Leeds, The Construction and Differential Value Of A Scale for Determining Teacher-Pupil Attitude, (Unpublished Thesis at the University of Minnesota, 1946)  
pp. 1-2.

Ten years have passed since Leeds first began the construction and validation of his Teacher-Pupil Attitude Inventory, and it would now seem to be a fitting time to take 'stock' of the many related experiments that have followed.

The purpose of this chapter is twofold: first, to give a brief description of the Minnesota Teacher Attitude Inventory; and secondly, to present a review of the experiments directly concerned with this instrument. However, since these two aspects are inter-related in that they both go to make up the history of the Inventory, the two phases will be presented together under the chapter heading, " The History of the Minnesota Teacher Attitude Inventory" and set down in the order of the following principal steps:

1. The Purpose and Rationale of the MTAI Inventory
2. The Construction of the MTAI Inventory
3. The Bias of the MTAI Inventory
4. The Validity of the MTAI Inventory
5. The Standardization of the MTAI Inventory
6. Relationship of the MTAI Scores to Other Factors
7. The Susceptibility of the MTAI Inventory to Faking
8. Summary



## I. THE PURPOSE AND RATIONALE OF THE INVENTORY

The Minnesota Teacher Attitude Inventory was designed to estimate teacher-pupil interaction based on the assumption that a teacher who had good classroom rapport would rate high on the scale and a teacher who had poor classroom rapport would rate low on the scale. The purpose, then, of the Inventory is to discriminate between teachers who are able to maintain a cooperative learning situation and teachers who are unable to maintain a favorable learning situation. Good classroom rapport refers to a state of harmonious teacher-pupil relationship wherein the learning situation is characterized by sympathetic understanding, kindness, mutual respect, and cooperative behavior. In other words the key to the problem of teacher-pupil relations is reasoned to be teachers' attitude; however, the complete explanation of the observed differences must be recognized as the concomitant effect of a great number of factors, such as intelligence, social values, abilities, personality traits, energy, and social skills. It also follows, therefore, that merely to impress on the minds of teachers or prospective teachers attitudes such as those held by superior teachers would not necessarily in itself result in good teacher-pupil relations, though it would be expected to improve inter-personal relations between teachers and pupil.

## II. THE CONSTRUCTION OF THE INVENTORY

The experimental form of the Minnesota Teacher Attitude Inventory was known as the Teacher-Pupil Inventory. This Inventory was constructed by Leeds and reported in his doctoral thesis, The Construction And Differential Value Of A Scale For Determining Teacher-Pupil Attitudes (1).

### 1. Item Sampling From Five Educational Areas

In the construction of the tryout items, five educational areas were explored to obtain an adequate and representative sampling of teacher-pupil attitude. In all 756 items were obtained and placed into two tryout forms of equal size - Form A and Form B.

Leeds has presented in his doctoral thesis the evidence of a very thorough and comprehensive investigation of these five educational areas concerning teacher-pupil relationships. Here are the specific areas (2) from which the tryout items were selected:

1. Moral status of children in the opinions of adults, especially as concerns their adherence to adult - imposed standards, moral or otherwise. Example: Pupils are naturally born stubborn.

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<sup>1</sup> Leeds, (1), op. cit., pp. 1-276.

<sup>2</sup> Walter W. Cook and Carroll H. Leeds, Measuring the Teacher Personality, Educational Psychological Measurement, 7, Autumn, 1947. pp. 401-2.

2. Discipline and problems of conduct in the classroom and elsewhere and methods employed in dealing with them.

Example: Pupils found writing notes should be severely punished.

3. Principles of child development and behavior related to ability, achievement, learning, motivation, and personality development.

Example: Success is more motivating than failure.

4. Principles of Education related to philosophy, curriculum and administration.

Example: Pupils should be required to do more studying at home.

5. Personal reactions of teacher, his likes and dislikes, sources of irritation, etc.

Example: Without children life would be dull.

Table I gives the distribution of the items according to the five categories for the final Inventory of 164 items. It is interesting to note that there is considerable overlapping of items in the several categories.

TABLE I  
NUMBER OF ITEMS IN FINAL INVENTORY OF 164 ITEMS  
CLASSIFIED UNDER EACH OF FIVE CATEGORIES <sup>1</sup>

Category	No. Of Items
Moral status	110
Discipline	43
Child knowledge	43
Educational principles	50
Personal reactions of the teacher	43

<sup>1</sup> Leeds' Thesis, op. cit., (1), p. 134.

## 2. Type of Item Selected

After considering a great number of item techniques, it was finally decided that a modified version of an item technique used by Likert (3) and resembling the items of Strong's Interest Inventory (4) would provide the most adequate type of item for both teacher attitude responses and scoring purposes. However, a five-point scale was constructed in place of the three-point scale used by Strong. It was reasoned that a five-point scale would provide a greater range wherein candidates could discriminate or express the strength of their feelings towards the items. In fact, this technique virtually provides an attitude scale for each item.

The scale and type of item used is as follows:

1. Strongly agree
2. Agree
3. Undecided
4. Disagree
5. Strongly disagree

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<sup>3</sup> Charles Bird, Social Psychology, New York: D. Appleton-Century Company, 1940, p. 159.

<sup>4</sup> E. K. Strong Jr., Vocational Interests of Men and Women, Stanford University: Stanford University Press, 1943, pp. 603-618.

" 1. Most children are obedient. 1 2 3 4 5

.

.

150. In pupil appraisal effort should be distinguished from scholarship. 1 2 3 4 5 "

### 3. The Basic Criterion Is Empirical

In place of using expert opinion (as in the Thurstone-Chave (33) technique) as a basis for establishing the validity and relative importance of the items, an empirical procedure was chosen. Two extreme criterion groups were selected by principals for the purpose of determining item validity. The principals of some seventy schools were requested to name one or two teachers who had excellent teacher-pupil relations and the qualities essential to teaching success. They were then asked to name one or two teachers who had extremely poor teacher-pupil relations and who lacked the qualities essential to teacher success.

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<sup>33</sup> L. L. Thurstone, and E. J. Chave, The Measurement of Attitude, Chicago: University of Chicago Press, 1929, pp. 4-24.

The principals were requested to consider the following criteria with reference to each teacher in making the selections:

- (1) ability to win the affection of his pupils.
- (2) fondness for, and understanding of children.
- (3) ability to maintain a desirable form of discipline.<sup>5</sup>

The teachers were selected from elementary, junior, and senior grade schools in the states of Ohio and Pennsylvania. The philosophies of these schools seemed to tend towards the conservative view in education.

The cooperation of the designated 100 superior teachers and the 100 inferior teachers was then sought and each teacher was given the Form A consisting of 378 items. Several weeks later the Form A was picked up and the Form B also consisting of 378 items was left with the teachers to be completed and returned by mail. It was the intention of the investigators to construct two separate inventories. If this had been successful, the two forms would have provided very valuable mutual validating criteria. However, after the items had been tested for validity and subjected to a rigorous selection criterion, there was only a sufficient number of high quality items left to construct a single form of the instrument.

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<sup>5</sup>  
Carroll H. Leeds, "A Scale for Measuring Teacher-Pupil Attitudes and Teacher-Pupil Rapport", Psychological Monograph: General and Applied, vol. 64, No. 6, 1950, p. 7.

TABLE II

NUMBER OF SCHOOL AND TEACHERS REPRESENTING  
DIFFERENT-SIZED COMMUNITIES AND DIFFERENT  
SCHOOL LEVELS FROM WHICH TWO GROUPS  
OF 100 TEACHERS EACH WERE DRAWN<sup>1</sup>

Size of Community		Superior Group		Inferior Group	
		No. of Sch.	No. of Tch.	No. of Sch.	No. of Tch.
Cities with population of 100,000 and over	Sr.High	2	3	1	4
	Jr.High	1	1	1	2
	Elem.	9	14	8	16
Cities with population between 1,000 and 100,000	Sr.High	9	21	8	20
	Jr.High	5	10	4	9
	Elem.	17	30	18	33
Country schools and Towns with population of 1,000 and under	High	14 <sup>x</sup>	9	11 <sup>x</sup>	9
	Elem.		12		7
TOTAL		57	100	51	100

<sup>x</sup> Both elementary and secondary grades were housed in one building.

<sup>1</sup> Cook and Leeds, op. cit. (2) p. 403.

4. Item Validity and the Selection of Items

The chi-square technique was used to test the validity of the items. All the items retained for use in the final form of the Inventory were found to discriminate significantly between the two criterion groups. The 164 items were selected on the basis of the following criteria:

1. The item had to discriminate adequately between the two criterion groups of teachers.
2. The item had to be free of ambiguousness in meaning and weakness in structure.
3. The item was not to duplicate content.
4. The item was to show a logical response pattern.

The probability levels of confidence for 96 per cent of the 164 items are given below:

79 (48 per cent) met the probability level of .05 ( $X^2 = 9.488$ )  
112 (68 per cent) met the probability level of .10 ( $X^2 = 7.779$ )  
134 (82 per cent) met the probability level of .20 ( $X^2 = 5.989$ )  
146 (89 per cent) met the probability level of .30 ( $X^2 = 4.878$ )  
157 (96 per cent) met the probability level of .50 ( $X^2 = 3.357$ )<sup>1</sup>

In order to explain what is meant by an illogical response pattern, Table III is presented.

It is to be observed that item 250 has received a significant number of responses "agree" and "disagree"

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<sup>1</sup> Leeds, op. cit. (1), p. 150.



from both criterion groups of 100 teachers. It is also to be noted that the item discriminates significantly between the two groups in both the responses "agree" and "disagree"; however, their positions are obviously reversed and consequently present an illogical response pattern.

TABLE III

DISTRIBUTION OF RESPONSES OF THE SUPERIOR AND INFERIOR GROUPS OF TEACHERS TO ITEM 250(FORM A)<sup>1</sup>

	Strongly Agree	Agree	Un- decided	Dis- agree	Strongly Disagree
Response	1	2	3	4	5
Superior	9	22	23	39	7
Inferior	1	44	23	25	7
Difference	8	-22	00	14	0

<sup>1</sup> Leeds, op. cit. (1), p. 150.

5. Administering The Inventory

In administering the Inventory, there is no time set for completing the work. However, the writer is asked to work as rapidly as he can and to think of general situations rather than specific ones. The administration requires from 20 to 30 minutes to complete.

The writer is instructed that there is no "right" or "wrong" answer; what is wanted is the writer's sincere opinion regarding each statement or item.

6. Scoring The Inventory

In practice a "right" key and a "wrong" key are used. This is done only to avoid a change in accepted usage or terminology. The answers or responses are merely scored on the basis of agreement or disagreement with the responses recorded by the two original groups - the one-hundred so-called superior teachers and the one-hundred so-called inferior teachers. Of course, it must be remembered that all the items retained for use in the final form of the Inventory were found to discriminate significantly between these two criterion groups.

The scoring system used in the original Teacher-Pupil Inventory study was that of the Kelly-Formula which was developed for use with the Strong system of weighting responses (1). By use of appropriate formulas, weights ranging from minus 4 to plus 4 were computed for each of the five responses for each of the 164 items. This procedure was adopted because the responses for each item were not normally distributed and because of the desire to make the procedure of scoring comply as nearly as possible with the empirical differentiation established between the two criterion groups of teachers. This is the procedure used by Strong in weighting responses on his Vocational Interest Inventory.

TABLE IV

WEIGHTING AN ITEM IN THE ORIGINAL STUDY<sup>2</sup>

	Strongly Agree	Agree	Un- decided	Dis- agree	Strongly Disagree
Item: It is sometimes necessary to break promises to children.					
Superior teachers	2	38	12	44	4
Inferior teachers	1	53	15	22	9
Difference	1	-15	-3	22	-5
Scoring Weight	0	-4	-1	4	-1

<sup>1</sup> Strong, op.cit. (4), pp. 603-15.

<sup>2</sup> Cook and Leeds, op. cit. (2) p. 404.

A simplified scoring procedure was also adopted. The simplified procedure disregards all negative and zero weights and assigns a plus 1 to each positive weight. This simplified system of scoring was adopted because the cumbersome method reported above was not justified in light of the high correlation existing between scores weighted by the two methods.

7. The Effect of Different Scoring Procedures

The validity of the Inventory was also found to be affected slightly by different scoring procedures. For example the test validity was found to be 0.59 for weighted scores and 0.60 for simplified scores. The correlation between the weighted and simplified scores for the 164 items was found to be 0.97.

In a follow-up study (9) carried out at a later date in South Carolina, it was found more satisfactory to assign plus 1 to each response marked with a positive weight and a minus 1 to each response marked with a negative weight as determined by the use of the Kelly-Formula (2). This procedure of scoring resulted in slightly higher test validity coefficients.

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<sup>9</sup> Carroll H. Leeds, "A Second Validity Study of the Minnesota Teacher Attitude Inventory", The Elementary School Journal, vol. 52, March, 1952, pp. 398-405.

<sup>2</sup> Strong, op. cit., (4) pp. 603 ff.

The reported norms in the Minnesota Teacher Attitude Inventory Manual (6) were also established on the basis of this weighted scoring procedure.

### III. THE BIAS OF THE INVENTORY

Though it may be unscientific, it is quite natural that an instrument which is designed to measure a highly subjective mental function should be somewhat tainted with the bias of its own author's philosophy of education. This is particularly true, since one's attitude of mind must be in large the outcome of a particular philosophy. The present writer does not want to infer that this is necessarily undesirable. The question would naturally resolve itself in whether or not the influence is a desirable one for the best interest of the child's education within any particular frame of philosophical and/or psychological reference.

The authors of the MPAI freely admit that the Inventory is somewhat biased by their own particular educational philosophy:

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<sup>6</sup> Walter W. Cook, Carroll H. Leeds, and Robert Callis, Minnesota Teacher Attitude Inventory Manual, New York: The Psychological Corporation, 1952, pp. 8-9.

Since the scores on the Inventory reflect at least to some extent the educational philosophy of the authors, the potential user should determine whether his own philosophy of education corresponds with that reflected by the Inventory before he uses it for purposes of selection. It is possible that an administrator who scored low on the Inventory (ie., whose philosophy is at variance with that reflected by the Inventory) might find that teachers who scored high would be out of place in his school system.<sup>1</sup>

From a thorough study of the MTAI Inventory, it would appear to this writer that the philosophy of the authors is moderate educational progressivism. Furthermore it should be understood that the authors had young children of elementary school age in mind in the construction of the items (2).

#### IV. THE VALIDITY AND RELIABILITY OF THE MINNESOTA TEACHER ATTITUDE INVENTORY

##### THE FIRST VALIDITY STUDY OF THE MTAI INVENTORY

##### The Pennsylvania — Ohio Study (3) — 1946

Though the validity of the individual items had been established on the basis of their efficacy

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<sup>1</sup> Cook and Leeds (6), Ibid., p. 4.

<sup>2</sup> Leeds and Cook (5), op. cit., p. 3.

<sup>3</sup> Leeds (9), op. cit. pp. 13-24.

in discriminating between principal designated superior teachers and inferior teachers, the validity of the Inventory as an instrument to measure that which it was designed to estimate remained to be established by some outside criterion.

Thus in order to determine or to obtain an estimate of the validity of the entire Inventory, it was decided to test an unselected group and have them rated by outside criteria.

1. The Sample

A random sampling was made in order to obtain a sample of 100 teachers to test the validity of the "Teacher-Pupil Inventory". Three validating criteria were established:

1. principals' ratings of teachers versus teacher MTAI scores.
2. experts' ratings of teachers versus teacher MTAI scores.
3. pupils' ratings of teachers versus teacher MTAI scores.

2. Principals' Rating Scale

The rating scale used by principals was specifically designed to cover the following areas;

1. ability to maintain discipline.

2. "personnel" versus subject-matter.
3. attitude towards children.
4. understanding of child behavior problems.
5. personality adjustment.
6. pupil attitude towards teacher.

A reliability index of 0.87 was obtained for the rating scale by the split-half method.

The principals' ratings correlated with the teachers' scores on the MTAI to produce an index of validity of 0.43 for the original weighted scores and 0.45 for the simplified scores. This index is significant at the one per cent level of confidence.

### 3. Experts' Rating Scale

The scale used by the experts was a modified version of the Baxter Rating Scale (7). This scale was purposely designed to give special attention to the following areas.

1. pupil self-reliance.
2. discipline ability.
3. friendly classroom atmosphere.
4. sense of pupil security.
5. sense of classroom stability.

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<sup>7</sup> B. Baxter, Teacher-Pupil Relationships, N.Y: The Mcmillan Company, 1942.



The split-half technique produced a test reliability coefficient of 0.92 after being stepped up by the Spearman-Brown prophecy formula.

The correlation between the Inventory scores and the experts' ratings resulted in coefficients of 0.49 for the original weighted scores and 0.48 for the simplified scores.

#### 4. Pupils' Rating Scale

Special attention will be given to the pupil rating aspect of the study, since the present writer will attempt to determine the validity of the MTAI with respect to practice teaching.

The rating scale used by the pupils was constructed by Leeds and is known as "My Teacher". This scale is composed of 50 items of the "NO - YES" type such as :

48. Does this teacher explain your lesson clearly?
49. Do you like this teacher?
50. Do the other children like this teacher?

The questions were purposely worded so as to meet with the mental maturity and experience of fourth,

fifth, and sixth grade children. It was that investigators view that:

Even though children are immature, when gauged by the standards of adults, and even though their opinions of teachers may change considerably as they grow older, it would seem that it is their present attitude, infantile as it may seem, that they should be of greatest significance to the educator.<sup>1</sup>

The pupils were doubly assured that no one would ever know the results of the questions except the tester. Only the tester and the pupils were present in the room at the time of the testing. The pupils were not asked to rate their home room teacher because it was the belief of the tester that the home-room teacher commands a special status in the minds of his pupils. The pupils were asked not to indicate their names in any way on their answer sheets. They were also asked not to discuss the questions afterwards with the teacher or other pupils.

The reliability of the pupil rating scale was obtained in two different ways.

The first method used was that of the split-half technique. From the 100 piles of student ratings of the 100 teachers, two papers were selected at random from each pile. The correlation between the odd and

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<sup>1</sup> Leeds, op. cit. (1), p. 177.

even items produced a coefficient of 0.94 after being stepped up by the Spearman-Brown formula. However, the test builder was careful to point out that this estimation was probably too high because of the "halo effect and logical error".<sup>1</sup>

The second method used was a consideration of the consistency with which individual pupils rated the teachers. Two groups of ten papers were selected at random from each teachers pile of pupil ratings. The means were calculated for each group of ten papers and the two obtained mean scores for each teacher were paired. The hundred pairs were then correlated. This correlation resulted in a value of 0.83. When stepped up from ten raters to twenty-five raters (the number contained in the average size class) by the Spearman-Brown prophecy formula, a coefficient of 0.93 was obtained.

This is probably a better estimation; at least it is a realistic one, since in practice an entire class would rate a teacher and not a single rater as is implied in the first technique for estimating test reliability.

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<sup>1</sup> Leeds, op. cit. (5), p. 18.

The correlation between the Inventory scores obtained by the teacher and the ratings given by their pupils produced a coefficient of 0.45 for the original weighted scores and 0.46 for the simplified scores.

##### 5. Validating Correlations

Validity coefficients were obtained by correlating the scores of each of the teachers' ratings scales with the Teacher-Pupil Inventory scores. Combinations of the scores were also correlated with the scores of the Teacher-Pupil Inventory scores. In order to make a combination of the scores possible, all scores were changed to T-scores. A coefficient of 0.59 was obtained as a result of correlating the Inventory scores with the three validating criteria combined.

A coefficient of this size (0.60) was also obtained from a multiple correlation of the Inventory scores and the three criteria. Table V presents the correlations obtained between Inventory scores and outside criteria. It is particularly interesting to note that the very criteria used to select the two criterion groups of teachers, in the final analysis, shows the lowest correlation of all.

TABLE V

CORRELATIONS OBTAINED BETWEEN INVENTORY SCORES (ORIGINAL AND SIMPLIFIED) AND RATINGS CONSIDERED SEPARATELY AND IN COMBINATION, TOGETHER WITH CORRELATIONS OBTAINED BETWEEN THE RATINGS, FOR THE UNSELECTED GROUP OF 100 TEACHERS<sup>1</sup>

	Original Scoring		Simplified Scoring	
	r*	$\overline{cr}$	r*	$\overline{cr}$
Inventory and Principals' Ratings	.434	.082	.445	.081
Inventory and Classroom Observations	.486	.077	.485	.077
Inventory and Pupils' Attitudes	.452	.080	.456	.080
Inventory and Three Validating Criteria Combined	.594 .595**	.065 .065	.596	.065
Inventory and Combination of Classroom Observations and Principals' ratings	.536	.072	.544	.071
Inventory and Combination of Classroom Observation and Pupils' Attitudes	.576	.067	.579	.067
Inventory and Combination of Principals' Ratings and Pupils' Attitudes	.534	.072	.543	.071
Classroom Observations and Principals' Ratings	.480	.077		
Classroom Observations and Pupils' Attitudes	.326	.090		
Principals' Ratings and Pupils' Attitudes	.389	.085		

\* These obtained r's are all statistically significant at the 1 per cent level.

\*\* Multiple correlation coefficient

<sup>1</sup> Leeds, op. cit. (5), p. 20.

6. Comparisons of Inventory Scores

Table VI is a comparison of the unselected group with the two divisions of the selected group. As one would expect the statistics for the unselected group lie between those of the selected groups. This indicates that a fair degree of success was attained in the selecting of the two extreme criterion groups in the original study.

TABLE VI

RESULTS OBTAINED IN THE COMPARISON OF INVENTORY SCORES FOR THE SUPERIOR, UNSELECTED, AND INFERIOR GROUPS OF TEACHERS<sup>1</sup>

Statistic	Superior Group	Unselected Group	Inferior Group
N	100	100	100
Range	423-(-99)	254-(-176)	213-(-297)
M.	131.0	77.6	-32.0
S.D	102.19	103.49	112.46
<del>GM</del>	10.19	10.35	11.18
Mdn	130.0	85.5	-41.5

<sup>1</sup> Leeds, op. cit. (1), p. 157.

7. The Reliability of the Original Form

The reliability of the original form of the instrument known as the Teacher-Pupil Inventory was determined by two methods (8).

The first reliability coefficient was obtained from a split-half correlation of the odd-numbered items with the even-numbered items. The correlation of 0.83 was stepped up by the Spearman-Brown prophecy formula yielding a reliability coefficient of 0.91 for the entire Inventory.

A second estimate of reliability was determined by means of the split-half technique applied to obtained scores based on a simplified scoring procedure. Under these modified conditions, a correlation of 0.79 was obtained. The coefficient for the entire test as estimated by the Spearman-Brown formula was found to be 0.88. It is interesting to note that a coefficient of 0.97 was obtained when the scores from the simplified system were correlated with the original scores.

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Carroll H. Leeds and Walter W. Cook, "The Construction and Differential Value of A Scale For Determining Teacher- Pupil Attitude", Journal of Experimental Education, vol. 16, December, 1947. p. 156.

8. Summary

Cook and Leed's have briefly and adequately summarized the findings of this study as follows:

1. When we assume that by "teaching personality" we mean those characteristics of the teacher's behavior related to the emotional responses of pupils and the ability to establish intimate and harmonious working relations with them, we find that "teacher personality" can be measured.
2. We find that the attitude of individual teachers towards pupils is significantly related to the pupils' attitudes towards the teachers. Both sets of attitudes can be measured with a reliability approaching .90 and the relationship between them established with a correlation as high as .46.
3. Pupils' ratings of teachers at the intermediate grade levels are reliable and valid. There is a significant relationship between their ratings and those of the principal and of an expert. Pupils' ratings of teachers correlate with principals' ratings .39, and with an experts' ratings, .33. The expert's and the principals' ratings correlate .48.
4. The "teaching personality" can be measured with as high a validity as can academic aptitude, the correlation with three combined being, .60. <sup>1</sup>

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<sup>1</sup> Cook and Leeds, op. cit. (2), p. 409.



A SECOND VALIDITY STUDY OF THE MTAI

The South Carolina Study (9) - 1951

The second validity study was made with the published form of the Inventory. This form is known as the Minnesota Teacher Attitude Inventory, Form A (2). This revised Inventory contains 150 items which were taken from the original Teacher-Pupil Inventory or later called "Form X-164" and the "Form X-239" which was constructed from the remaining items of the original reservoir of 592 items. The second investigation was also carried out by Leeds.

1. The Sample

In the second validity study, a random sample was drawn from three public school systems in South Carolina. This resulted in the complete cooperation of 100 teachers. The three systems investigated were stratified in that they were composed of communities made up of the industrial regions, merchantile areas,

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<sup>9</sup> Carroll H. Leeds, "A Second Validity Study of the Minnesota Teacher Attitude Inventory", The Elementary School Journal, vol. 52, March, 1952, pp. 398-405.

<sup>2</sup> See Appendix B.

and wealthy residential districts. All the teachers used in this study were employed at the fourth, fifth, or sixth grade levels. Leeds made the selection from these grade levels because it was felt that teacher-pupil relations were of peculiar importance at the elementary grade level, and it was also believed that sincere pupil ratings of the teacher would be obtained most effectively from children in this age range.

## 2. Administering the Inventory

After the necessary cooperation was obtained from the administrative heads, the individual teachers were approached and requested to participate in the study. Form A of the Inventory was left with those who wished to take part in the investigation. The teachers were requested to have the Inventory completed by a special date when the investigator would return to pick it up.

## 3. Criteria For Validating the Inventory

The method and criteria used in the second validating study was the same as that used in the first investigation. That is, data were collected

from the following sources by means of identical rating scales: (1) ratings by principals, (2) ratings by investigators, (3) ratings by pupils. Since the same ratings scales<sup>x</sup> were again used as in the earlier study, there is no point in repeating the nature and content of these scales here. The reliability coefficients of the several rating scales were not re-examined in this investigation.

Absolutely no attempt was made to obtain the criterion data until after all the copies of the Inventory had been collected. It was thought important that the teachers should not suspect that they would be rated later by out-side criteria. The investigator also avoided scoring the Inventories until after all the criterion data had been collected. These precautions were taken in order to avoid unnecessary bias.

#### 4. Test Validity of the MTAI

The Inventory was validated as in the Pennsylvania-Ohio study by correlating the scores of each of the three criteria with the MTAI scores. And as in the original study, correlations were also made between the MTAI scores and the possible combinations of the criterion scores.

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<sup>x</sup>  
See Pages 28-30.

Leeds believed that the combined judgment of the criterion groups should produce a much more valuable criterion. The facts, however, only slightly support this reasoning. It might be that the tendency of the combined ratings to produce a better criterion was due to the counter-balancing effect of the moderate ratings on the extremes.

A multiple correlation between the three criteria and the MTAI scores produced an index of 0.63.

Table VII adequately presents the correlations for each of the criteria alone as well as in combinations. The table also presents an interesting comparison with the original Pennsylvania-Ohio study of 1946.

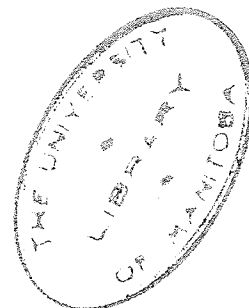


TABLE VII

INTER-CORRELATIONS FOUND IN 1946 AND 1951 BETWEEN INVENTORY SCORES AND RATINGS BY PUPILS, PRINCIPALS, AND EXPERTS FOR 100 FOURTH, FIFTH, AND SIXTH-GRADE TEACHERS <sup>1</sup>

Factors Correlated <sup>x</sup>	1946 Study	1951 Study
Inventory vs. pupil' ratings	.45	.31
Inventory vs. principals' ratings	.43	.46
Inventory vs. experts' ratings	.49	.57
Inventory vs. three validating criteria (combined equal weights)	.59	.59
Inventory vs. three validating criteria (combined multiple weights)	.60	.63
Experts' ratings vs. principals' ratings	.48	.43
Experts' ratings vs. pupils' ratings	.33	.22
Principals' ratings vs. pupils' ratings	.39	.39

<sup>x</sup> All correlations are significant at the 5 per cent level or better.

Leeds (2) concludes:

The writer has no satisfactory explanation for the discrepancies between the results of the 1946 and 1951 studies, such as that found for the correlations between Inventory scores and pupils' ratings.

<sup>1</sup> Leeds, op. cit. (9), p. 403.

<sup>2</sup> Leeds, op. cit. (9), p. 403.

THE THIRD VALIDATING STUDY OF THE MTAI INVENTORY

The Missouri Study (10) - 1951

1. The Sample

The Missouri Study was based on a random sample of 77 public school teachers from Mexico, Boonville, Fulton, and Jefferson City. The teachers were teaching grades 4 through 10.

2. The Validating Criteria

Beyond a few minor statistical changes in the treatment of the data, the Missouri Study followed the same pattern as did the two earlier validity studies. However, in place of having one expert do the rating, two observers did the ratings. The scores of the two raters were averaged in order to get a single expert score for each teacher. Unfortunately instead of improving the criterion as it had been hoped, it appeared to suffer from this procedure. The correlation between the two experts was 0.33 which is surprisingly

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<sup>10</sup> R. Callis, "Efficiency of the Minnesota Teacher Attitude Inventory for Predicting Interpersonal Relations in the Classroom", Journal of Applied Psychology, vol. 37, April, 1953, pp. 82-85.

low. The explanation may lie in the fact that there are experts and "so called experts", or in other words perhaps some are more sensitive than others in recognizing the true conditions of "classroom atmosphere".

TABLE VIII  
SUMMARY STATISTICS FOR THE PREDICTOR (MTAI)  
AND THE VARIOUS CRITERIA<sup>2</sup>

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Variable	Mean	Standard Deviation
Criteria: (1) Observer X Ratings	18.7	4.8
(2) Observer Y Ratings	18.1	3.3
(3) Mean Observer Ratings	49.8 <sup>x</sup>	10.1 <sup>x</sup>
(4) Student Ratings	24.4	11.4
(5) Principal (deviation score)	50.4 <sup>x</sup>	9.3 <sup>x</sup>
(6) Composite	49.7 <sup>x</sup>	10.1 <sup>x</sup>
Predictor. MTAI	27.5	35.4

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<sup>x</sup> Based on standard scores computed from a few more cases than the 77 teachers in the correlation analysis. Values other than those marked (x) are based on raw scores.

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<sup>2</sup> Callis, op. cit. (10), p. 84.

### 3. Correlation for Validating the MTAI

The correlation between the pupils' ratings of their teachers and the teachers' MTAI scores were found to be 0.49 which is considerably higher than in any other study yet reported. The three studies based on the pupils' ratings of the teachers and the teachers' MTAI scores were respectively 0.46, 0.31, and 0.49.

The combined ratings by the experts resulted in the lowest correlation ever obtained between experts' ratings of teachers and teachers' MTAI scores. This correlation resulted in a validity index of 0.40.

The principals' ratings of the teachers correlated surprisingly low with the teachers' MTAI scores resulting in a validity coefficient of 0.19. It may well be that this lack of relationship is responsible for the lowest index yet obtained from a combination of the three criteria, namely, principals' ratings, pupils' ratings, and experts' ratings. The coefficients based on combined criteria for three validating studies reported here are 0.60, and 0.63, and 0.46 respectively.

In order to provide a clear comparison of the findings from the three validity studies the following table is presented.



TABLE IX

INTERCORRELATIONS OF THE INVENTORY AND THE VARIOUS  
CRITERIA FOR THE THREE VALIDATION STUDIES<sup>1,2</sup>

Factors Correlated <sup>x</sup>	1946 Pen. Ohio Study	1951 S. Car. Study	1951 Missouri Study
Inventory vs. pupils' ratings	.45	.31	.49
Inventory vs. principals' ratings	.43	.46	.19
Inventory vs. experts' ratings	.49	.57	.40
Inventory vs. three validating criteria (combined equal weights)	.59	.59	...
Inventory vs. three validating criteria (combined multiple weights)	.60	.63	.46
Experts' ratings vs. principals' ratings	.48	.43	.12
Experts' ratings vs. pupils' ratings	.33	.22	.29
Principals' ratings vs. pupils' ratings	.39	.39	.46

<sup>x</sup> All correlations are significant at the 5 per cent level or better.

<sup>1</sup> Leeds, op. cit. (9), p. 403.

<sup>2</sup> Callis, op. cit. (10), p. 85.

Cook, Leeds, and Callis have optimistically remarked that:

It is interesting to note that the development of the MTAI constitutes a demonstration that one may start with a poor criterion, such as principals' ratings (in the selection of 100 superior and 100 inferior teachers), and develop a scale which will correlate higher with other better criteria than with the original.<sup>1</sup>

#### A FOURTH VALIDATION STUDY OF THE MTAI INVENTORY

##### The Illinois Gage-Suci Study (11) - 1951

The Gage-Suci study was designed to test the hypothesis that there is a positive relationship between teacher-pupil relations and the degree to which the pupils are valued positively by the teacher.

##### 1. The Sample

A sample consisting of twenty teachers from a single high school were selected for this study. Not only could this sample be considered biased because of its selectiveness, but equally because it could be influenced by the particular educational philosophy of the institution.

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<sup>1</sup> Cook et al., op. cit. (6), p. 14.

<sup>11</sup> N. L. Gage and G. Suci, "Social Perception and Teacher-Pupil Relationships", Journal of Psychology, vol. 42, March, pp. 144-52.

2. Administering the Inventory

Unlike previous studies, this study had the pupils rate the teachers before the teachers took the MTAI. The Inventory used by the pupils consisted of 52 items and was a modified version of the Leeds' Inventory, "My Teacher".

3. The Validating Criterion

Only one validating criterion was used in this study, namely, the pupils' ratings of the teacher.

4. The Resulting Correlation

The correlation of the teachers' MTAI scores and the pupils' ratings resulted in the lowest correlation ever obtained for any outside criterion. Moreover, the correlation is negative; however, it is not significantly different from zero.

Unlike previous findings, the Gage-Suci findings yielded a negative coefficient of  $-.20$ . This

finding is significantly lower than those reported by Cook and Leeds (1).

Results support the hypothesis. The teachers' 'mean error' scores had a fair internal consistency (correlated odd-even  $r$ , .73) and correlated  $-.37$  with mean rating by pupils. Their 'r score' on the Teacher Attitude Inventory correlated  $-.57$  with 'mean error' scores but, unexpectedly,  $-.20$  with mean ratings (For  $N = 20$  and  $r$ , of  $.44$  significant at the five per cent level).<sup>2</sup>

It must be noted however, that the Gage-Suci study was limited to high school teachers and to staff members of a single high school plant. This could be particularly significant if a certain philosophy of education dominated the teaching process.

#### A FIFTH VALIDITY STUDY OF THE MTAI INVENTORY

##### The Piana-Gage Study (12) - Illinois 1953

Piana made an attempt to validate the Minnesota Teacher Attitude Inventory in her thesis, "Cognitive-Affective Values of Pupils and Teacher-Pupil Relation-

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<sup>1</sup> See page 42, Table VII.

<sup>2</sup> Gage and Suci, (11), op. cit. p. 152.

<sup>12</sup> G. M. D. Piana, Cognitive-Affective Values of Pupils and Teacher-Pupil Relationships, (Unpublished Master's Thesis, 1953, on file in the University of Illinois Library).

ships". The investigator made her validation study on the basis of three criterion scores.

1. "My Teacher" Inventory which was previously discussed on pages 30 to 33 of this chapter;
2. "Affective Merit" Inventory which was designed to estimate the extent to which a teacher is effective in helping the pupil satisfy his social and emotional needs;
3. "Cognitive-Merit" Inventory which was designed to estimate the effectiveness of the teacher in helping the pupils achieve the traditional cognitive, intellectual, subject matter objectives of school learning;
4. "General Merit" Inventory which was designed to estimate the extent to which a teacher is liked or disliked without specification of the like or dislike.

The correlations between these several criteria and the MTAI are presented in Table X.

TABLE X

CORRELATIONS BETWEEN MTAI AND MEAN  
PUPIL SCORES OVER ALL TEACHERS<sup>13</sup>  
( N = 97)

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	Leeds' "My Teacher" Inventory	Affective Merit	Cognitive Merit	General Merit
MTAI	.256*	.210*	.262*	.248*

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\*  
Significant at .05 level.

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A correlation of the scores obtained on "My Teacher" with the MTAI scores produced a coefficient of 0.26 which is somewhat lower than those found in other studies: 0.45, 0.31, and 0.49 respectively (1).

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<sup>13</sup> G. M. D. and N. L. Gage, Pupil Values and the Validity of the MTAI, (Unpublished Paper on file at the Bureau of Educational Research, College of Education, University of Illinois, 1953), p. 6.

<sup>1</sup> See page 46.

The Investigators (1) concluded in their summary of the study that:

Accordingly, the MTAI will vary in validity for teacher effectiveness according to the values of the pupils interacting with the teachers. Teachers scoring high on MTAI will probably be better liked by pupils who have strong affective values concerning teachers. If the pupils have strong cognitive values, the teacher's MTAI will make less difference.

It does not seem unreasonable to suggest that the findings of this study may be in part the answer to the findings in the Gage -Suci Study (2). In any event there appears to be several important variables functioning in teacher-pupil relations that have their basis in pupil values such as cognitive and affective values. It also seems reasonable to suggest that a school's prevailing philosophy and its reciprocating effect are significant factors that should be carefully studied before any attempt is made to measure teacher-pupil relations regardless of the reputation of the evaluating instrument.

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<sup>1</sup> Piana and Gage, (13), Ibid., p. 10.

<sup>2</sup> Gage and Suci, (11), op. cit., pp. 144-152.

