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Curricular validity of the Stanford Achievement Tests in social studies for one fourth grade group

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Tests in Social Studies for One Fourth Grade Group

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CURRICULAR VALIDITY OF THE STANFORD
ACHIEVEMENT TESTS IN SOCIAL STUDIES
FOR ONE FOURTH GRADE GROUP

Submitted by

Alice Gertrude Kiernan
(B.S. in Ed., Lowell State Teachers College, 1942)

In partial fulfillment of requirements
for the degree
Master of Education

June 1949

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First Reader: W. Linwood Chase, Professor of Education

Second Reader: Helen A. Murphy, Associate Professor of
Education

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CHAPTER I

STATEMENT OF THE PROBLEM

The publishers of achievement tests attempt to select the contents to be tested in such a way that the test may be used in any community. Standardized tests today are comparatively accurate measuring instruments in most instances. Their authors take particular care to standardize their contents so that they can be considered reasonably valid testing devices.

Courses of study, however, differ to such a degree that the selected content of a standardized test may vary widely from the content studied in a particular school. This is especially true of courses of study in the social studies, where the development of broad understandings, rather than specific informations and skills, is the important goal.

The purpose of this study is to determine the curricular validity of the Stanford Achievement Tests in Social Studies^{1/} for one fourth grade in the town where the writer taught.

^{1/}Truman L. Kelley, Giles M. Ruch, and Lewis M. Terman, Stanford Achievement Test: Social Studies, Advanced Battery, Forms E and Dm, (World Book Co., 1940).

CHAPTER II

REVIEW OF THE LITERATURE

Many writers have emphasized the importance of challenging the validity of achievement tests. A few opinions are given below to afford the reader a better understanding of the great strides which have been taken in employing the use of achievement tests as a guide to a better understanding of the pupil's needs rather than as a perfect measuring stick.

Kelley,^{1/} in emphasizing the importance of questioning the validity of a test states:

The purposes for which schoolmasters have used tests have been too intimately connected with the weal of their pupils to permit the validity of a test to go unchallenged.

Greene,^{2/} in writing in the same vein, says:

The uncritical acceptance of an invalid test by a teacher for performing a desired function might easily lead to serious injustice to the pupils. Therefore, teachers cannot be too careful in assuring themselves of the validity of the tests they use.

Validity is therefore a specific rather than a general criterion of a good examination. It is specific in the sense that a test may be highly valid for use in one situation and highly invalid for use in another. It is specific also in the sense that a

^{1/} Truman L. Kelley, Interpretation of Educational Measurements, (World Book Co., 1927), p. 13.

^{2/} Harry A. Greene, Albert N. Jorgensen, and J. Raymond Gerberich, Measurement and Evaluation in the Elementary School, (Longmans, Green and Co., 1943), pp. 53-54.

test may be valid for use with one group of pupils but not for use with a different pupil group.

Tests cannot correctly be described as valid in general terms, but only in connection with their intended use and at the intended ability level of pupils.

In a study as to the validity of four types of examinations, Peters and Martz^{1/} found that for the elementary school multiple choice and essay-discussion are about equally valid. The essay-discussion type, when objectively scored by fixed standards, is valid in any grade. They found also that the validity of the essay-discussion type is in marked contrast to what has been common belief. Their correlations are found below.

	<u>Gr.</u>	<u>True-False</u>	<u>Multiple Choice</u>	<u>Completion</u>	<u>Essay</u>
History	4	.129	.546	.777	.607
Geog.	4	.280	.439	.587	.557

Value of Achievement Tests. Many differences of opinions have been expressed as to the value of tests in the social studies. Kelley and Krey,^{2/} in a study of the pros and cons, lists the following opinions and refer to them as:

o opponents p proponents

o- The opponents show no awareness of the tests of reliability and validity of measuring instruments,

^{1/}C.C. Peters and H. B. Martz, "A Study of the Validity of Various Types of Examinations," School and Society, 33: 336-338, 1931.

