

1948

The reliability of the check list used in the study Subject preferences of children

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BOSTON UNIVERSITY
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Thesis

THE RELIABILITY OF THE CHECK LIST USED
IN THE STUDY

--

A Phase of the Research Project

Subject Preferences

of

Children

Submitted by

Francis Leroy Thompson

(B.S. in Education, Boston University, 1938)

In partial fulfillment of the requirements for the
degree of Master of Education

1948

✓

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Education



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Subject Preferences of Fifth Grade Children

"Subject Preferences of Fifth Grade Children" is a cooperative study in which a number of graduate students have contributed to the total research project. It was facilitated through the cooperation of the New England School Development Council. This thesis is one of the studies in the project. Those completed and filed as graduate studies in June and August, 1948 were:

1. Subject Preferences in the Fifth Grade by Helen C. Blanchard
2. The Reliability of the Check List Used in the Study by Francis L. Thompson
3. An Analysis of Sex Differences in Fifth-Grade Children's Preferences for School Subjects by Eleanor M. Skahill
4. Preferences for Content, Skills, and Aesthetic Subjects in Five Communities by Ado Commito
5. Children's Evaluation of the Difficulty of Well-Liked School Subjects by Katherine M. Kinsley
6. Children's Evaluation of the Difficulty of Disliked School Subjects by Esther M. Sullivan
7. An Analysis of Fifth-Grade Pupils' Subject Preferences in Relation to Their Teachers' Preferences by Helen M. Sprague
8. High Morale Classrooms in the Subject Preference Study by George H. Englesby
9. An Analysis of the Influences of Intelligence and Age Differences Upon Fifth-Grade Children's Preferences for School Subjects by William L. Earley, Jr.

10. An Analysis of the Influence of Achievement on Preference for Reading and Arithmetic by Mary E. Cusack
11. Differences in Subject Preferences of High-Achievement Readers and Low-Achievement Readers by George H. Gardner
12. An Analysis of the Subject Preferences of 3,403 Third, Fourth, Fifth, and Sixth Grade Pupils in the Public Schools of Quincy, Massachusetts by Francis D. Mills
13. Techniques and Practices Used in Twenty Social Studies Classrooms by William A. Wolffer

1. The first part of the document is a list of names and dates. The names are: John Doe, Jane Smith, and Bob Johnson. The dates are: 1990, 1991, and 1992.

2. The second part of the document is a list of numbers and dates. The numbers are: 1, 2, and 3. The dates are: 1990, 1991, and 1992.

3. The third part of the document is a list of letters and dates. The letters are: A, B, and C. The dates are: 1990, 1991, and 1992.

4. The fourth part of the document is a list of symbols and dates. The symbols are: α , β , and γ . The dates are: 1990, 1991, and 1992.

THE RELIABILITY OF THE CHECK LIST USED IN THE STUDY

To check the reliability of the check list that had been used in the study of "Subject Preferences of Fifth-Grade Children" the same check list was given a second time to all fifth-grade children in town 45 after a lapse of two months. The first checking was done the first week in January, 1948, and the second during the second week in March, 1948. Town 45 was chosen for this purpose for two reasons: (1) it included all economic groups and (2) it provided a large number of the same for sampling. Wert claims that: "It is common experience that more confidence is placed in the larger sample than in the smaller."^{1/}

There were 698 fifth-grade pupils in the first checking and 739 fifth-grade pupils in the second checking. The difference in these number was due to absences, transfers, and new enrollments. Matching the check lists of pupils who had done both checkings resulted in 653 paired lists.

The tallied results of both sets of papers are arranged in a series of tables to show:

- (a) the significance of the difference of percentages in subject matter choices between the two samplings.
- (b) the coefficient of correlation between subject choices in the two samplings.

^{1/} James E. Wert, Educational Statistics; New York: McGraw Hill Book Co., 1938, p. 145.

THE HISTORY OF THE UNITED STATES OF AMERICA

The history of the United States of America is a story of a young nation that grew from a small group of colonies on the eastern coast of North America. In 1776, the colonies declared their independence from Great Britain, and the United States was born. The new nation faced many challenges, including the American Revolutionary War (1775-1783), which established the United States as a sovereign nation. The Constitution was drafted in 1787, and the Bill of Rights was added in 1791. The United States then expanded westward, acquiring new territories and states. The Civil War (1861-1865) was a major conflict that resulted in the abolition of slavery and the preservation of the Union. The United States emerged as a world power in the late 19th and early 20th centuries, and played a leading role in World War I (1914-1918) and World War II (1939-1945). The Cold War (1947-1991) was a period of tension between the United States and the Soviet Union. The United States has since become a superpower, and continues to play a significant role in world affairs.