## V. STANDARDIZING THE MINNESOTA TEACHER ATTITUDE INVENTORY

A grant from the Graduate School of the University of Minnesota provided the necessary funds to carry out an extensive testing program for the standardization of the Minnesota Teacher Attitude Inventory. All the samplings were made in the state of Minnesota with one exception of the sampling of university freshmen taken from the University of Missouri.

This study was considered worthwhile, because the Minnesota Teacher Attitude Inventory had repeatedly shown significant differences among the following groups: primary teachers, intermediate teachers, academic high school teachers, and special subject high school teachers. Not only were these differences evident both at the time of entrance and at the time of graduation in education, but these differences were also found significant for experienced teachers in the field.

Since it was the conviction of the investigators that the Inventory could be a useful counseling aid in helping to advise prospective teachers as to their fitness for teaching, they also included in their investigation samplings from both high school seniors and university freshmen.



1. Norms for High School Seniors

The MTAI was administered to a group of 122 high school seniors. The pupils were drawn from a school system which serves both an upper and lower middle class society. The educational standing of both parents was as follows:  $Q_1$  = 9th grade,  $Q_2$  = 12th grade, Mothers  $Q_3$  = 14th grade, Fathers  $Q_3$  = BA.

2. Norms for University Freshmen

A random sample of 384 freshmen from the University of Minnesota constituted the standardization group used to obtain the required norms and statistics.

The sample was composed of : 193 students from Arts and Science, 118 from Agriculture, 43 from Education, and 30 from Engineering.

It is interesting to note that the mean score for Education freshmen was 6.08 above the next highest group, namely, the Arts and Science who had a mean of 8.59, Agriculture's mean score was -5.07, and Engineering's mean score was 4.90.

3. Norms for Candidates In Education

Norms have been set up for candidates in education according to the classifications which have been defined as follows:

- (a) Juniors in early childhood education refers to freshmen enrolled in a four-year course at the University of Minnesota, which prepares them to teach pre-school and primary grades.
- (b) Seniors in early childhood education refers to the aforementioned population at the end of the senior year.
- (c) Elementary education refers to a four-year course at the University of Minnesota which trains prospective teachers for teaching children at the primary and elementary grade levels.
- (d) Secondary education juniors with academic majors refers to prospective teachers taking a four-year course at the University of Minnesota which prepares them to teach high school.

- (e) Secondary education seniors with academic majors refers to candidates at the end of a four-year course which has prepared them to teach high schools.
- (f) Secondary education juniors with nonacademic majors refers to candidates beginning a four-year sequence in professional education courses at the University of Minnesota.
- (g) Secondary education seniors with nonacademic majors refers to teacher candidates at the end of a four-year sequence of professional educational courses at the University of Minnesota.
- (h) Graduate student, College of Education, refers to experienced teachers taking introductory graduate courses during summer school at the University of Minnesota.

In order to give a brief illustration of the norms for each group the following table was prepared. However, for a complete presentation of the norms,

the reader is referred to the Minnesota Teacher Attitude Manual pages 8 and 9 and the Cook and Hoyt study (14).

The standardization is based on percentile rank equivalents for raw scores obtained on the MTAI by the several groups or categories. The raw scores are obtained simply by scoring "rights" minus "wrongs" in agreement with the two original criterion groups.

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<sup>14</sup> Walter W. Cook and Cyril J. Hoyt, "Procedure for Determining Number and Nature of the Norm Groups for the 'MTAI', Educational and Psychological Measurement, vol. 12, No. 4, 1952, pp. 569-73.

TABLE--XI

DATA BASED ON RAW SCORES FOR STUDENT NORM GROUPS  
ON THE MINNESOTA TEACHER ATTITUDE INVENTORY <sup>1</sup>

Norm Group	N	Mean	SD	Percentile Ranks	
				1st	99th
High School Senior	122	12.8	31.6	-81	76
University Freshmen	384	4.8	28.9	-59	73
<u>Beginning Education Juniors</u>					
Early childhood	134	65.9	29.8	-10	113
Elementary	228	59.9	26.3	-13	101
Academic Secondary	136	48.3	29.2	-16	104
Nonacademic Secondary	138	44.1	27.1	-19	99
<u>Graduating Education Seniors</u>					
Early childhood	108	80.4	22.6	4	118
Elementary	150	77.4	24.7	11	118
Academic Secondary	237	67.8	24.3	4	116
Nonacademic Secondary	185	63.3	25.4	-11	107
Graduates in Education (mean experience 9.96 years)	200	64.0	33.3	-21	115

<sup>1</sup> Based on data from the Minnesota Teacher Attitude Manual, p. 8.

4. The Experienced Teacher Group

The sample for this study was secured by making a stratified random selection of the teachers in the State of Minnesota. A total of 1,934 Inventories was mailed out to teachers. By persistent follow-up requests 89 per cent of the Inventories were completed and returned.

In order to facilitate the presentation of the data the following summarized table was constructed:

TABLE XII

DATA BASED ON RAW SCORES FOR EXPERIENCED TEACHERS NORM GROUPS ON THE MINNESOTA TEACHER ATTITUDE INVENTORY<sup>1</sup>

Norm Group	Years of training	N	Mean	Percentile Ranks		
				SD	1st	99th
Rural Teachers		332	29.7	38.1	-64	112
Elementary Teachers (systems with less than 21 teachers)	2	118	29.2	38.6	-67	110
	4	102	31.0	39.4	-39	107
Elementary Teachers (systems with more than 21 teachers)	2	249	40.1	37.2	-48	108
	4	247	55.1	36.7	-50	114
Secondary Teachers (Academic)	4	264	24.7	40.6	-58	103
	5	218	40.8	39.5	-65	112
Secondary Teachers (Nonacademic)	4	98	9.7	42.7	-85	98
	5	70	28.9	36.5	-50	98

<sup>1</sup> Based on data from Minnesota Teacher Attitude Inventory Manual, p. 9.

The Investigators arrived at the following statistically tested conclusions.

1. Length of teaching experience was not significantly related to teacher attitudes in any of the analyses, indicating that the elimination of items negatively correlated with experience from the published form of the Inventory had achieved its purpose.
2. Amount of post-high school education was significantly and positively related to teachers attitudes in graded elementary schools and high schools but not in one roomed rural schools.
3. Size of the school system was significantly and positively related to teacher attitudes in graded elementary schools.
4. The subject taught was significantly related to teacher attitudes at the high school level. Teachers of academic subjects scored higher in general than teachers of special fields such as music, art, business, and physical education. However, teachers of vocational agriculture scored highest of all the high school groups.
5. The analyses indicated that nine sets of norms should be established for use of the Minnesota Teacher Attitude Inventory with experienced teachers. These norms are presented in Table 2.<sup>1</sup>

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<sup>1</sup>MTAI Manual, op. cit. (6), p. 10.

The present writer wishes to emphasize that the norms established by the Minnesota-Missouri studies are not to be considered in anyway adequate or applicable to our students and teachers here in Manitoba. This could be particularly true since there has been an entirely different teacher training program available in Minnesota from that in Manitoba. For example, four-year teacher training courses are offered in specialized teaching areas such as: early childhood education, elementary education, secondary education with academic majors, and secondary education with nonacademic majors. There is no such comparable training available here in Manitoba.

A number of authorities could be quoted to support this reasoning; however, since this view could not be opposed logically, only one quotation will be given in its support:

A given test can only be valid for the population represented by its standardization group.<sup>15</sup>

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James L. Mursell, Psychological Testings,  
New York: Longmans, Green and Company, 1949, p. 49.



## VI. THE RELATIONSHIP OF MTAI SCORES TO OTHER FACTORS

### 1. The Leeds Study of Personal Factors (1) - 1946

As a secondary objective, Leeds made an analysis of the data obtained in his investigation of the possibility of building an inventory to estimate teacher-pupil attitude. This secondary study consisted of a personal data-sheet, which was issued in conjunction with the regular Teacher-Pupil Inventory to each member of the three groups, namely, the two criterion groups, and the unselected group used in the first validity study. The following personal factors of the teachers were considered in this investigation in relation to MTAI scores: sex, nationality, marital status, parental status, training, teaching experience, grade-level, subject taught, and the experience of a course in mental hygiene.

The personal data were classified and statistically analysed in relation to the Inventory scores. These analyses produced the following findings concerning

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<sup>1</sup> Leeds, op. cit., (1), pp. 132-136.

the three groups:

- (a) Age and experience indicated a small inverse relationship to certain items, these items have since been removed from the published form of the Inventory. The elimination of these would be necessary before the test could be used with assurance by administrators in the selection of students at the teacher training institutions and in the selection of teachers for employment at the graduation level.
- (b) Irrespective of marks obtained or sex, there was a decided agreement among children as to what teachers are liked or disliked.
- (c) Primary teachers tend to score higher than elementary teachers who in turn score higher than secondary teachers.
- (d) A significant difference at the one per cent level was found between those who indicated that they liked teaching "very much" and those who indicated they liked teaching only "fairly well". Those who liked teaching "very well" scored higher.

(e) Teachers who had taken courses in mental hygiene scored higher. This difference was found to be significant at the five per cent level for all groups.

2. The Callis Study (16) - 1942

The second experimental form of the Inventory was constructed in order to determine the extent to which the Inventory scores might be related to teaching experience and professional courses. It was reasoned that if the Inventory were to serve as a valid discriminator at the teacher training level and the teacher employment level, it would be necessary to remove items whose responses might be greatly affected by professional courses or early teaching experience. This second Inventory known as Form X-239 was composed of Form X-164 in addition to 75 items from the remaining tryout reservoir of 592 items. All the items, included in the Inventory, discriminated at least at the ten per cent level.

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<sup>16</sup> Robert Callis, "Changes in Teacher-Pupil Attitudes Related to Training and Experience", Educational and Psychological Measurement, vol. 10, Winter, 1950, pp. 718-27.

This (1947-48) study was composed of four groups: a control group, a junior group, a senior group, and an experienced group. The control group was made up of first quarter juniors in education and was tested and then retested about ten days later. The junior group was composed of a randomly selected group of first quarter juniors. The senior group was composed of first quarter seniors. The junior group and the senior groups were both tested at the beginning of the school year and then tested after six months of professional courses. The experienced group was made up of graduates in education from the College of Education. This group was tested at the time of graduation and again after six months of teaching experience.

Significant changes in mean scores were found for the four groups between the two testings. The differences of means for the three groups were then compared with the change in mean scores for the control group. There was no significant change in mean scores for the seniors. The change in mean scores for the junior group was found to be significantly higher at the one per cent level.

The change in mean scores for the experienced group was found to be significantly lower at the one per cent level.

The increase for the junior group as contrasted with the no-increase for the senior group may in part have its explanation in the fact that the juniors were receiving their first professional courses. Further this difference may be due in some measure to the nature of the courses. The junior courses tend to emphasize child psychology and mental hygiene as contrasted with the practice teaching and method courses set for the seniors.

The apparent decrease in desirable teacher attitude for the experience group seemed to be the result of certain items. Eleven per cent of the 239 items showed a significant change in responses between the testing before and after experience.

Callis made the following report on the findings of this study:

An analysis of the effect of training and early experience on each of the 239 teacher-pupil attitudes (items) in the Inventory revealed that a majority of the attitudes were not affected significantly by training or experience. The first six months of the professional training produced changes in the desirable direction in 20 per cent of the attitudes (items) while the first six months of experience produced significant changes in the desirable direction in 11 per cent of the attitudes (items).<sup>1</sup>

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<sup>1</sup> Callis, Ibid. (16), p. 273.

All items indicating a significant change in responses because of experience or professional training were omitted from the published form composed of 150 items and known as Form A. As a matter of fact, 129 items were obtained from Form X-164 and 21 items were obtained from the remaining items of Form X-239.

There is indication in the following study conducted by Cook and Hoyt that the objective of this experiment has been somewhat realized.

3. The Cook And Hoyt Study (14) - 1952

Cook and Hoyt made an analytical study of the affect of teaching experience, post-high school education, and size of school system on attitudes (items) in the published form of the MTAI. For a more detailed consideration of the statistical data, the reader is referred to the tables of norms reported in the MTAI Manual (1) and the Cook-Hoyt study.

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<sup>14</sup> Walter W. Cook, and Cyril J. Hoyt, "Procedure for Determining Number and Nature of the Norm Groups for the MTAI," Educational and Psychological Measurement, vol. 12, No. 4, 1952, pp. 569-73.

<sup>1</sup>Cook et al., op. cit. (6), pp. 8-9.

The findings of the Cook and Hoyt study are as follows:

1. The factor of years of teaching experience was not significantly related to teacher attitudes in any of the analyses, indicating that the elimination of items negatively correlated with experience from the published form of the Inventory had achieved its purpose.
2. The factor of amount of post-high school education was significantly and positively related to teacher attitudes in graded elementary schools and high school, but not in one-roomed rural schools.
3. The factor of size of the school system is significantly and positively related to teacher attitudes in graded elementary schools.<sup>1</sup>

4. The Downie and Bell Study (17) - 1953

The purpose of the Downie and Bell study was to determine efficiency of the MTAI as an aid in the selection of teachers. Three variables were considered in this study: ACE total scores, over-all grade point averages (GPA), and grades in education.

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<sup>1</sup> Cook and Hoyt, op. cit. (14), p. 571.

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N. M. Downie and C. R. Bell, "The MTAI As An Aid in the Selection of Teachers", Journal of Education, vol. 46, May, 1953, pp. 699-704.

The sample consisted of 202 freshmen and 124 to 141 sophomores. The freshmen were taking a first course in education, and the sophomores were taking a second course in education.

A correlation was run between the MTAI scores and the three previously mentioned variables. The results are presented in the following table.

TABLE XIII

CORRELATION BETWEEN MTAI SCORES AND  
THREE OTHER VARIABLES<sup>1</sup>

	ACE Total Scores	Overall GPA	Grades in Education
Freshmen MTAI scores	.257	.289	.146 <sup>x</sup>
Sophomore MTAI scores	.385	.296	.518

<sup>x</sup> Based upon one course

<sup>1</sup> N. M. Downie and Bell, Ibid., (17) p.703.



Downie and Bell arrived at the following findings:

1. That there was a significant relationship between scores on the MTAI and total scores on the ACE psychological examination.
  2. That there was a significant relationship between scores on the MTAI and overall grade point average. There was definite relationship between MTAI scores and grades in education for sophomores but not freshmen.
  3. That the students who scored high on the MTAI tended to have background of experience with young people, an expressed interest in teaching and were rated as good prospects by their instructors. Poor students tend to show the opposite of these traits.<sup>1</sup>
5. The Cook and Medley Study (18) - 1954

Cook and Medley have recently investigated the possibility of building a "hostility" and "pharisaic-virtue" scale for the Minnesota Multiphasic Personality Inventory (19). The construction of the two scales for the Minnesota Multiphasic Personality Inventory are based principally on two selected sets

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<sup>1</sup> Downie and Bell, *Ibid.*, (17), p. 704.

<sup>18</sup> Walter W. and Donald M. Medley, "Proposed Hostility and Pharisaic-Virtue Scales for the MMPI", Journal of Applied Psychology, vol. 38, December, 1954, pp. 414-418.

of 50 items from 250 items found to differentiate significantly between teachers scoring high and teachers scoring low on the MTAI.

The hostility scale is designed to estimate the hostility in one's attitude or feeling towards situations and people as expressed in terms of statements.

The pharisaic-virtue scale is designed to estimate the degree with which one seeks security through virtue.

The sample consisted of 100 male and 100 female teachers. Correlations were run between the obtained scores on the MMPI scales and the scores on the MTAI (1).

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<sup>19</sup> Starke R. Hathaway and J. Charnley McKinley, The Minnesota Multiphasic Personality Inventory, New York: The Psychological Corporation, 1943.

<sup>1</sup> Cook and Medley, *Ibid.*, (18), p. 415.

TABLE XIV

RELATIONS AMONG Ho, Pv, AND MTAI SCALES

Correlations Coefficients	Males N = 100	Females N = 100	Total N = 200
Ho vs. MTAI	-.44	-.45	-.44
Pv vs. MTAI	-.38	-.54	-.46
Ho vs. Pv	.65	.73	.69
Ta vs. MTAI	-.45	-.54	-.50
Multiple R, Pv+Ho vs. MTAI	-.46	-.55	-.51
Beta weight for Ho	-.335	-.109	
Beta weight for Pv	-.163	-.463	

The results show that the Ho scale tends to be more effective for males, whereas the Pv scale tends to be more effective for females as indicated by the magnitude of the correlations and the beta weights. The multiple regression equation does not indicate a significant improvement over the prediction of Ho scale alone for the males or the Pv scale alone for the females. The implication is that males are less inhibited in indicating their hostilities and females less inhibited in indicating their virtue.

Where it is desirable to estimate the degree to which teachers of both sexes can maintain good classroom rapport, the authors (20) recommend use of the two scales combined into a single teacher attitude (Ta) scale.

#### VII. THE SUSCEPTIBILITY OF THE MTAI TO FAKING

Certainly, it is always difficult to know whether or not a testee's response to an item is a sincere one from the point of revealing his true attitude. There can be no positive assurance that a respondent's reply is an indication of his attitude; for in fact, it may be the very opposite of his true attitude. It is feasible that a teacher who has an antagonistic attitude towards children might respond quite oppositely to his true feelings in order to conceal his unfavorable or unpopular opinion from others. Again it would seem to be a matter of "choice" versus "attitude". In spite of this difficulty there is some consolation in the assumption that most people believe

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<sup>20</sup> Walter W. Cook and Donald M. Medley, Proposed Pharisaic-Virtue Scales for the MMPI Designed to Measure Ability to Work Harmoniously With People, (An Unpublished Paper on file at the College of Education, University of Minnesota, 1954), p. 8.

that their personal attitude towards children is the right one and would, therefore, support their position by making their answers conform to their beliefs.

In any event, a test which is greatly affected by faking has very little practical value. To date only two studies to determine the susceptibility of the Minnesota Teacher Attitude Inventory to faking have been reported in the literature.

1. The Callis Faking Study (16) - 1950

The first study to investigate the susceptibility of the MTAI items to faking was reported by Callis in 1950.

Form X-239 was used. This Form contains the original 164 items plus 75 additional ones taken from the remaining 492 tryout items. All the items selected for this form were known to discriminate at least at the 10 per cent confidence level between the two criterion groups.

The sample for this study was drawn from students registered as first quarter juniors in the College of Education, University of Minnesota.

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<sup>16</sup>R. Callis, "Changes in Teacher-Pupil Attitudes Related to Training and Experience", Education and Psychological Measurement, vol. 10, Winter, 1950, pp. 718-27.

Three testing sequences were used in order to test the susceptibility of the Inventory to faking. About six weeks time was allowed to elapse between the two testings of the first sequence. About ten days time was allowed to elapse between the two testings of sequence two and three respectively.

Here are the faking instructions verbatim:

"For the purpose of this task you are to place yourself in the following situation - you have applied for a teaching position you want very much to secure. It has all the qualities you hope to find in a teaching position. There are two other applicants for this job with approximately the same qualifications you have. The superintendent has asked the three of you to answer the Inventory and you know that the person who makes the highest score on the Inventory will get the job. Your sole aim in answering this inventory is to get as high a score as possible. You are to put your 'best foot forward'. You are to answer these items the way you think an excellent teacher would." <sup>1</sup>

A Table follows which presents a complete statistical comparison of the three testing sequences in the order which the standard and faking instructions were given.

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<sup>1</sup> Ibid. (16), p. 720.

TABLE XV

A STATISTICAL COMPARISON OF TESTING SEQUENCE 1,2, and 3<sup>1</sup>

Sequence	N	r	SD	Mean
(1) Standard	78		21.26	141.53
Faking	78	.53	22.84	151.13
(2) Faking	44		17.81	147.16
Standard	44	.78	18.72	145.34
(3) Standard	57		16.76	135.77
Standard	57	.84	20.06	135.77

<sup>x</sup>Probability greater than .05.

<sup>xx</sup>Probability less than .01.

The evidence presented in Table XV indicates that the test is only slightly susceptible to faking.

Callis writes:

The first conclusion is that the attitude measured by the Teacher Attitude Inventory are of sufficient stability to warrant further investigation as to their efficiency in predicting teacher-pupil relations and in pre-training selection of teachers.<sup>2</sup>

<sup>1</sup> Ibid. (16), p. 720.

<sup>2</sup> Ibid. (16), p. 725.

2. The Coleman Faking Study (21) - 1954

William Coleman of the University of Tennessee made a study of experienced teachers with the expressed purpose of testing the susceptibility of the MTAI to faking.

The sample consisted of 76 experienced teachers who were graduate students in education. The sample had a statistical mean teaching experience of 9.5 years.

The Inventory was first administered according to standard instructions. After a period of about seven days had elapsed, the test was administered a second time according to instructions to fake.

The instructions to fake (1) were as follows:

"Last week you completed this Inventory with what we hoped was a frank statement of your attitude on the questions given. Today, I would like to have you fill it out as you might in applying for a teaching position in a school system known for its permissive atmosphere and pupil-centred point of view. The salary and working conditions are the best in this area. Answer the questions in the way you would expect the administrators in this school system to favor." <sup>2</sup>

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<sup>21</sup> William Coleman, "Susceptibility of the Minnesota Teacher Attitude Inventory to Faking With Experienced Teachers," Educational Administration and Supervision, vol. 40, April, 1954, pp. 234-37.

<sup>1</sup> Coleman, Ibid. (21), p. 235.

<sup>2</sup> Ibid. (21), p. 235.



TABLE XVI

MINNESOTA TEACHER ATTITUDE INVENTORY MEANS AND  
SIGMAS FOR 76 EDUCATION GRADUATE STUDENTS<sup>1</sup>

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Instructions	Mean	SD
Standard	48.48	25.09
Faking	60.89	22.59

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The second testing resulted in a mean gain of 12.41 points as compared with a mean gain of 9.60 points found in the Minnesota study. The mean gain for the Coleman study was found significant at the one per cent level.

Coleman then goes on to conclude on the basis of this data that:

Use of the MTAI as a major factor in hiring a teacher or accepting a student for teacher-training would not seem warranted in light of the instruments susceptibility to faking.<sup>2</sup>

This conclusion would scarcely seem justified in light of the following observed weaknesses.

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<sup>1</sup> Ibid. (20), p. 235.

<sup>2</sup> Ibid. (20), p. 236.

In the first instance the investigator failed to use a control group. A gain of considerable size could be expected alone on the basis that experience gained from the first administration could provide the subjects with considerable insight into the nature of the Inventory.

In the second instance the investigator biased the instructions to faking a good score by deliberately giving the subjects insight into the nature of the attitudes (items) of the Inventory. Such instructions on the nature of the Inventory would obviously invalidate or destroy the usefulness of the instrument to measure the attitude which it was designed to estimate. Certainly the Coleman study can not be considered as a valid study to test the susceptibility of the Inventory to faking.

However, it is not the intention of this writer to imply that the MTAI is not at all susceptible to faking. As a matter of fact reputable studies (22, 23) have shown that instruments of this type are frequently susceptible to faking.

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<sup>22</sup> O. H. Cross, "A Study of Faking on the Kuder Preference Record", Educational and Psychological Measurement, vol. 10, No. 2, 1950, pp. 271-77.

<sup>23</sup> H. C. Steinmetz, "Measuring Ability to Fake Occupational Interests", Journal of Applied Psychology, vol. 16, March, 1932, pp. 123-30.

### SUMMARY

It was the purpose of this chapter to present a brief descriptive history of the Minnesota Teacher Attitude Inventory. This involved a thorough study of both the construction of the MTAI and a considerable number of 'further studies'. The data or source material used for this chapter were obtained from a complete survey of the literature, a study of Leeds' doctoral thesis, and a number of unpublished thesis documents and reprints.

The Minnesota Teacher Attitude Inventory was founded on the assumption that teacher attitude is one of the most important elements in good teacher-pupil relations. In other words, it is assumed that teachers possessing good classroom rapport, based on sympathetic understanding, kindness, mutual respect, and cooperative participation, have desirable teacher attitude. This assumption was later justified by the evidence from the studies in that the individual and combined criterion ratings of the teachers consistently correlated positively and significantly with the teachers' MTAI scores.

Investigations carried out in Pennsylvania, Ohio, South Carolina, Missouri, and Minnesota indicate that the Minnesota Teacher Attitude Inventory does perform its function with high reliability. Reliability studies for the entire test by the split-half procedure have usually yielded coefficients of the magnitude of 0.90.

Several validating studies have also been conducted in these states. All of these studies have used one or more outside criteria to determine test validity. The three criteria used singly, and in combination are: 1. principals' ratings of the teachers, 2. experts' ratings of the teachers, 3. pupils' ratings of the teachers. Of all criteria used, the pupils and experts appear to provide the most effective evaluation from point of agreement with the teachers' MTAI scores. The Inventory has consistently produced validity coefficients around 0.60, when a combination of the three criteria are used.

Other criteria (1) developed recently such as the proposed Ho and Pv scales from the Minnesota Multiphasic Personality Inventory indicate quite definitely that outside criteria of an objective nature can be constructed and used to determine the validity of the Inventory.

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<sup>1</sup> Cook and Medley, op. cit., (20), pp. 1-15.

High correlations obtained repeatedly between teachers' MTAI scores and teacher pupil relations found in the teachers' classrooms, indicate that the Minnesota Teacher Attitude Inventory does perform validly the function it was designed to perform. The Inventory can evidently be used with considerable assurance in the selection of students for teacher training and the selection of teachers for teaching positions. However, the norms presently available would not seem applicable in populations where different educational programs have been and are in operation. This is felt to be particularly true in view of the fact that in systems where four-year specialized courses are available, selection would naturally be much greater than in systems where only one-year general courses are given.

It has been suggested by the authors that the use of the Inventory could conceivably be extended to high school counseling of students and measuring of the effectiveness of a teacher training program. However, to date there has been no investigation to determine the application and validity of the Inventory in these areas.

A more specific use of the Inventory is implicit in the fact that the teachers who had taken courses in mental hygiene score significantly higher than teachers in general.

For a test to be an effective measuring instrument, it should be relatively free from the weakness of being susceptible to faking a good score. To date two studies have been carried out to test the susceptibility of the Minnesota Teacher Attitude Inventory to faking a good score. In the Callis study where faking instructions were given without providing any insight into the nature of the Inventory, it was found that the test was not susceptible to faking a good score.

However, in the biased Coleman study where insight into the nature of the test was made evident in the faking instructions, a significant increase in mean score was obtained. However, because of the extreme bias in the instructions, the Coleman study cannot be seriously considered as contributing information as to whether or not the test is really susceptible to faking.

From a complete survey of the previous works on the Minnesota Teacher Attitude Inventory, there appears to be sufficient evidence to conclude that the educational

background of the teacher population in Manitoba is not comparable to the educational background of the standardization groups. This implicitly indicates the need for local research on the Inventory before it can be used by administrators with assurance in selection practice in Manitoba.

## CHAPTER III

### THE VALIDITY AND RELIABILITY OF THE MINNESOTA TEACHER ATTITUDE INVENTORY

#### I. INTRODUCTION

##### 1. The Purpose

It is the primary purpose of this chapter to examine the validity of the Minnesota Teacher Attitude Inventory in Manitoba in order to establish norms for its use in several unique situations. Specifically, these unique situations include senior high schools, teacher training institutions, and school systems with twenty-eight or more teachers employed.

##### 2. The Validity of the Inventory

Two aspects of test validity will be considered in this chapter, namely, the relevance with which the test measures what it was designed to measure, and the functional validity of the test. Functional validity refers to the ability of the test to differentiate among teachers or potential teacher populations wherein it is suppose to function as a valid measuring instrument.



An attempt will be made to obtain an estimate of the effectiveness of the MTAI in the teacher training institutions. This will be done by considering the student-teacher MTAI scores in relation to outside validating criteria. The validating criteria will include pupil ratings of the student-teachers and advisor ratings based on the general performance of the student-teacher in practice teaching.

The MTAI will also be examined for susceptibility to faking, for it is generally recognized that an instrument which is highly susceptible to faking has little if any practical value.

### 3. The Reliability of the Inventory

Since the reliability of an instrument is a very important aspect of its validity, an attempt will also be made in this study to obtain an estimate of the reliability of the MTAI. Specifically, the test-retest procedure involving the product-moment correlation of first scores versus second scores will be applied to a random sample of student-teachers from each of the two local teacher training institutions.

4. The Limitations of the Study

For practical reasons it was necessary to limit this aspect of the study to the teacher training institutions and to classrooms in the Greater Winnipeg area where the student-teachers had done their practice teaching.

It was the original plan of the investigator to have pupils provide the basic validating criterion by formally reporting their reactions to their teachers. In spite of the fact that pupil-reaction toward teachers was esteemed to be a very important validating criterion, it was necessary to abandon the plan, because the idea met with such hostility and opposition by a large number of principals and teachers. However, it was possible to get a considerable number of principals and teachers to cooperate in having the student-teachers rated by this method. Some principals and teachers accepted with interest the idea of having pupils rate student-teachers and gave the investigator a free hand to carry out the work. Others opposed the idea with arguments against the principle, though reluctantly permitting the work to go ahead. Still others stood implacably hostile towards the entire idea.

Those who opposed the idea appeared frightened and shocked at the suggestion that pupils or "consumers" be asked to be critical of the quality of teaching they "purchase". Even after it was carefully explained that the results of the pupil ratings would be used only as a basis for determining the validity of another test, and that only the student-teachers would be rated by the scale, they still protested that the idea was too suggestive to the pupils and that it would undoubtedly arouse in the pupils an unusually critical attitude toward their own classroom teachers. The author was advised by many "teachers of long standing" that the whole thing spelt evil and if used would have dire consequences that would undoubtedly disrupt the entire good discipline and respect presently maintained in their schools.

A second argument advanced by some was that young children at the elementary grade level were not sufficiently mature to exercise valid criticism of what they see and hear. It was argued that children could not retain an accurate picture of the teacher's behavior from lesson to lesson. It is strange indeed

to hear such lack of confidence in the minds of young children. Certainly, in a democratic society, it is not only essential but important that children learn early to exercise critical thinking which is, at the same time, fair and constructive criticism of the things they see and hear. Still there are those who stubbornly maintain that it is the function of the teacher to tell with final authority and the function of the pupil to accept without criticism.

In view of the rather widespread displeasure on the matter of having pupils formally record reactions towards teachers, it is assumed to be appropriate to defend the position taken in this study even at the risk of becoming somewhat irrelevant to the primary purpose of the investigation. The literature is replete with studies pertinent to pupil ratings. Over one-hundred such studies have been reported in the last twenty years and not a single one of these studies has found that pupil ratings of teachers or student-teachers has had any adverse effect on the morale of teachers, student-teachers, or pupils.

Bowman concludes from his extensive research over the period of several years, that:

1. The morale of the pupils is improved by the opportunity to rate their teachers.
2. Student-teachers welcome pupil ratings as a means of growth.
3. The fact the student-teachers know in advance that they are to be rated by their pupils appears to stimulate the student-teacher to do good work rather than to "play the galleries".
4. The more often pupils are asked to rate teachers the more understandingly they appear to work and the more seriously they regard the under-taking.
7. When corrected for attenuation such ratings appear to be about as reliable<sup>25</sup> as results on many standardized tests.

Ward reports the following findings concerning high-school pupils rating practice-teachers:

2. If authorities can distinguish between good teaching characteristics and poor teaching characteristics, then this study indicates that high school pupils are capable, to a marked degree, of the same judgment, since the median correlation coefficient between pupils' ratings of practice-teachers and authorities' ratings of practice-teachers was .87 with 15 of 40 coefficients greater than .90.

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<sup>25</sup>  
E. G. Bowman "Pupil Ratings of Student-Teachers",  
Educational Administration and Supervision, vol. 20,  
February, 1934, p. 146.

3. There is practically no relationship between pupils' scholastic standing and their attitudes toward teachers (average biserial  $r$  0.05) as these attitudes are indicated by the Purdue Rating Scale for Instructors.<sup>26</sup>

Sister Mary has worked for many years on the problem of pupils rating their teachers. Here are the conclusions to her recent study:

1. Students are frank in their opinions of their teachers.
2. Students do express their attitudes and sentiments to others.
3. Students see their teachers daily in both good and adverse circumstances.
4. Student criticism may acquaint the teacher with hitherto unknown undesirable qualities.
5. Student rating is one easy, convenient, and economical way for a teacher to see himself as he is daily mirrored before his class.

In conclusion one might state that since elementary school pupils are (1) fairly stable in their ratings of teachers, and (2) exhibit a satisfactory degree both of agreement and discrimination, teachers in the elementary schools might profitably use teacher ratings as a means of knowing how they stand in the opinion of their pupils. This may prove a first step toward improvement of pupil-teacher relationships.<sup>27</sup>

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<sup>26</sup> W. D. Ward and Others, "The Training of Teacher-Personality by Means of Student Ratings", School and Society, vol. 53, February, 1941, p. 192.

<sup>27</sup> M. Amatora Sister Mary, "Teacher Rating by Younger Pupils," Journal of Teacher Education, vol. V, No. 2, 1954, pp. 150-152.

A foremost educational researcher, who has spent a number of years investigating the problem of having pupils rate their teachers has this to say:

From a series of questions designed to determine the effect on the morale of teachers that might have occurred from teachers evaluating their students' reaction to themselves, the investigators were able to conclude that the great majority of teachers can learn how their students are reacting without being emotionally disturbed.....

Certainly, the study gives no indication that the attitude of students was affected unfavorably through reporting their reactions to their teachers.<sup>28</sup>

From almost any angle that one views education, one is faced with the same conclusion, namely, that student reactions are so tremendously important that the most reliable methods available should be used in evaluating them.<sup>29</sup>

In the final analysis it is the pupil who experiences the "day to day" and "face to face" contact with the teacher. It is the pupil who sees the teacher over a sustained period of time. Logically then, the pupil is in the best possible position to observe the teacher in a normal atmosphere.

It appears extremely naïve to presume that the attitude of pupils would be affected adversely through formally making known how they feel toward their teachers.

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<sup>28</sup> R. C. Bryon, "Benefits Reported by Teachers Who Obtained Written Student Reactions," Educational Administration And Supervision, vol. 28, January, 1942, p. 75.

<sup>29</sup> R. C. Bryon, "Why Student Reactions to Teachers Should Be Evaluated", Educational Administration and Supervision, vol. 27, November, 1941, p. 590.

Formally too, it is possible to prove that children's ratings are honest, fair, constructive, and frank. Faking is most unusual, so is undue prejudice. In fact almost all prejudice is teacher caused as this MTAI assumes.

5. The Plan of the Chapter in Brief

A series of experiments were designed to obtain information on the validity and usefulness of the Minnesota Teacher Attitude Inventory in Manitoba. Specifically, the investigation will pursue the following plan:

- (a) The MTAI was administered to students of the two local teacher training institutions. In addition these people were randomly sampled and retested under different conditions or instructions.
- (b) A student-teacher rating scale was constructed in order to have school children rate Faculty of Education student-teachers. These ratings constitute the basic criterion for validating the MTAI



- (c) Random samples from both teacher training institutions were selected. The student-teachers' MTAI scores will be correlated with the supervisors' ratings on the general proficiency of their practice teaching.
- (d) A random sample selected from each of the two teacher training institutions was tested and retested under standard instructions. The results obtained from the two respective testings of each group will be correlated in order to obtain an estimate of the reliability of the MTAI.
- (e) The MTAI was administered under standard and faking instructions in order to test it for susceptibility to faking.

## II. OUR STUDENT-TEACHER

Since the use of Leeds' pupil rating scale "My Teacher" had consistently resulted in pupil ratings on teachers that have correlated high with

MTAI scores<sup>x</sup>, it was reasoned by analogy that a similar scale could be used successfully in having pupils rate their student-teachers. Thus "Our Student-Teacher"<sup>xx</sup> was constructed on the basis of Dr. Leeds' "My Teacher" pupil rating scale (1).

Leeds' scale consists of fifty questions. The pupil is requested to express his feeling toward the items by underlining "yes", "no", "?". For example,

" 38. Does this teacher lower your grade when you help anyone else?"<sup>2</sup>

The pupils were assured by the administrator of the scale that no one would ever know the results except the author. The pupils were also requested not to put their names on the scale.

On the basis of correlating odd and even numbered items, Leeds obtained an estimate of test reliability of the magnitude 0.94 after the Spearman-Brown formula was used (3).

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<sup>x</sup> See pages 30 to 33.

<sup>xx</sup> See Appendix C.

<sup>1,2</sup> Leeds, op. cit. (1) Appendix D  
Acknowledgement is made to Dr. Leeds in appreciation for the permission to use this material.

<sup>3</sup> Leeds, op. cit. (5), p. 18.

For more detailed report on Leeds' pupil rating scale, the reader is referred to pages 30 to 33 of Chapter II.

"Our Student-Teacher", Form A\*. The first experimental form of Our Student-Teacher contained 70 statements. The items permit three responses: "true", "false", or "not sure".

In administering the scale the pupils are given the following instructions:

"..... has been your STUDENT-TEACHER. Here are some things that might be said about this student-teacher. Underline "true", "false", "not sure" to tell how you feel about the question.

DO NOT write your name on this paper. NO ONE will ever know how you answered the questions. Give your honest answer to each question."

As in the case of "My Teacher", "Our Student-Teacher" was designed to be used in the elementary grades - grades four to six inclusive. Needless to say, the vocabulary had to be couched in grade four language. Though it was considered quite permissible to explain the meaning of the more difficult words to the class, in practice this was not necessary.

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\* See Appendix C.

After the Faculty of Education students had completed three weeks of practice teaching in the elementary grades, the pupil rating scale was administered. The results were very encouraging in that the pupils were in general agreement as to what they liked or disliked about a particular student-teacher. For example, in a particular class twenty-five out of thirty thought the student-teacher " talks too much", and at the same time twenty considered him " nice to listen to".