^{2/}Truman L. Kelley and A. C. Krey, Tests and Measurements in the Social Sciences, (Charles Scribner Co., 1934), pp. 487-491.

either judgment of teachers or test scores.

p- We believe that such awareness is essential to any educator who is not content to work in the dark.

o- The opponents assert that objective tests can only measure the mechanical aspects of instruction and achievement.

p- With this we unqualifiedly disagree. Any aspect of instruction subject to appraisal by teachers is generally more accurately appraised by the consensus of several teachers than one - that it is more accurately appraised when the judgments of these several are combined into an average than when lumped together by general impression, and is more accurately appraised by tests than by the judgments of teachers or associates.

Methods of Testing Validity. As a guide in determining the curricular validity of a test the teacher may employ the use of textbooks, courses of study, reports of national or regional committees, and the writings of subject-matter specialists. By examining these materials he will become familiar with the opinions of experts and will be able to determine the important outcomes to test.

Reports of national or regional committees are so seldom accompanied by instructional materials at the time of their appearance that the teacher wishing to use their recommendations in considering the validity of his tests

finds no suitable standardized tests available.

The method of testing statistical validity involves the determination of the correlation between test scores and such criteria as teachers' marks, ratings of expert judges, scores on other tests designed for the same type of use, and measures of successes on certain types of future outcomes. The test is said to be valid if high correlations are obtained between scores on it and criterion measures. Correlation coefficients obtained from such a study are called validity coefficients.

The method of testing validity by correlation with school marks assumes that a test must have considerable validity if pupils whose school marks in the subject are consistently high make the superior scores on the tests, and if pupils whose school marks are consistently inferior make the inferior scores on the test. In the long run, an educational test which consistently picks out the pupils who, in the judgment of the teacher, are superior or inferior, probably does have significant validity.

To test validity by accomplishments of widely-spaced groups, a test may be given to pupils who have had the subject matter to be tested, and then to pupils who have taken none of the work in that field. A valid test would show a significant difference, assuming, of course, that the pupils who have taken the course have actually learned something. This method is often used in the evaluation of

tests in aptitude.

Students in higher grades should show a higher achievement if subjected to a valid test. This method is described as the rise in the percentage of successes.

Validation through social utility assumes that the course of study is based on that point of view. For instance, a spelling test based in social utility would contain words proved to be those most frequently needed in written language.

Psychological and logical validity is found for certain tests such as reading and language, which are composed of interrelated abilities. A study is made in which as many as possible of the basic abilities are identified. Then further study makes possible the selection of qualities which are best measured by the objective method.

Validity of the Stanford Achievement Tests. In the Manual of Directions^{1/} the validity of content was discussed. The current revision of the Stanford Achievement Test is based on a thoroughgoing analysis of representative courses of study from the entire country; it has been carefully evaluated by experts in the various subject fields, and subjected to rigid statistical evaluation as described fully in the Manual for Interpreting the Stanford Achievement Test.^{2/}

^{1/}Truman L. Kelley, Giles M. Ruch, and Lewis M. Terman, Manual of Directions of the Stanford Achievement Test, Social Studies, Advanced Battery, (World Book Co., 1940).

^{2/}Truman L. Kelley, Giles M. Ruch, and Lewis M. Terman, Manual for Interpreting the Stanford Achievement Test, Social Studies, Advanced Battery, (World Book Co., 1940).

CHAPTER III

PROCEDURE AND ANALYSIS OF DATA

Since the validity of a test depends upon whether it measures what it purports to measure, the writer wished to make a study of the curricular validity of the Stanford Achievement Test in Social Studies for the fourth-grade pupils in the town in which she teaches.

Thirty fourth-grade pupils were given the complete battery of tests in Form E, including the Social Studies Tests, as part of the regular testing program carried out by the town. Then Form Dm of the Social Studies test, which is the separate answer sheet edition, was given.