The significance of differences between two percentages was determined by application of the formula for critical ratio where the two percentages are shown by p_1 and p_2

$$\text{C.R.} = \frac{p_1 - p_2}{\text{S.F. Diff } p_1 p_2}$$

The standard error of a difference between two percentages can be determined by the following formula:

$$\text{S.F. Diff } p_1 p_2 = \sqrt{\text{SE } p_1^2 + \text{SE } p_2^2}$$

The standard errors of percentages for the varying numbers of cases were obtained from Edgerton's tables. ^{1/}

In using the critical ratio for analyzing data Wert says:

Whenever this ratio is unit, 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; and whenever the ratio is three or more, it is a practical certainty that the difference is too great to be the result of sampling fluctuations. ^{2/}

Another check for reliability is the coefficient of correlation by the rank difference method using the Spearman formula.

$$p = 1 - \frac{6 \sum D^2}{N(N^2 - 1)}$$

^{1/} Harold A. Edgerton and Donald G. Paterson, "Table of Standard Errors and Probable Errors of Percentages for Varying Numbers of Cases," Journal of Applied Psychology, September, 1926.

^{2/} Op. cit., p. 145.

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$$\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$$

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$$\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$$

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C. C. Ross says:

To give two equivalent forms of a survey (check list in this case) to a large number of pupils, usually with only a short interval of time between the tests (check lists) the survey (check list) will then be said to be reliable if there is close agreement between the results. If such an agreement is perfect the correlation will be 1.00 but if there is no consistent relationship then the correlation will be .00 1/

Ross also states that:

The rho (p) method has certain definite advantages. It is simple and economical of time if the number of cases is small, possibly not more than 30; and it is especially appropriate if the original data are in ranks. 2/

To indicate the ranks of the school subjects in both the first and second checking, the subject chosen the greatest number of times is listed first, then the subject chosen the next greatest number of times is listed second, and so on.

The comparison of per cents of choice in each subject field between the first checking and the second checking were used to determine the reliability of the check list as a measuring instrument. The differences being small as they are show that a close relationship does exist between the two checkings.

When the check list was first checked in January, 1948, 27.57% of 653 pupils made reading their first choice. Two months later,

1/ C. C. Ross, Measurement in Today's Schools, New York; Prentice Hall, Inc., 1947, pp. 237-239.

2/ Ibid.

The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry should be supported by a valid receipt or invoice. This ensures transparency and allows for easy auditing of the accounts.

Financial Summary

The following table provides a summary of the financial data for the period from January to December. The total revenue for the year was \$1,200,000, while the total expenses amounted to \$850,000, resulting in a net profit of \$350,000.

It is noted that the revenue has increased by 15% compared to the previous year, which is a positive indicator for the business. However, the expenses have also increased, primarily due to higher costs for raw materials and labor. The management team is currently reviewing these costs to identify areas for potential savings.

The financial performance is generally strong, but there are some concerns regarding the timing of cash flows. The company has experienced a delay in receiving payments from some of its major clients, which has impacted its liquidity. To address this, the company is implementing stricter credit control measures and offering early payment discounts to encourage faster settlements.

In conclusion, the company has achieved a solid financial result for the year. The management team is confident in the company's ability to continue to grow and improve its financial performance in the coming year. The focus will be on increasing revenue while maintaining and reducing costs, and ensuring that cash flow remains healthy.

Table 1

PERCENTAGE OF FIRST CHOICE PREFERENCES OF 653 PUPILS
ON THE CHECK LIST IN TWO DIFFERENT CHECKINGS

Subjects	First Checking						Second Checking						Totals	
	Boys		Girls		Totals		Boys		Girls		Totals		N	%
	N	%	N	%	N	%	N	%	N	%	N	%		
Reading	81	24.18	99	31.13	180	27.57	86	25.67	96	30.19	182	27.97	182	27.97
Arithmetic	83	24.78	80	25.16	163	24.96	69	20.60	76	23.90	145	22.21	145	22.21
Language	0	0	0	0	0	0	2	.60	5	1.57	7	1.07	7	1.07
Pennmanship	4	1.19	8	2.52	12	1.87	3	.90	11	3.46	14	2.14	14	2.14
Spelling	33	9.85	39	12.26	72	11.03	39	11.64	41	12.89	80	12.25	80	12.25
Geography	1	.30	0	0	1	.15	0	0	0	0	0	0	0	0
History	4	1.19	1	.31	5	.77	2	.60	0	0	2	.31	2	.31
Social Studies	23	6.87	9	2.83	32	4.90	20	5.97	7	2.20	27	4.13	27	4.13
Drawing	76	22.69	54	16.98	130	19.91	70	20.90	52	16.35	122	18.68	122	18.68
Music	10	2.99	23	7.23	33	5.05	15	4.48	15	4.72	30	4.59	30	4.59
Nature Study	15	4.48	4	1.26	19	2.91	22	6.56	1	.31	23	3.52	23	3.52
Health	5	1.49	1	.31	6	.92	7	2.09	14	4.40	21	3.22	21	3.22
Total Choice	335		318		653		335		318		653		653	