However, a number of items were found to be useless, since they did not discriminate among the student-teachers. For example, item 30, " is easy to fool", received a negative reply in almost every case. Such items which failed to discriminate among student-teachers were removed from the revised rating scale Form B<sup>x</sup>.

A reliability coefficient for Form A was estimated by the procedure of selecting at random two samples of ten pupil ratings. The mean score was determined for each sample of ten papers. The

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<sup>x</sup> See Appendix D.

two mean scores<sup>x</sup> for each student-teacher were paired and the fifty pairs were then correlated by the product-moment correlation technique. The correlation obtained was 0.81. This is an estimate of the reliability for ten raters; however, in practice there are usually well over twenty raters in a class. The estimate of reliability obtained by the Spearman-Brown prophecy formula for twenty raters is 0.89.

It is reasoned that this mean score procedure provides a much better estimate of reliability than does the split-half procedure . The logic behind this is that in the split-half procedure only one or two papers can be selected for each student-teacher. However, by using mean scores for paired groups of ten or so ratings on each student-teacher, it is possible to include the majority of the individual ratings in estimating the reliability of the scale. Certainly, the paired mean score method is very much more realistic than the split-half method. In practice an entire class would rate a student-teacher and not just a randomly selected individual as is implied in the split-half procedure.

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<sup>x</sup> See Appendix A, Table I.

"Our Student-Teacher", Form B<sup>X</sup>. Form B of Our Student-Teacher is a revised and improved version containing the best sixty items from the original seventy-item pupil rating scale.

After the Faculty of Education students had spent between two and three weeks practice teaching in the secondary grades, Our Student-Teacher was administered to the classes of a random sample of twenty-six student-teachers.

The reliability estimate for Form B was determined by the same procedure as used in estimating the reliability for Form A. Briefly, two samples of ten papers were selected at random from each of the twenty-six piles of pupil ratings. The mean for each group of ten papers was determined and the two mean scores<sup>XX</sup> for each student-teacher were paired and then correlated by the product-moment correlation technique. The correlation yielded a coefficient of 0.82, and when stepped up from ten to twenty raters the estimate became 0.91, which was slightly higher than the 0.89 obtained for Form A. In spite of the fact that reliability is directly dependent on the length of the test, it was apparently possible to remove non-functioning items without reducing the reliability of the test.

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<sup>X</sup> See Appendix D.

<sup>XX</sup> See Appendix A, Table II.

Scoring Our Student-Teacher. The initial form of the pupil rating scale was submitted to a panel of four experts in education\* in order to establish a criterion for scoring. Only those items, which received unanimous agreement in scoring from the four experts, were retained for use in the pupil rating scale.

The items of Our Student-Teacher were scored on the basis of agreement with the criterion scores which are reported in Appendix C and Appendix D. The pupil rating scales were scored by subtracting the number of "adverse responses" from the total possible.

The following table presents a statistical comparison of the internal consistency of the two forms of Our Student-Teacher rating scale.

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\* Faculty of Education Staff.

TABLE XVII

A STATISTICAL COMPARISON OF THE INTERNAL  
CONSISTENCY OF "OUR STUDENT-TEACHER"<sup>x</sup>

FORM A (70 items)		FORM B (60 items)	
Mean Scores X	Mean Scores Y	Mean Scores X	Mean Scores Y
n 10	n 10	n 10	n 10
R(30 to 62)	R(27 to 62)	R(32 to 52)	R(30 to 54)
GM 48.44	GM 48.22	GM 41.42	GM 42.04
SD 7.54	SD 7.40	SD 7.24	SD 6.59
.....		.....	
$r_{xy}$ 0.808 for n 10		$r_{xy}$ 0.822 for n 10	
$r_{xy}$ 0.894 for n 20		$r_{xy}$ 0.909 for n 20	

Conclusion. The attitude of pupils toward their student-teachers can evidently be measured with a high degree of reliability approaching (0.91).

<sup>x</sup> See Appendixes C and D.



### III. VALIDITY STUDIES

#### 1. The First Validity Study

The MTAI was administered to the entire student population enrolled in Education I prior to practice teaching in the schools.

After the Faculty of Education students had spent a three week period practising the art of teaching in the elementary grades from four to six, a random sample was made and Our Student-Teacher (Form A) was administered to the classes of fifty student-teachers.

Pupil Ratings. The pupil ratings on the student-teachers were scored. The average mark was determined for each class. This mean score represented the student-teachers obtained score. The obtained raw scores were then changed into T-scores. These pupil ratings were appropriately matched with the student-teacher MTAI T-scores<sup>x</sup>. These T-scores were then correlated by means of the product-moment method in order to obtain an estimate of the test validity of the MTAI. The

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<sup>x</sup> See Appendix A, Table III.

correlation between MPAI scores and pupil ratings produced a coefficient of the magnitude 0.39. This value is considerably higher than 0.31 found in the South Carolina Study and considerably lower than the correlations of 0.45 and 0.49 found in the Pennsylvania-Ohio and Missouri studies respectively.<sup>x</sup>

As was previously reported, the consistency with which the pupils rated their student-teachers was estimated to be 0.89. The product-moment correlation method and the Spearman-Brown prophecy formula were employed to determine the consistency of the test.

Advisor Ratings. The Faculty of Education students are assigned to an advisor for the duration of their training in Education I. During the periods of practice teaching these advisors go out into the schools and observe and aid these people in their practice-teaching. It is to be emphasized that this rating is not limited to any one phase of teaching competence such as teacher-pupil relations, nor do the advisors use a single uniform rating scale.

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<sup>x</sup> See pages 31 to 33.

The basic assumption of the authors (1) of the MTAI was that harmonious teacher-pupil relationships was one of the most important elements necessary for successful teaching. If this assumption were sound and the advisors' ratings were indicative of general teaching competence, at least a positive correlation should exist between the MTAI scores and the advisors' ratings.

The advisors' ratings on student-teachers performance in practice teaching were assigned in letters ranging from D\* to A\*. This range of 10 appeared to provide a convenient means for transmuting the literal numbers into real numbers; however, it was questionable that each advisor had used the literal numbers with the same values in mind. This was particularly suggested from the observation that some advisors used the plus and minus signs frequently and others used them scarcely at all. It was quite possible, therefore, that the writer committed a gross error in combining these ratings in spite of the fact that the ratings were supposed to be based on the same scale of values.

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<sup>1</sup> Leeds, op. cit. (5), p. 1.

It may be thought that a conversion of raw scores to T-scores in the case of each individual advisors' ratings would remove the difficulty. Unfortunately, it was not as simple as that. In the first instance, the ratings were already supposed to be comparable in terms from D<sup>+</sup> to A<sup>+</sup>. Secondly, because of the smallness and alikeness of the standard deviations for all groups of subjects, there could be no statistically significant change effected by a conversion to T-scores among or within groups. This should not be interpreted, however, to mean that it was not necessary to convert the raw scores obtained from the advisors' ratings in order to make a combination of different criterion scores possible. In fact T-scores<sup>x</sup> were the only scores used in this particular part of the study.

Combined criteria. The pupil and advisor ratings were combined to be used as a single criterion. In order to make this combination, all raw scores were converted into T-scores.

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<sup>x</sup>  
See Appendix A, Table III.

The correlation between the student-teacher MTAI scores and the combined criteria yielded a validity coefficient of 0.39. This was significant at the one per cent level and was identically the same as that obtained when using the pupil criterion alone.

The following table presents three validity coefficients obtained by correlating pupil ratings, advisor ratings, and combined pupil advisor ratings with student-teacher MTAI scores.

TABLE XVIII

CORRELATIONS BETWEEN MTAI SCORES AND PUPIL RATINGS,  
AND ADVISOR RATINGS FOR A RANDOM SAMPLE OF 50  
FACULTY OF EDUCATION STUDENT-TEACHERS

Factors Correlated	r	SE
MTAI vs. pupils' ratings	.387*	.121
MTAI vs. advisors' ratings	.174	.139
MTAI vs. combined pupil- advisors' ratings	.387*	.121
Advisors' ratings vs. pupils' ratings	.092	.142

\* These obtained r's are statistically significant at the one per cent level: Tables reported in Lindquist (30) were in this study.

<sup>30</sup> E. F. Lindquist, Statistical Analysis In Educational Research, New York: Houghton Mifflin Co., 1940, Table 13, p. 212.

Conclusions

- (a) An entire class of elementary school children can evidently rate student-teachers, whom they have known for a relatively short period of time, with a high degree of consistency. This closeness of agreement is expressed by the reliability coefficient of 0.89.
  
- (b) It was found that the mean scores from pupil ratings correlated positively and significantly at the one per cent level with MTAI scores obtained by the student-teachers. This obtained correlation of 0.39 indicates that the MTAI is a valid predictor of how well student-teachers will 'get along' with their pupils.
  
- (c) Since there can be no assurance that the advisors' ratings are truly comparable, or that they should have been combined, it is concluded, therefore, that the use of the advisors' ratings in this instance does not contribute information to the study.

## 2. The Second Validity Study

The second validity study was also based on the Faculty of Education students' practice teaching. This study differed from the first study in that the basic criterion was obtained from secondary pupils rather than from elementary pupils. A second observed difference existed in the fact that it was the second such teaching experience for these students. A third observed difference existed in the fact that the revised Form B\* of Our Student-Teacher was used in the second study. It was reasoned that the removal of the non-functioning items would serve to increase the discriminatory power of the rating scale.

After the student-teachers had completed from two to three weeks practice teaching at the secondary schools in grades seven to nine inclusive, Form B of Our Student-Teacher was administered to the class which the student-teacher had taught most frequently. This study involved a random sample of twenty-six student-teachers.

In this study the investigator personally administered the rating scale to the pupils. The investigator was extremely careful to avoid any remarks that

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\* See Appendix D.



might bias the pupils one way or the other concerning their student-teacher. This was done by using standard instruction in every class. Mr X's name was printed on the blackboard and the following instructions were given from memory.

" Mr. X has been your student-teacher. I would like you to help me do an experiment about Mr. X.

I have prepared 60 questions for you to answer. How you answer these questions will not hurt Mr. X in any way. I shall keep it strictly a secret. I want to learn how well you really know Mr. X."

The pupils were then asked to turn over their answer sheets and fill in the student-teacher's name. The instructions at the top of the sheet were then read with the class as follows:

" Mr. X has been your STUDENT-TEACHER. Here are some things that might be said about this student-teacher. Underline "true", "false", or "not sure" to tell how you feel about the question.

DO NOT write your name on this paper. NO ONE will ever know how you answered the questions. Give your honest answer to each question.

" THIS STUDENT-TEACHER

- |                                  |      |       |          |
|----------------------------------|------|-------|----------|
| 1. is hard to understand . . . . | true | false | not sure |
| 2. is easy to talk to . . . . .  | true | false | not sure |

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x See Appendix D.

In addition to the standard testing procedure, a second experimental instruction was imposed on the pupils immediately after they had completed the pupil rating scale. A scale numbered from one to ten was placed horizontally on the blackboard. The word "low" was written above the number "1", the word "average" was written above the number "5", and the word "high" was written above the number "10". The following instructions were given:

"You have just finished telling how well you know Mr. X by answering sixty questions about him. A scale numbered one to ten has been placed on the blackboard. Look at it! One is the low end. Five is the middle or average. Ten is the high end. Now forget about Mr. X as a person, or personality. Think only of the lessons Mr. X has taught you. Think seriously and honestly about the lessons. Put down a number from one to ten to tell how you feel about these lessons. Keep your hand over this number."

Pupil ratings. The pupil ratings were scored. The average mark was determined for each class. These mean scores represented the student-teacher' obtained score. The obtained raw scores were then appropriately matched with the student-teachers' MTAI raw scores<sup>\*</sup>

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<sup>\*</sup> See Appendix A, Table IV.

and correlated by means of the product-moment correlation technique. A validity coefficient of 0.51 was obtained. This was considerably higher than the coefficient 0.39 obtained in the first validity study and was in fact slightly higher than coefficients previously found between pupil ratings and MTAI scores.<sup>x</sup>

This increase might be attributed to the fact that most of the classes tested in the second experiment had a much more intimate acquaintance with their student-teachers. In the secondary schools many of the student-teachers guided a class through an entire unit extending over a two-week period of continued work.

It may even be that better performance was achieved in the second experiment than in the first by a virtue of a sense of security afforded the pupils in having an outsider administer the test under standard instructions. These reasons are of course only speculative.

The obtained correlation of 0.51 between pupil ratings and the MTAI scores certainly indicates that MTAI does predicate with a high degree of validity the teacher-pupil relationships that a student-teacher is likely

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<sup>x</sup> See pages 30 to 33.

to experience with pupils. This obtained correlation is slightly higher than those reported in previous studies;<sup>X</sup> however, it is observed that the local sample is smaller and the standard error is therefore considerably larger. The statistics for the Manitoba and Missouri study are respectively:  $0.51 \pm .15$ ,  $N = 26$ , and  $0.49 \pm .09$ ,  $N = 77$ .

Pupil Estimates. Upon completing Our Student-Teacher rating scale, the pupils were asked to think seriously and honestly about the lessons they had received from their student-teacher. They were asked to look at the blackboard where an increasing scale was drawn with numbers ranging from one to ten. They were asked to assign a number to these lessons quite apart from the student-teacher as a person or personality. The pupils were requested to record their estimate in secrecy from others.

As in the case of the pupil rating scale, the student-teacher's score was determined by taking the average score for the entire class.<sup>XX</sup>

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<sup>X</sup> See pages 30 to 33.

<sup>XX</sup> See Appendix A, Table IV.

Finally after the twenty-six mean scores were determined, they were matched appropriately with student-teachers' MPAI scores and correlated by the product-moment correlation method. A coefficient of 0.28 was obtained. It is interesting to observe, however, that these pupil estimates of the student-teachers' lessons correlated 0.80 with Our Student-Teacher which in turn correlated 0.51 with the MPAI.

Certainly, a correlation of the magnitude 0.80 between the pupils' estimates of the practice lessons and the pupils' ratings of the student-teachers indicates a high degree of consistency in the pupils' general reaction toward the student-teachers and their lessons. In view of the fact that the pupil ratings are based on "teaching personality" and their estimates are based on the effectiveness of the practice lessons, the high correlation might suggest that the pupils regard teaching personality as a very important element in teaching proficiency.

It is also interesting to note that the pupils' estimates of teaching proficiency also closely approximate the evaluations made by the advisors on the student-teachers' general performance in practice teaching. The

relationship is significant at the one per cent level and is expressed by the correlation coefficient of 0.40.

As was reported in the reliability study<sup>x</sup> on Our Student-Teacher, pupils are able to report consistently their reactions toward student-teachers with reliability approaching 0.91. This high degree of consistency is also apparent from the obtained correlation (0.80) between the pupils' ratings of the student-teacher and the pupils' estimates of the effectiveness of the lessons taught by the student-teachers.

Advisor Ratings. Unlike the ratings obtained in the first validity study, the advisor's ratings in this study were obtained on a uniform scale ranging in value from one to ten points.

It should be understood that the advisors' ratings on the student-teachers were based on general teaching proficiency and were not limited to teacher-pupil inter-personal relationships.

These assigned ratings were correlated with the student-teachers' obtained MTAI scores. This relationship was found to be significant at the one per cent

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x

See pages 96 to 100.

level as determined from the correlation coefficient of 0.43. The advisors' ratings correlated 0.63 with Our Student-Teacher and 0.40 with pupils' estimates of the student-teachers' lessons.

The very high relationship (0.63) existing between the advisors' ratings and the pupils' ratings of the student-teachers indicates that both advisors and pupils tend to see student-teachers in very much the same light even if viewed from somewhat different positions. It is also interesting to observe that the advisors' ratings correlate only slightly higher with the MTAI (0.43) than with the pupils' estimates of the student-teachers' lessons (0.40).

Combined criteria. It was reasoned that the combined ratings might possibly provide a better validating criterion by virtue of the fact that the extremes from both ratings might tend to counterbalance each other and thus yield a more moderate estimate of the student-teachers' true position.

The necessary conversion of raw scores into T-scores\* was made before the two ratings were combined. The MTAI scores were also changed into T-scores. The

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\* See Appendix A, Table V.

combined criteria were then correlated with the MTAI scores. The obtained coefficient was of the magnitude 0.56. Evidently, the combined criteria do approach more closely in agreement with the MTAI scores.

Table XIX presents the correlations obtained among rating procedures and the correlations obtained between separate criteria and the student-teachers' MTAI scores.



TABLE XIX

CORRELATIONS BETWEEN FACULTY OF EDUCATION STUDENT-TEACHER  
MTAI SCORES AND RATINGS BY PUPILS, AND ADVISORS

Factors Correlated	N = 50		N = 26	
	First Study		Second Study	
	r	SE	r	SE
MTAI scores vs. pupils' ratings	.387*	.121	.507*	.149
MTAI scores vs. pupils' estimates of student-teachers' lessons			.282	.184
MTAI scores vs. advisors' ratings	.174	.139	.425*	.164
MTAI scores vs. combined pupil- advisors' ratings	.387*	.121	.559*	.138
Advisors' ratings vs. pupils' ratings	.092	.142	.628*	.121
Advisors' ratings vs. pupils' estimates of student-teachers' lessons			.404**	.167
Pupils' ratings vs. pupils' estimate of student-teachers' lessons			.797*	.073

\* Significant at the 1% level

\*\* Significant at the 5% level

Conclusions

- (a) The obtained correlation (0.51) between pupil ratings and the MTAI scores indicates that the MTAI is a valid instrument in predicting a student-teachers' ability to 'get along' well with pupils.
- (b) Evidently pupils' attitudes toward their student-teacher can be measured with high degree of reliability (0.91). The correlation (0.80) between pupils' ratings of student-teachers and pupils' estimates of practice lessons is additional evidence of the consistency with which pupil attitudes can be measured.
- (c) The combined ratings of pupils and advisors resulted in an improved validity criterion (0.56).
- (d) The advisors' ratings correlated 0.43 with the student-teachers' MTAI scores.

### 3. The Third Validity Study

The third validity study included a random sample of 50 Normal School students. In this study only one validating criterion was used, namely, the combined rating of the classroom teacher and the student-teacher's advisor. The ratings were based on a scale from D<sup>+</sup> to A<sup>+</sup>.

Since the student-teachers were dispersed across the province, it was not practicable to go out and administer the pupil rating scale to their classes.

The MTAI was administered to the Normal School student-teachers prior to a two week period of practice teaching in public schools. The majority of these people practised in ungraded rural school.

These student-teachers were evaluated on the basis of general teaching proficiency. The assigned ratings for these student teachers were matched with their MTAI scores<sup>x</sup> and correlated by the product-moment correlation method. The resulting coefficient was 0.45. This was certainly surprisingly high in view of the lack of uniformity in the rating procedure.

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<sup>x</sup> See Appendix A, Table VI.

The problem of rating over five-hundred student-teachers poses a tremendous problem. With the available personnel, it is not possible to have experts observe all the students in their practice teaching. Certainly in view of this difficulty, it would be interesting to study the possibility of having the pupils rate their student-teachers.

This validity coefficient of 0.45 obtained on the basis of advisor versus MTAI scores compares favorably with its counterpart 0.43 obtained in the second validity study with Faculty of Education student-teachers.

The following table presents a comparison of the validity coefficients obtained in the three validity studies.

TABLE XX

A COMPARISON OF THE VALIDITY COEFFICIENTS FOR THE THREE STUDIES FROM CORRELATING ADVISORS' RATINGS AND STUDENT-TEACHERS' MTAI SCORES

Factor Correlated	N = 50		N = 26		N = 50	
	First Study		Second Study		Third Study	
	r	SE	r	SE	r	SE
MTAI versus Advisors' rating	.174	.139	.425	.164	.445	.115

Conclusions. The closeness of agreement (0.45) between advisors' ratings of practice teaching and the student teachers' MTAI scores would indicate that the Minnesota Teacher Attitude Inventory could be used as an important aid in teacher selection practices at the Provincial Normal School.

#### IV. THE RELIABILITY OF THE INVENTORY

In a strictly statistical sense, the reliability of an instrument refers to the consistency with which it measures whatever it does measure. The reliability coefficient then refers to the ratio of the variance of the true scores to the variance of the obtained scores. An estimate of the reliability of a test is usually determined by one or more of the following major procedures: (a) administering two equivalent tests and correlating the respective scores; (b) analysis of variance among items, (c) sub-dividing the test into equivalent halves; (d) administering the test a second time.

The first procedure in the case of the MTAI was rendered impossible for the time being by the fact that the authors (1) were unable to produce two

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<sup>1</sup> Leeds, op. cit. (5), p. 10.

equivalent forms with high valid items. So far as it is known an analysis of variance among the items has not been done. Both the 1946 and 1952 validation studies (1) employed the split-half procedure. By using the Spearman-Brown prophecy formula, coefficients of 0.91 and 0.93 were obtained respectively.

So far as the writer is aware there has been no deliberate attempt to determine the reliability of the Inventory by the procedure of administering the Inventory a second time. The idea may have been rejected because of the following difficulties which frequently distort the true picture of test reliability obtained by this method: (a) the memory factor, (b) the element of motivation, (c) the constancy of the sampling factor.

In spite of the shortcomings which this procedure may have, it is reasoned that if the test is highly reliable, a second testing should correlate positively and significantly high with the first testing.

1. MTAI Reliability Study at the Faculty of Education

The MTAI was administered and re-administered to a random sample of twenty-five student-teachers in the Faculty of Education at the University of Manitoba.

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<sup>1</sup> Leeds, op. cit. (9), p. 405.

The test was administered first about three weeks prior to the mid-year recess and then again just after the holiday. It is reasoned that the period of time was sufficiently long enough to erase memory or at least reduce its effect. However, it is unknown to what extent the three weeks of instruction might have affected the attitude of these students.

The paired scores obtained on the MTAI were correlated by the product-moment correlation technique. A reliability coefficient of 0.88 was obtained. This obtained correlation is probably less than might be expected on the basis of the test-retest procedure.

Reliability coefficients calculated from a repetition of the same test may be expected to be higher than those based upon parallel, equivalent forms to the extent that this variance associated with sampling of items is a factor.<sup>31</sup>

Nevertheless, the measure is a realistic one and it does approach closely the known reliability of 0.90 obtained from a different population.

The following table presents a statistical comparison of the two testings.

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<sup>31</sup>E. L. Lindquist, Educational Measurement, George Banta, Publishing Co., Menasha, Wisconsin, 1951, p. 578.

TABLE XXI

STATISTICS BASED ON MTAI RAW SCORES OBTAINED FROM A  
TEST AND RETEST OF 25 FACULTY OF EDUCATION STUDENTS<sup>1</sup>

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Statistic	First Testing	Second Testing
Range of scores	(-34 to 92)	(-26 to 94)
Mean score	26.64 ± 7.25	36.56 ± 7.06
Standard deviation	36.26 ± 5.23	35.32 ± 5.09

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Mean gain ..... 9.92\*  
" t" ratio ..... 2.765

Correlation coefficient 0.884 ± .044

Sex: 12 females, 13 males.

Educational background - ( 3 to 4) years in arts and science.

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\* Significant at the 1% level.

Conclusion. The validity studies show that the Inventory is a valid measuring instrument of teacher attitude. This study demonstrates that the instrument does measure with a high degree of consistency.

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\* See Appendix A, Table VI.



2. MTAI Reliability Study at Normal School

The MTAI was administered and re-administered to an unselected group of 36 Normal School students. In this study a period of about six weeks intervened the two testings.

As in the previous reliability study, the scores from the two testings were paired and correlated by the product-moment correlation technique. A somewhat higher correlation (0.92) was obtained in this study.

TABLE XXII

STATISTICS BASED ON MTAI RAW SCORES OBTAINED FROM A TEST AND RETEST OF 36 NORMAL SCHOOL STUDENTS<sup>1</sup>

Statistic	First Testing	Second Testing
Range of scores	(-36 to 76)	(-47 to 88)
Mean score	17.83 ± 4.83	26.22 ± 5.09
Standard deviation	28.98 ± 3.47	30.52 ± 3.65

Mean gain ..... 8.39<sup>‡</sup>

Critical ratio ..... 4.415

Correlation coefficient 0.923<sup>‡</sup> ± .025.

Sex: 22 females, 14 males.

Educational background: Grade (XI to XII) in academic subjects.

<sup>‡</sup> Significant at 1% level.

<sup>1</sup> See Appendix A, Table VIII.

Conclusion. In conjunction with the findings from the validity studies, it can be said that the Minnesota Teacher Attitude Inventory is a highly reliable measuring instrument of teacher attitude.

#### V. FAKING THE INVENTORY

A test is obviously useless if it fails to estimate validly and reliably whatever it was intended to measure. It follows logically, therefore, that a test which is highly susceptible to faking cannot be used with confidence or assurance in selection practices.

There can be no absolute assurance that a person will tell the truth. Inconsistencies can be observed and statistical correction made, but this does not account for the consistent liar, nor does it reveal the whole truth where a falsehood has been detected.

Certainly, it is known that people will falsify things in the face of threat and fear. The communists have little difficulty in persuading their hostages to lie or tell the truth. Examiners who set aims too high for their pupils are in fact inviting them to cheat. However, in a society where trust is a common

thing, it is intolerable to assume that most people will generally lie. It is only logical for people to believe in what they think; and so in a society where freedom of thought and expression is permitted, it is reasonable to expect frank and honest expression of thought.

Of course at the same time it is important that a test be relatively free from susceptibility to faking, if it is to be used successfully in selection practices where a fairly high degree of competition necessarily exists.

In designing a faking study there are many conditions that should be met; however, in practice it is not always possible to approximate the ideal. Nevertheless, it is vitally important that a control group be used and that the faking instructions be such that they permit no insight into the nature of the instrument. The present writer has previously criticized the Coleman study for these weaknesses (1).

To date there has been insufficient evidence to establish categorically one way or the other whether or not the Minnesota Teacher Attitude Inventory is

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<sup>1</sup> See page 78.

significantly susceptible to faking. It is the intention of the present writer to investigate this problem in a limited way.

1. MTAI Study Based On Biased Instructions

This study was suggested from the Coleman Study (1). The Coleman study employed one biased instruction without a control group. The present study employed two biased instructions with a control group.

The student-teachers at the Faculty of Education were divided into three randomly selected groups of twenty-five each. All these subjects had previously taken the MTAI. One group was given the Coleman instructions, namely an extremely progressivist point of view. A second group was given instructions based on the extreme opposite to Coleman instructions, namely an extremely traditionalist point of view. A third group was given standard instructions.

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<sup>1</sup> Coleman, op. cit. (21), pp. 234-37.

The three instructions are as follows:

Coleman Instruction.

" 'You have recently' completed this Inventory with what we hoped was a frank statement of your attitude on the questions given. Today, I would like to have you fill it out as you might in applying for a teaching position in a school system known for its permissive atmosphere and pupil-centred point of view. The salary and working conditions are the best in this area. Answer the questions in the way you would expect the administrators in this school system to favor." <sup>1</sup>

Instructions Based on Traditionalist Point of View.

" You have recently completed this Inventory with what we hoped would be a frank statement of the attitude on the questions given. Today, I would like you to fill it out as you might in applying for a teaching position in a school system known for its severe disciplinary control and teacher-centred point of view. The salary and working conditions are the best in this area. Answer the questions in the way you expect the administrators in the traditionalist school system to favor."

Standard Instruction.

" This Inventory consists of 150 statements designed to sample opinions about teacher-pupil relations. There is considerable disagreement as to what these relations should be: therefore, there are no right or wrong answers. What is wanted is your own individual feeling about the statements. Read each statement and decide how YOU feel about it. Then mark your answer on the space provided on the answer sheet. Do not make any marks on this booklet." <sup>2</sup>

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<sup>1</sup> Coleman, op. cit. (21), p. 235.

<sup>2</sup> Callis, Ibid. (16), p. 720.

In addition to the biased instructions quoted verbatim, an explanation was also given to clarify terms included in the instructions, such as "traditionalists" and "pupil-centred".

The control group registered a significant increase in mean score with a mean gain of 9.92 points (1). The relationship between the two testings is expressed by the correlation coefficient (0.88). In the case of the two biased groups there was absolutely no relationship between their attitude scores and their biased scores. The obtained correlations between biased and standard instructions for the "progressivists" (Coleman) and "traditionalists" were 0.09 and 0.15 respectively. The mean increase based on progressivists' instructions was of the magnitude 68.84, and the mean decrease based on the traditionalists' instruction was 141.68.

To facilitate comparison and interpretation of the data the following table was prepared.

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<sup>1</sup> See Table XXIII, page 132.

TABLE XXIII

STATISTICS BASED ON MTAI RAW SCORES OBTAINED BY  
FACULTY OF EDUCATION STUDENTS FROM STANDARD  
AND BIASED INSTRUCTION

STATISTICS			
First Testing	Standard Group	Progressivist Group	Traditionalist Group
Number of subjects	25	25	25
Range of scores	(-34 to 92)	(-46 to 59)	(-80 to 102)
Mean score	26.64 <sup>†</sup> 7.20 <sup>✓</sup>	10.12 <sup>†</sup> 5.19	37.92 <sup>†</sup> 7.95
Standard deviation	36.26 <sup>†</sup> 5.23	25.94 <sup>†</sup> 3.74	39.73 <sup>†</sup> 5.73
-----			
Second Testing			
Number of subjects	25	25	25
Range of scores	(-26 to 94)	(42 to 112)	(-125 to -86)
Mean score	36.56 <sup>†</sup> 7.06	78.96 <sup>†</sup> 4.08	-103.76 <sup>†</sup> 2.58
Standard deviation	35.32 <sup>†</sup> 5.09	20.38 <sup>†</sup> 2.94	12.92 <sup>†</sup> 1.86
Mean gain	9.92 <sup>x</sup>	68.84 <sup>x</sup>	141.68 <sup>x</sup>
Correlation r	0.384 <sup>x</sup> ± .044	0.087 <sup>†</sup> ± .198	0.154 <sup>†</sup> ± .195

<sup>x</sup> Significant at the 1% level.

In most things there are extremes. This is particularly true in areas of human relations. Education is no exception. In the area of teacher-pupil interpersonal relations, two possible extremes are rather obvious, a dominating ego-centric teacher at one extreme and a pampered unruly child at the opposite extreme.

In fact, all that this study has shown is that a student determined to favor one extreme or the other can successfully raise or lower his score in agreement with the two original criteria groups (1), apart from any relationship to his own true attitude. However, quite to the contrary, this does not mean that the test is susceptible to faking, it means rather that the test is adequate in revealing a biased or prejudiced attitude toward children from either extreme.

## 2. MTAI Faking Study

The Callis Study (2) was designed to test the susceptibility of the MTAI to faking in the case of the inexperienced teachers. Callis found that the test was not significantly susceptible to faking (3).

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<sup>1</sup> See page 18.

<sup>2</sup> Callis, op. cit. (16), pp. 718-27.

<sup>3</sup> See page 74.



In spite of the fact that this study seemed to have been excellently designed and executed, it appeared necessary to check this aspect of the Inventory in a local study, because of population differences (1).

In this faking study, 36 unselected Normal School students were chosen for the control group and twenty-two unselected Normal School students were drawn for the experimental group. The MTAI was previously administered to these people in a mass administration of the Inventory to the population. In the second administration the control group was given standard instructions and the experimental group was given the Callis faking instructions.

The standard and faking instructions are as follows:

"This Inventory consists of 150 statements designed to sample opinions about teacher-pupil relations. There is considerable disagreement as to what these relations should be: therefore, there are no right or wrong answers. What is wanted is your own individual feeling about the statements. Read each statement and decide how YOU feel about it. Then mark your answer on the space provided on the answer sheet. Do not make any marks on this booklet." 2

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<sup>1</sup> See pages 61, 64.

<sup>2</sup> See Appendix B.

Faking Instructions.

"For the purpose of this task you are to place yourself in the following situation - you have applied for a teaching position you want very much to secure. It has all the qualities you hope to find in a teaching position. There are two other applicants for this job with approximately the same qualifications you have. The superintendent has asked the three of you to answer the Inventory and you know that the person who makes the highest score on the Inventory will get the job. Your sole aim in answering this Inventory is to get as high a score as possible. You are to put your 'best foot forward'. You are to answer these items the way you think an excellent teacher would."<sup>1</sup>

The intervening time between the two testings was approximately six weeks.

It is interesting to note that in this study only the control group increased its scores significantly. In the case of the control group, the mean gain is significant at the one per cent level; whereas in the case of the experimental group, the main gain is not significant at the five per cent level.

It is also interesting to observe the effect the different instructions seemed to have had on the variance within the groups. The variance of the control group increased from 840.04 to 931.29, an increase of 91.25; whereas the variance of the experimental group increased from 659.92 to 1081.51, an increase of 421.59 .

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<sup>1</sup> Callis, op. cit., (16), p. 720.

The two testings of the control group based on standard instructions correlated 0.92. The two testings of the experimental group based on standard and faking instructions respectively correlated 0.69. These obtained correlations differed significantly at the one per cent level as determined by the method of "z" differences (1).

It would appear from these statistics that the "faking" instructions only served to confuse the subjects.

The following table presents the obtained statistics.

TABLE XXIV

STATISTICS OBTAINED FROM A FAKING STUDY AT  
THE PROVINCIAL NORMAL SCHOOL\*

STATISTIC		
Control Group	First Testing	Second Testing
Number of subjects	36	36
Range of scores	(-36 to 76)	(-47 to 88)
Mean score	17.83 ± 4.83	26.22 ± 5.09
Variance within	840.0355	931.2894
Standard deviation	28.98 ± 3.46	30.52 ± 3.65
.....		
Mean gain .....	8.39, significant at 1% level	
C.R of (M <sub>x</sub> -M <sub>y</sub> ) .....	4.415	
Correlation r <sub>xy</sub> .....	0.923 ± .025**	
Experimental Group	Standard	Faking
Number of subjects	22	22
Range of scores	(-16 to 68)	(-32 to 83)
Mean score	26.95 ± 5.48	35.09 ± 7.01
Variance within	659.9248	1081.5101
Standard deviation	25.69 ± 3.96	32.88 ± 5.07
.....		
Mean gain .....	8.14, not significant at 5% level	
"t" of (M <sub>x</sub> -M <sub>y</sub> ) .....	1.554	
Correlation r <sub>xy</sub> .....	0.692 ± .111**	

\* See Appendix A, Table VIII and XI.

\*\*  $(z_1 - z_2) = 0.7411 > (z_1 - z_2) \cdot (2.58) = .5488$ ,  
difference is significant at 1% level.

Conclusion. It is apparent from this study that the Minnesota Teacher Attitude Inventory is not significantly susceptible to faking.

#### VI. CONCLUSIONS TO CHAPTER III

(a) The findings of the studies reported in this chapter indicate that pupil attitude toward teachers can be measured with a high degree of reliability (from 0.89 to 0.91). The correlation (0.80) between the pupils' ratings of student-teachers on "Our Student-Teacher" and the pupils' estimates of the student-teachers' practice lessons provides additional evidence of the consistency with which pupil attitudes can be measured.

(b) Obtained correlations of 0.39 and 0.51 between the pupils' ratings and the student-teachers' MTAI scores indicate that the Minnesota Teacher Attitude Inventory is a valid instrument for predicting how well a student-teacher is likely 'to get along' with pupils.

(c) In the second validity study, the advisors' ratings correlated with the student-teachers' MTAI scores to produce a validity coefficient of 0.43.

(d) The combined ratings of the pupils and the advisors resulted in an improved validity criterion (0.56).

(e) The test-retest procedure has resulted in coefficients of 0.88 and 0.92. Evidently student-teacher attitude can be measured with a high degree of reliability.

(f) The findings of the 'biased' and 'faking' studies indicate that the Minnesota Teacher Attitude Inventory is not significantly susceptible to faking at the teacher training level.

## CHAPTER IV

### PERSONAL FACTORS IN RELATION TO THE MINNESOTA TEACHER ATTITUDE INVENTORY

#### I. INTRODUCTION

It is the primary purpose of this chapter to examine certain other personal factors in relation to MTAI scores in order to determine what classifications should be used in building group norms for use with the MTAI. Logically, the definition of the population for which a norm is to be built is highly arbitrary (1); nevertheless, it would be useless to build individual group norms where differences were not evident. The basic requirement for establishing a norm is that the population be homogeneous. "The more homogeneous the population for which the norm is established, the more meaningful the norm, granting that the individual whose score is being interpreted naturally belongs to the population."<sup>2</sup> Ideally then, wherever differences exist within a defined population, appropriate norms should be determined.

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<sup>1</sup> Lindquist, op. cit. (31), p. 739.

<sup>2</sup> Ibid. p. 740.

Specifically, it is the purpose of this Chapter to analyze the MTAI scores in relation to other personal factors, such as: teaching experience; age, academic standing, professional qualifications, intelligence, religion, scholarship - leadership, and 'choise of grade-level' in order to determine what classifications would justify the building of local norms.

The population. For practical reasons it was necessary to confine the present investigation to the Greater Winnipeg area, the 'off-campus' courses, and the teacher training institutions.

Cook and Hoyt found in their study to determine norms for the MTAI that "the size of the school system was significantly and positively related to teacher attitudes in graded elementary schools"<sup>1</sup> This study found a significant difference between school systems with twenty-one or more teachers and school systems with fewer than twenty-one teachers.

Since similar population differences could be expected to exist in Manitoba, it was considered wise to make similar distinction in considering the local population. However, in practice the smallest school

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<sup>1</sup> Cook and Hoyt, op. cit. (14), p.571.



school system sampled contained twenty-eight teachers. The local population consisted of approximately two-thousand teachers from eight suburban and two urban school systems which contained in all about one-hundred and fifty schools.

The population of experienced teachers enrolled in 'off-campus' professional teacher courses were considered independently of the random sample of experienced teachers.