Since the two sections of the social studies tests were used in both forms E and Dm, it might be simpler to refer to the first sections in each form as EI and DmI, while the second sections will be referred to as EII and DmII. EI and DmI consist of history items primarily, while EII and DmII are geographical in content.

An analysis of the item-content of the tests was made and checked with the texts^{1/} in use at the time of the study to determine the number of items content from both

^{1/}DeForest Stull and Roy W. Hatch, Journeys Through Many Lands, (Allyn and Bacon Co., 1942), pp. 142, and Howard E. Wilson, Florence Wilson, and Bessie E. Erb, Where Our Ways of Living Come From, (American Book Co., 1937), pp. 474.

forms E and Dm which were included in the material in the textbooks.

No course of study other than the textbooks were used in the school system where the writer taught. These two books were the only criteria used since they were the only social studies materials in the hands of each pupil. Furthermore, the home background of a large percentage of the children studied was so far below average that it could not be said that many enriching experiences which would result in subject-matter accomplishment were enjoyed by many of the children tested.

Table I shows that of the 120 history items, a total of ten items, or 8.33 per cent, were included in the texts. From a total of 120 geography items, forty-three, or 33.83 per cent of them, were included in the texts used.

The total picture shows that out of a possible 240 items, fifty-three, or 22.08 per cent, were included in the texts.

TABLE 1

NUMBER AND PROPORTION OF TEST ITEMS TESTING
CONTENT APPEARING IN THE TEXTS USED BY A FOURTH GRADE

<u>Form</u>	<u>Subject</u>	<u>No. Items In Test</u>	<u>Total No.</u>	<u>Items in Text</u>	<u>Per Cent</u>
E I	History	50			
Dm I	History	70	120	10	8.33
E II	Geography	50			
Dm II	Geography	70	<u>120</u>	<u>43</u>	<u>35.83</u>
Total			240	53	22.08

TABLE II
 PER CENT OF THIRTY CHILDREN ANSWERING ITEMS
 CORRECTLY IN FORM E TEST I (HISTORY)

Item	No. of Correct Answers	% Correct on Items Included in Text	% Correct on Items not Included in Text
1	28		93.33
2	22	73.33	
3	22	73.33	
4	9		30.00
5	8		26.67
6	19		63.33
7	11		36.67
8	12		40.00
9	16		53.40
10	14		46.67
11	6		20.00
12	16	53.33	
13	10		33.33
14	8		26.67
15	3		10.00
16	13		43.39
17	11		36.67
18	10		33.33
19	17		56.67
20	9	30.00	
21	14		46.67
22	10		33.33
23	15		50.00
24	5	16.67	
25	8		26.67
26	7		23.33
27	10		33.33
28	3		10.00
29	4		13.33
30	7		23.33
31	5		16.67
32	4		13.33
33	5		16.67
34	2		6.67
35	8		26.67
36	3	10.00	
37	5		16.67
38	3		10.00
39	5		16.67
40	2		6.67

TABLE II (Concluded)

Item	No. of Correct Answers	% Correct on Items Included in Text	% Correct on Items not Included In Text
41	6		20.00
42	6		20.00
43	8		26.67
44	5		16.67
45	6		20.00
46	3		10.00
47	3		10.00
48	2		6.67
49	2		6.67
50	3		10.00
Average Per Cent		42.77	26.97

Table II shows that out of a possible 180 correct answers (30 children attempting 6 items) on items included in the texts, a total of 77, or 42.77 per cent were answered correctly. From a possible 1,320 correct answers, (30 children attempting 44 items), on items not included in the texts, a total of 356, or 26.97 per cent were answered correctly. This is a difference of 15.80 per cent in favor of the items included in the texts.

On 5 items which were not included in the texts (items 1, 6, 9, 19 and 23), 50 per cent or more of the children answered these items correctly.