Sampling the general population. A random sampling (1) was made of the one-hundred and fifty school plants in the Greater Winnipeg area.

In all, approximately ninety per cent of the teachers volunteered to complete the Inventory. Of the ninety per cent who offered cooperation, about ninety-five per cent completed the Inventory. In fact, about eighty-five per cent of the total random sample contributed to this study.

Administering the Inventory. The project was explained to the appropriate school administrators. Without exception the author was given permission to request the principals of the schools to cooperate in the project.

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<sup>1</sup>Rand's Random Numbers. See Dixon and Massey, op. cit. (24). pp. 290-94.

The author personally delivered the Inventories to the schools concerned. The teachers were requested to complete the Inventory by a certain date when the author would return to pick them up. In most cases the Inventories were ready on time; however, in some cases it was necessary to make several return trips for the Inventories.

In the case of the teachers engaged in further professional training the writer obtained permission from the individual instructors to take the last half hour of one of their lecture periods for the purpose of administering the Inventory.

Personal data sheet. A personal data inquiry was mimeographed on the reverse side of the answer sheets (1):

DO NOT GIVE YOUR NAME

1. State the grades you presently teach.. \_\_\_\_\_
2. State the grades you prefer or would prefer to teach ..... \_\_\_\_\_
3. State your academic standing Grade XII, B. A., etc ..... \_\_\_\_\_
4. State your professional standing: Normal School, B. Ed., etc ..... \_\_\_\_\_
5. State number of years teaching experience ..... \_\_\_\_\_
6. State your age ..... \_\_\_\_\_

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<sup>1</sup> See Appendix B, Answer Sheet.

This personal data sheet provided the basis for setting up the different classifications of personal factors.

Chapter outline. Briefly, the chapter will be presented as follows:

- (a) The Inventory was administered to Grade XII students who indicated no special interest in teaching and to high-school seniors enrolled at Normal School to see whether or not the MTAI differentiated significantly between these two classifications.
- (b) The Normal School students' MTAI scores will be examined in relation to the following personal factors:
  - (a) religion;
  - (b) scholarship and leadership;
  - (c) choice of grade-level.
- (c) The MTAI scores obtained by the Faculty of Education students will be considered in relation to the following personal factors:
  - (a) ACE total scores (32).
  - (b) "Ta" scores (1).

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32 L. L. Thurstone and T. G. Thurstone, The American Psychological Examination, Washington DC: The American Council on Education, 1949.

(d) The MTAI was administered to a random sample of teachers teaching in primary, elementary, and secondary schools in the Greater Winnipeg area. The obtained MTAI scores will be examined in relation to the following personal factors:

- (a) 'choice of grade-level;
- (b) age;
- (c) teaching experience;
- (d) educational background;
- (e) 'off-campus' professional educational courses.

## II. MTAI SCORES OF HIGH-SCHOOL SENIORS IN RELATION TO THEIR INTEREST IN TEACHING

The immediate objective of this study is to determine whether or not the MTAI differentiates significantly between high-school seniors who have selected teaching as a vocation and those who indicate no special interest in becoming teachers.

Rands' (24) random numbers were employed to obtain a random sample of six intact groups of Grade XII students from the Greater Winnipeg area. After

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<sup>24</sup> Wilfrid J. Dixon and Frank J. Massey, Introduction to Statistical Analysis, New York: McGraw-Hill Book Company, Inc., pp. 290-94.

the pupils completed the Inventory, they were requested to indicate on their answer sheets if they had any intention of becoming teachers. No more than a half dozen indicated such a choice. These were eliminated from the sample.

The MTAI scores of this sample of randomly selected groups were tested by the technique of analysis of variance to see whether or not all the groups were drawn in a statistical sense from the same population. No significant or observed differences were found. Evidently, the sample was a fairly good estimate of the high-school senior population from the Greater Winnipeg area.

The MTAI had been previously administered to the Normal School population of high school seniors enrolled in a one year course in education. The Normal School sample of 386 students was classified according to the grade-level they indicated a preference to teach. The breakdown was as follows: 115 primary, 195 elementary, and 76 secondary prospective teachers.

A statistical analysis of the two classifications was made by applying the analysis of variance technique to the between and within groups. The following table

presents the statistics based on:

- (a) The consideration of the four sub-groups of high-school seniors: prospective primary teachers, prospective elementary teachers, prospective secondary teachers, and non-teachers.
- (b) The consideration of the two groups of high-school seniors: those enrolled in teacher training, and those who indicate no special interest in becoming teachers.

TABLE XXV

ANALYSIS OF VARIANCE OF MTAI RAW SCORES ACCORDING TO  
FOUR CLASSIFICATIONS OF HIGH-SCHOOL SENIORS - 1955<sup>1</sup>

Source of Variance	n	d.f	Sum of Squares	Variance	F
Between sub-groups	4	3	16208.3828	5402.7943	
Within sub-groups	525	525	426832.9069	813.0151	
Total	529	528	443041.2897	6215.8094	
Variance ratio					6.65*
Between total groups	2	1	12110.0322	12110.0322	
Within total groups	527	527	426832.9069	809.9296	
Total	529	528	438942.9391	12919.9618	
Variance ratio					14.95*

\* Significant at the 1% level

\* See Appendix A, Tables: XII-XV.

Table XXV shows a highly significant difference between the MTAI scores of high-school seniors who select teaching and those who indicate no special desire to teach. With limited information it is dangerous to attempt to interpret the significance of this difference. It is known for instance, that a significantly greater percentage (about ninety per cent) of rural seniors than urban seniors enroll at Normal School each year. Whether or not this has a further implication will be left to the reader to speculate on.

Conclusion. There is a statistically significant difference between MTAI scores of high-school seniors enrolled at Normal School and Grade XII students in Greater Winnipeg schools who indicate no special desire to become teachers.

### III. NORMAL SCHOOL STUDENT-TEACHER MTAI SCORES AND PERSONAL FACTORS

#### 1. A Study of MTAI Scores in Relation to Religion

The Normal School population was sampled and classified on the basis of religion. In all a sample of one-hundred and sixteen Catholics and a sample of two-hundred and seventy-one Protestants were obtained.

TABLE XXVI

STATISTIC BASED ON MTAI SCORES IN RELATION TO RELIGION  
FOR 116 CATHOLICS AND 271 PROTESTANTS AT NORMAL SCHOOL

Statistics	Catholics	Protestants
Number of teachers	116	271
Range of MTAI scores	(-64 to 78)	(-69 to 91)
Mean MTAI score	4.41 <sup>1</sup> ± 2.78	16.38 <sup>1</sup> ± 1.89
Standard deviation	29.85 <sup>1</sup> ± 1.97	30.99 <sup>1</sup> ± 1.33
N. of primary teachers	25	90
N. of secondary teachers	36	40
% of primary teachers	40.98	69.23
% of secondary teachers	59.02	30.77
-----*		
Difference between mean MTAI scores .....		11.97*
Critical ratio .....		3.41
Difference between grade percentages .....		28.25*
Critical ratio .....		4.16

\* Significant at the 1% level.

Studies (1) show consistently that primary teachers tend to score significantly higher than secondary teachers on the MTAI. Similarly, in this study (2), the prospective primary teachers tend to score significantly higher than the secondary teachers.

From Table XXVI, it is observed that the difference between the MTAI scores of the Catholics and Protestants is significant at the one per cent level; however, this difference may be explained in the fact that a significantly larger per cent of the Catholic students have an interest

<sup>1</sup> Cook et al., op. cit. (6), p. 6.

<sup>2</sup> See page 152 ff.



in teaching secondary grades. This difference is also significant at the one per cent level.

Therefore, the evidence indicates that the MTAI does not discriminate significantly between attitudes of Catholics and Protestants.

2. A Study of the MTAI Scores in Relation To Scholarship  
And Leadership

Two groups of approximately forty-seven students each were selected from the entire Normal School population on the basis of their previous scholarship - leadership attainment. One group was selected on the basis of its superior status and the other on the basis of its inferior status.

The MTAI raw scores for these two groups were tested statistically to determine what relationship if any might exist between students' scholarship - leadership qualities and their MTAI scores.

The following table presents a comparison of the statistics for the superior and inferior groups.

TABLE XXVII

A STATISTICAL COMPARISON OF NORMAL SCHOOL STUDENTS  
 CLASSIFIED RESPECTIVELY ACCORDINGLY TO SUPERIOR  
 AND INFERIOR SCHOLARSHIP — LEADERSHIP <sup>1</sup>

Statistics	Superior Group	Inferior Group
Number of subjects	47	47
Range of scores	(-43 to 69)	(-69 to 69)
Mean score	11.40 ± 4.06	1.62 ± 4.45
Standard deviation	27.54 ± 2.87	30.22 ± 3.15
-----		
Differences between means	9.78*	
Critical ratio .....	1.53	

\* Not significant at the 5% level.

It was stated at the outset of this thesis, that differences would be considered significant at the one per cent level in the case of consistency and the five per cent level in the case of relevance or relationship. Since the closeness of agreement between the two categories does not satisfy the confidence level, the null hypothesis of no difference would be accepted.

<sup>1</sup> See Appendix A, Table XVIII.

However, the writer would emphasize that it may well be that in this case the level of confidence is set too high for such highly subjective data. If this is so, the hypothesis of no significant difference in means is being rejected when in fact it may be real.

The fact that the difference is significant at the ten per cent level would justify further research. It would be interesting to consider leadership and scholarship separately in relation to MTAI scores.

3. Normal School Student-Teachers Classified According  
to 'Choice of Grade'

It is the immediate objective of this study to determine whether or not a real difference exists at the teacher training level between the obtained MTAI scores and the grade-levels the prospective teachers indicate a preference to teach.

At the time of administering the MTAI to the Normal School students, they were asked to indicate the grades they would prefer to teach. The grades were then classified into primary, elementary, and secondary levels.

In all an unselected sample of 386 student-teachers was obtained and classified according to the grade-levels they indicated a preference to teach. The classification is as follows: 115 primary teachers, 195 elementary teachers, and 76 secondary teachers.

Statistically, the technique of analysis of variance was applied to test the hypothesis that the three classifications are from the same population.

Table XXVIII presents the statistical treatment of the data.

TABLE XXVIII

ANALYSIS OF VARIANCE OF PRIMARY, ELEMENTARY AND  
SECONDARY NORMAL SCHOOL PROSPECTIVE TEACHERS

Source of Variation	n	d.f	Sum of Squares	Variance	F
Grade-levels (between)	3	2	6707.2378	3353.6189	
Within Groups	383	383	326054.0991	851.3162	
Total	386	385	332761.3369	4204.9351	
Variance ratio					3.94 <sup>x</sup>

<sup>x</sup> Significant at the 5% level.

An obtained "F" of 3.94 indicates that differences are not due to chance. The hypothesis that all groups are representative of the same population is rejected.

This application of analysis of variance only tells us whether or not the groups belong to the same population; it does not tell us that all the groups differs significantly from each other. It is therefore necessary to apply yet another technique to determine whether or not all the groups means differs significantly from each other.

Table XXIX presents a statistical comparison of the three grade-levels and the application of the critical-ratio test to the differences between means.

TABLE XXIX

STATISTICS BASED ON MTAI RAW SCORES OBTAINED BY  
PRIMARY, ELEMENTARY, AND SECONDARY PROSPECTIVE  
TEACHERS AT THE PROVINCIAL NORMAL SCHOOL

Statistic	Primary	Elementary	Secondary
Number of subjects	115	195	76
Range of scores	(-58 to 91)	(-69 to 73)	(-69 to 68)
Mean score	16.47 ± 2.95	12.23 ± 1.89	7.09 ± 3.51
Standard deviation	31.51 ± 2.09	26.51 ± 1.34	30.38 ± 2.48
-----			
Mean of primary - mean of elementary .....			4.24
CR for primary - elementary .....			1.211
Mean of primary - mean of secondary .....			9.38 <sup>x</sup>
CR for primary - secondary .....			2.049
Mean of elementary - mean of secondary .....			5.14
CR for elementary - secondary .....			1.301

<sup>x</sup> Significant at 5% level.

The findings of this study indicate that there is a significant difference between the attitude of students who elect to become primary teachers and those who elect to become secondary teachers.

In spite of the fact that the differences between prospective primary teachers and elementary teachers, elementary teachers and secondary teachers, were not found to be significant at the five per cent level, it was considered wise to set up separate norms for each grade-level in order to provide better homogeneous grouping. As was pointed out earlier, the value of a norm is essentially dependent on the homogeneity of the represented category or population. The logic of this decision was also supported by earlier findings reported by Cook, Leeds, and Callis.

"The MTAI has consistently shown significant differences between the attitudes of primary teachers, intermediate grade teachers, high school academic teachers . . . . These differences are present at the time education students begin professional courses and at the time they graduate with a teaching certificate, as well as among experienced teachers in the field." <sup>1</sup>

#### IV. FACULTY OF EDUCATION STUDENT-TEACHER

##### MTAI SCORES AND PERSONAL FACTORS

##### 1. MTAI Scores in Relation to ACE Scores <sup>2</sup>

It is the purpose of this study to determine whether or not there exists a relationship between

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<sup>1</sup> Cook et al., op. cit. (6), p. 6.

<sup>2</sup> Thurstone and Thurstone, op. cit. (32), (ACE Test).

intelligence as measured by the ACE and teacher attitude as measured by the MTAI.

The MTAI scores obtained by the Faculty of Education students were correlated with their total ACE scores.

The correlation yielded a coefficient (-.138) which is not significantly different from zero. For further consideration of this problem, the reader is referred to Appendix A, Table XIX.

This finding verifies earlier findings reported by the authors of the MTAI.

"A later study using first quarter juniors in the College of Education, University of Minnesota, indicated that MTAI scores are not significantly related to intelligence. The correlation coefficient between scores on the Miller Analogies Test (Form A) and Inventory scores (Form A), was .13, which is not significantly at the five per cent level." <sup>1</sup>

Conclusion. The findings of this study with Faculty of Education students indicates that there is no measurable relationship between intelligence and attitude toward children in so far as the MTAI is concerned.

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<sup>1</sup> Cook et al. op. cit. (6) p. 12.



2. MPI Scores In Relation to "Ta" Scores<sup>x</sup>

Medley and Cook (1) have recently developed a proposed Teacher-attitude (Ta) scale for the MMPI. This teacher-attitude scale is made up of two sub-scales called the Hostility (Ho) scale and the Pharisaic-virtue (Pv) scale. All the items contained in these scales are taken in text from the MMPI (2).

The teacher who scores low on the MPI is essentially insecure socially. This is evidenced most directly by a high level of generalized hostility toward people. The low scoring teacher tends to believe that children are not honest, sincere, well meaning, industrious, etc. The relationship is circular --- rejection generates hostility and hostility generates rejection. Such a teacher tends to find security through (A) Pharisaic-virtue (a rigid adherence to high standards of morality and perfection); (B) power over people (strong emphasis on dominance - submission, strong - weak, leader-follower dimensions); and (C) a thorough knowledge of subject matter (if one knows his subject little else matters in teaching).<sup>3</sup>

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<sup>x</sup> "Ta" Scores: see pages 70-71.

<sup>1</sup> Cook and Medley, op. cit. (18), pp. 414-18.

<sup>2</sup> Hathaway and McKinley, op. cit. (19), (MMPI test).

<sup>3</sup> Cook and Medley, op. cit. (20), p. 1.

On admission to the Faculty of Education at the University of Manitoba, all students were requested to take the MMPI. At a later date they were requested to complete the MTAI.

A special key was constructed and used to obtain each students' Ho and Pv scores from the MMPI. The scores on the sub-scales were correlated both separately and in combination with the students' MTAI scores.

The following table presents the statistical relationship between the obtained scores on the scales and the MTAI scores.

TABLE XXX

RELATIONSHIP AMONG Ho, Pv, Ta, AND MTAI SCORES WITH A SAMPLE OF 89 FACULTY OF EDUCATION PROSPECTIVE TEACHERS<sup>1</sup>

Correlation Coefficients	Males (N=35)	Females (N=54)	Total (N=89)
Ho vs. MTAI	-.439 <sup>X</sup> ± .139	-.130 ± .135	-.297 <sup>X</sup> ± .097
Pv vs. MTAI	-.298 <sup>XX</sup> ± .153	-.262 ± .128	-.257 <sup>XX</sup> ± .099
Ta vs. MTAI	-.416 <sup>X</sup> ± .140	-.232 ± .130	-.315 <sup>X</sup> ± .096
Ho vs. Pv	0.554 <sup>X</sup> ± .117	0.389 <sup>X</sup> ± .117	0.440 <sup>X</sup> ± .086

<sup>X</sup> Significant at the 1% level.

<sup>XX</sup> Significant at the 5% level.

<sup>1</sup> See Appendix A, Tables XX, XXI, XXII.

The findings of this study are substantially in agreement with the findings of Cook and Medley reported on page 72. Although the observed inverse relationships among the Ho, Pv, and Ta scores with the MTAI scores in the present study are lower, they are not significantly lower (1) than those reported in the Cook and Medley study.

Certainly, it would appear that the proposed Ta scale may provide a useful measuring device for estimating teacher attitude. Another possible function of the Teacher-attitude scale is its use as a validating criterion for the Minnesota Teacher Attitude Inventory.

Conclusion. The Teacher-attitude (Ta) scale does apparently measure teacher attitude in significant inverse agreement with the MTAI as is evident by the correlation coefficients:  $-.416$  for the males, and  $-.315$  for both sexes.

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<sup>1</sup> Lindquist, op. cit., (30), p. 215.

V. OTHER PERSONAL FACTORS OF EXPERIENCED  
TEACHERS AND THEIR MTAI SCORES

1. A Study of MTAI Scores in Relation to 'Choice of Grade'

It is the immediate purpose of this chapter to analyze the MTAI scores of experienced teachers in order to determine whether or not the scores differentiate significantly among the teachers on the basis of the grades they indicate a preference to teach.

A criterion. It was necessary first to establish a criterion for classifying teachers into definite categories such as primary, elementary, and secondary teachers. Unlike the Minnesota teacher training institutions, Manitoba teacher training institutions do not prepare teachers for specialized teaching in such areas as: early childhood education, elementary education, and secondary education. Therefore, it was not possible to establish a criterion on the basis of training; however, two criteria seemed possible, namely, classification according to the grades the teachers were employed to teach, or classification according to the grades the teachers indicated a preference to teach.

A classification of teachers according to the grades they were employed to teach would in many cases be nothing more than a categorization according to circumstances.

It was reasoned that if a true indication of teacher attitude was to be obtained on the basis of grade-levels, it would be necessary to classify the teachers according to their preferences or choice of grades. In practice however, approximately seventy-five per cent of the teachers indicated that they were satisfied to teach their present grades.

The sample. The total random sample consisted of 392 experienced teachers. The breakdown of the sample according to the grade-levels the teachers indicate a preference to teach is as follows: 111 primary teachers, 103 elementary teachers, 178 secondary teachers.

Primary refers to kindergarten to grade three inclusive. Elementary refers to grades four to six inclusive. Secondary refers to grades seven to twelve inclusive.

It is to be observed that the largeness of the secondary sample is to be attributed to the fact that this classification contains six grades; whereas

the other classifications contained four and three grades respectively.

Treating the data. The technique of analysis of variance was applied first to determine whether or not the observed differences among groups were statistically significant.

The following table presents this procedure.

TABLE XXXI

ANALYSIS OF VARIANCE OF EXPERIENCED TEACHERS' MTAI  
RAW SCORES CLASSIFIED ACCORDING TO THE GRADE LEVELS<sup>1</sup>  
THEY INDICATED A PREFERENCE TO TEACH — 1955

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Source of Variation	n	d.f	Sum of Squares	Variance	F
Between levels	3	2	48710.6050	24355.3025	
Within levels	389	389	590793.6721	1518.7498	
Total	392	391	639504.2771	25874.0523	
Variance ratio					16.04 <sup>x</sup>

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<sup>x</sup> Significant at the 1% level.

<sup>1</sup>

See Appendix A, Tables: XXIV, XXV, XXXI.

The analysis of variance indicates that there is a significant difference among the experienced teacher groups. However, this difference merely indicates that the groups are not all from the same statistical population. It is now necessary to discover exactly where the real differences exist. In order to do this the differences between means will be tested for significance by the critical-ratio test.

The following table presents the statistics for the three grade-levels.

TABLE XXXII

STATISTICS BASED ON MTAI RAW SCORES OBTAINED BY PRIMARY, ELEMENTARY, AND SECONDARY TEACHERS FROM THE GREATER WINNIPEG AREA — 1955

Statistic	Primary	Elementary	Secondary
Number of subjects	111	103	178
Range of scores	(-14 to 116)	(-60 to 98)	(-64 to 75) <sup>x</sup>
Mean score	31.34 ± 3.53	21.98 ± 3.75	5.55 ± 2.77
Standard deviation	37.08 ± 2.50	37.91 ± 2.65	36.82 ± 1.96
-----			
Mean of primary - mean of elementary .....			9.36 <sup>xx</sup>
"CR" for primary - elementary .....			1.817
Mean of primary - mean of secondary .....			25.79 <sup>x</sup>
"CR" for primary - elementary .....			5.748
Mean of elementary - mean of secondary .....			16.43 <sup>x</sup>
"CR" for elementary - secondary .....			3.526

<sup>x</sup> Significant at the 1% level.

<sup>xx</sup> Significant at the 7% level.

Table XXXII indicates clearly that there is a highly significant difference between the MTAI scores of the primary and secondary teachers. Likewise there is a highly significant difference between the MTAI scores of the elementary and secondary teachers. In both instances, the lower grade teachers score significantly higher than the secondary teachers. In the case of the primary and elementary teachers, the primary teachers tend to score higher than the elementary teachers. This difference is significant at the seven per cent level.

Conclusion. The significance of the differences between grade-levels indicates that these people do not come from the same statistical population. Though the difference between the primary and elementary is not statistically significant at the five per cent level, a difference in means as large as 9.36 could be expected to happen by chance only seven times in a hundred. In fact the differences among the primary, elementary, and secondary teachers are sufficiently large to indicate that individual grade-level norms would be necessary for adequate interpretation of MTAI scores in practice.



As in the Cook and Hoyt (1) study the MTAI discriminates among the primary teachers, the elementary teachers, and the secondary teachers. The primary teachers tend to score highest; the elementary teachers tend to score second highest, and the secondary teachers tend to score lowest.

## 2. A Study of Teaching Experience in Relation to MTAI Scores

The immediate purpose of this study is to determine whether or not the MTAI scores are significantly affected by experience; whereas the primary purpose of this study is to determine whether or not it will be necessary to build norms on the basis of teaching experience.

Only eighty-one primary teachers and sixty-eight elementary teachers indicated their number of years of teaching experience. Those who indicated this information were so classified according to their number of years of teaching experience into intervals of one to ten years and eleven years upwards.

The following table presents the pertinent statistics.

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<sup>1</sup> Cook and Hoyt, op. cit. (14), pp. 569-573.

TABLE XXXIII

EXPERIENCED PRIMARY AND ELEMENTARY TEACHERS CLASSIFIED  
ACCORDING TO TEACHING EXPERIENCE

Statistics	Primary Teachers	Elementary Teachers
<u>Exp. (1 to 10) yrs (X)</u>		
Number of teachers	33	23
Range of scores	(-19 to 116)	(-42 to 78)
Mean score	29.46 ± 6.22	23.13 ± 6.78
Standard deviation	35.22 ± 4.40	31.82 ± 4.80
.....		
<u>Exp. (11 to 40) yrs (Y)</u>		
Number of teachers	48	45
Range of scores	(-48 to 116)	(-61 to 90)
Mean score	27.58 ± 5.44	17.09 ± 5.85
Standard deviation	37.25 ± 3.84	38.78 ± 4.13
$M_x - M_y$	6.04 <sup>x</sup>	1.38 <sup>x</sup>
CR for ( $M_x - M_y$ )	0.582	0.328

<sup>x</sup> Not significantly different from zero.

It is evident from Table XXXIII that there is no significant relation between experience and attitude as measured by the MTAI.

A further study was carried out to check whether or not a significant difference might be evident in a direct comparison of Inventory scores with the exact number of years of teaching experience. In order to make such a comparison, the Inventory scores of the same 81 primary teachers were matched with the teachers' years of teaching experience, and the data were correlated. The correlation resulted in a coefficient of  $-.13$  which does not differ significantly from zero. For further statistical comparison see Appendix A, Table XXIX.

The findings of this study are in substantial agreement with those reported by the authors of the Minnesota Teacher Attitude Inventory.

" 1. Length of teaching experience was not significantly related to teacher attitudes in any of the analyses, indicating that the elimination of the items negatively correlated with experience from the published form of the Inventory had achieved its purpose."<sup>1</sup>

Conclusion. It is evident from the findings of this study that experience does not significantly, or observably affect the scores on the MTAI, and it is, therefore, unnecessary to build norms for the MTAI on the basis of teaching experience.

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<sup>1</sup> Cook et.al., op. cit., (6), p. 10.

3. A Study of MTAI Scores in Relation to Age<sup>1</sup>

The immediate interest of this study was to determine whether or not attitude as measured by the MTAI is affected by age.

The MTAI scores of eighty-one unselected primary teachers were matched with the teachers' ages in years, and the two series of data were correlated. The obtained coefficient of  $-.16$  indicated that there was no significant relationship between age and MTAI scores.

The findings of this study was not surprising in view of the fact that it had already been established in the previous study that teaching experience was not related to MTAI scores.

4. A Study of MTAI Scores in Relation to Educational Background

The purpose of this study is to determine whether or not MTAI scores are affected significantly by educational background.

In the population considered in the present study there was insufficient differentiation in professional background to make a statistical analysis

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<sup>1</sup> See Appendix A, Table XXIX.

of this factor with MTAI scores possible. This became particularly evident once it was found that the 'choice Of grade-level' had a significant effect on MTAI scores.

A study was made, however, to see what effect academic standing might have on MTAI scores. In this study the MTAI scores were matched with the number of years of academic training above Grade X. This provided a convenient means for differentiating between the academic qualifications of the individual members of the sample. The range of years of academic training beyond Grade X was from one to seven years, or Grade XI to five years at university.

Years of academic training correlated with MTAI scores to yield a coefficient of 0.15. This correlation did not indicate a significant relationship.

The findings of this study cannot be considered of much importance in light of the fact that there was a very limited variation in academic qualifications throughout the sample. For example over fifty-seven per cent of the teachers indicated a Grade XII standing. The standard deviation in fact was only 1.84. Before any conclusions can be made and justified, further research would be necessary.

5. A Study of MTAI Scores in Relation to Professional Courses

It was the immediate interest of this study to determine whether or not the MTAI scores of experienced teachers who had elected to take 'off-campus' professional courses were significantly different from the MTAI scores of experienced teachers in general.

Theory and method courses. This study was concerned with eighty-two experienced teachers enrolled in 'off-campus' professional educational courses in: geography methods, curriculum, and elementary school administration.

At least ninety-five per cent of the teachers enrolled in the courses were from the same population defined in this study as the Greater Winnipeg area.

The classes had completed approximately twenty-four hours of course work at the time the Inventory was administered. The Inventory was administered to each of the classes during the last half hour of one of their regular lecture periods.

Since there were only a half dozen teachers who indicated a preference to teach in the primary grades, the primary and elementary teachers were combined in this study. In all, the sample contained twenty-six indicating a preference to teach grades one to six and fifty-six teachers indicating a preference to teach grades seven to twelve.

The following table presents the statistical comparison of the two groups.

TABLE XXXIV

A COMPARISON OF MTAI RAW SCORES OF 82 TEACHERS TAKING 'OFF-CAMPUS' COURSES IN EDUCATION — 1954<sup>1</sup>

Statistic	Gr. (I-VI) Teachers	Gr. (VII-XII) Teachers
Number of teacher	26	56
Range of scores	(-42 to 93)	(-56 to 86)
Mean score	38.12 ± 7.50	8.16 ± 5.09
Standard deviation	37.51 ± 5.30	37.75 ± 3.60
-----		
$(M_x - M_y)$ is 29.96 <sup>x</sup> , $t (M_x - M_y)$ is 2.754		
Experience	(1 to 5) yrs.	(6 to 30) yrs.
Number of subjects	32	50
Range of scores	(-53 to 86)	(-67 to 93)
Mean score	17.66 ± 7.23	17.10 ± 5.72
Standard deviation	40.26 ± 5.12	40.03 ± 4.04
-----		
$(M_x - M_y)$ is .56, $t (M_x - M_y)$ is 1.		

<sup>x</sup> Significant at the 1% level.

<sup>1</sup> See Appendix A, Tables: XXX, XXXI.

It is to be observed that the difference between the mean score for the primary - elementary teachers and the mean score for the secondary teachers is significant at the one per cent level. Again as in previous studies, the lower-grade teachers tend to score significantly higher than the upper-grade teachers. It is also to be observed that in this study, as in other studies, the MTAI does not discriminate on the basis of teaching experience. In fact there are no significant or observed differences between this group of teachers taking 'off-campus' course and the general population considered earlier in this study.

A Course in Mental Hygiene. This course of study is unlike the other 'off-campus' courses in that its subject matter deals specifically with human relations in child education. A second observed difference is noted in the fact that the sample is from outside the general population defined as the Greater Winnipeg area.

The sample was composed of twenty-eight experienced teachers who had just completed a thirty-five hour 'off-campus' course in mental hygiene.



Unfortunately, this group was not tested at the time the course commenced. It would have provided a basis for estimating any effect that the course may have had on the attitudes of the teachers. However, the present study was not begun until a much later date.

In order to facilitate the interpretation of the data, Table XXXV is presented.

TABLE XXXV

MTAI RAW SCORES OF 28 EXPERIENCED TEACHERS HAVING JUST COMPLETED AN OFF-CAMPUS COURSE IN MENTAL HYGIENE- 1954

NO.	SCORE	
<u>PRIMARY</u>		
1.	85	1. MTAI scores (a): $S_a = 318$ , $S_a^2 = 22238$ .
2.	02	2. Range of MTAI scores (2 to 82) points.
3.	24	3. Mean of MTAI scores (53.00 ± 13.43) points.
4.	74	4. Standard deviation = 29.96 ± 9.48.
5.	59	1. Range of experience (4 to 28) years.
6.	74	2. Mean of experience (14.43) years.
<u>ELEMENTARY</u>		
1.	65	1. MTAI scores (b): $S_b = 400$ , $S_b^2 = 25994$ .
2.	22	2. Range of MTAI scores (22 to 95) points.
3.	67	3. Mean of MTAI scores (57.14 ± 8.01) points.
4.	45	4. Standard deviation = 21.24 ± 6.14.
5.	61	
6.	95	1. Range of experience (2 to 30) years.
7.	45	2. Mean of experience (15.78) years.
<u>SECONDARY</u>		
1.	75	
2.	61	
3.	72	
4.	73	1. MTAI scores (c): $S_c = 816$ , $S_c^2 = 55210$ .
5.	08	2. Range of MTAI scores (8 to 95) points.
6.	55	3. Mean of MTAI scores = (54.40 ± 7.17) points.
7.	25	4. Standard deviation = 26.85 ± 5.08.
8.	95	
9.	65	1. Range of experience (1 to 23) years.
10.	71	2. Mean of experience (11.16) years.
11.	20	
12.	15	
13.	30	
14.	90	
15.	61	
<u>TOTAL GROUP N = 28</u>		
1.		Range of experience (1 to 30) years.
2.		Mean years of experience 12.75 years.
3.		Range of MTAI scores (2 to 95) points.
4.		Mean of MTAI scores (54.79 ± 5.06) points.
5.		SD of MTAI scores = 26.31 ± 3.58.

x Teachers are classified according to the grade-level they would prefer to teach.

It is particularly interesting to observe that there are no significant differences among MTAI scores for the three grade-levels. This is certainly unlike the previous findings reported in this chapter. A further observed difference is noted in the size of the mean scores ( 53.00, 57.14, 54.40) for the primary, elementary and secondary teachers respectively as compared with the mean scores ( 31.34, 21.98, 5.55) for the Greater Winnipeg area population.

A statistical comparison of the mental hygiene class is made with the other 'off-campus' classes in education which consist of teachers taking courses in education theory and method. The comparison is presented in Table XXXVI.

TABLE XXXVI

THE STATISTICAL DIFFERENCE BETWEEN MTAI GENERAL  
MEAN SCORES FOR A MENTAL HYGIENE CLASS AND  
A GROUP OF METHODS AND THEORY CLASSES

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Statistic	Mental Hygiene Course	Method-Theory Courses
Number of subjects	28	82
Range of scores	(2 to 95)	(-67 to 93)
Mean score	54.79	17.32
.....		
Mean difference .....	37.47 <sup>x</sup>	
CR for ( $M_x - M_y$ ) .....	3.457	

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<sup>x</sup> Significant at the 1% level.

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Certainly, the evidence indicates that these teachers do not belong to the same population. It would seem to be fairly safe to assume that something has happened to this sample that did not happen to the other 'off-campus' sample of teachers taking professional courses.

One of the basic functions of a mental hygiene course in early childhood education is to correct misconceptions and unhealthy attitudes toward children. It is only logical, therefore, that attitudes of the teacher should be significantly affected by a course of study in mental hygiene.

It is known that the MTAI was designed to predict teacher-pupil relations in the classroom by measuring teacher attitude. It is also known that a great number of items (1) contained in the MTAI were drawn from the area of mental health.

It, therefore, appears feasible that the highly significant differences between means for 'off-campus' classes could be attributed to a change of teacher attitude.

This finding is in substantial agreement with the earlier findings by the authors of the MTAI.

" 5. Teachers who had courses in mental hygiene scored higher than those who had not. This was found for all three groups; the difference was significant at the five per cent level for the superior group"<sup>2</sup>

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<sup>1</sup> Leeds, op. cit. (5), p. 4.

<sup>2</sup> Cook et al., op. cit. (6), p. 12.

## VI. CONCLUSION TO CHAPTER IV

The findings of this study have quite definitely indicated that separate norms should be determined for: Grade XII students; primary, and secondary student-teachers at Normal School; Faculty of Education students; and experienced primary, elementary, and secondary teachers in the field.

- (a) A statistically significant difference at the one per cent level was found to exist between the MTAI scores of the high-school seniors enrolled at Normal School and Grade XII students from school in the Greater Winnipeg area who indicated no interest in becoming teachers. The Normal School students scored significantly higher than the Grade XII students.
- (b) The MTAI was not found to discriminate significantly between teacher attitude of Catholics and Protestants.

- (c) There appeared to be a positive relationship between scholarship - leadership attainment and MTAI scores. However, this difference was only found to be significant at the ten per cent level.
- (d) There was a statistically significant difference (at the five per cent level) found to exist between the attitudes of Normal School students who elected to become primary teachers and those who elected to become secondary teachers. The primary teachers scored highest; the elementary teachers scored second highest; and the secondary teachers scored lowest.
- (e) A study at the Faculty of Education indicated that there was no relationship ( $-.14$ ) between intelligence as measured by the ACE and the teacher attitude as measured by the MTAI.
- (f) Faculty of Education students' MTAI scores correlated significantly and negatively ( $-.32$ ) with the Teacher-attitude (Ta) scale.

- (g) MTAI scores differentiated significantly (0.01 to 0.07) among experienced teachers on the basis of their choice of grade-levels. The primary teachers scored highest; the elementary teachers scored second highest; and the secondary teachers scored lowest.
- (h) There was no significant relationship found between teaching experience and teacher attitude as measured by the MTAI. This indicated that the authors of the MTAI had apparently succeeded in eliminating items affected by experience.
- (i) The findings of this study also indicated that there was no significant relationship between age and teacher attitude as measured by the MTAI.
- (j) The MTAI did not differentiate significantly between teachers enrolled in 'off-campus' courses and teachers from the general population.
- (k) A highly significant difference (0.01) was observed between those who had received a course in mental hygiene and those who had taken other 'off-campus' courses in education.



## CHAPTER V

### DETERMINING NORMS FOR THE MINNESOTA TEACHER ATTITUDE INVENTORY IN MANITOBA

Research on the Minnesota Teacher Attitude Inventory in Manitoba has indicated quite definitely that the Inventory was a valid predictor of how well student-teachers would be likely 'to get along' with pupils. Correlations of 0.39 and 0.56 were obtained between outside criteria and the MTAI scores of the student-teachers. This outside criteria consisted of the combined ratings of the pupils and advisors on the student-teachers at their practice teaching. These obtained correlations were also found to be in substantial agreement with those reported by the authors (1) of the MTAI (0.58, 0.50).

In two local test-retest studies the MTAI was found to be a highly reliable measuring instrument at the teacher training level. Correlation coefficients of 0.86 and 0.92 were obtained in these studies after the Spearman-Brown prophecy formula had been applied. These findings were also in close agreement with the earlier findings reported by Leeds (2). Leeds obtained reliability coefficients of 0.91 and 0.93 by using the 'split-half' method of correlating odd and even numbered items. The obtained correlation coefficients were stepped-up by using the Spearman-Brown prophecy formula.

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<sup>1</sup>

Cook et al., op. cit. (6). pp. 11, 14.

<sup>2</sup> Leeds, op. cit. (9), p. 405.

Grade-level Classification according to grade-level implies the teachers' personal choice of grade-level; it does not refer to teacher preparation or employment status.

Population groups. The populations were defined as follows: Grade XII students from the Greater Winnipeg area; Normal School student-teachers from Manitoba; Faculty of Education students from Manitoba; and experienced teachers from the Greater Winnipeg area.

The Greater Winnipeg area refers to eight suburban and two urban school systems. This investigation was restricted to school systems with a minimum of twenty-eight teachers. This was done because of possible population differences. Previous studies have shown that "the size of the school system was significantly and positively related to teacher attitudes in graded elementary schools." <sup>1</sup>

An analysis of variance of the MTAI scores was made in order to determine whether or not certain other personal variables were related to teacher attitude and if so, what local norm groups should be established for adequate interpretation of the various MTAI scores. These studies which were reported in Chapter IV have shown quite definitely that eight sets of norms should be determined for the use of the MTAI in Manitoba.

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<sup>1</sup>

Cook and Hoyt, op. cit. (14), p. 571.

Specifically, norms will be presented for:

- (1) High-school seniors.
- (2) Normal School prospective primary teachers.
- (3) Normal School prospective elementary teachers.
- (4) Normal School prospective secondary teachers.
- (5) Faculty of Education prospective teachers.
- (6) Experienced primary teachers.
- (7) Experienced elementary teachers.
- (8) Experienced secondary teachers.

1. High-School Seniors

In view of the fact that the high-school population at the Grade XII level has provided Manitoba with its primary source of prospective teachers, it was considered of practical importance to present a norm for high-school seniors.

The norm for Grade XII students was based on a random sample of 143 high-school seniors at about midway in their final year at high school. The sample consisted of seventy males and seventy-three females. This sample represented students from essentially all socio-economic levels in the Greater Winnipeg area.

The norm for Grade XII students is presented in Figure 1. The interpretation of MTAI raw scores into percentile rank equivalents is given in Table XXXV.

TABLE XXXVII

CALCULATION OF CUMULATIVE PERCENTAGES BASED ON  
MTAI SCORES OBTAINED BY 143 GRADE XII STUDENTS<sup>1</sup>

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Intervals	f	Cum.f	Cum. % f
75- 89	1	143	100.00
60- 74	1	142	99.30
45- 59	3	141	98.60
30- 44	14	138	96.50
15- 29	23	124	86.71
00- 14	32	101	70.63
-15- (-01)	37	69	48.25
-30- (-16)	19	32	22.38
-45- (-31)	6	13	9.09
-60- (-46)	6	7	4.90
-70- (-61)	1	1	.70

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<sup>1</sup> See Appendix A, Table XII.

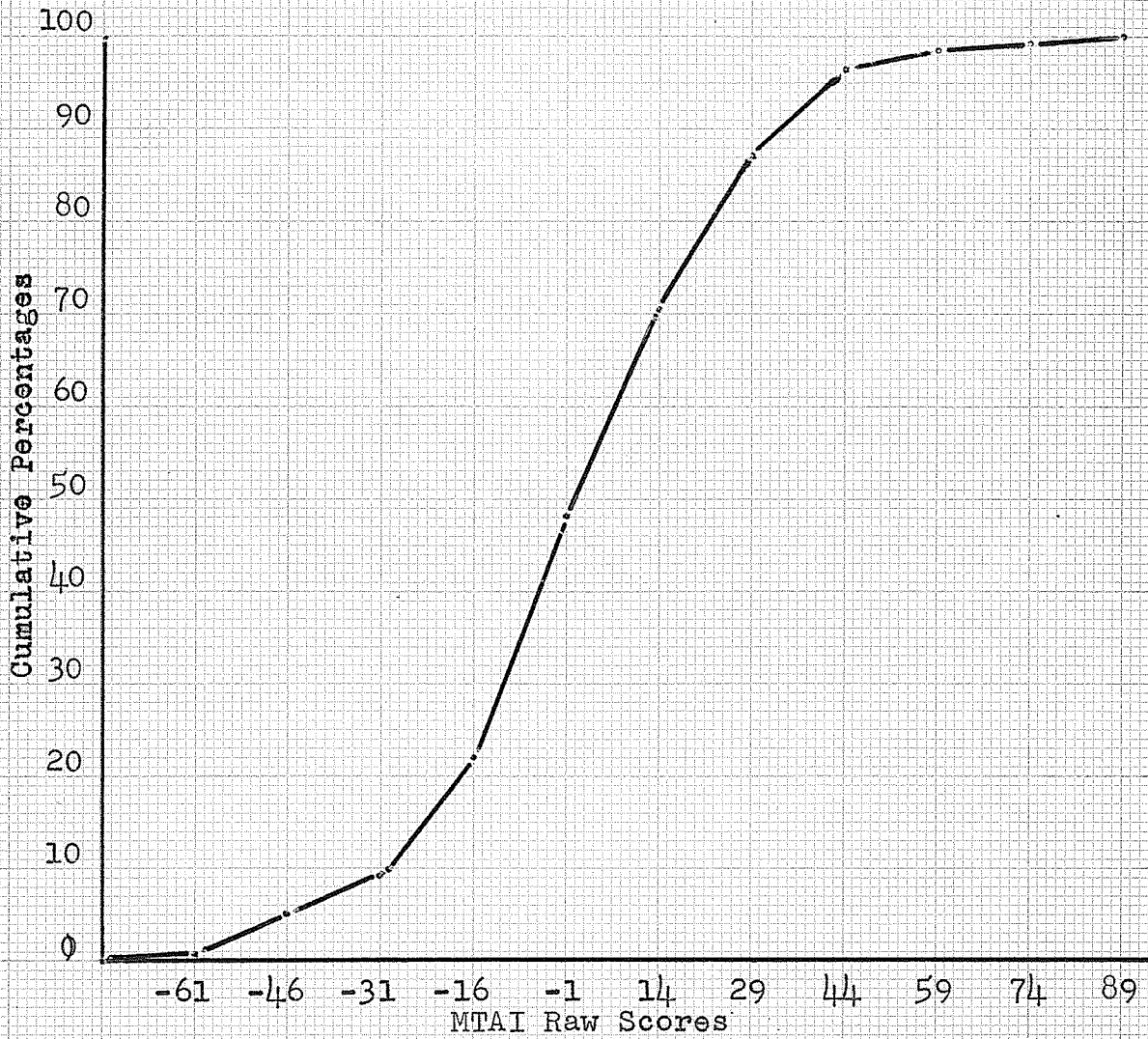


FIGURE 1

MTAI SCORES FOR 143 GRADE XII STUDENTS  
(CUMULATIVE PERCENTAGE CURVE PLOTTED  
FROM TABLE XXXVII)

2. Normal School Prospective Teachers

The Manitoba Provincial Normal School population was primarily made up of high-school seniors who had recently left school with academic standings varying from Grade XI to a complete Grade XII. About twelve per cent of this population was drawn from the Greater Winnipeg area. The remaining eighty-eight per cent was obtained from the high-school centres across the Province of Manitoba.

These prospective teachers were enrolled in a one-year course of basic preparation for teaching. Emphasis was placed on preparing these students to teach in ungraded rural schools which generally include the first eight grades.

Classification into the grade levels of: (a) primary, (b) elementary, (c) and secondary was based strictly on the expression of the student-teacher's attitude or choice of grades and was in no way related to his formal training.

The following three tables present the classified data used in building the norms for the Normal School primary, elementary, and secondary student-teachers respectively. The individual norms are presented in graphical form in the accompanying figures.

TABLE XXXVIII

CALCULATION OF CUMULATIVE PERCENTAGES BASED ON MTAI  
SCORES OBTAINED BY 115 NORMAL SCHOOL PROSPECTIVE  
PRIMARY TEACHERS<sup>1</sup>

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Intervals	f	Cum. f.	Cum. % f.
90- 100	1	115	100.00
75- 89	6	114	99.13
60- 74	4	108	93.91
45- 59	11	104	90.43
30- 44	13	93	80.87
15- 29	26	80	69.56
00- 14	15	54	46.96
-15-(-01)	21	39	33.91
-30-(-16)	12	18	15.65
-45-(-31)	4	6	5.22
-60-(-46)	2	2	1.74

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<sup>1</sup> See Appendix A, Table XIII.

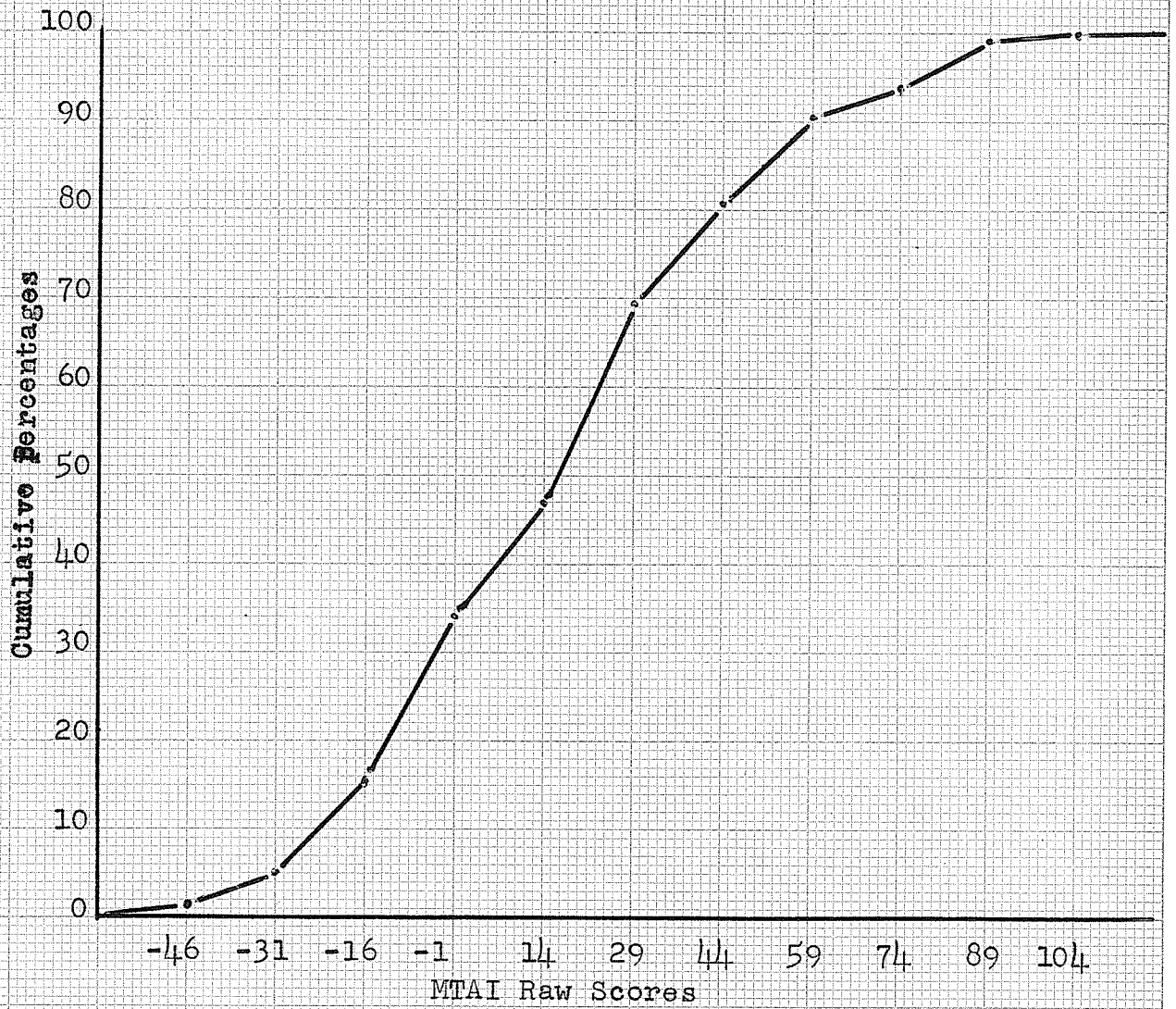


FIGURE 2

MTAI SCORES FOR 115 NORMAL SCHOOL PROSPECTIVE  
PRIMARY TEACHERS (CUMULATIVE PERCENTAGE CURVE  
PLOTTED FROM TABLE XXXVIII)



TABLE XXXIX

CALCULATION OF CUMULATIVE PERCENTAGES BASED ON  
MTAI SCORES OBTAINED BY 195 NORMAL SCHOOL  
PROSPECTIVE ELEMENTARY TEACHERS <sup>1</sup>

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Intervals	f.	Cum. f.	Cum. % f.
60- 74	9	195	100.00
45- 59	25	186	95.38
30- 44	31	161	82.56
15- 29	29	130	66.67
00- 14	30	101	51.79
-15-(-01)	34	71	36.41
-30-(-16)	22	37	18.97
-45-(-31)	7	15	7.69
-60-(-46)	6	8	4.10
-75-(-61)	2	2	1.03

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<sup>1</sup> See Appendix A, Table XIV.

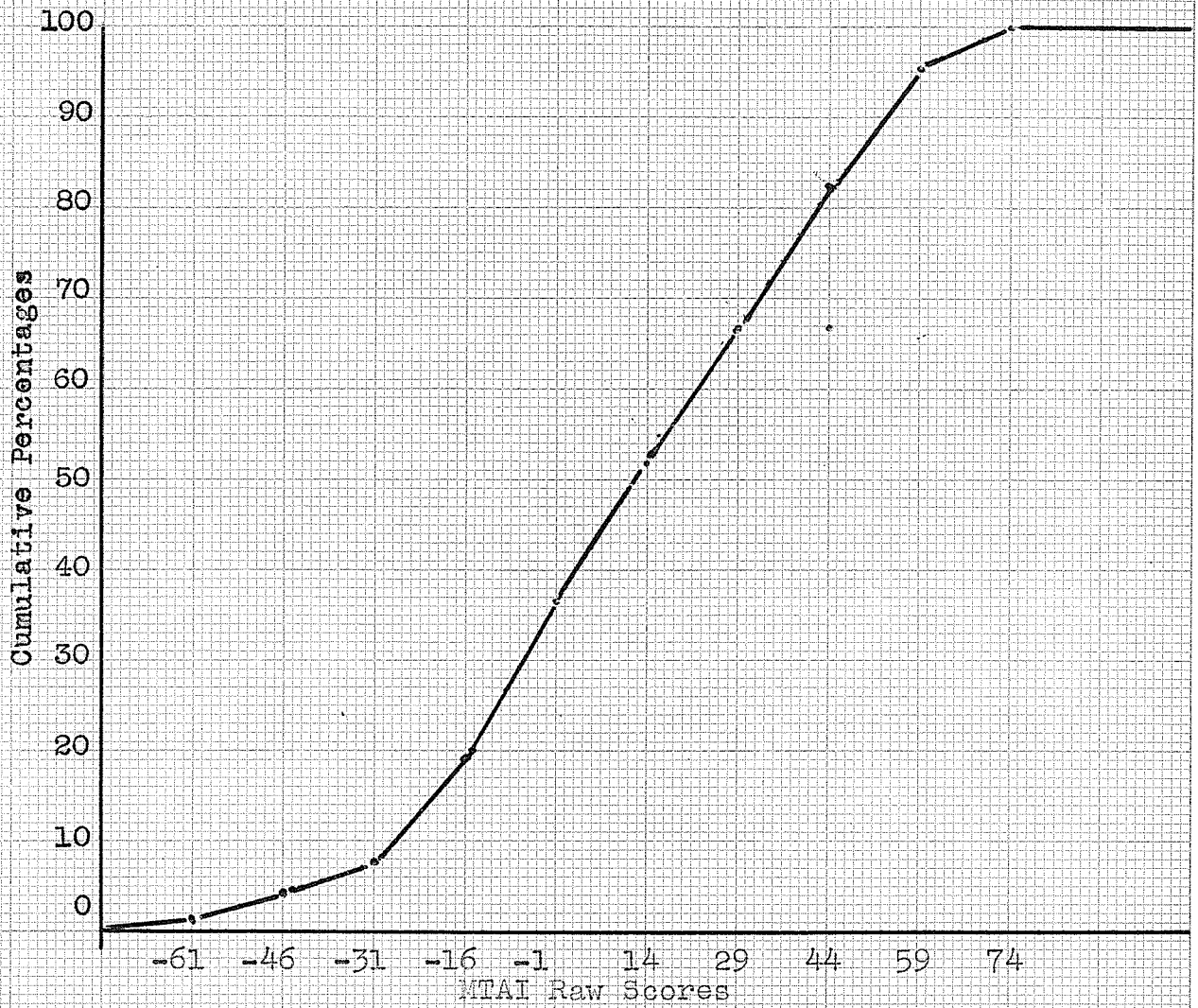


FIGURE 3

MTAI SCORES FOR 195 NORMAL SCHOOL PROSPECTIVE  
ELEMENTARY TEACHERS (CUMULATIVE PERCENTAGE  
CURVE PLOTTED FROM TABLE XXXIX)

TABLE XL

CALCULATION OF CUMULATIVE PERCENTAGES BASED ON  
MTAI SCORES OBTAINED BY 76 NORMAL SCHOOL  
PROSPECTIVE SECONDARY TEACHERS<sup>1</sup>

Intervals	f.	Cum. F.	Cum. % f.
60- 74	2	76	100.00
45- 59	9	74	97.37
30- 44	9	65	85.53
15- 29	11	56	73.68
00- 14	13	45	59.21
-15-(-01)	15	32	42.10
-30-(-16)	8	17	22.37
-45-(-31)	6	9	11.84
-60-(-46)	2	3	3.95
-75-(-61)	1	1	1.32

<sup>1</sup> See Appendix A, Table XV.

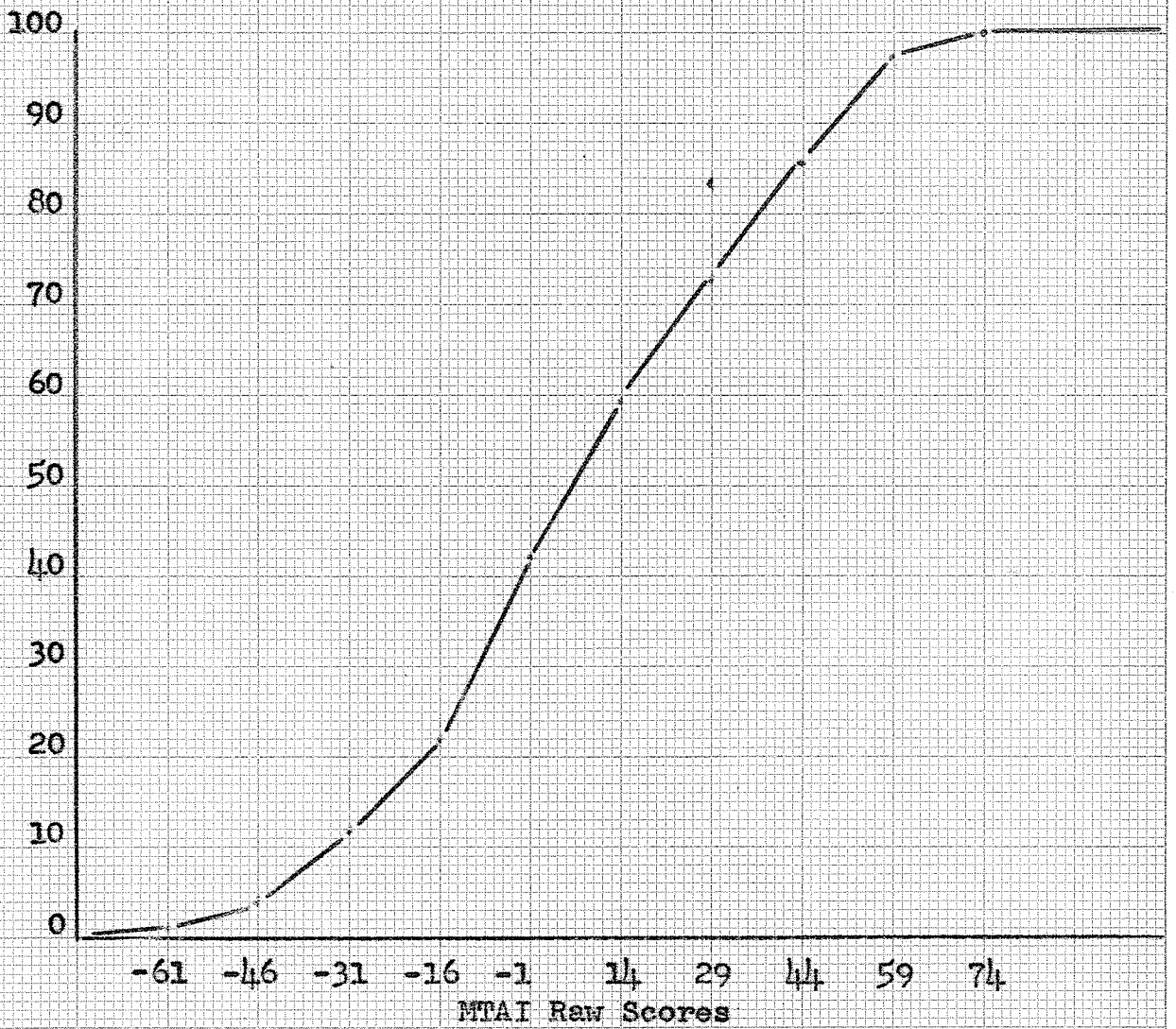


FIGURE 4

MTAI SCORES FOR 76 NORMAL SCHOOL PROSPECTIVE  
SECONDARY TEACHERS (CUMULATIVE PERCENTAGE  
CURVE PLOTTED FROM TABLE XL)

3. Faculty of Education Prospective Teachers

The Faculty of Education population group consisted of university students with two to five years of university training in academic subjects. The majority of these people had previously obtained a degree in arts or science.

These students were enrolled in a one year course at the Faculty of Education of the University of Manitoba. This course was designed to give student-teachers a general background in educational theory and practice.

Eighty per cent of these student-teachers indicated that they were interested in becoming secondary teachers. Thus, in the case of the Faculty students it was not practical to set up norms on the basis of the grades they indicated a preference to teach. This group consisted of fifty-four females and thirty-five males.

The following table presents the classified data used in determining the norm for the Faculty of Education student-teachers. This table is followed by a graph showing the cumulative curve for the norm group. The percentile ranks for the raw scores can be read directly from Figure 5. However, Table XLV presents a more convenient interpretation of percentile rank equivalents for MTAI raw scores.

TABLE XLI

CALCULATION OF CUMULATIVE PERCENTAGES BASED ON  
MTAI SCORES OBTAINED BY 89 FACULTY OF EDUCATION  
PROSPECTIVE TEACHERS<sup>1</sup>

Intervals	f.	Cum.f.	Cum. % f.
90- 100	2	89	100.00
75- 89	5	87	97.75
60- 74	11	82	92.13
45- 59	9	71	79.75
30- 44	8	62	69.66
15- 29	23	54	60.67
00- 14	10	31	34.83
-15-(-01)	10	21	23.59
-30-(-16)	6	11	12.36
-45-(-31)	3	5	5.62
-60-(-46)	1	2	2.25
-75-(-61)	0	1	1.12
-90-(-76)	1	1	1.12

<sup>1</sup> See Appendix A, Table XXIII.

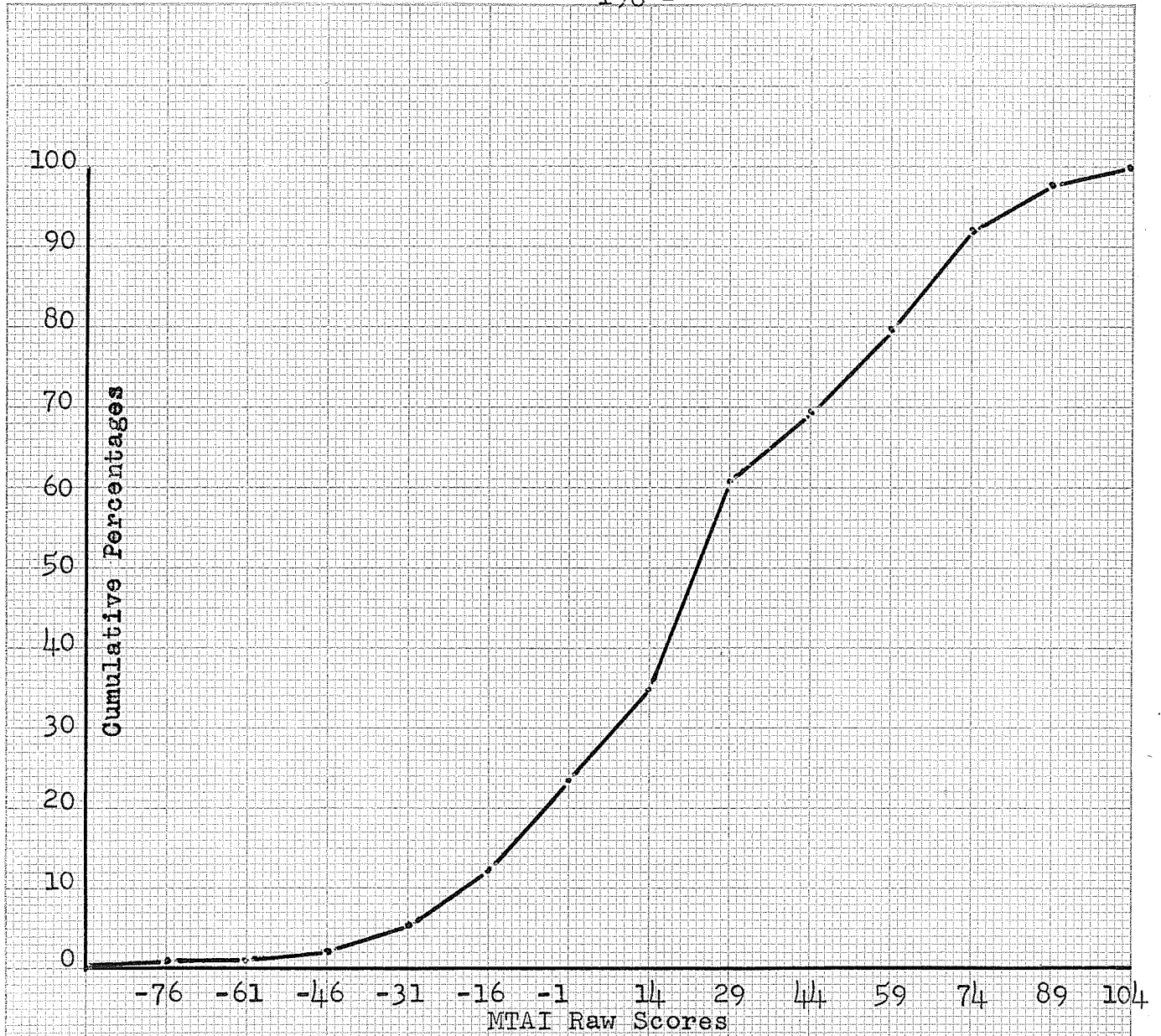


FIGURE 5

MTAI SCORES FOR 89 FACULTY OF EDUCATION  
STUDENT-TEACHERS (CUMULATIVE PERCENTAGE  
CURVE PLOTTED FROM TABLE XLI.)

#### 4. Experienced Teachers

The random sample of experienced teachers was drawn from the Greater Winnipeg area. A total of ten independent school systems were contained in this population. Each of these school systems employed twenty-eight or more teachers. Approximately one-hundred and fifty schools were included in the total population of nearly two-thousand academic teachers.

The teachers were classified into the three categories of primary, elementary, and secondary teachers according to the grades they indicated a preference to teach. This classification resulted in samples of: one-hundred and eleven primary teachers, one-hundred and three elementary teachers, and one-hundred and seventy-eight secondary teachers. The primary teachers included kindergarten to Grade III. The elementary teachers included grades four to six. The secondary teachers included grades seven to twelve.

The following tables present the classified data for the three categories of teachers. The data is followed by a cumulative curve for each norm group. Table XLVI presents the interpretation of MTAI raw scores into percentile rank equivalents for the three grade-levels of experienced teachers.



TABLE XLII

CALCULATION OF CUMULATIVE PERCENTAGES BASED ON MTAI  
SCORES OBTAINED BY 111 PRIMARY EXPERIENCED TEACHERS<sup>1</sup>

Intervals	f.	Cum.f.	Cum. % f.
105- 119	3	111	100.00
90- 104	3	108	97.30
75- 89	4	105	94.59
60- 74	21	101	90.99
45- 59	8	80	72.07
30- 44	22	72	64.86
15- 29	12	50	45.04
00- 14	14	38	34.23
-15-(-01)	12	24	21.62
-30-(-16)	6	12	10.81
-45-(-31)	4	6	5.41
-60-(-46)	2	2	1.80

<sup>1</sup> See Appendix A, Table XXIV.

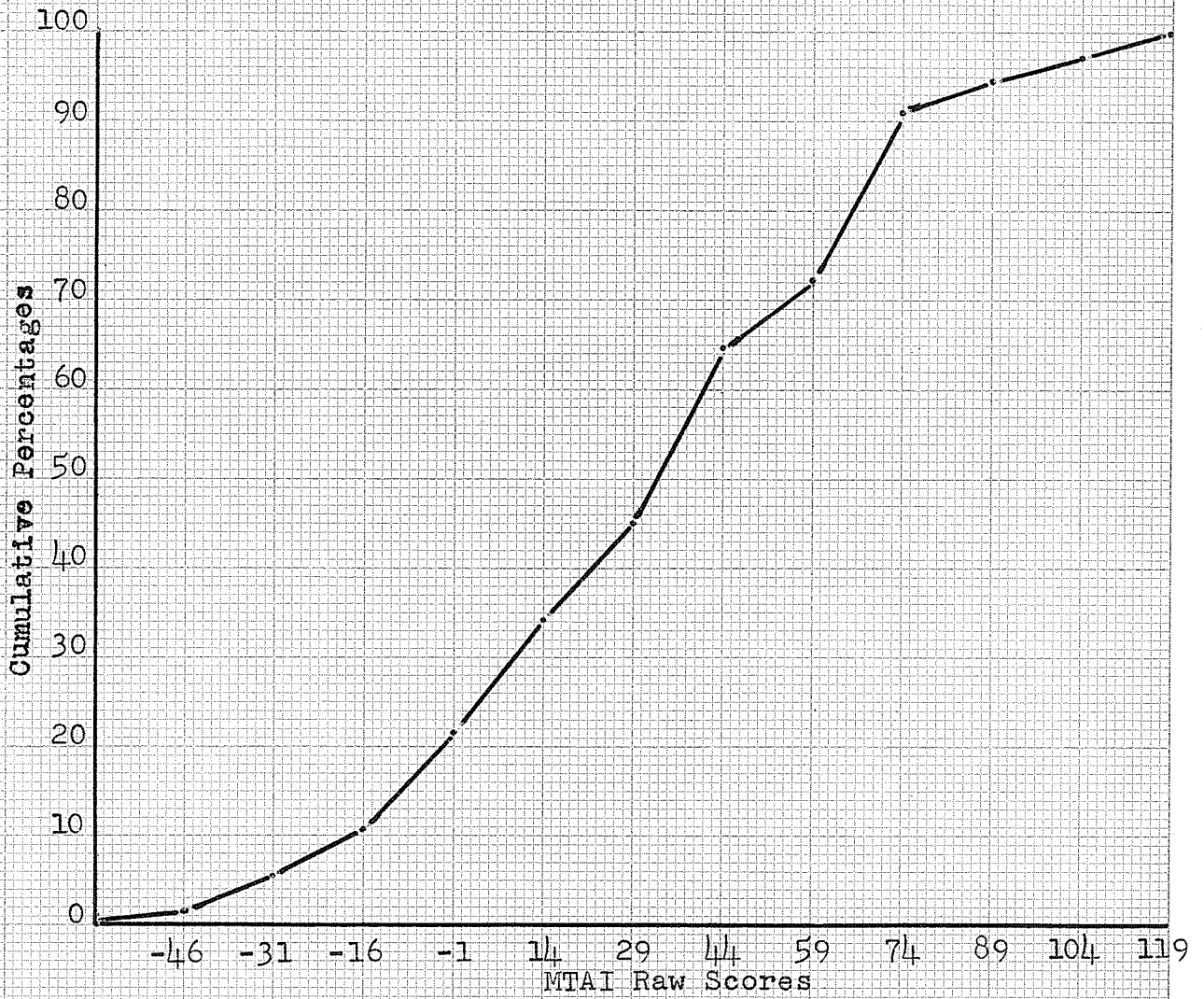


FIGURE 6

MTAI SCORES FOR 111 EXPERIENCED PRIMARY TEACHERS  
(CUMULATIVE PERCENTAGE CURVE PLOTTED FROM  
TABLE XLII)

TABLE XLIII

CALCULATION OF CUMULATIVE PERCENTAGES BASED ON MTAI  
SCORES OBTAINED BY 103 ELEMENTARY EXPERIENCED TEACHERS<sup>1</sup>

Intervals	f.	Cum.f.	Cum. % f.
90- 100	3	103	100.00
75- 89	4	100	97.08
60- 74	13	96	93.20
45- 59	11	83	80.58
30- 44	16	72	69.90
15- 29	14	56	54.37
00- 14	11	42	40.78
-15-(-01)	13	31	30.10
-30-(-16)	6	18	17.48
-45-(-31)	9	12	11.65
-60-(-46)	3	3	2.91

<sup>1</sup> See Appendix A, Table XXV.

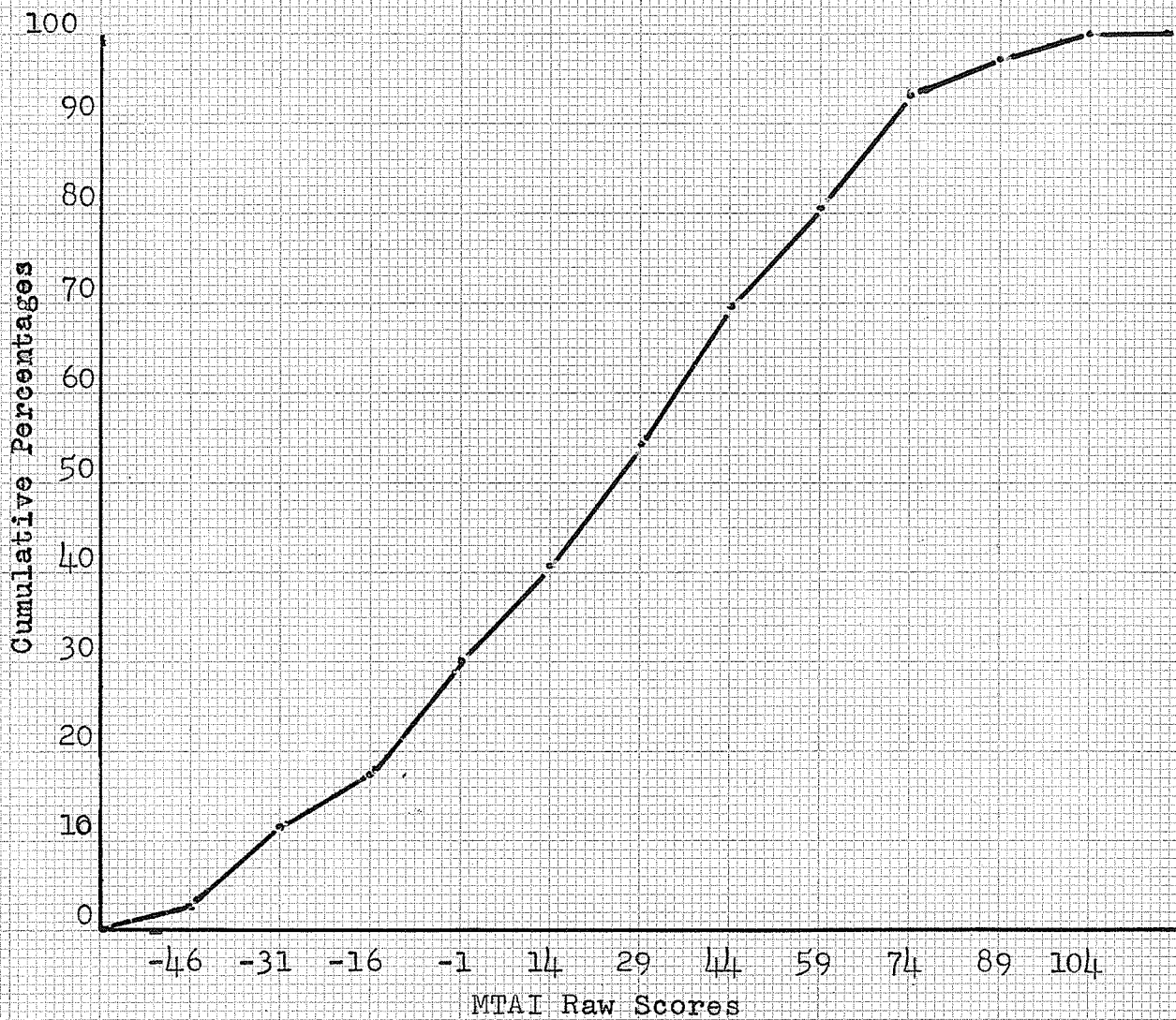


FIGURE 7

MTAI SCORES FOR 103 EXPERIENCED ELEMENTARY TEACHERS  
(CUMULATIVE PERCENTAGE CURVE PLOTTED FROM  
TABLE XLIII)

TABLE XLIV

CALCULATION OF CUMULATIVE PERCENTAGES BASED ON MTAI  
SCORES OBTAINED BY 178 SECONDARY EXPERIENCED TEACHERS <sup>1</sup>

Intervals	f.	Cum. f.	Cum. % f.
75- 89	4	178	100.00
60- 74	12	174	97.75
45- 59	14	162	91.01
30- 44	18	148	83.15
15- 29	30	130	73.03
00- 14	19	100	56.18
-15-(-01)	27	81	45.50
-30-(-16)	18	54	30.33
-45-(-31)	19	36	20.22
-60-(-46)	13	17	9.55
-75-(-61)	3	4	2.25
-90-(-76)	1	1	.56

<sup>1</sup> See Appendix A, Table XXVI.