TABLE III

PER CENT OF THIRTY CHILDREN ANSWERING ITEMS
CORRECTLY IN FORM DM TEST I (HISTORY)

Item	No. of Correct Answers	% Correct on Items Included in Text	% Correct on Items not Included in Text
1	27		90.00
2	17	56.67	
3	24		80.00
4	20	66.67	
5	20		66.67
6	15		50.00
7	15		50.00
8	9	30.00	
9	14		46.67
10	16		53.33
11	9		30.00
12	9		30.00
13	20		66.67
14	15		50.00
15	13		43.33
16	11		36.67
17	15		50.00
18	8		26.67
19	16		53.33
20	8		26.67
21	12		40.00
22	6		20.00
23	10		33.33
24	12		40.00
25	7		23.33
26	8		26.67
27	10		33.33
28	6		20.00
29	6		20.00
30	5		16.67
31	8		26.67
32	10		33.33
33	3		10.00
34	6		20.00
35	4		13.33
36	5		16.67
37	3		10.00
38	3		10.00
39	8		26.67
40	9		30.00

TABLE III (Concluded)

Item	No. of Correct Answers	% Correct on Items Included in Text	% Correct on Items not Included in Text
41	4		13.33
42	2		6.67
43	4		13.33
44	7		23.33
45	4		13.33
46	7		23.33
47	2		6.67
48	2	16.67	
49	2		6.67
50	5		16.67
51	3		10.00
52	0		0.00
53	1		3.33
54	0		0.00
55	0		0.00
56	3		10.00
57	1		3.33
58	2		6.67
59	1		3.33
60	2		6.67
61	3		10.00
62	2		6.67
63	1		3.33
64	0		0.00
65	1		3.33
66	0		0.00
67	0		0.00
68	2		6.67
69	2		6.67
70	2		6.67
Average Per Cent		42.50	23.18

Table III shows that out of a possible 120 correct answers (30 children attempting 4 items) on items included in the texts, a total of 51, or 42.50 per cent were answered correctly. From a possible 1,980 correct answers

(30 children attempting 66 items) on items not included in the texts, a total of 459, or 23.18 per cent were answered correctly. This is a difference of 19.32 per cent in favor of the items included in the texts.

It is interesting to note here that of the 10 items not included in the texts on which 50 per cent or more of the children had correct answers, all of them appeared within the first 17 items of the test. Expressed as a per cent they appeared within 24.29 per cent of the beginning of the test.

TABLE IV
PER CENT OF THIRTY CHILDREN ANSWERING ITEMS
CORRECTLY IN FORM E TEST II (GEOGRAPHY)

Item	No. of Correct Answers	% Correct on Items Included in Text	% Correct on Items not Included in Text
1	20		66.67
2	22	73.33	
3	17	56.67	
4	15		50.00
5	10		33.33
6	7	23.33	
7	12	40.00	
8	9		30.00
9	10		33.33
10	13	43.33	
11	5		16.67
12	9		30.00
13	11		36.67
14	4		13.33
15	25	83.33	
16	13	43.33	
17	14		46.67
18	4	13.33	
19	7		23.33
20	9		30.00

TABLE IV (Concluded)

Item	No. of Correct Answers	% Correct on Items Included in Text	% Correct on Items not Included in Text
21	11		36.67
22	13		43.33
23	8		26.67
24	18	60.00	
25	9		30.00
26	4		13.33
27	8		26.67
28	3		10.00
29	12		40.00
30	2	6.67	
31	4		13.33
32	12		40.00
33	10		33.33
34	8	26.67	
35	9	30.00	
36	2		6.67
37	2		6.67
38	7	23.33	
39	5	16.67	
40	9		30.00
41	1		3.33
42	3		10.00
43	3		10.00
44	5		16.67
45	2		6.67
46	3		10.00
47	1		3.33
48	5		16.67
49	5		16.67
50	0		0.00
Average Per Cent		38.57	23.89

Table IV shows that out of a possible 420 correct answers (30 children attempting 14 items) on items included in the texts, a total of 162, or 38.57 per cent, were answered correctly. From a possible 1,080 correct answers

(30 children attempting 36 items) on items not included in the texts, a total of 258, or 23.89 per cent, were answered correctly. This is a difference of 14.68 per cent in favor of the items included in the texts. Only two items which did not appear in the texts (items 1 and 4), were answered correctly by 50 per cent or more of the class.

TABLE V

PER CENT OF THIRTY CHILDREN ANSWERING ITEMS
CORRECTLY IN FORM DM TEST II (GEOGRAPHY)

Item	No. of Correct Answers	% Correct on Items Included in Text	% Correct on Items not Included in Text
1	30	100.00	
2	28	93.33	
3	25		83.33
4	22		73.33
5	16	53.33	
6	7	23.33	
7	17	56.67	
8	15	50.00	
9	15	50.00	
10	17		56.67
11	11		36.67
12	9		30.00
13	16		53.33
14	6	20.00	
15	17		56.67
16	7	23.33	
17	16		53.33
18	3		10.00
19	15	50.00	
20	15		50.00
21	19	63.33	
22	10	33.33	
23	11	36.67	
24	13		43.33
25	8		26.67
26	15		50.00
27	9		30.00

TABLE V (Continued)

Item	No. of Correct Answers	% Correct on Items Included in Text	% Correct on Items not Included in Text
28	14		46.67
29	7		23.33
30	16	53.33	
31	9		30.00
32	3		10.00
33	3		10.00
34	10	33.33	
35	4		13.33
36	7		23.33
37	10		33.33
38	6		20.00
39	10	33.33	
40	9	30.00	
41	11		36.67
42	8		26.67
43	3	10.00	
44	7	23.33	
45	6		20.00
46	7	23.33	
47	5	16.67	
48	2	6.67	
49	6		20.00
50	1	3.33	
51	6	20.00	
52	6	20.00	
53	5		16.67
54	6	20.00	
55	5		16.67
56	3		10.00
57	5		16.67
58	2		6.67
59	4		13.33
60	1		16.67
61	6	20.00	
62	4		13.33
63	2		6.67
64	6	20.00	
65	4		13.33
66	7	23.33	
67	1		3.33
68	7		23.33
69	5		16.67
70	8		26.67
Average Per Cent		34.71	28.46

Table V shows that out of a possible 870 correct answers (30 children attempting 29 items) on items included in the texts, a total of 303, or 34.71 per cent, were answered correctly. From a possible 1230 correct answers (30 children attempting 41 items) on items not included in the texts, a total of 350, or 28.46 per cent were answered correctly. This is a difference of 6.25 per cent in favor of the items included in the texts. One hundred per cent of the children attempting item one answered it correctly. Eight items which were not included in the texts were answered correctly by 50 per cent or more of the pupils tested.

The performance data from all the test items were examined. The number of correct answers on items included in the texts were listed separately as were the correct answers on items not included in the texts. Corresponding percentages were then tabulated, and the significance of differences in percentages were determined.

The critical ratio of the differences of the percentages was accepted as the most satisfactory instrument for analysis of the data, since a significant difference statistically determines the trend of a group.

To determine the significance of the difference between any two percentages, the formula for finding the critical ratio (CR), when the two percentages are expressed by P_1 and P_2 , is:

$$CR = \frac{P_1 - P_2}{SE \text{ Diff } P_1 P_2}$$

$$\text{The SE Diff } P_1 P_2 = \sqrt{SE P_1^2 - SE P_2^2}$$

In reference to the critical ratio and its implications, Wert^{1/} says:

Whenever this ratio is unity, the chances are 68 in 100 that the difference is too great to be the result of sampling fluctuations; whenever this ratio is two, the chances are 95 out of 100 that the difference is too great to be the result of sampling fluctuations; whenever the ratio is three or more, it is practical certainty that the difference is too great to be the result of sampling fluctuations.