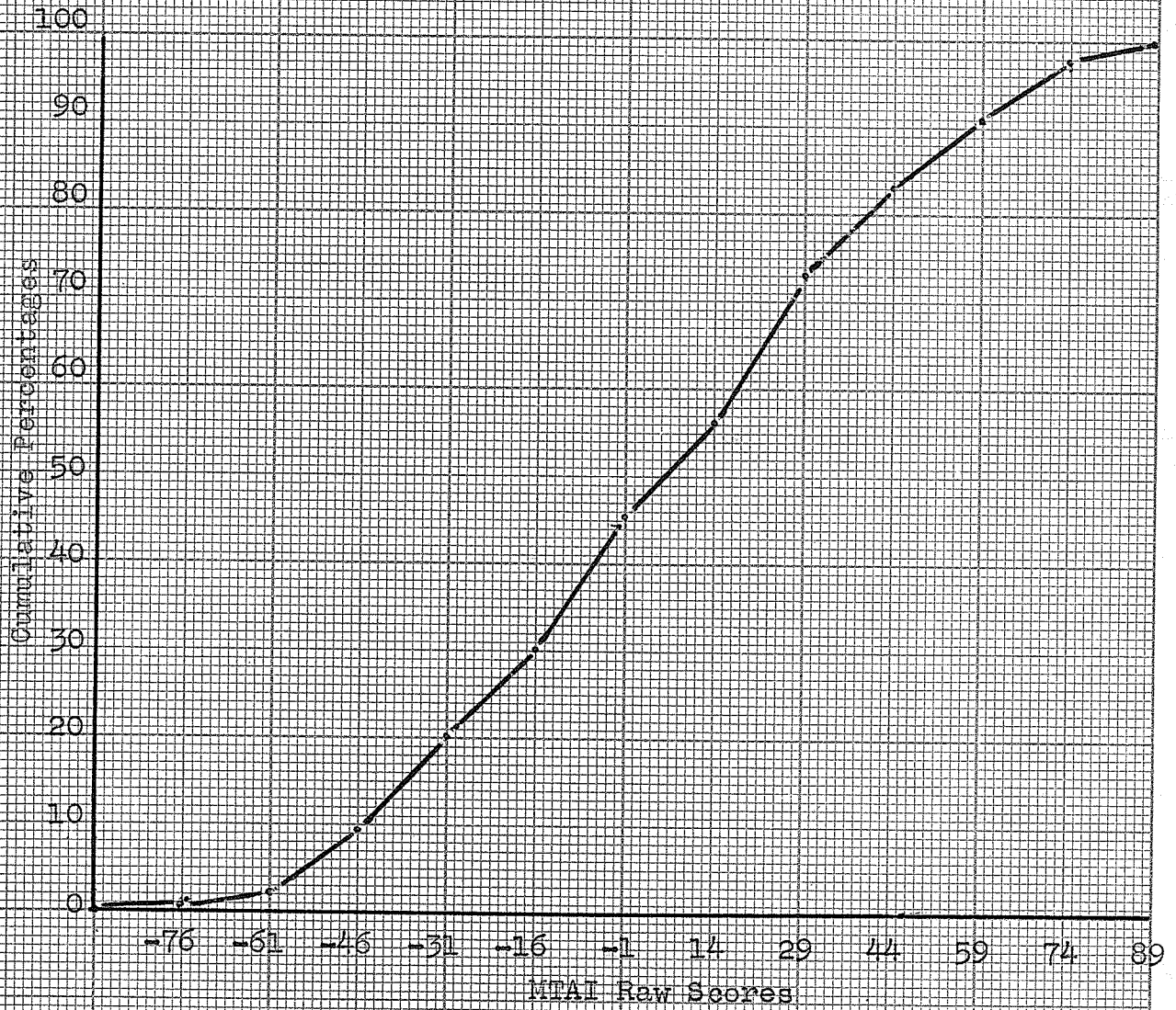


FIGURE 8

MTAI SCORES FOR 178/EXPERIENCED SECONDARY  
TEACHERS (CUMULATIVE PERCENTAGE CURVE  
PLOTTED FROM TABLE XLIV)

5. Tables of Norms

The percentile ranks for a particular norm group could be read directly from its cumulative curve; however, since this is not a particularly convenient method, Table XLV and Table XLVI will be presented in order to facilitate the interpretation of MTAI raw scores into percentile rank equivalents. The first table will present the norms for the student groups, and the second table will present the norms for the experienced academic teachers.

6. Conclusion

An examination of the Minnesota - Missouri norm groups for the MTAI indicates quite clearly that they do not apply to the Manitoba groups considered in this investigation. Therefore, the Manitoba norms for the several groups should provide valuable assistance to local administrators in the interpretation of the various scores obtained on the MTAI.



TABLE XLV

PERCENTILE RANK EQUIVALENTS FOR RAW SCORES ON THE MINNESOTA TEACHER ATTITUDE INVENTORY, FORM A  
STUDENTS

NORMAL SCHOOL STUDENTS						
Percentile Rank	High School Seniors	Prospective Primary Teachers	Prospective Elementary Teachers	Prospective Secondary Teachers	Faculty of Education I	Percentile Rank
99	74	89	71	68	98	99
95	42	77	59	56	82	95
90	34	59	53	50	71	90
80	23	43	42	37	59	80
75	18	36	37	31	53	75
70	14	30	32	24	44	70
60	7	23	22	15	29	60
50	00	16	12	6	22	50
40	-06	6	3	-03	17	40
30	-12	-04	-06	-10	8	30
25	-14	-08	-10	-14	1	25
20	-19	-12	-15	-19	-06	20
10	-30	-24	-27	-20	-21	10
5	-46	-51	-42	-44	-54	5
1	-61	-40	-61	-61	-76	1
N	143	115	195	76	89	N
Mean	1.70	16.47	12.23	7.09	25.27	Mean
SD	25.38	31.51	26.33	30.38	35.49	SD



TABLE XLVII

PERCENTILE RANK EQUIVALENTS FOR RAW SCORES ON THE MINNESOTA TEACHER ATTITUDE INVENTORY, FORM A  
TEACHERS

EXPERIENCED TEACHERS				
Percentile Rank	Primary Teachers	Elementary Teachers	Secondary Teachers	Percentile Rank
99	113	99	82	99
95	91	81	69	95
90	73	70	56	90
80	65	58	39	80
75	61	51	32	75
70	55	44	26	70
60	40	34	17	60
50	33	24	5	50
40	22	13	-06	40
30	9	-01	-16	30
25	3	-07	-24	25
20	-17	-13	-31	20
10	-02	-34	-45	10
5	-33	-42	-55	5
1	-53	-56	-72	1
N	111	103	178	N
Mean	31.34	21.98	5.55	Mean
SD	37.08	37.91	36.82	SD

## CHAPTER VI

### FINDINGS AND CONCLUSIONS

#### I. FINDINGS

Major problems. It was a principal purpose of this investigation to examine the validity of the Minnesota Teacher Attitude Inventory in Manitoba as a predictor of how well a prospective teacher would be likely 'to get along' with pupils. It was found from this research that the MTAI could predict with a fairly high degree of validity how well a prospective teacher would be likely 'to get along' with pupils. In the first and second validity studies, the student-teachers' MTAI scores were found to correlate 0.39 and 0.56 respectively with the combined ratings of their advisors and pupils. In the third validity study, the advisors' ratings were found to correlate 0.45 with the student-teachers' MTAI scores. In fact, the Manitoba validity studies on the MTAI were found to reaffirm the earlier findings of the Pennsylvania, South Carolina, and Missouri validity studies (1).

The reliability of the MTAI was determined by the test-retest method. This method resulted in reliability coefficients of 0.88 and 0.92. These findings, in conjunction with the findings from the

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<sup>1</sup> See page 46.

validity studies, indicated that the MTAI could estimate teacher attitude with a fairly high degree of reliability. Leeds (1) first and second reliability studies yielded reliability coefficients of 0.91 and 0.93 respectively.

Another important aspect of the Inventory, the unreliability or the susceptibility of the Inventory to faking was also investigated. The findings from both the "biased" and "faking" studies indicated with considerable assurance that the MTAI was not highly susceptible to faking at the teacher-training level.

It was also found from an investigation with a pupil rating scale that pupils' attitudes toward their student-teachers could be measured with a high degree of reliability (0.89 to 0.91). The correlation of 0.80 between the pupils' ratings of the student-teachers on "Our Student-Teacher" and the pupils' estimates of the practice lessons taught by the student-teachers provided additional evidence of the consistency with which the pupils' attitudes could be measured.

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<sup>1</sup> Leeds, op. cit. (9), p. 405.

A second major problem of this study was the construction of norms for use with the MTAI in Manitoba population groups. It was found in this study that the MTAI differentiated significantly high among 'grade-levels' so as to warrant the building of separate norms for each of the following classifications:

- (1) Grade XII students.
- (2) Normal School primary student-teachers.
- (3) Normal School elementary student-teachers.
- (4) Normal School secondary student-teachers.
- (5) Faculty of Education student-teachers.
- (6) Experienced primary teachers.
- (7) Experienced elementary teachers.
- (8) Experienced secondary teachers.

It was also found from a statistical comparison of Manitoba groups with the Minnesota - Missouri groups (1) that local norms would be necessary for adequate interpretation of the various scores obtained on the MTAI.

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<sup>1</sup> Cook et al., op. cit. (6), pp. 8-9.

Minor problems. It was a subordinate problem of this paper to make a thorough study of the Minnesota Teacher Attitude Inventory from the original documents and related works. This study was considered essential to the understanding of the major and other minor problems set forth in this thesis. The documentary evidence of this survey was presented in Chapter II.

A second minor problem of this study was an investigation of the relationship between teacher attitude and other personal factors such as: age, teaching experience, educational background, intelligence, religion, and 'choice of grade-level'. This research resulted in the following findings:

(a) A significant difference was found to exist between MTAI scores of high-school seniors enrolled at Normal School and Grade XII students who indicated no special interest in teaching. The Normal School students scored significantly higher (at the one per cent level) than the high-school seniors.

(b) There was no significant relationship found to exist between the attitudes of Catholics and Protestants as measured by the MTAI.

(c) There appeared to be a positive relationship between scholarship - leadership attainment and MTAI scores. This relationship was found to be significant at the ten per cent level.

(d) There was a significant difference found (at the five per cent level) between the attitudes of Normal School students who elected to become primary teachers and those who elected to become secondary teachers. The prospective primary teachers scored higher than the prospective elementary teachers who in turn scored significantly higher than the prospective secondary teachers.

(e) At the Faculty of Education, there was no relationship found between intelligence as measured by the ACE and teacher attitude as measured by the MTAI. The obtained correlation of  $-.14$  was found to be not significantly different from zero.

(f) Faculty of Education student-teachers' MTAI scores correlated significantly and negatively with their scores on the Ta scale ( a proposed teacher-attitude scale for the MMPI). This finding provided additional evidence of the validity of the MTAI.

(g) The MTAI was found to differentiate significantly among experienced teachers on the basis of their choice of grade-level. The primary teachers scored higher than the elementary teachers. Both the primary and elementary teachers scored significantly higher ( at the one per cent level) than the secondary teachers.

(h) It was evident from the studies of age and teaching experience that the MTAI scores were not affected significantly either by age or teaching experience. This would indicate that the authors (1) of the MTAI had successfully eliminated those items which would have given weight to experience.

(i) There was no significant difference found between MTAI scores of teachers taking 'off-campus' courses in educational method and theory and teachers from the general population.

(j) A highly significant difference was observed between teachers who had completed a course in mental hygiene and teachers who had taken other 'off-campus' courses in education. This difference was found to be significant at the one per cent level.

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<sup>1</sup> Cook et al., op. cit. (6), p. 10.

## II. INFERENCES

1. The reliability (0.92) and the validity (0.56) with which the MTAI measures teacher attitude implies that it would be an important aid in selecting students for admission to teacher training institutions.

2. Evidently the MTAI discriminates significantly (at the five per cent level) among student-teachers on the basis of the student-teachers' choice of grade-level. This finding seems to indicate that the Inventory could be used to advantage in guiding prospective teachers into appropriate grade-levels of teaching.

3. The fact that the MTAI discriminates significantly (at the one per cent level) between experienced teachers who indicate a preference to work with young children in the primary and elementary grades and experienced teachers who indicate a preference to work with older children in the secondary grades implies that the MTAI could be used to advantage in selecting teachers at the employment level and in guiding teachers into appropriate grade-levels of teaching.



4. A study of the MTAI with teachers who had just completed a course in mental hygiene shows that these teachers score significantly higher ( at the one per cent level) than teachers in general. This finding in addition to those reported by Cook, Leeds and Callis (1) suggests that most teachers could profit considerably from a course in mental hygiene. These studies also suggest that the MTAI could be used in the area of mental health as a measure of teaching success.

5. An examination of the Minnesota-Missouri group norms for the MTAI indicates quite definitely that they do not apply to the Manitoba population groups considered in this study. Therefore, the Manitoba norms for the several groups should provide valuable assistance to local administrators in the interpretation of the various scores obtained on the MTAI.

6. The fact that pupils' attitudes toward their practice teachers can be measured with a high degree of reliability (0.91) recommends serious consideration of the pupils' reactions in rating student-teachers. This is further supported by the findings that the pupils' ratings of the student-teachers in the second validity study correlate 0.63 with the advisors' ratings.

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<sup>1</sup> Cook et al., op. cit. (6), p. 12.

### III. SUGGESTIONS FOR FURTHER RESEARCH

1. In the final analysis, the only true measure of teaching success is pupil achievement. It would be, therefore, of considerable importance to investigate whether or not a positive relationship exists between pupil achievement and teacher attitude as measured by the MTAI.

2. It would be important to compare moral attitude and teacher attitude as measured by the MTAI.

3. Investigations are needed to determine the value of the MTAI in vocational guidance as regards teaching or similar employment which necessitates working with young people.

4. It would be of considerable importance to investigate scholarship and leadership attainment of student-teachers in relation to their obtained MTAI scores.

5. It would be of considerable value to follow-up the present study on student-teachers with individual case studies (extending over a period of several years) in order to determine the practical significance of student-teachers' MTAI scores in relation to their success (or absence of it) in teaching.

6. Because of possible population differences, it would also be very important to consider the problem of building norms for nonacademic teachers rural teachers, and teachers from systems with fewer than twenty-eight teachers.

FOOTNOTES

<sup>1</sup> Carroll H. Leeds, The Construction and Differential Value of a Scale for Determining Teacher-Pupil Attitude, (Unpublished Doctoral Thesis at the University of Minnesota, 1946).

<sup>2</sup> Walter W. Cook, and Carroll H. Leeds, "Measuring the Teacher Personality," Educational and Psychological Measurement, vol. 7, No. 3, Autumn, 1947.

<sup>3</sup> Charles Bird, Social Psychology, New York: D. Appleton-Century Company, 1940.

<sup>4</sup> E. K. Strong Jr., Vocational Interests of Men and Women, Stanford University: Stanford University Press, 1943.

<sup>5</sup> Carroll H. Leeds, "A Scale for Measuring Teacher-Pupil Attitudes and Teacher-Pupil Rapport," Psychological Monographs General and Applied, vol. 64, No. 6, 1950.

<sup>6</sup> Walter W. Cook, Carroll H. Leeds, and Robert Callis, Minnesota Teacher Attitude Inventory Manual, New York: The Psychological Corporation, 1952.

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APPENDIX A

TABLES OF RAW DATA

TABLE I

CORRELATION OF PAIRED MEAN SCORES OBTAINED FROM  
 PUPIL RATINGS\* ON STUDENT-TEACHERS - 1954

NO.	X	Y	NO.	X	Y	NO.	X	Y
1.	36	43	18.	48	47	35.	47	49
2.	54	52	19.	46	43	36.	45	50
3.	58	53	20.	40	44	37.	51	51
4.	40	45	21.	49	46	38.	58	58
5.	61	60	22.	45	49	39.	53	48
6.	40	48	23.	59	60	40.	56	52
7.	43	41	24.	50	54	41.	50	55
8.	30	38	25.	51	50	42.	54	52
9.	44	40	26.	46	37	43.	38	30
10.	46	44	27.	45	50	44.	62	61
11.	38	27	28.	46	48	45.	45	53
12.	35	43	29.	48	51	46.	62	54
13.	50	45	30.	40	45	47.	60	62
14.	44	42	31.	43	39	48.	60	61
15.	55	50	32.	57	55	49.	45	49
16.	47	42	33.	56	54	50.	49	46
17.	43	41	34.	54	54			

Mean Scores (x) For First Ten Randomly Selected Ratings

1. Range (30 to 62),  $S_x = 2422$ ,  $S_x^2 = 120168$ ,  $N = 50$ .
2. Mean of mean scores =  $48.44 \pm 1.08$ .
3. Standard deviation =  $7.54 \pm .77$ .

Mean scores (x) For Second Ten Randomly Selected Ratings

1. Range (27 to 62),  $S_y = 2411$ ,  $S_y^2 = 118999$ ,  $S_{xy} = 119042$ .
2. Mean of mean scores =  $48.22 \pm 1.06$ .
3. Standard deviation =  $7.40 \pm .75$ .

Reliability Coefficient

1. Correlation  $r = 0.808 \pm .050$ , for  $n = 10$ .
2. Estimated  $r = 0.894$ , for  $n = 20$ .

\* Elementary students (grades 4 to 6) rated teachers on "Our Student Teacher - Form A". Two sets of ten papers were drawn at random from each student teacher's pile of pupil ratings. The two mean scores for each of the 50 student teachers were paired and correlated.

TABLE II

CORRELATION OF PAIRED MEAN SCORES OBTAINED FROM  
PUPIL RATINGS\* ON STUDENT TEACHERS - 1954

NO.	X	Y	NO.	X	Y
1.	45	38	14.	42	47
2.	50	49	15.	52	51
3.	33	39	16.	44	41
4.	37	47	17.	39	45
5.	42	45	18.	47	42
6.	33	35	19.	52	48
7.	36	36	20.	28	33
8.	51	54	21.	37	36
9.	45	36	22.	46	47
10.	30	30	23.	40	43
11.	30	31	24.	32	34
12.	49	51	25.	42	41
13.	49	46	26.	46	48

Mean Scores (x) For First Ten Randomly Selected Ratings  
 1. Range (32 to 52),  $S_x = 1077$ ,  $S_x^2 = 45971$ ,  $N = 26$ .  
 2. Mean of mean scores =  $41.42 \pm 1.45$ .  
 3. Standard deviation =  $7.24 \pm 1.03$ .

Mean Scores (y) For Second Randomly Selected Ratings  
 1. Range (30 to 54),  $S_y = 1093$ ,  $S_y^2 = 47079$ ,  $S_{xy} = 46295$ .  
 2. Mean of mean scores =  $42.04 \pm 1.32$ .  
 3. Standard deviation =  $6.59 \pm .93$ .

Reliability Coefficient  
 1. Correlation  $r = 0.822 \pm .065$  for  $n = 10$ .  
 2. Estimated  $r = 0.909$ , for  $n = 20$ .

\* Secondary students (grades 7 to 9) rated teachers on "Our Student Teacher - Form B". Two sets of ten papers were drawn at random from each student teacher's pile of pupil ratings. The two mean scores for each of the 26 student teachers were paired and correlated.

TABLE III

CORRELATIONS OF MTAI SCORES WITH STUDENT AND ADVISOR  
 RATINGS OF PRACTICE TEACHING FOR 50 FACULTY OF  
 EDUCATION STUDENTS 1954 - 55

Subject No.	T - Scores = $50 \pm$		$\frac{10(x-m)}{SD}$	MTAI
	Advisor	Student	Combined	
1.	49	42	45	24
2.	29	59	44	33
3.	54	57	55	36
4.	49	46	47	37
5.	49	66	57	37
6.	44	42	43	38
7.	25	41	33	39
8.	54	38	46	40
9.	64	40	52	41
10.	54	45	49	41
11.	54	22	38	41
12.	59	36	47	42
13.	44	46	45	42
14.	64	38	51	42
15.	44	52	48	43
16.	44	45	44	43
17.	39	41	40	43
18.	44	50	47	43
19.	39	41	40	45
20.	54	44	49	46
21.	54	49	51	47
22.	49	49	49	48
23.	69	67	68	49
24.	54	58	56	49
25.	44	54	49	49
26.	64	46	55	49
27.	34	52	43	50
28.	54	48	51	51
29.	54	51	52	52
30.	34	44	39	52
31.	39	33	36	52
32.	49	61	55	52
33.	44	56	50	54
34.	49	60	54	55
35.	49	50	49	55
36.	39	54	46	58
37.	54	53	53	60
38.	69	49	59	60
39.	69	48	59	60
40.	54	58	56	60



TABLE (continued)

No.	Advisor	Student	Combined	MTAI
41.	54	59	56	61
42.	59	60	59	61
43.	39	25	32	63
44.	64	70	67	64
45.	39	59	49	64
46.	49	59	54	64
47.	49	69	59	65
48.	39	67	53	66
49.	49	51	50	67
50.	64	50	57	68

MTAI Scores(a):  $S_a = 2501$ ,  $S_a^2 = 130293$ ,

1. Range ( 24 to 68),
2. Mean score =  $50.02 \pm 1.45$ ,
3. Standard deviation =  $10.19 \pm 1.03$ .

Advisors' Ratings(b):  $S_b = 2486$ ,  $S_b^2 = 128704$ ,  $S_{ab} = 125243$ ,

1. Range ( 25 to 69 ),
2. Mean score =  $49.72 \pm 1.44$ ,
3. Standard deviation =  $10.09 \pm 1.02$ ,
4. Advisor vs. MTAI, correlation  $r = 0.174 \pm .139$ .

Student Ratings(c):  $S_c = 2500$ ,  $S_c^2 = 130338$ ,  $S_{ac} = 127037$ ,

1. Range ( 22 to 70),
2. Mean score =  $50.00 \pm 1.48$ ,
3. Standard deviation =  $10.33 \pm 1.04$ ,
4. Student vs. MTAI, correlation  $r = 0.387 \pm .121$ .

Advisor and Student Ratings Combined(d):  $S_d = 2480$ ,

- $S_d^2 = 126442$ ,  $S_{ad} = 125836$ ,
1. Range ( 32 to 68),
  2. Mean score =  $49.72 \pm 1.08$ ,
  3. Standard deviation =  $7.53 \pm .76$ ,
  4. Combined vs. MTAI, correlation  $r = 0.387 \pm .121$ .

TABLE IV

CORRELATIONS OF MTAI RAW SCORES WITH PUPIL RATINGS,  
PUPIL ESTIMATES, AND ADVISOR RATINGS FOR 26 FACULTY  
OF EDUCATION STUDENT TEACHERS — 1955

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NO.	W	X	Y	Z
1.	71	47	7	9
2.	05	38	6	4
3.	61	47	8	9
4.	10	48	8	7
5.	25	48	8	8
6.	14	52	9	7
7.	29	49	8	7
8.	59	55	9	8
9.	41	51	9	7
10.	02	44	6	6
11.	36	46	7	8
12.	20	51	8	8
13.	36	37	5	5
14.	20	38	6	5
15.	35	53	9	8
16.	73	47	8	9
17.	17	51	8	8
18.	88	52	8	9
19.	-18	47	8	7
20.	-27	43	8	6
21.	-05	39	6	6
22.	-31	37	7	8
23.	-08	36	7	4
24.	-34	42	7	6
25.	-07	50	7	8
26.	-10	38	7	8

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TABLE IV (continued)

MTAI Scores (W):

1. R ( -34 to 88),  $S_w = 502$ ,  $S_w^2 = 37102$ ,  $N = 26$ .
2. Mean score =  $19.31 \pm 6.49$ .
3. Standard deviation =  $32.47 \pm 4.64$ .

Our Student Teacher Scores (x):

1. R ( 36 to 55),  $S_x = 1186$ ,  $S_x^2 = 54942$ ,  $S_{wx} = 25349$ .
2. Mean score =  $45.61 \pm 1.15$ .
3. Standard deviation =  $5.73 \pm .82$ .

Pupil Estimate on Scale 1 to 10 points (y):

1. R ( 4 to 9),  $S_y = 194$ ,  $S_y^2 = 1476$ ,  $S_{wy} = 3996$ ,  $S_{xy} = 8974$ .
2. Mean score =  $7.46 \pm .21$ .
3. Standard deviation =  $1.05 \pm .14$ .

Student Teachers Advisors' Ratings (z):

1. R ( 4 to 9),  $S_z = 185$ ,  $S_z^2 = 1371$ ,  $S_{wz} = 4250$ ,  
 $S_{yz} = 1402$ ,  $S_{xz} = 8577$ .
2. Mean score =  $7.11 \pm .38$ .
3. Standard deviation =  $1.89 \pm .26$ .

Validity Coefficients

1. MTAI vs. pupil OST,  $r = 0.507 \pm .149^*$ .
2. MTAI vs. pupil estimates,  $r = 0.282 \pm .184$ .
3. MTAI vs. Advisors ratings,  $r = 0.425 \pm .164^{**}$ .
4. Advisor vs. pupil estimates,  $R = 0.404 \pm .167^{**}$ .
5. Advisor vs. pupil OST,  $r = 0.628 \pm .121^*$ .
6. Pupil OST vs. pupil estimate,  $r = 0.797 \pm .073^*$ .

\* significant at the 1% level.

\*\* significant at the 5% level.

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TABLE V

CORRELATION OF MTAI T-SCORES WITH COMBINED PUPIL-  
ADVISOR RATINGS (T-SCORES) FOR 26 FACULTY OF  
EDUCATION STUDENT TEACHERS - 1955

NO.	Advisor Ratings	Pupil Ratings	Combined Ratings	MTAI Ratings
1.	60	52	112	66
2.	34	36	70	46
3.	60	52	112	63
4.	50	54	104	47
5.	55	54	109	52
6.	50	61	111	48
7.	50	55	105	53
8.	55	66	121	62
9.	50	59	109	57
10.	45	46	91	45
11.	55	50	105	55
12.	55	59	114	50
13.	40	34	74	55
14.	40	36	76	50
15.	55	61	116	55
16.	60	52	112	67
17.	55	59	114	49
18.	60	61	121	71
19.	50	52	102	39
20.	45	46	91	36
21.	45	41	86	43
22.	55	34	89	35
23.	34	33	67	42
24.	45	43	88	34
25.	55	58	113	42
26.	55	36	91	41

MTAI T-Scores (x)

1. R (34 to 71),  $S_x = 1303$ ,  $S_x^2 = 67847$ ,  $N = 26$ .
2. Mean score =  $50.12 \pm 1.97$ .
3. Standard deviation =  $9.87 \pm 1.40$ .

Combined Pupil - Advisor Ratings (y)

1. R (67 to 121),  $S_y = 2603$ ,  $S_y^2 = 267029$ ,  $S_{xy} = 132683$ .
2. Mean score =  $100.14 \pm 3.11$ .
3. Standard deviation =  $15.56 \pm 2.20$ .

Validity Coefficient

1.  $r_{xy} = 0.559 \pm 0.138$ , significant at 1% level.

TABLE VI

CORRELATION OF MTAI SCORES WITH THE COMBINED RATINGS  
OF CLASSROOM TEACHERS AND STUDENT TEACHER'S ADVISORS  
FOR A RANDOM SAMPLE OF 50 NORMAL SCHOOL STUDENT  
TEACHERS — 1955

NO.	X	Y	NO.	X	Y	NO.	X	Y
1.	45	7	18.	24	6	34.	-05	2
2.	59	8	19.	23	3	35.	-01	3
3.	20	6	20.	19	4	36.	-25	3
4.	21	4	21.	45	6	37.	-32	3
5.	11	6	22.	17	6	38.	-09	4
6.	18	7	23.	17	5	39.	-27	2
7.	88	6	24.	04	9	40.	-01	4
8.	09	3	25.	61	6	41.	-32	3
9.	22	3	26.	16	6	42.	-21	7
10.	23	6	27.	17	3	43.	-07	6
11.	36	4	28.	44	7	44.	-10	3
12.	17	3	29.	25	9	45.	-02	3
13.	25	7	30.	22	4	46.	-01	6
14.	23	7	31.	09	6	47.	-09	6
15.	14	3	32.	57	6	48.	-05	5
16.	15	4	33.	36	3	49.	-18	3
17.	07	3				50.	-40	3

MTAI Scores (X):

1. R (32 to 88), N= 50, Sx= 644.
2. Mean score = 12.88 ± 3.65.
3. Standard deviation = 25.57 ± 2.55.

Combined Rating:

1. R (2 to 9), N= 50, Sy=242, Sy<sup>2</sup>= 1338, Sxy = 4158.
2. Mean score = 4.84 ± .26.
3. Standard deviation = 1.83 ± .18.

Validity Index:

1. r<sub>xy</sub> = 0.445 ± .115, significant at 1% level.

TABLE VII

A COMPARISON OF MTAI RAW SCORES OBTAINED FROM A TEST AND RETEST OF A RANDOM SAMPLE OF 25 FACULTY STUDENTS\* BEFORE AND AFTER THE MID-YEAR RECESS -- 1954 - 55.

No.	Ist Testing	IIInd Testing	Point Difference
1.	-27	15	42
2.	-07	09	16
3.	-21	08	29
4.	-34	-22	12
5.	-08	-26	-18
6.	-08	-05	03
7.	27	09	-18
8.	14	23	09
9.	79	92	13
10.	58	82	24
11.	92	63	-29
12.	68	72	04
13.	71	93	22
14.	47	80	33
15.	88	94	06
16.	10	19	09
17.	01	17	16
18.	36	67	31
19.	16	03	-13
20.	05	24	19
21.	02	20	18
22.	16	38	22
23.	22	35	13
24.	59	55	-04
25.	60	49	-11
Totals	666	914	248
Sum of Squares	50618	64610	9896

Range -34 to 92 -26 to 94  
 Mean 26.64±7.25 36.56±7.06  
 Mean gain 9.92, t ratio 2.765, significant at 1% level<sup>1</sup>  
 Standard deviation 36.26±5.23 35.32±5.10  
 Correlation r = 0.834±.044, significant at 1% level<sup>1</sup>

<sup>1</sup> Lindquist, op. cit., pp. 53-55, p. 212.

\* Most of these students have completed a general bachelor degree in arts or science and are now enrolled in a one year course at the Faculty of Education.

TABLE VIII

A COMPARISON OF MTAI RAW SCORES OBTAINED FROM A TEST AND RETEST OF A RANDOM SAMPLE OF 36 NORMAL SCHOOL STUDENTS

NO.	First Testing	Second Testing	Point Difference	Deviation
1.	04	18	14	06
2.	08	03	-05	-13
3.	11	31	20	12
4.	31	55	24	16
5.	55	88	33	25
6.	29	40	11	03
7.	59	46	-13	-21
8.	39	66	27	19
9.	15	23	08	00
10.	42	46	04	-04
11.	01	18	17	09
12.	56	80	24	16
13.	33	11	-22	-30
14.	16	21	05	-03
15.	49	42	-07	-15
16.	39	31	-08	-16
17.	32	36	04	-04
18.	19	10	-09	-17
19.	54	58	04	-04
20.	48	48	00	-08
21.	19	19	00	-08
22.	10	11	01	-07
23.	01	01	00	-08
24.	58	75	17	09
25.	22	22	00	-08
26.	76	86	10	02
27.	-36	-47	-11	-19
28.	-26	-03	23	15
29.	-29	-21	08	00
30.	-09	-05	04	-04
31.	-24	-24	00	-08
32.	-24	04	28	20
33.	-05	30	35	27
34.	-01	14	15	07
35.	-10	06	16	08
36.	-20	05	25	17

TABLE VIII (continued)

First Testing :  $N = 36$ ,  $R = (-36 \text{ to } 76)$ .

1. MTAI scores (x):  $S_x = 642$ ,  $S_x^2 = 41686$ .
2. Mean score =  $17.83 \pm 4.83$ .
3. Standard deviation =  $28.98 \pm 3.46$ .

Second Testing:  $N = 36$ ,  $R = (-47 \text{ to } 88)$

1. MTAI scores (y):  $S_y = 944$ ,  $S_y^2 = 58276$ ,  $S_{xy} = 46211$ .
2. Mean score =  $26.22 \pm 5.09$ .
3. Standard deviation =  $30.52 \pm 3.65$ .
4.  $(M_y - M_x) = 8.39$ .

Correlation Coefficients

$r_{xy} = 0.923 \pm 0.025$ .

Deviation Measures

1. Sum of the difference = 302.
2. Mean of the differences = 8.389.
3. Sum of the squares of the deviations = 6692.
4. C.R. = 4.415 significant at the 1% level.



TABLE IX

A CORRELATION OF MTAI RAW SCORES FOR A RANDOM SAMPLE OF 25 FACULTY OF EDUCATION STUDENTS OBTAINED ON A TEST AND RETEST WITH STANDARD AND BIASED\* INSTRUCTIONS RESPECTIVELY - GIVEN BEFORE AND AFTER THE MID-YEAR RECESS - 1954-55

No.	Standard Instructions	Biased* Instructions	Score Difference
1.	-10	72	82
2.	-18	62	80
3.	-46	90	136
4.	-14	102	116
5.	-16	89	105
6.	-05	72	77
7.	-07	105	112
8.	-12	104	116
9.	-31	81	112
10.	-13	27	40
11.	26	73	47
12.	19	88	69
13.	20	65	45
14.	21	64	43
15.	04	52	48
16.	16	79	63
17.	59	89	30
18.	49	87	38
19.	27	89	62
20.	23	68	45
21.	20	42	22
22.	30	111	81
23.	35	112	77
24.	51	82	31
25.	25	69	44
Totals	<u>253</u>	<u>1974</u>	<u>1721</u>
Sum of squares	4340	166256	

Range (-46 to 59) 42 to 112  
 Mean  $10.12 \pm 5.19$   $78.96 \pm 4.08$   
 Mean gain = 68.84,  $t = 10.510$  significant at 1% level.  
 Standard deviation =  $25.94 \pm 3.74$   $20.38 \pm 2.94$   
 Correlation  $r = 0.087 \pm .198$ , not significant at 5% level.

\* Biased Instructions refers to the deliberate attempt to have student's consider the Inventory from an extreme Progressivist's point of view.

TABLE X

A COMPARISON OF MTAI RAW SCORES FOR A RANDOM SAMPLE OF 25 FACULTY OF EDUCATION STUDENTS OBTAINED ON TEST AND RETEST WITH STANDARD AND BIASED INSTRUCTIONS\* RESPECTIVELY - GIVEN BEFORE AND AFTER THE MID-YEAR RECESS - 1954-55

No.	Standard Instruction	Biased Instruction**	Point Difference
1.	-17	-111	- 94
2.	-80	-105	- 25
3.	-12	-125	-113
4.	26	-106	-132
5.	64	-100	-164
6.	73	- 88	-161
7.	74	- 94	-168
8.	22	-114	-136
9.	00	- 94	- 94
10.	64	- 96	-160
11.	80	- 87	-167
12.	88	-104	-192
13.	36	- 92	-128
14.	05	-110	-115
15.	05	- 95	-100
16.	29	-104	-133
17.	17	-120	-137
18.	53	- 92	-145
19.	73	-125	-198
20.	102	-125	-227
21.	59	- 94	-153
22.	23	-116	-139
23.	62	-123	-185
24.	61	- 88	-149
25.	41	- 86	-127
Totals	948	-2594	-3542
Sum of squares	75408	273300	541490

Range -80 to 102 -125 to -86  
 Mean  $37.92 \pm 7.95$   $-103.76 \pm 2.58$ <sup>1</sup>  
 Mean gain 141.68, t ratio = 17.427, significant at 1% level.<sup>1</sup>  
 Stand. deviation  $39.73 \pm 5.73$   $12.92 \pm 1.86$ <sup>1</sup>  
 Correlation r =  $0.154 \pm .195$ , not significant at 5% level.<sup>1</sup>

\* Biased Instructions refers to the deliberate attempt to have students consider the Inventory from an extreme Traditionalist's point of view.

<sup>1</sup>

Lindquist, op. cit. pp. 53-55, p. 212.

TABLE XI

A COMPARISON OF MTAI RAW SCORES OBTAINED FROM A TEST AND RETEST OF RANDOM SAMPLE OF 22 NORMAL SCHOOL STUDENTS BASED ON STANDARD AND FAKING INSTRUCTIONS RESPECTIVELY - 1955

No.	Standard Instructions	Faking Instructions	Point Differences
1.	-09	-32	-23
2.	-07	-08	-01
3.	-16	49	65
4.	-13	02	15
5.	03	-09	-12
6.	13	-32	-45
7.	25	35	10
8.	68	72	04
9.	64	48	-16
10.	51	36	-15
11.	30	50	20
12.	35	83	48
13.	66	73	07
14.	01	22	21
15.	23	12	-11
16.	45	49	04
17.	36	45	09
18.	44	70	26
19.	42	53	11
20.	17	27	10
21.	56	64	08
22.	19	63	44
			173

Standard Instructions: N = 22, R = (-16 to 68)

1. MTAI scores (x):  $S_x = 593$ ,  $S_x^2 = 30497$ .

2. Mean score =  $26.95 \pm 5.48$ .

3. Standard deviation =  $25.69 \pm 3.96$ .

Faking Instructions: N = 22, R = (-32 to 83).

1. MTAI scores (y):  $S_y = 772$ ,  $S_y^2 = 50882$ ,  $S_{xy} = 33662$ .

2. Mean score =  $35.09 \pm 7.01$ .

3. Standard deviation =  $32.88 \pm 5.07$ .

4.  $(M_y - M_x) = 8.14$ .

Correlation,  $r_{xy} = 0.692 \pm .111$ .

"t" for  $(M_y - M_x)$  is 1.554, not significant at the 1% level.

TABLE XII

MTAI RAW SCORES FOR 143 UNSELECTED GRADE XII  
HIGH SCHOOL SENIORS\* - STANDARD GROUP - 1954-55

NO.	SCORE	NO.	SCORE	NO.	SCORE	NO.	SCORE
1.	08	38.	06	75.	-13	108.	-11
2.	00	39.	07	76.	-03	109.	-01
3.	26	40.	22	77.	-06	110.	-07
4.	12	41.	03	78.	-58	111.	-14
5.	27	42.	28	79.	-03	112.	-30
6.	23	43.	00	80.	-18	113.	-16
7.	29	44.	37	81.	-49	114.	-35
8.	10	45.	10	82.	-05	115.	-48
9.	58	46.	27	83.	-07	116.	-23
10.	38	47.	42	84.	-09	117.	-11
11.	75	48.	55	85.	-02	118.	-50
12.	15	49.	19	86.	-12	119.	-14
13.	17	50.	11	87.	-01	120.	-32
14.	33	51.	08	88.	-06	121.	-21
15.	26	52.	22	89.	-32	122.	-11
16.	36	53.	02	90.	-19	123.	-20
17.	33	54.	24	91.	-12	124.	-27
18.	26	55.	17	92.	-03	125.	-09
19.	16	56.	01	93.	-03	126.	-10
20.	02	57.	14	94.	-24	127.	-09
21.	47	58.	30	95.	-16	128.	-13
22.	41	59.	00	96.	-20	129.	-39
23.	07	60.	06	97.	-29	130.	-02
24.	25	61.	13	98.	-27	131.	-09
25.	67	62.	21	99.	-23	132.	-32
26.	08	63.	03	100.	-29	133.	-13
27.	07	64.	25	101.	-17	134.	-47
28.	32	65.	44	102.	-15	135.	-25
29.	03	66.	31	103.	-04	136.	-06
30.	43	67.	04	104.	-07	137.	-13
31.	30	68.	40	105.	-09	138.	-10
32.	12	69.	09	106.	-02	139.	-68
33.	17	70.	14	107.	-53	140.	-35
34.	24	71.	07			141.	-30
35.	27	72.	06			142.	-17
36.	24	73.	07			143.	-09
37.	04	74.	04				

1. Scores (x):  $S_x = 244$ ,  $S_x^2 = 91694$ .

2. Range = (-68 to 75).

3. Mean =  $1.70 \pm 2.13$ .

4. Standard deviation =  $25.38 \pm 1.51$ .

\*. Stratified sample intact groups

$$\text{est'd } M_{pop} = \frac{\sum n'_p M_p}{\sum n'_p} \quad ; \quad \text{est'd } \sigma_m^2 = \frac{\sum n'_p s_p^2}{(\sum n'_p)^2} - \frac{\sum M_p T_p - G.M.G.T}{N(V-1)}$$

TABLE XIII

MTAI RAW SCORES FOR 115 NORMAL SCHOOL STUDENT  
PROSPECTIVE PRIMARY TEACHERS\* — 1954

NO.	Score	NO.	Score	NO.	Score	NO.	Score
1.	-12	30.	-06	59.	14	88.	64
2.	-16	31.	-10	60.	59	89.	32
3.	-03	32.	-22	61.	08	90.	04
4.	-24	33.	-40	62.	05	91.	15
5.	-35	34.	-01	63.	23	92.	31
6.	-58	35.	-09	64.	11	93.	18
7.	-01	36.	-01	65.	21	94.	37
8.	-25	37.	-27	66.	78	95.	44
9.	-04	38.	-22	67.	16	96.	69
10.	-40	39.	-29	68.	26	97.	17
11.	-21	40.	36	69.	26	98.	61
12.	-55	41.	46	70.	24	99.	36
13.	-19	42.	57	71.	76	100.	07
14.	-06	43.	86	72.	31	101.	35
15.	-09	44.	25	73.	11	102.	09
16.	-05	45.	91	74.	19	103.	03
17.	-01	46.	84	75.	56	104.	37
18.	-07	47.	25	76.	30	105.	08
19.	-18	48.	23	77.	29	106.	22
20.	-05	49.	23	78.	17	107.	24
21.	-23	50.	38	79.	48	108.	03
22.	-11	51.	88	80.	15	109.	19
23.	-07	52.	17	81.	04	110.	57
24.	-25	53.	10	82.	58	111.	46
25.	-13	54.	29	83.	22	112.	54
26.	-31	55.	02	84.	75	113.	61
27.	-02	56.	29	85.	28	114.	26
28.	-07	57.	55	86.	46	115.	06
29.	-15	58.	36	87.	38		

1. MTAI scores ( $\bar{x}$ ):  $Sx = 1894$ ,  $Sx^2 = 145390$ , Range (-58 to 91).
2. Mean =  $16.47 \pm 2.95$ .
3. Standard deviation =  $31.51 \pm 2.09$ .

\* Normal school students who have indicated a preference to teach primary grades.

TABLE XIV

MTAI RAW SCORES FOR 195 NORMAL SCHOOL STUDENTS  
PROSPECTIVE ELEMENTARY TEACHERS\* — 1954

NO.	Score	NO.	Score	NO.	Score	NO.	Score
1.	31	36.	48	71.	38	106.	30
2.	27	37.	38	72.	59	107.	23
3.	28	38.	30	73.	14	108.	08
4.	14	39.	66	74.	31	109.	35
5.	22	40.	39	75.	45	110.	03
6.	52	41.	64	76.	26	112.	26
7.	06	42.	36	77.	39	113.	53
8.	44	43.	56	78.	27	114.	03
9.	46	44.	17	79.	50	115.	35
10.	33	45.	49	80.	06	116.	07
11.	06	46.	39	81.	12	117.	00
12.	61	47.	01	82.	40	118.	-01
13.	73	48.	48	83.	41	119.	-02
14.	40	49.	59	84.	06	120.	-12
15.	15	50.	67	85.	17	121.	-22
16.	02	51.	12	86.	28	122.	-59
17.	48	52.	51	87.	46	123.	-18
18.	27	53.	62	88.	26	124.	-64
19.	35	54.	22	89.	09	125.	-19
20.	18	55.	16	90.	11	126.	-13
21.	20	56.	25	91.	04	127.	-57
22.	53	57.	12	92.	03	128.	-26
23.	21	58.	40	93.	32	129.	-20
24.	36	59.	06	94.	13	130.	-10
25.	42	60.	57	95.	61	131.	-36
26.	45	61.	16	96.	08	132.	-01
27.	13	62.	44	97.	33	133.	-09
28.	59	63.	37	98.	12	134.	-32
29.	20	64.	54	99.	23	135.	-29
30.	33	65.	51	100.	15	136.	-18
31.	43	66.	01	101.	50	137.	-05
32.	51	67.	00	102.	28	138.	-09
33.	71	68.	45	103.	21	139.	-07
34.	45	69.	02	104.	69	111.	-01
35.	19	70.	16	105.	05	140.	-06

\* Normal school students who have indicated a preference to teach elementary grades.

TABLE XIV (continued)

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NO.	Score	No.	Score	NO.	Score	NO.	Score
141.	-57	155.	-02	<del>169</del>	-44	183.	-07
142.	-01	156.	-29	170.	-08	184.	-19
143.	-51	157.	-18	171.	-10	185.	-51
144.	-26	158.	-07	172.	-21	186.	-09
145.	-21	159.	-09	173.	-27	187.	-09
146.	-02	160.	-10	174.	-06	188.	35
147.	-36	161.	-43	175.	-11	189.	39
148.	-50	162.	-43	176.	-08	190.	19
149.	-13	163.	-23	177.	-05	191.	42
150.	-21	164.	-30	178.	-08	192.	55
151.	-25	165.	-23	179.	-27	193.	16
152.	-19	166.	-10	180.	-12	194.	42
153.	-05	167.	-01	181.	-05	195.	01
154.	-31	168.	-69	182.	-25		

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1. MAI scores ( $\bar{x}$ ):  $Sx = 2384$ ,  $Sx^2 = 164203$ , Range ( -69 to 73).
  2. Mean score =  $12.23 \pm 1.89$ .
  3. Standard deviation =  $26.33 \pm 1.34$ .
-

TABLE XV

MTAI RAW SCORES FOR 76 NORMAL SCHOOL STUDENTS

PROSPECTIVE JUNIOR HIGH TEACHERS\* — 1954

NO.	Score	NO.	Score	NO.	Score	NO.	Score
1.	07	23.	33	1.	-32	17.	-12
2.	19	24.	09	2.	-05	18.	-11
3.	24	25.	35	3.	-34	19.	-13
4.	21	26.	01	4.	-06	20.	-69
5.	00	27.	01	5.	-13	21.	-57
6.	21	28.	29	6.	-24	22.	-08
7.	09	29.	24	7.	-24	23.	-19
8.	20	30.	02	8.	-07	24.	-05
9.	48	31.	04	9.	-12	25.	-36
10.	58	32.	46	10.	-39	26.	-02
11.	56	33.	13	11.	-21	27.	-21
12.	29	34.	42	12.	-09	28.	-35
13.	41	35.	58	13.	-19	29.	-25
14.	42	36.	16	14.	-28	30.	-07
15.	07	37.	61	15.	-39	31.	-51
16.	35	38.	14	16.	-10	32.	-08
17.	68	39.	34				
18.	08	40.	17				
19.	54	41.	45				
20.	32	42.	22				
21.	31	43.	45				
22.	10	44.	49				

1. MTAI scores ( $\bar{x}$ ):  $Sx = 539$ ,  $Sx^2 = 73965$ , Range ( -69 to 68).
2. Mean score =  $7.09 \pm 3.51$ .
3. Standard deviation =  $30.38 \pm 2.48$ .

\* Normal school students who have indicated a preference to teach junior high grades.



TABLE XVI

MTAI SCORES FOR 116 NORMAL SCHOOL STUDENTS OF CATHOLIC FAITH

NO.	SCORE	NO.	SCORE	NO.	SCORE	NO.	SCORE
1.	14	35.	10	61.	-32	89.	-02
2.	22	36.	58	62.	-03	90.	-21
3.	06	37.	22	63.	-08	91.	-64
4.	73	38.	09	64.	-35	92.	-19
5.	29	39.	16	65.	-01	93.	-02
6.	02	40.	37	66.	-04	94.	-09
7.	29	41.	46	67.	-08	95.	-39
8.	27	42.	38	68.	-40	96.	-10
9.	35	43.	31	69.	-21	97.	-10
10.	78	44.	01	70.	-27	98.	-12
11.	58	45.	38	71.	-13	99.	-31
12.	56	46.	27	72.	-05	100.	-44
13.	13	47.	32	73.	-25	101.	-08
14.	20	48.	16	74.	-06	102.	-10
15.	41	49.	26	75.	-05	103.	-43
16.	45	50.	09	76.	-26	104.	-08
17.	26	51.	17	77.	-18	105.	-19
18.	30	52.	33	78.	-10	106.	-36
19.	07	53.	23	79.	-36	107.	-30
20.	24	54.	50	80.	-01	108.	-40
21.	36	55.	28	81.	-09	109.	-21
22.	49	56.	07	82.	-32	110.	-23
23.	31	57.	30	83.	-24	111.	-25
24.	01	58.	49	84.	-36	112.	-07
25.	12	59.	22	85.	-05	113.	-57
26.	19	60	00	86.	-01	114.	-13
27.	22			87.	-51	115.	-19
28.	56			88.	-13	116.	-64
29.	12						
30.	30						
31.	19						
32.	17						
33.	31						
34.	48						

1. Scores (x): Range = ( -64 to 78),  $Sx = 512$ ,  $Sx^2 = 105624$ ,
2. Mean =  $4.41 \pm 2.78$ .
3. Standard deviation =  $29.85 \pm 1.97$

TABLE XVII

MTAI SCORES FOR <sup>211</sup> NORMAL SCHOOL STUDENTS OF PROTESTANT FAITH

NO.	SCORE	NO.	SCORE	NO.	SCORE	NO.	SCORE
1.	36	48.	36	94.	04	140.	04
2.	27	49.	42	95.	33	141.	03
3.	28	50.	45	96.	01	142.	14
4.	07	51.	59	97.	02	143.	17
5.	19	52.	29	98.	16	144.	61
6.	46	53.	33	99.	46	145.	41
7.	52	54.	16	100.	59	146.	32
8.	57	55.	43	101.	14	147.	36
9.	86	56.	51	102.	45	148.	34
10.	25	57.	42	103.	26	149.	13
11.	91	58.	71	104.	39	150.	61
12.	84	59.	19	105.	29	151.	45
13.	25	60.	48	106.	64	152.	08
14.	44	61.	38	107.	50	153.	01
15.	23	62.	26	108.	04	154.	12
16.	24	63.	66	109.	04	155.	07
17.	38	64.	35	110.	40	156.	35
18.	23	65.	39	111.	06	157.	15
19.	88	66.	64	112.	57	158.	09
20.	17	67.	56	113.	44	159.	21
21.	46	68.	35	114.	15	160.	57
22.	31	69.	17	115.	54	161.	22
23.	06	70.	39	116.	51	162.	19
24.	61	71.	76	117.	01	163.	03
25.	10	72.	48	118.	00	164.	69
26.	40	73.	11	119.	45	165.	37
27.	21	74.	59	120.	13	166.	08
28.	15	75.	67	121.	31	167.	22
29.	02	76.	51	122.	18	168.	24
30.	00	77.	01	123.	37	169.	45
31.	55	78.	28	124.	42	170.	03
32.	36	79.	62	125.	08	171.	19
33.	21	80.	68	126.	03	172.	23
34.	14	81.	08	127.	61	173.	07
35.	48	82.	16	128.	53	174.	35
36.	59	83.	54	129.	75	175.	03
37.	20	84.	25	130.	41	176.	06
38.	08	85.	32	131.	44	177.	53
39.	23	86.	35	132.	06	178.	26
40.	11	87.	39	133.	17	179.	26
41.	18	88.	42	134.	28	180.	61
42.	21	89.	55	135.	58	181.	03
43.	20	90.	29	136.	46	182.	08
44.	48	91.	16	137.	69	183.	54
45.	53	92.	42	138.	61	184.	46
46.	33	93.	15	139.	11	185.	35
47.	21						

TABLE XVII (continued)

NO.	SCORE	NO.	SCORE	NO.	SCORE	NO.	SCORE
186.	-24	208.	-09	230.	-57	251.	-43
187.	-05	209.	-09	231.	-25	252.	-18
188.	-16	210.	-09	232.	-07	253.	-01
189.	-12	211.	-07	233.	-31	254.	-29
190.	-34	212.	-20	234.	-26	255.	-59
191.	-10	213.	-24	235.	-07	256.	-22
192.	-58	214.	-29	236.	-12	257.	-12
193.	-25	215.	-05	237.	-39	258.	-22
194.	-21	216.	-23	238.	-11	259.	-02
195.	-05	217.	-02	239.	-13	260.	001
196.	-27	218.	-50	240.	-69	261.	-27
197.	-06	219.	-11	241.	-21	262.	-09
198.	-11	220.	-13	242.	-19	263.	-51
199.	-05	221.	-21	243.	-29	264.	-23
200.	-08	222.	-25	244.	-18	265.	-22
201.	-12	223.	-19	245.	-07	266.	-05
202.	-55	224.	-05	246.	-09	267.	-02
203.	-19	225.	-07	247.	-10	268.	-35
204.	-06	226.	-09	248.	-06	269.	-01
205.	-07	227.	-07	249.	-28	270.	-10
206.	-19	228.	-01	250.	-39	271.	-01
207.	-51	229.	-06				

1. Range = ( -69 to 91).
2. Mean =  $16.38 \pm 1.88$ .
3. Standard deviation =  $30.99 \pm 1.33$ .
4. Number of scores = 271.
5. Sum of scores = 4438
6. Sum of squares of scores = 332932.

TABLE XVIII

MTAI RAW SCORES FOR NORMAL SCHOOL STUDENTS CLASSIFIED  
ON THE BASIS OF PREVIOUS RECORD OF GENERAL  
SCHOLARSHIP AND LEADERSHIP\* → 1954-55

GROUP RATED SUPERIOR				GROUP RATED INFERIOR			
No.	Score	No.	Score	No.	Score	No.	Score
1.	17	24.	08	1.	35	24.	-51
2.	61	25.	33	2.	15	25.	-08
3.	32	26.	12	3.	50	26.	-43
4.	36	27.	41	4.	09	27.	-08
5.	17	28.	28	5.	28	28.	-19
6.	45	29.	58	6.	21	29.	-23
7.	07	30.	-02	7.	57	30.	-05
8.	44	31.	-19	8.	19	31.	-36
9.	06	32.	-18	9.	03	32.	-30
10.	17	33.	-07	10.	69	33.	-02
11.	46	34.	-28	11.	37	34.	-21
12.	16	35.	-10	12.	08	35.	-23
13.	69	36.	-12	13.	07	36.	-25
14.	26	37.	-13	14.	22	37.	-07
15.	09	38.	-31	15.	24	38.	-69
16.	61	39.	-21	16.	45	39.	-09
17.	11	40.	-09	17.	03	40.	-44
18.	04	41.	-29	18.	19	41.	-10
19.	03	42.	-09	19.	30	42.	-22
20.	14	43.	-15	20.	49	43.	-40
21.	34	44.	-10	21.	23	44.	-35
22.	13	45.	-06	22.	22	45.	-01
23.	61	46.	-43	23.	23	46.	-10
		47.	-11			47.	-01

Superior Group

1. Grade choice: Primary 8, Elementary 22, Secondary 17.
2. MTAI scores (x):  $S_x = 536$ ,  $S_x^2 = 41750$ ,  $R = (-43 \text{ to } 69)$ .
3. Mean score =  $11.40 \pm 4.06$ .
4. Standard deviation =  $27.54 \pm 2.87$ .

Inferior Group

1. Grade Choice: Primary 15, Elementary 17, Secondary 15.
2. MTAI scores (y):  $S_y = 76$ ,  $S_y^2 = 43042$ ,  $R = (-69 \text{ to } 69)$ .
3. Mean score =  $1.62 \pm 4.45$ .
4. Standard deviation =  $30.22 \pm 3.15$ .

Difference Between Means

$t = 1.53$ , significant at 10% level.

\* These two groups have been selected from 555 students enrolled at the Manitoba Provincial Normal School on the basis of previous scholarship - leadership attainment.

TABLE XIX

CORRELATION OF MTAI RAW SCORES WITH ACE RAW SCORES\*,  
FOR 89 FACULTY OF EDUCATION STUDENTS — 1954-55

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NO.	MTAI	ACE	NO.	MTAI	ACE
1.	-07	133	36.	74	158
2.	-34	133	37.	20	99
3.	-07	121	38.	16	98
4.	-28	140	39.	16	116
5.	-08	140	40.	68	140
6.	-13	116	41.	64	155
7.	-16	130	42.	29	125
8.	-18	130	43.	71	136
9.	-17	191	44.	05	144
10.	-10	124	45.	00	109
11.	-08	140	46.	22	141
12.	-27	154	47.	16	119
13.	-46	121	48.	27	123
14.	-21	166	49.	05	146
15.	-14	142	50.	59	100
16.	-31	148	51.	59	154
17.	-31	144	52.	62	141
18.	-12	125	53.	27	97
19.	-12	104	54.	53	154
20.	-80	149	55.	36	102
21.	-05	157	56.	60	94
22.	01	132	57.	05	89
23.	16	154	58.	19	103
24.	80	77	59.	21	109
25.	25	123	60.	20	111
26.	64	128	61.	73	126
27.	23	81	62.	26	127
28.	29	100	63.	28	127
29.	30	135	64.	41	120
30.	23	149	65.	22	164
31.	07	122	66.	88	113
32.	35	135	67.	17	116
33.	25	125	68.	35	127
34.	51	106	69.	10	127
35.	14	170	70.	102	117

TABLE XIX (continued)

NO.	MTAI	ACE	NO.	MTAI	ACE
71.	40	122	81.	84	139
72.	41	98	82.	73	110
73.	61	120	83.	71	123
74.	47	143	84.	92	131
75.	04	122	85.	49	138
76.	02	84	86.	16	168
77.	79	133	87.	59	128
78.	36	146	88.	88	156
79.	58	163	89.	49	118
80.	26	127			

MTAI scores (x):  $S_x = 2249$ ,  $S_x^2 = 168967$ ,

1. Range of MTAI scores ( -80 to 102),
2. Mean MTAI score =  $25.27 \pm 3.78$ ,
3. Standard deviation of MTAI scores =  $35.49 \pm 2.67$ .

ACE scores (y):  $S_y = 11441$ ,  $S_y^2 = 1511953$ ,  $S_{xy} = 279767$ ,

1. Range of ACE scores ( 77 to 191),
2. Mean ACE score =  $128.55 \pm 2.29$ ,
3. Standard deviation of ACE scores =  $21.44 \pm 1.62$ ,
4. ACE vs. MTAI correlation  $r = -.138 \pm .104$ , not significant at the 5% level<sup>1</sup>.

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\* ACE scores refer to total raw scores obtained on the American Council on Education Psychological Examination, The American Council on Education, 744 Jackson Place, Washington 6,DC.,(1951).

1. Lindquist, op. cit., p. 212.

TABLE XX

CORRELATION OF MTAI RAW SCORES WITH Ho, Pv, AND ta RAW SCORES\* FOR 89 FACULTY OF EDUCATION STUDENTS— 1954-55

Subject No.	Ho	Pv	ta	MTAI
1.	09	30	39	-17
2.	14	24	38	16
3.	09	18	27	59
4.	11	18	29	58
5.	08	12	20	88
6.	20	16	36	14
7.	26	27	53	79
8.	28	22	50	16
9.	23	19	42	73
10.	13	13	26	-80
11.	02	12	14	23
12.	09	11	20	19
13.	20	22	42	-13
14.	16	25	41	-16
15.	05	07	12	73
16.	22	26	48	-08
17.	17	11	28	71
18.	21	16	37	17
19.	15	20	35	102
20.	12	18	30	-14
21.	13	13	26	29
22.	19	14	33	36
23.	13	12	25	27
24.	14	11	25	49
25.	09	15	24	36
26.	11	14	25	30
27.	18	14	32	49
28.	26	25	51	-31
29.	16	16	32	-07
30.	23	18	41	02
31.	12	18	30	35
32.	17	14	31	01
33.	20	17	37	64
34.	22	13	35	20
35.	30	21	51	-34
36.	23	20	43	62
37.	06	10	16	59
38.	17	21	38	-07
39.	15	21	36	47
40.	19	18	37	-18

\* The Hostility scale (Ho) and Pharisaic-virtue scale (Pv) combine to form a Teacher Attitude scale (ta). See page 72.

TABLE XX (continued)

No.	Ho	Pv	ta	MTAI
41.	15	17	32	05
42.	18	14	32	25
43.	21	29	50	-21
44.	24	21	45	-27
45.	28	16	44	-08
46.	06	04	10	92
47.	24	20	44	60
48.	19	13	32	16
49.	04	09	13	51
50.	13	24	37	22
51.	14	16	30	-05
52.	10	17	27	05
53.	19	14	33	28
54.	27	18	45	00
55.	21	11	32	-12
56.	08	15	23	35
57.	16	20	36	68
58.	09	16	25	29
59.	16	11	27	-28
60.	16	22	38	-46
61.	11	19	30	80
62.	11	12	23	04
63.	12	10	22	23
64.	09	13	22	16
65.	12	22	34	25
66.	32	08	40	61
67.	16	15	31	64
68.	27	26	53	20
69.	14	23	37	26
70.	24	30	54	59
71.	13	20	33	41
72.	09	10	19	88
73.	07	16	23	22
74.	19	17	36	21
75.	17	07	24	16
76.	23	31	54	-31
77.	08	13	21	40
78.	06	12	18	84
79.	16	07	23	27
80.	08	09	17	10
81.	16	20	36	53
82.	23	29	52	05
83.	25	26	51	-10
84.	04	15	19	41
85.	19	32	51	07
86.	21	13	34	-12
87.	13	07	20	26
88.	15	19	34	71
89.	20	23	43	74



TABLE XX (continued)

MTAI scores (a):  $S_a = 2249$ ,  $S_a^2 = 168967$ ,

1. Range = (-80 to 102),
2. Mean =  $25.27 \pm 3.78$ ,
3. Standard deviation =  $35.49 \pm 2.67$ .

Ho scale (b):  $S_b = 1421$ ,  $S_b^2 = 26549$ ,  $S_{ab} = 30161$ ,

1. Range = ( 2 to 32),
2. Mean =  $15.97 \pm .70$ ,
3. Standard deviation =  $6.57 \pm .49$ ,
4. Ho vs. MTAI, correlation  $r = -.297 \pm .097$ , significant at 1% level.<sup>1</sup>

Pv scale (c):  $S_c = 1523$ ,  $S_c^2 = 29405$ ,  $S_{ac} = 33506$ ,

1. Range = ( 4 to 32),
2. Mean =  $17.11 \pm .65$ ,
3. Standard deviation =  $6.13 \pm .46$ ,
4. Pv vs. MTAI, correlation  $r = -.257 \pm .099$ , significant at 1% level.<sup>1</sup>
5. Pv vs. Ho, correlation  $r = 0.440 \pm .086$ , significant at 1% level.<sup>1</sup>

ta scale (d):  $S_d = 2944$ ,  $S_d^2 = 107742$ ,  $S_{ad} = 63667$ ,

1. Range = ( 10 to 54 ),
2. Mean =  $32.95 \pm 1.15$ ,
3. Standard deviation =  $10.78 \pm .81$ ,
4. ta vs. MTAI, correlation  $r = -.315 \pm .096$ , significant at the 1% level.<sup>1</sup>

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1. Lindquist, op. cit., p. 212.

TABLE XXI

CORRELATION OF Ho, Pv, AND ta RAW SCORES WITH MTAI RAW  
 SCORES\* FOR 54 FEMALE FACULTY OF EDUCATION STUDENTS—1954-55

NO.	Ho	Pv	ta	MTAI
1.	11	19	30	80
2.	09	13	22	16
3.	12	22	34	25
4.	32	08	40	61
5.	16	15	31	64
6.	14	23	37	26
7.	24	30	54	59
8.	09	10	19	88
9.	07	16	23	22
10.	19	17	36	21
11.	23	31	54	-31
12.	08	13	21	40
13.	06	12	18	84
14.	16	20	36	53
15.	23	29	52	05
16.	04	15	19	41
17.	19	32	51	07
18.	13	07	20	26
19.	15	19	34	71
20.	09	30	39	-17
21.	14	24	38	16
22.	09	18	27	59
23.	11	18	29	58
24.	08	12	20	88
25.	20	16	36	14
26.	26	27	53	79
27.	23	19	42	73
28.	13	13	26	-80
29.	02	12	14	23
30.	09	11	20	19
31.	13	20	33	41
32.	16	25	41	-16
33.	05	07	12	73
34.	17	11	28	71
35.	21	16	37	17
36.	15	20	35	102
37.	12	18	30	-14
38.	19	14	33	36
39.	17	14	31	01
40.	20	17	37	64
41.	22	13	35	20
42.	23	20	43	62
43.	06	10	16	59
44.	17	21	38	-07
45.	15.	17	32	05

\* See page 72.

TABLE XXI (continued)

NO.	Ho	Pv	ta	MTAI
46.	18	14	32	25
47.	06	04	10	92
48.	04	09	13	51
49.	19	14	33	28
50.	27	18	45	00
51.	21	11	32	-12
52.	09	16	25	29
53.	24	20	44	60
54.	16	20	36	68

MTAI scores (a):  $S_a = 1945$ ,  $S_a^2 = 140083$ .

1. Range = ( -80 to 102 ),
2. Mean =  $36.02 \pm 4.95$ ,
3. Standard deviation =  $36.01 \pm 3.50$ ,

Ho scale score (b):  $S_b = 806$ ,  $S_b^2 = 14458$ ,  $S_{ab} = 27333$

1. Range = ( 4 to 30 ),
2. Mean =  $14.93 \pm .92$ ,
3. Standard deviation =  $6.69 \pm .65$ ,
4. Ho vs. MTAI correlation  $r = -.130 \pm .135^1$

Pv scale scores (c):  $S_c = 920$ ,  $S_c^2 = 17844$ ,  $S_{ac} = 29917$ ,

1. Range = ( 4 to 29 ),
2. Mean =  $17.04 \pm .87$ ,
3. Standard deviation =  $6.33 \pm .61$ ,
4. Pv vs. MTAI correlation  $r = -.262 \pm .128^1$ ,
5. Pv vs. Ho correlation  $r = 0.389 \pm .117$ , significant at the 5% level.<sup>1</sup>

ta scale scores (d):  $S_d = 1726$ ,  $S_d^2 = 1945$ ,  $S_{ad} = 57250$ ,

1. Range = ( 10 to 51 ),
2. Mean =  $31.96 \pm 1.49$ ,
3. Standard deviation =  $10.88 \pm 1.06$ ,
4. ta vs. MTAI correlation  $r = -.232 \pm .130^1$ .

1. Not significant at the 5% level.

TABLE XXII

CORRELATION OF Ho, Pv, AND ta RAW SCORES\* WITH MTAI RAW  
SCORES FOR 35 MALE FACULTY OF EDUCATION STUDENTS —1954-55

NO.	Ho	Pv	ta	MTAI
1.	16	22	38	-46
2.	11	12	23	04
3.	24	21	45	-27
4.	08	09	17	10
5.	27	26	53	20
6.	15	21	36	47
7.	16	11	27	-28
8.	14	16	30	-05
9.	20	23	43	74
10.	28	22	50	16
11.	22	26	48	-08
12.	13	13	26	29
13.	20	22	42	-13
14.	19	18	37	-18
15.	10	17	27	05
16.	19	13	32	16
17.	16	07	23	27
18.	13	12	25	27
19.	25	26	51	-10
20.	13	24	37	22
21.	28	16	44	-08
22.	12	18	30	35
23.	23	18	41	02
24.	09	15	24	36
25.	21	29	50	-21
26.	18	14	32	49
27.	26	25	51	-31
28.	21	13	34	-12
29.	17	07	24	16
30.	16	16	32	-07
31.	12	10	22	23
32.	30	21	51	-34
33.	08	15	23	35
34.	11	14	25	30
35.	14	11	25	49

\* See page

TABLE XXII(continued)

MTAI scores (a):  $S_a = 304$ ,  $S_a^2 = 2884$ ,

1. Range = ( -46 to 74),
2. Mean =  $8.69 \pm 4.63$ ,
3. Standard deviation =  $27.38 \pm 3.32$ ,

Ho scale scores (b):  $S_b = 615$ ,  $S_b^2 = 12091$ ,  $S_{ab} = 2828$ ,

1. Range = ( 8 to 30),
2. Mean =  $17.57 \pm 1.02$ ,
3. Standard deviation =  $6.05 \pm .73$ ,
4. Ho vs. MTAI, correlation  $r = -.439 \pm .136$ , significant at the 1% level.<sup>1</sup>

Pv scale scores (c):  $S_c = 11561$ ,  $S_{ac} = 3589$ ,

1. Range = ( 7 to 29),
2. Mean =  $17.23 \pm .98$ ,
3. Standard deviation =  $5.78 \pm .70$ ,
4. Pv vs. MTAI, correlation,  $r = -.298 \pm .153$ , not significant at the 5% level.<sup>1</sup>
5. Pv vs. Ho, correlation  $r = 0.554 \pm .117$ , significant at the 1% level.<sup>1</sup>

ta scale scores (d):  $S_d = 1218$ ,  $S_d^2 = 46198$ ,  $S_{ad} = 6417$ ,

1. Range = ( 17 to 51 ),
  2. Mean =  $34.80 \pm 1.76$ ,
  3. Standard deviation =  $10.43 \pm 1.26$ ,
  4. ta vs. MTAI, correlation  $r = -.416 \pm .140$ , significant at the 2% level.<sup>1</sup>
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1. Lindquist, op. cit., p. 212.

TABLE XXIII

MTAI RAW SCORES FOR 89 FACULTY OF EDUCATION STUDENTS,  
EDUCATION I — 1954 - 55

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NO.	MTAI	NO.	MTAI	NO.	MTAI
1.	-07	31.	07	61.	73
2.	-34	32.	35	62.	26
3.	-07	33.	25	63.	28
4.	-28	34.	51	64.	41
5.	-08	35.	14	65.	22
6.	-13	36.	74	66.	88
7.	-16	37.	20	67.	17
8.	-18	38.	16	68.	35
9.	-17	39.	16	69.	10
10.	-10	40.	68	70.	102
11.	-08	41.	64	71.	40
12.	-27	42.	29	72.	41
13.	-46	43.	71	73.	61
14.	-21	44.	05	74.	47
15.	-14	45.	00	75.	04
16.	-31	46.	22	76.	02
17.	-31	47.	16	77.	79
18.	-12	48.	27	78.	36
19.	-12	49.	05	79.	58
20.	-80	50.	59	80.	26
21.	-05	51.	59	81.	84
22.	01	52.	62	82.	73
23.	16	53.	27	83.	71
24.	80	54.	53	84.	92
25.	25	55.	36	85.	49
26.	64	56.	60	86.	16
27.	23	57.	05	87.	59
28.	29	58.	19	88.	88
29.	30	59.	21	89.	49
30.	23	60.	20		
31.					

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TABLE XXIV

MTAI RAW SCORES FOR 111 UNSELECTED EXPERIENCED  
 SELF-CLASSIFIED\* PRIMARY PUBLIC SCHOOL TEACHERS  
 IN SCHOOL SYSTEMS WITH MORE THAN 21 TEACHERS -1954

NO.	SCORE	NO.	SCORE	NO.	SCORE	NO.	SCORE
1.	41	30.	16	59.	02	88.	-26
2.	103	31.	64	60.	69	89.	-10
3.	34	32.	19	61.	43	90.	-05
4.	38	33.	29	62.	51	91.	-01
5.	05	34.	80	63.	25	92.	-07
6.	30	35.	74	64.	20	93.	-06
7.	05	36.	21	65.	03	94.	-16
8.	113	37.	43	66.	36	95.	-46
9.	36	38.	43	67.	41	96.	-48
10.	20	39.	73	68.	62	97.	-22
11.	53	40.	51	69.	28	98.	-31
12.	01	41.	17	70.	12	99.	-36
13.	61	42.	83	71.	01	100.	-45
14.	30	43.	21	72.	89	101.	-20
15.	32	44.	68	73.	92	102.	-08
16.	33	45.	76	74.	116	103.	-19
17.	70	46.	35	75.	59	104.	-10
18.	66	47.	46	76.	66	105.	-16
19.	35	48.	32	77.	62	106.	-02
20.	31	49.	69	78.	93	107.	-42
21.	32	50.	07	79.	63	108.	-10
22.	09	51.	66	80.	26	109.	-08
23.	70	52.	05	81.	02	110.	-11
24.	116	53.	62	82.	24	111.	-12
25.	70	54.	40	83.	74		
26.	64	55.	40	84.	59		
27.	62	56.	54	85.	74		
28.	05	57.	47	86.	40		
29.	09	58.	38	87.	11		

MTAI scores (x)  $S_x = 3479$ ,  $S_x^2 = 261641$ ,  $N = 111$ .  
 Range of MTAI scores ( -14 to 116) points  
 Mean MTAI score =  $31.34 \pm 3.53$  points  
 Standard deviation =  $37.08 \pm 2.50$

Range of experience ( 1 to 42) years  
 Mean experience = 15 years

\* Self-Classified is used to indicate that the teachers are classified according to the grade they would prefer to teach.

TABLE XXV

MTAI RAW SCORES FOR 103 UNSELECTED EXPERIENCED  
 SELF-CLASSIFIED\* ELEMENTARY PUBLIC SCHOOL TEACHERS  
 IN SCHOOL SYSTEMS WITH MORE THAN 21 TEACHERS

NO.	SCORE	NO.	SCORE	NO.	SCORE	NO.	SCORE
1.	58	27.	46	53.	42	79.	-02
2.	67	28.	25	54.	43	80.	-57
3.	24	29.	35	55.	67	81.	-05
4.	07	30.	04	56.	84	82.	-15
5.	25	31.	12	57.	30	83.	-10
6.	32	32.	22	58.	66	84.	-35
7.	04	33.	82	59.	23	85.	-59
8.	61	34.	35	60.	65	86.	-08
9.	44	35.	28	61.	27	87.	-34
10.	24	36.	35	62.	23	88.	-34
11.	36	37.	14	63.	72	89.	-06
12.	33	38.	14	64.	65	90.	-42
13.	50	39.	18	65.	22	91.	-06
14.	00	40.	49	66.	67	92.	-06
15.	52	41.	24	67.	45	93.	-09
16.	78	42.	57	68.	61	94.	-10
17.	59	43.	66	69.	45	95.	-03
18.	43	44.	11	70.	95	96.	-27
19.	61	45.	53	71.	05	97.	-60
20.	35	46.	25	72.	98	98.	-32
21.	08	47.	54	73.	-42	99.	-42
22.	73	48.	06	74.	-18	100.	-30
23.	90	49.	64	75.	-29	101.	-15
24.	34	50.	40	76.	-21	102.	-39
25.	37	51.	24	77.	-13	103.	-30
26.	38	52.	77	78.	-35		

Range (-60 to 98) MTAI scores(x):  $Sx = 2264$ ,  $Sx^2 = 28174$ ,  $N = 103$ .  
 Mean  $\approx 21.981 \pm 3.75$   
 Standard Deviation  $\approx 37.91 \pm 2.67$

Range of experience ( 1 to 35) years  
 Mean experience  $\approx 15$  years

\* Self-Classified is used to indicate that the teachers are classified according to the grade they would prefer to teach.