Using this formula, the significance of difference between performance on those items included in the texts and those not included in the tests was found. The results are shown in the following table:

TABLE VI

ANALYSIS OF PERFORMANCE ON ITEMS CONTENT
INCLUDED IN THE TEXTS WITH THOSE NOT INCLUDED

Item	Subject	% Cor- rect	SE ²	% Diff	SE Diff	CR
EI	Included	42.77	81.	15.18	12.11	1.30
	Hist.					
EI	Not Included	26.97	65.61			
EII	Included	38.57	79.21	14.68	11.84	1.24
	Geog.					
EII	Not Included	23.87	60.84			
DMI	Included	42.50	81.	19.32	11.84	1.65
	Hist.					
DMI	Not Included	23.18	59.29			
DMII	Included	34.71	75.69	6.25	11.94	.52
	Geog.					
DMII	Not Included	28.46	67.24			

^{1/}James E. Wert, Educational Statistics (McGraw Hill Co., Inc., 1938) p. 145.

Table VI shows an analysis of the performance between items content included and that not included in the texts.

The CR of 1.30 shows that there are 81 chances in 100 that this is a true difference in favor of the items content included in the text.

The CR of 1.24 shows that there are 78 chances in 100 that this is a true difference in favor of the items content included in the text.

The CR of 1.65 shows that there are 90 chances in 100 that this is a true difference in favor of the items content included in the text.

The CR of .52 shows that there are 40 chances in 100 that this is a true difference in favor of the items content included in the text.

CHAPTER IV

SUMMARY AND CONCLUSIONS

The purpose of this study was to determine the curricular validity of the Stanford Achievement Test in Social Studies for one fourth-grade group. It was understood that although a test might be valid for one group it might not be a good measure of the achievement of another group.

Of the 120 history items in the tests used, subject-matter covered by a total of ten items, or 8.33 per cent, was included in the texts. Subject-matter covered by ~~forty-three~~ out of 120 geography items was included in the texts. This is 35.83 per cent of the total. Considering the combined history and geography items together, subject-matter covered by fifty-three out of 240 items, or 22.08 per cent, was included in the texts.

The average per cent of correct answers on history items, Form E, the subject-matter of which was included in the texts was 42.77 per cent, while the average per cent of correct answers on items, the subject-matter of which was not included in the texts, was 26.97 per cent.

In Form Dm of the History test the average per cent of correct answers covered by the subject-matter included in the texts was 42.50 per cent, while the average per cent

of correct answers on subject-matter not included in the texts was 23.18 per cent.

The average per cent of correct answers on subject-matter covered by geography items included in the texts was 38.57 per cent, while 23.89 per cent of the children answered correctly those items which were not covered by subject-matter included in the texts.

Of the pupils tested, 34.71 per cent answered correctly the geography items from form Dm the subject-matter of which was included in the texts, while the percentage of children answering correctly the items the subject-matter of which was not included in the texts, was 28.46 per cent.

No statistically significant difference was found between the performance on subject-matter covered by items included in the texts and that which was not covered by the texts. The following critical ratios were determined by comparing the percentages obtained.

The CR of 1.30 for History, Form E, shows that there are 81 chances in 100 that this is a true difference in favor of the items content included in the texts.

The CR of 1.24 for Geography, Form E, shows that there are 78 chances in 100 that this is a true difference in favor of the items content included in the texts.

In History, Form E, the CR of 1.65 shows that there are 90 chances in 100 that this is a true difference in favor of the items content included in the texts.

The CR of .52 for Geography, Dm, shows that there are 40 chances in 100 that this is a true difference in favor of the items content appearing in the texts.

Since the home background of the average child in this group was far below normal, it cannot be supposed that the pupils on the whole obtained this information from home sources. Many of these facts are contained in readers and library books available to the children, but they were not considered as part of the curriculum, because all of the children were not subjected to their use. Furthermore, it was not possible to check all outside reading done by the children.

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CHAPTER 1

The first part of the book discusses the history of the subject and the various methods used to study it. It covers the development of the theory and the practical applications of the subject. The second part of the book is devoted to the study of the subject in detail, and the third part to the study of the subject in its practical applications. The book is written in a clear and concise style, and is suitable for students of the subject.



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