TABLE XXVI

MTAI RAW SCORES FOR 178 UNSELECTED EXPERIENCED  
SELF-CLASSIFIED\* SECONDARY PUBLIC SCHOOL TEACHERS  
IN SCHOOL SYSTEMS WITH MORE THAN 21 TEACHERS -1954

NO.	SCORE	NO.	SCORE	NO.	SCORE
1.	29	34.	17	66.	27
2.	17	35.	03	67.	53
3.	78	36.	20	68.	18
4.	37	37.	47	69.	22
5.	46	38.	86	70.	45
6.	06	39.	08	71.	40
7.	01	40.	55	72.	17
8.	53	41.	25	73.	57
9.	28	42.	38	74.	17
10.	61	43.	65	75.	21
11.	33	44.	71	76.	44
12.	36	45.	20	77.	48
13.	22	46.	15	78.	40
14.	05	47.	30	79.	21
15.	68	48.	11	80.	05
16.	56	49.	61	81.	23
17.	69	50.	47	82.	00
18.	11	51.	11	83.	28
19.	48	52.	73	84.	24
20.	75	53.	35	85.	10
21.	61	54.	00	86.	09
22.	72	55.	36	87.	57
23.	73	56.	10	88.	50
24.	02	57.	41	89.	05
25.	41	58.	06	90.	22
26.	19	59.	34	91.	62
27.	40	60.	07	92.	16
28.	17	61.	29	93.	34
29.	24	62.	56	94.	28
30.	23	63.	27	95.	32
31.	15	64.	75	96.	10
32.	31	65.	27	97.	34
33.	60				

\* Self-Classified is used to indicate that the teachers are classified according to the grade they would prefer to teach.

TABLE (continued)

NO.	SCORE	NO.	SCORE	NO.	SCORE
98.	-02	125.	-19	152.	-29
99.	-21	126.	-52	153.	-62
100.	-02	127.	-14	154.	-76
101.	-01	128.	-08	155.	-29
102.	-03	129.	-22	156.	-47
103.	-30	130.	-45	157.	-50
104.	-01	131.	-10	158.	-25
105.	-19	132.	-14	159.	-50
106.	-28	133.	-50	160.	-01
107.	-04	134.	-38	161.	-17
108.	-48	135.	-36	162.	-25
109.	-13	136.	-01	163.	-53
110.	-19	137.	-36	164.	-14
111.	-24	138.	-44	165.	-42
112.	-24	139.	-43	166.	-56
113.	-13	140.	-03	167.	-10
114.	-42	141.	-51	168.	-37
115.	-52	142.	-03	169.	-10
116.	-07	143.	-63	170.	-14
117.	-37	144.	-35	171.	-37
118.	-07	145.	-17	172.	-48
119.	-37	146.	-56	173.	-12
120.	-28	147.	-08	174.	-43
121.	-31	148.	-64	175.	-32
122.	-46	149.	-31	176.	-29
123.	-05	150.	-28	177.	-40
124.	-05	151.	-34	178.	-12

MTAI scores ( $\bar{x}$ ):  $Sx = 988$ ,  $Sx^2 = 246762$ ,  $N = 178$ .

Range of MTAI scores ( -64 to 75 ) points

Mean MTAI score =  $5.55 \pm 2.77$  points

Standard deviation =  $36.82 \pm 1.96$

Range of experience ( 1 - 45 ) years

Mean experience = 14 years

TABLE XXVII

MTAI RAW SCORES FOR 81 UNSELECTED PRIMARY TEACHERS

CLASSIFIED ACCORDING TO EXPERIENCE — 1954

EXPERIENCE(1 to 10)YRS.				EXPERIENCED (11 to 40) YRS.			
NO.	Score	NO.	Score	NO.	Score	NO.	Score
1.	80	18.	31	1.	116	25.	41
2.	16	19.	32	2.	28	26.	83
3.	09	20.	68	3.	41	27.	29
4.	62	21.	34	4.	03	28.	05
5.	116	22.	12	5.	20	29.	64
6.	33	23.	62	6.	25	30.	70
7.	113	24.	43	7.	54	31.	70
8.	38	25.	-19	8.	40	32.	09
9.	40	26.	-06	9.	05	33.	32
10.	01	27.	-07	10.	66	34.	35
11.	36	28.	-10	11.	69	35.	70
12.	51	29.	-10	12.	11	36.	46
13.	40	30.	-16	13.	17	37.	35
14.	62	31.	-08	14.	51	38.	-48
15.	07	32.	-10	15.	74	39.	-46
16.	19	33.	-11	16.	30	40.	-22
17.	64			17.	61	41.	-31
				18.	01	42.	-36
				19.	53	43.	-16
				20.	20	44.	-01
				21.	36	45.	-02
				22.	30	46.	-42
				23.	05	47.	-08
				24.	103	48.	-12

Experience ( 1 to 10) years

1. MTAI scores (x):  $S_x = 972$ ,  $S_x^2 = 69576$ , Range ( -19 to 116).
2. Mean score =  $29.46 \pm 6.22$ .
3. Standard deviation =  $35.22 \pm 4.40$ .

Experience ( 11 to 40) years

1. MTAI scores (y):  $S_y = 1324$ ,  $S_y^2 = 103058$ , Range( -48 to 116).
2. Mean score =  $27.58 \pm 5.44$ .
3. Standard deviation =  $37.25 \pm 3.84$ .
4. t for  $(M_x - M_y) < 1$ , not significant.

TABLE XXVIII

MTAI RAW SCORES FOR 68 UNSELECTED ELEMENTARY TEACHERS

CLASSIFIED ACCORDING TO EXPERIENCE — 1954

EXPERIENCE(1 to 10)yrs.		EXPERIENCE(11 to 35) years			
No.	Score	No.	Score	NO.	Score
1.	54	1.	58	24.	66
2.	25	2.	67	25.	25
3.	44	3.	07	26.	06
4.	33	4.	61	27.	64
5.	59	5.	24	28.	98
6.	35	6.	36	29.	-35
7.	04	7.	50	30.	-06
8.	78	8.	00	31.	-27
9.	43	9.	52	32.	-15
10.	61	10.	35	33.	-30
11.	34	11.	08	34.	-61
12.	37	12.	73	35.	-10
13.	22	13.	90	36.	-06
14.	14	14.	38	37.	-06
15.	18	15.	46	38.	-34
16.	49	16.	04	39.	-34
17.	53	17.	12	40.	-08
18.	-09	18.	82	41.	-59
19.	-03	19.	35	42.	-10
20.	-32	20.	28	43.	-02
21.	-30	21.	14	44.	-35
22.	-15	22.	24	45.	-13
23.	-42	23.	57		

Experience (1 to 10) years

1. Scores (x):  $S_x = 532$ ,  $S_x^2 = 35684$ , Range ( -42 to 78).
2. Mean score =  $23.13 \pm 6.95$ .
3. Standard deviation =  $31.82 \pm 4.91$ .

Experience ( 11 to 35) years

1. Scores (y):  $S_y = 769$ ,  $S_y^2 = 82971$ , Range ( -61 to 90).
2. Mean score =  $17.09 \pm 5.85$ .
3. Standard deviation =  $38.78 \pm 4.13$ .
4. t for (  $M_x - M_y$  ) is 0.582, not significant.

TABLE XXIX  
CORRELATION OF MTAI RAW SCORES WITH PERSONAL  
FACTORS FOR 81 PRIMARY TEACHERS — 1954

NO.	MTAI	AGE	TEACHING EXPERIENCE	ACADEMIC STANDING
1.	-19	25	3	5
2.	-06	23	5	2
3.	-07	21	2	2
4.	110	24	3	2
5.	-10	22	3	2
6.	-16	47	6	2
7.	-08	30	9	2
8.	-10	29	9	2
9.	-11	31	8	2
10.	-48	53	30	1
11.	-46	53	33	1
12.	-22	52	30	2
13.	-31	58	37	2
14.	-36	56	35	1
15.	-16	32	12	1
16.	-01	55	17	3
17.	-02	30	12	3
18.	-42	44	14	2
19.	-08	36	13	1
20.	-12	45	25	3
21.	80	22	1	2
22.	16	24	1	5
23.	09	26	3	5
24.	62	23	5	7
25.	116	34	1	2
26.	33	20	1	3
27.	113	33	1	3
28.	38	24	2	5
29.	40	21	1	5
30.	01	22	2	2
31.	36	25	3	2
32.	51	26	5	2
33.	40	24	5	2
34.	62	24	3	5
35.	07	33	5	4
36.	19	29	1	1
37.	64	34	9	3
38.	31	28	7	2
39.	32	25	6	2
40.	68	30	6	2
41.	34	26	10	2
42.	12	26	8	2
43.	62	35	6	2
44.	43	23	6	5
45.	116	40	6	3
			17	7

TABLE XXIX (continued)

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NO.	MTAI	AGE	TEACHING EXPERIENCE	ACADEMIC STANDING
46.	28	49	18	1
47.	41	52	16	2
48.	03	50	32	2
49.	20	56	35	2
50.	25	47	26	2
51.	54	33	15	2
52.	40	31	12	2
53.	05	33	14	5
54.	66	52	26	5
55.	69	43	23	5
56.	11	55	35	2
57.	17	48	16	3
58.	51	59	35	1
59.	74	34	14	3
60.	30	34	15	2
61.	61	38	20	2
62.	01	34	12	2
63.	53	39	21	2
64.	20	48	29	2
65.	36	40	20	2
66.	30	35	12	2
67.	05	48	25	2
68.	103	58	40	3
69.	41	40	23	7
70.	83	35	12	5
71.	29	58	36	2
72.	05	54	30	2
73.	64	40	20	2
74.	70	45	14	2
75.	70	40	19	3
76.	09	32	12	2
77.	32	41	15	2
78.	35	33	12	2
79.	70	50	26	5
80.	46	32	11	2
81.	35	30	12	2

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TABLE XXIX (continued)

MTAI scores (a):  $S_a = 2256$ ,  $S_a^2 = 172634$ .

1. Mean score =  $27.85 \pm 4.09$ .
2. Standard deviation =  $36.82 \pm 2.91$ .

Age In Years (b):  $S_b = 2989$ ,  $S_b^2 = 120789$ ,  $S_{ab} = 79528$ .

1. Mean age =  $36.90 \pm 1.26$ .
2. Standard deviation =  $11.38 \pm .90$ .
3. Correlation of MTAI scores vs. age,  $r = -.159$ .

Experience (c):  $S_c = 1179$ ,  $S_c^2 = 26549$ ,  $S_{ac} = 28591$ .

1. Mean experience =  $14.55 \pm 1.20$ .
2. Standard deviation =  $10.77 \pm .85$ .
3. Correlation of MTAI scores vs. experience,  $r = -.132$ .

Academic Standing In Years Beyond Grade 11:  $S_d = 243$ ,  
 $S_d^2 = 1003$ ,  $S_{ad} = 7600$ .

1. Mean years =  $3 \pm .20$ .
2. Standard deviation =  $1.84 \pm .15$ .
3. Correlation of MTAI scores vs. Academic Standing,  $r = 0.152$ .

TABLE XXX

MTAI RAW SCORES FOR 82 TEACHERS TAKING  
OFF-CAMPUS COURSES\* IN EDUCATION —1954

PRIMARY AND ELEMENTARY TEACHERS**							
NO.	Score	NO.	Score	NO.	Score	NO.	Score
1.	62	8.	40	15.	30	22.	-26
2.	66	9.	24	16.	66	23.	-42
3.	59	10.	77	17.	23	24.	-18
4.	26	11.	42	18.	65	25.	-29
5.	63	12.	43	19.	27	26.	-21
6.	75	13.	67	20.	23		
7.	93	14.	84	21.	72		

SECONDARY TEACHERS**							
NO.	Score	NO.	Score	NO.	Score	NO.	Score
1.	29	15.	68	29.	60	43.	-14
2.	17	16.	56	30.	17	44.	-42
3.	78	17.	69	31.	03	45.	-56
4.	37	18.	11	32.	20	46.	-10
5.	46	19.	48	33.	47	47.	-37
6.	06	20.	02	34.	86	48.	-10
7.	01	21.	41	35.	47	49.	-14
8.	53	22.	19	36.	-50	50.	-37
9.	28	23.	40	37.	-25	51.	-48
10.	61	24.	17	38.	-50	52.	-12
11.	33	25.	24	39.	-01	53.	-43
12.	36	26.	23	40.	-17	54.	-32
13.	22	27.	15	41.	-25	55.	-29
14.	05	28.	31	42.	-53	56.	-40

Primary and Elementary Teachers

1. MTAI scores (x):  $S_x = 991$ ,  $S_x^2 = 74361$ , Range ( -42 to 93).
2. Mean score =  $38.12 \pm 7.50$  points.
3. Standard deviation of scores =  $37.51 \pm 5.20$ .
4. Range of experience ( 1 to 30) years.
5. Mean experience = 14 years.

Secondary Teachers

1. MTAI scores (y):  $S_y = 457$ ,  $S_y^2 = 83569$ , Range ( -56 to 86).
2. Mean score =  $8.16 \pm 5.09$  points.
3. Standard deviation =  $37.75 \pm 3.60$ .
4. Range of experience ( 1 to 30) years.
5. Mean experience = 11 years.

Difference between Means

t for  $(M_x - M_y)$  is 2.754, significant at 0.1% level.

\* Courses: curriculum, geography methods, elementary school administration.

\*\* Teachers classified according to grades they would prefer to teach.



TABLE XXXI

MTAI RAW SCORES FOR 82 TEACHERS TAKING OFF-CAMPUS COURSES  
IN EDUCATION CLASSIFIED ACCORDING TO EXPERIENCE → 1954

EXPERIENCE ( 1 to 5) YEARS				EXPERIENCED (6 to 30) YEARS			
No.	SCORE	NO.	SCORE	NO.	SCORE	NO.	SCORE
1.	46	17.	59	1.	29	26.	31
2.	78	18.	26	2.	19	27.	60
3.	61	19.	86	3.	37	28.	47
4.	53	20.	22	4.	05	29.	17
5.	01	21.	19	5.	06	30.	24
6.	36	22.	75	6.	28	31.	02
7.	11	23.	-25	7.	68	32.	41
8.	56	24.	-17	8.	69	33.	48
9.	40	25.	-25	9.	33	34.	-47
10.	20	26.	-50	10.	63	35.	-01
11.	03	27.	-53	11.	72	36.	-50
12.	17	28.	-42	12.	93	37.	-10
13.	15	29.	-29	13.	23	38.	-56
14.	62	30.	-18	14.	27	39.	-14
15.	40	31.	-42	15.	65	40.	-67
16.	66	32.	-26	16.	23	41.	-40
				17.	66	42.	-29
				18.	30	43.	-32
				19.	84	44.	-43
				20.	67	45.	-12
				21.	43	46.	-48
				22.	42	47.	-21
				23.	77	48.	-37
				24.	24	49.	-10
				25.	23	50.	-14

The ( 1 to 5) year experienced group

1. Range of scores = (-53 to 86).
2. Scores (x):  $S_x = 565$ ,  $S_x^2 = 61847$ .
3. Mean score =  $17.66 \pm 7.23$ .
4. Standard deviation of scores =  $40.26 \pm 5.12$ .

The ( 6 to 30) year experienced group

1. Range of scores = (-67 to 93).
2. Scores (y):  $S_y = 855$ ,  $S_y^2 = 99275$ .
3. Mean score =  $17.10 \pm 5.72$ .
4. Standard deviation of scores =  $40.03 \pm 4.04$ .

APPENDIX B

MINNESOTA TEACHER ATTITUDE INVENTORY

The Property of  
 JAS HARDY  
 Book 85

DO NOT OPEN UNTIL TOLD TO DO SO

# MINNESOTA TEACHER ATTITUDE INVENTORY

Form A

WALTER W. COOK  
 University of Minnesota

CARROLL H. LEEDS  
 Furman University

ROBERT CALLIS  
 University of Missouri

## DIRECTIONS

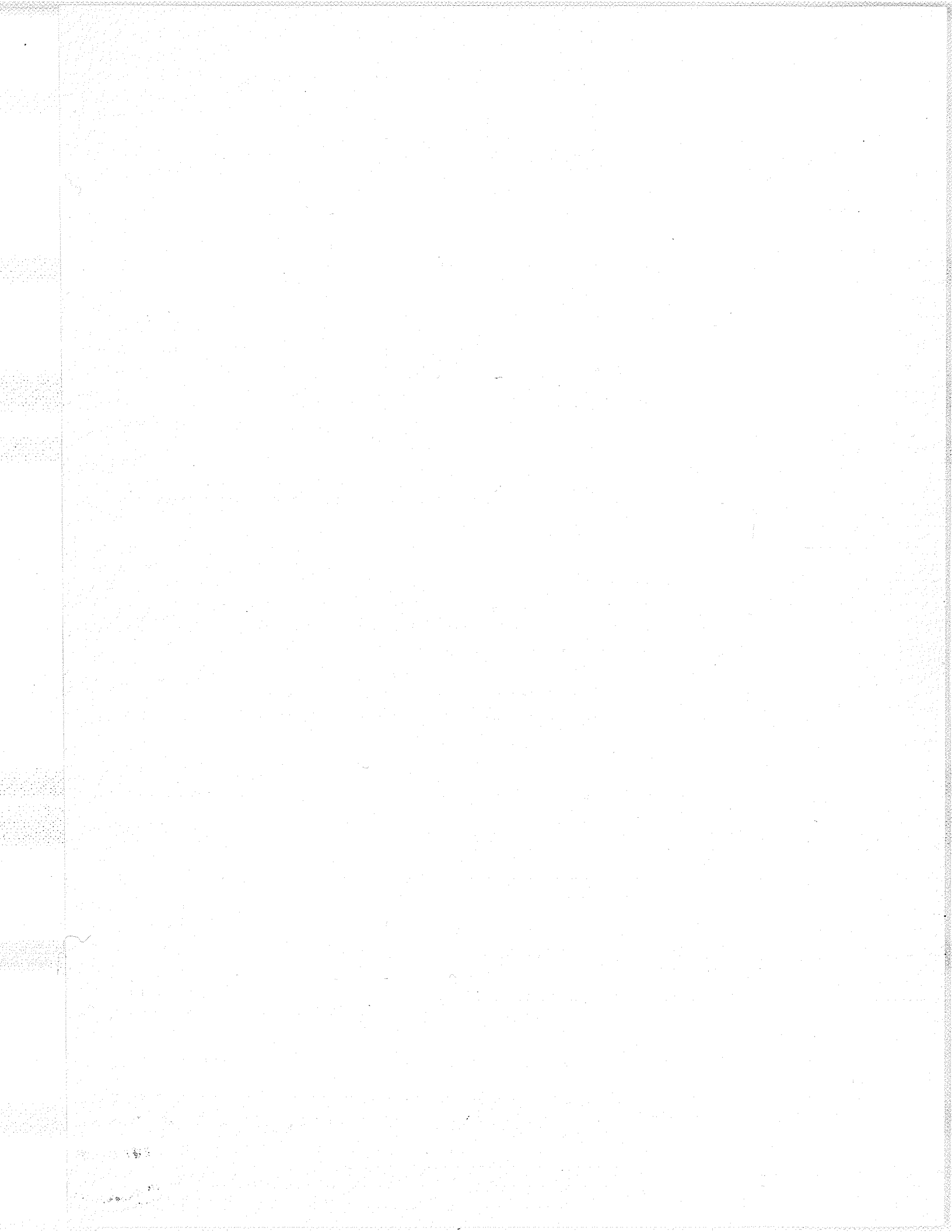
This inventory consists of 150 statements designed to sample opinions about teacher-pupil relations. There is considerable disagreement as to what these relations should be; therefore, there are no right or wrong answers. What is wanted is your own individual feeling about the statements. Read each statement and decide how YOU feel about it. Then mark your answer on the space provided on the answer sheet. Do not make any marks on this booklet.

- If you strongly agree, blacken space under "SA" .....
- If you agree, blacken space under "A" .....
- If you are undecided or uncertain, blacken space under "U" .....
- If you disagree, blacken space under "D" .....
- If you strongly disagree, blacken space under "SD" .....

SA	A	U	D	SD
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SA	A	U	D	SD
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SA	A	U	D	SD
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SA	A	U	D	SD
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SA	A	U	D	SD
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Think in terms of the general situation rather than specific ones. There is no time limit, but work as rapidly as you can. PLEASE RESPOND TO EVERY ITEM.

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 The Psychological Corporation  
 522 Fifth Avenue  
 New York 18, N. Y.



SA—Strongly agree  
A—Agree

U—Undecided  
or uncertain

D—Disagree  
SD—Strongly disagree

---

1. Most children are obedient.
2. Pupils who "act smart" probably have too high an opinion of themselves.
3. Minor disciplinary situations should sometimes be turned into jokes.
4. Shyness is preferable to boldness.
5. Teaching never gets monotonous.
6. Most pupils don't appreciate what a teacher does for them.
7. If the teacher laughs with the pupils in amusing classroom situations, the class tends to get out of control.
8. A child's companionships can be too carefully supervised.
9. A child should be encouraged to keep his likes and dislikes to himself.
10. It sometimes does a child good to be criticized in the presence of other pupils.
11. Unquestioning obedience in a child is not desirable.
12. Pupils should be required to do more studying at home.
13. The first lesson a child needs to learn is to obey the teacher without hesitation.
14. Young people are difficult to understand these days.
15. There is too great an emphasis upon "keeping order" in the classroom.
16. A pupil's failure is seldom the fault of the teacher.
17. There are times when a teacher cannot be blamed for losing patience with a pupil.
18. A teacher should never discuss sex problems with the pupils.
19. Pupils have it too easy in the modern school.
20. A teacher should not be expected to burden himself with a pupil's problems.
21. Pupils expect too much help from the teacher in getting their lessons.
22. A teacher should not be expected to sacrifice an evening of recreation in order to visit a child's home.
23. Most pupils do not make an adequate effort to prepare their lessons.
24. Too many children nowadays are allowed to have their own way.
25. Children's wants are just as important as those of an adult.
26. The teacher is usually to blame when pupils fail to follow directions.
27. A child should be taught to obey an adult without question.
28. The boastful child is usually over-confident of his ability.
29. Children have a natural tendency to be unruly.
30. A teacher cannot place much faith in the statements of pupils.

GO ON TO THE NEXT PAGE

SA—Strongly agree  
A—Agree

U—Undecided  
or uncertain

D—Disagree  
SD—Strongly disagree.

- 
31. Some children ask too many questions.
32. A pupil should not be required to stand when reciting.
33. The teacher should not be expected to manage a child if the latter's parents are unable to do so.
34. A teacher should never acknowledge his ignorance of a topic in the presence of his pupils.
35. Discipline in the modern school is not as strict as it should be.
36. Most pupils lack productive imagination.
37. Standards of work should vary with the pupil.
38. The majority of children take their responsibilities seriously.
39. To maintain good discipline in the classroom a teacher needs to be "hard-boiled."
40. Success is more motivating than failure.
41. Imaginative tales demand the same punishment as lying.
42. Every pupil in the sixth grade should have sixth grade reading ability.
43. A good motivating device is the critical comparison of a pupil's work with that of other pupils.
44. It is better for a child to be bashful than to be "boy or girl crazy."
45. Course grades should never be lowered as punishment.
46. More "old-fashioned whippings" are needed today.
47. The child must learn that "teacher knows best."
48. Increased freedom in the classroom creates confusion.
49. A teacher should not be expected to be sympathetic toward truants.
50. Teachers should exercise more authority over their pupils than they do.
51. Discipline problems are the teacher's greatest worry.
52. The low achiever probably is not working hard enough and applying himself.
53. There is too much emphasis on grading.
54. Most children lack common courtesy toward adults.
55. Aggressive children are the greatest problems.
56. At times it is necessary that the whole class suffer when the teacher is unable to identify the culprit.
57. Many teachers are not severe enough in their dealings with pupils.
58. Children "should be seen and not heard."
59. A teacher should always have at least a few failures.
60. It is easier to correct discipline problems than it is to prevent them.

GO ON TO THE NEXT PAGE

SA—Strongly agree  
A—Agree

U—Undecided  
or uncertain

D—Disagree  
SD—Strongly disagree

---

61. Children are usually too sociable in the classroom.
62. Most pupils are resourceful when left on their own.
63. Too much nonsense goes on in many classrooms these days.
64. The school is often to blame in cases of truancy.
65. Children are too carefree.
66. Pupils who fail to prepare their lessons daily should be kept after school to make this preparation.
67. Pupils who are foreigners usually make the teacher's task more unpleasant.
68. Most children would like to use good English.
69. Assigning additional school work is often an effective means of punishment.
70. Dishonesty as found in cheating is probably one of the most serious of moral offenses.
71. Children should be allowed more freedom in their execution of learning activities.
72. Pupils must learn to respect teachers if for no other reason than that they are teachers.
73. Children need not always understand the reasons for social conduct.
74. Pupils usually are not qualified to select their own topics for themes and reports.
75. No child should rebel against authority.
76. There is too much leniency today in the handling of children.
77. Difficult disciplinary problems are seldom the fault of the teacher.
78. The whims and impulsive desires of children are usually worthy of attention.
79. Children usually have a hard time following instructions.
80. Children nowadays are allowed too much freedom in school.
81. All children should start to read by the age of seven.
82. Universal promotion of pupils lowers achievement standards.
83. Children are unable to reason adequately.
84. A teacher should not tolerate use of slang expressions by his pupils.
85. The child who misbehaves should be made to feel guilty and ashamed of himself.
86. If a child wants to speak or to leave his seat during the class period, he should always get permission from the teacher.
87. Pupils should not respect teachers anymore than any other adults.
88. Throwing of chalk and erasers should always demand severe punishment.
89. Teachers who are liked best probably have a better understanding of their pupils.
90. Most pupils try to make things easier for the teacher.

GO ON TO THE NEXT PAGE

SA—Strongly agree  
A—Agree

U—Undecided  
or uncertain

D—Disagree  
SD—Strongly disagree

- 
91. Most teachers do not give sufficient explanation in their teaching.
92. There are too many activities lacking in academic respectability that are being introduced into the curriculum of the modern school.
93. Children should be given more freedom in the classroom than they usually get.
94. Most pupils are unnecessarily thoughtless relative to the teacher's wishes.
95. Children should not expect talking privileges when adults wish to speak.
96. Pupils are usually slow to "catch on" to new material.
97. Teachers are responsible for knowing the home conditions of every one of their pupils.
98. Pupils can be very boring at times.
99. Children have no business asking questions about sex.
100. Children must be told exactly what to do and how to do it.
101. Most pupils are considerate of their teachers.
102. Whispering should not be tolerated.
103. Shy pupils especially should be required to stand when reciting.
104. Teachers should consider problems of conduct more seriously than they do.
105. A teacher should never leave the class to its own management.
106. A teacher should not be expected to do more work than he is paid for.
107. There is nothing that can be more irritating than some pupils.
108. "Lack of application" is probably one of the most frequent causes for failure.
109. Young people nowadays are too frivolous.
110. As a rule teachers are too lenient with their pupils.
111. Slow pupils certainly try one's patience.
112. Grading is of value because of the competition element.
113. Pupils like to annoy the teacher.
114. Children usually will not think for themselves.
115. Classroom rules and regulations must be considered inviolable.
116. Most pupils have too easy a time of it and do not learn to do real work.
117. Children are so likeable that their shortcomings can usually be overlooked.
118. A pupil found writing obscene notes should be severely punished.
119. A teacher seldom finds children really enjoyable.
120. There is usually one best way to do school work which all pupils should follow.

GO ON TO THE NEXT PAGE



SA—Strongly agree  
A—Agree

U—Undecided  
or uncertain

D—Disagree  
SD—Strongly disagree

- 
- |  |   |
|--|---|
| 121. It isn't practicable to base school work upon children's interests.   | 136. A pupil should always be fully aware of what is expected of him.   |
| 122. It is difficult to understand why some children want to come to school so early in the morning before opening time. | 137. There is too much intermingling of the sexes in extra-curricular activities.                             |
| 123. Children that cannot meet the school standards should be dropped.   | 138. The child who stutters should be given the opportunity to recite oftener.                                |
| 124. Children are usually too inquisitive.   | 139. The teacher should disregard the complaints of the child who constantly talks about imaginary illnesses. |
| 125. It is sometimes necessary to break promises made to children.   | 140. Teachers probably over-emphasize the seriousness of such pupil behavior as the writing of obscene notes. |
| 126. Children today are given too much freedom.  | 141. Teachers should not expect pupils to like them.  |
| 127. One should be able to get along with almost any child.  | 142. Children act more civilized than do many adults.   |
| 128. Children are not mature enough to make their own decisions.   | 143. Aggressive children require the most attention.  |
| 129. A child who bites his nails needs to be shamed.   | 144. Teachers can be in the wrong as well as pupils.  |
| 130. Children will think for themselves if permitted.  | 145. Young people today are just as good as those of the past generation.                                     |
| 131. There is no excuse for the extreme sensitivity of some children.  | 146. Keeping discipline is not the problem that many teachers claim it to be.                                 |
| 132. Children just cannot be trusted.  | 147. A pupil has the right to disagree openly with his teachers.  |
| 133. Children should be given reasons for the restrictions placed upon them.   | 148. Most pupil misbehavior is done to annoy the teacher.   |
| 134. Most pupils are not interested in learning.   | 149. One should not expect pupils to enjoy school.  |
| 135. It is usually the uninteresting and difficult subjects that will do the pupil the most good.                        | 150. In pupil appraisal effort should not be distinguished from scholarship.                                  |

ATTITUDE INVENTORY  
COOK - LEEDS - CALLIS  
THE PSYCHOLOGICAL CORPORATION  
522 FIFTH AVENUE, NEW YORK, N. Y.


COLLEGE AND CLASS  
OR  
SCHOOL AND POSITION  
MALE \_\_\_\_\_ FEMALE \_\_\_\_\_

DATE \_\_\_\_\_

1	SA	A	U	D	SD	31	SA	A	U	D	SD	61	SA	A	U	D	SD	91	SA	A	U	D	SD	121	SA	A	U	D	SD
2	SA	A	U	D	SD	32	SA	A	U	D	SD	62	SA	A	U	D	SD	92	SA	A	U	D	SD	122	SA	A	U	D	SD
3	SA	A	U	D	SD	33	SA	A	U	D	SD	63	SA	A	U	D	SD	93	SA	A	U	D	SD	123	SA	A	U	D	SD
4	SA	A	U	D	SD	34	SA	A	U	D	SD	64	SA	A	U	D	SD	94	SA	A	U	D	SD	124	SA	A	U	D	SD
5	SA	A	U	D	SD	35	SA	A	U	D	SD	65	SA	A	U	D	SD	95	SA	A	U	D	SD	125	SA	A	U	D	SD
6	SA	A	U	D	SD	36	SA	A	U	D	SD	66	SA	A	U	D	SD	96	SA	A	U	D	SD	126	SA	A	U	D	SD
7	SA	A	U	D	SD	37	SA	A	U	D	SD	67	SA	A	U	D	SD	97	SA	A	U	D	SD	127	SA	A	U	D	SD
8	SA	A	U	D	SD	38	SA	A	U	D	SD	68	SA	A	U	D	SD	98	SA	A	U	D	SD	128	SA	A	U	D	SD
9	SA	A	U	D	SD	39	SA	A	U	D	SD	69	SA	A	U	D	SD	99	SA	A	U	D	SD	129	SA	A	U	D	SD
10	SA	A	U	D	SD	40	SA	A	U	D	SD	70	SA	A	U	D	SD	100	SA	A	U	D	SD	130	SA	A	U	D	SD
11	SA	A	U	D	SD	41	SA	A	U	D	SD	71	SA	A	U	D	SD	101	SA	A	U	D	SD	131	SA	A	U	D	SD
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17	SA	A	U	D	SD	47	SA	A	U	D	SD	77	SA	A	U	D	SD	107	SA	A	U	D	SD	137	SA	A	U	D	SD
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19	SA	A	U	D	SD	49	SA	A	U	D	SD	79	SA	A	U	D	SD	109	SA	A	U	D	SD	139	SA	A	U	D	SD
20	SA	A	U	D	SD	50	SA	A	U	D	SD	80	SA	A	U	D	SD	110	SA	A	U	D	SD	140	SA	A	U	D	SD
21	SA	A	U	D	SD	51	SA	A	U	D	SD	81	SA	A	U	D	SD	111	SA	A	U	D	SD	141	SA	A	U	D	SD
22	SA	A	U	D	SD	52	SA	A	U	D	SD	82	SA	A	U	D	SD	112	SA	A	U	D	SD	142	SA	A	U	D	SD
23	SA	A	U	D	SD	53	SA	A	U	D	SD	83	SA	A	U	D	SD	113	SA	A	U	D	SD	143	SA	A	U	D	SD
24	SA	A	U	D	SD	54	SA	A	U	D	SD	84	SA	A	U	D	SD	114	SA	A	U	D	SD	144	SA	A	U	D	SD
25	SA	A	U	D	SD	55	SA	A	U	D	SD	85	SA	A	U	D	SD	115	SA	A	U	D	SD	145	SA	A	U	D	SD
26	SA	A	U	D	SD	56	SA	A	U	D	SD	86	SA	A	U	D	SD	116	SA	A	U	D	SD	146	SA	A	U	D	SD
27	SA	A	U	D	SD	57	SA	A	U	D	SD	87	SA	A	U	D	SD	117	SA	A	U	D	SD	147	SA	A	U	D	SD
28	SA	A	U	D	SD	58	SA	A	U	D	SD	88	SA	A	U	D	SD	118	SA	A	U	D	SD	148	SA	A	U	D	SD
29	SA	A	U	D	SD	59	SA	A	U	D	SD	89	SA	A	U	D	SD	119	SA	A	U	D	SD	149	SA	A	U	D	SD
30	SA	A	U	D	SD	60	SA	A	U	D	SD	90	SA	A	U	D	SD	120	SA	A	U	D	SD	150	SA	A	U	D	SD

APPENDIX C

OUR STUDENT TEACHER (FORM A)

OUR STUDENT-TEACHER ( FORM A )

..... has been YOUR STUDENT-TEACHER. Here are some things that might be said about this student-teacher. Underline the "true", "false", or "?" (not sure) to tell how you feel about the question.

DO NOT write your name on this paper. NO ONE will ever know how you answered the questions. Give your honest answer to each question.

This Student-Teacher:

- |  |      |       |   |
|--|------|-------|---|
| 1. knows his work well .....                               | true | false | ? |
| 2. is easy to understand .....                             | true | false | ? |
| 3. never lets us give our ideas or say what we think ..... | true | false | ? |
| 4. scolds us when we make mistakes .....                   | true | false | ? |
| 5. is liked by most of the class .....                     | true | false | ? |
| 6. always seems to get things mixed up .....               | true | false | ? |
| 7. is excited and nervous most of the time .....           | true | false | ? |
| 8. seems to trust us very little .....                     | true | false | ? |
| 9. tries to learn our names .....                          | true | false | ? |
| 10. gets "mad" when we don't understand .....              | true | false | ? |
| 11. is easy to talk to .....                               | true | false | ? |
| 12. makes me feel "mixed up" .....                         | true | false | ? |
| 13. praises us for good work .....                         | true | false | ? |
| 14. has enough work for us .....                           | true | false | ? |
| 15. never laughs at things that are funny .....            | true | false | ? |
| 16. is fair with us all .....                              | true | false | ? |
| 17. seems to enjoy working with us .....                   | true | false | ? |
| 18. has no patience with us .....                          | true | false | ? |
| 19. has "teacher-pets" in the class .....                  | true | false | ? |
| 20. seems to be happy and cheerful most of the time .....  | true | false | ? |
| 21. nice to listen to .....                                | true | false | ? |
| 22. boasts to us about his other classes .....             | true | false | ? |
| 23. punishes us in front of the class .....                | true | false | ? |
| 24. shouts when things seem to go wrong .....              | true | false | ? |
| 25. talks too much .....                                   | true | false | ? |
| 26. thinks he is always right .....                        | true | false | ? |
| 27. is hard to hear .....                                  | true | false | ? |
| 28. makes time seem to go fast .....                       | true | false | ? |
| 29. tells us when he is wrong .....                        | true | false | ? |
| 30. is easy to fool .....                                  | true | false | ? |



APPENDIX D

OUR STUDENT TEACHER (FORM B)

OUR STUDENT-TEACHER ( FORM B )

..... has been your STUDENT-TEACHER. Here are some things that might be said about this student-teacher. Underline the "true", "false", or "not sure" to tell how you feel about the question.

DO NOT write your name on this paper. NO ONE will ever know how you answered the questions. Give your honest answer to each question.

This Student-Teacher:

1. is hard to understand .....	.....	true	false	?
2. makes work interesting or seem like fun .....	.....	true	false	?
3. is easy to talk to .....	.....	true	false	?
4. seems to think he is always right .....	.....	true	false	?
5. helps us a lot .....	.....	true	false	?
6. seems to dislike us .....	.....	true	false	?
7. seldom has us leave our seats to work .....	.....	true	false	?
8. is always polite to us .....	.....	true	false	?
9. lets us all take part in the lesson .....	.....	true	false	?
10. is easily bothered or annoyed at us .....	.....	true	false	?
11. makes me think .....	.....	true	false	?
12. helps me feel at ease .....	.....	true	false	?
13. makes us wish recess was longer .....	.....	true	false	?
14. never has us study pictures .....	.....	true	false	?
15. is good at answering questions .....	.....	true	false	?
16. explains what we don't understand .....	.....	true	false	?
17. often makes me feel foolish .....	.....	true	false	?
18. keeps on the lesson .....	.....	true	false	?
19. seems to trust us very little .....	.....	true	false	?
20. tries to learn our names .....	.....	true	false	?
21. makes me feel "mixed up" .....	.....	true	false	?
22. is liked by most of the class .....	.....	true	false	?
23. scolds us when we make mistakes .....	.....	true	false	?
24. seldom has us correct our work .....	.....	true	false	?
25. uses the blackboard very little .....	.....	true	false	?