Date	1891	1892	1893	1894	1895	1896	1897	1898	1899
Jan									
Feb									
Mar									
Apr									
May									
June									
July									
Aug									
Sept									
Oct									
Nov									
Dec									

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27.87% of these 653 pupils made reading their first choice, or a difference of .30%. Arithmetic has a difference of 2.75%; language a difference of 1.07%, no one chose language during the first sampling; penmanship showed a difference of .27%; spelling 1.22%; geography .15% difference with no one choosing geography the second time; history with a difference of .46%; social studies .77% difference; drawing 1.23% difference; music .45% difference; nature study a difference of .61% and health a difference of 2.30%.

Table 2

CRITICAL RATIO FROM DIFFERENCES OF PERCENTAGES
FOR FIRST CHOICES IN TWO DIFFERENT CHECKINGS.

Subjects	N	%	S.E.	Diff.	S.E. Diff.	C.R.
Reading - First Checking	180	27.57	3.3			
Reading - Second Checking	182	27.87	3.3	.30	4.61	.07
Arithmetic - First Checking	163	24.96	3.4	2.75	4.80	.57
Arithmetic - Second Checking	145	22.21	3.4			
Spelling - First Checking	72	11.03	3.7			
Spelling - Second Checking	80	12.25	3.6	1.22	5.16	.24
Social Studies - First Checking	38	5.82	3.9	1.38	6.17	.26
Social Studies - Second Checking	29	4.44	3.6			
Drawing - First Checking	130	19.91	3.5	1.23	5.03	.24
Drawing - Second Checking	122	18.68	3.6			
Music - First Checking	33	5.05	3.8	.46	5.50	.08
Music - Second Checking	30	4.59	4.0			

The following table shows the results of the experiments conducted on the effect of the concentration of the solution on the rate of reaction. The rate of reaction was measured by the volume of gas evolved per unit time. The results are given in the following table.

Table
 Effect of concentration on the rate of reaction

Concentration (M)	Time (s)	Volume of gas evolved (cm ³)	Rate of reaction (cm ³ /s)
0.1	100	10	0.1
0.2	50	20	0.4
0.3	33	30	0.9
0.4	25	40	1.6
0.5	20	50	2.5
0.6	17	60	3.5
0.7	14	70	5.0
0.8	12	80	6.7
0.9	11	90	8.2

Table 2 shows very small critical ratios. In none of the subject areas was there a statistically significant difference in per cent of choices. This would apparently indicate consistency of the pupils in indicating first choices by use of such a check list.

In reading the per cent difference was .30 and the critical ratio of .07 shows that there are only 5 chances in 100 that this represents a true difference in favor of the second checking.

In arithmetic the per cent difference was 2.75 and the critical ratio of .57 shows that there are only 43 chances in 100 that this represents a true difference in favor of the first checking.

In spelling the per cent difference was 1.22 and the critical ratio of .24 shows that there are only 19 chances in 100 that this represents a true difference in favor of the second checking.

In social studies (geography and history per cents combined with social studies) the per cent difference was 1.38 and the critical ratio of .26 shows that there are only 20 chances in 100 that this represents a true difference in favor of the first checking.

In drawing the per cent difference was 1.23 and the critical ratio of .24 shows that there are only 19 chances in 100 that this represents a true difference in favor of the first checking.

In music the per cent difference was .46 and the critical ratio of .08 shows that there are only 6 chances in 100 that this represents a true difference in favor of the first checking.

1870
The first of these is the fact that the
country is a very fertile one, and the
soil is very rich. The second is the
fact that the climate is very healthy,
and the air is very pure. The third
is the fact that the water is very
soft, and the food is very good.
The fourth is the fact that the
people are very kind and hospitable,
and the language is very easy to
learn. The fifth is the fact that
the country is very safe, and the
government is very good. The sixth
is the fact that the country is very
beautiful, and the scenery is very
picturesque. The seventh is the fact
that the country is very cheap, and
the cost of living is very low. The
eighth is the fact that the country
is very healthy, and the people are
very long-lived. The ninth is the
fact that the country is very
peaceful, and the people are very
friendly. The tenth is the fact that
the country is very interesting, and
there is a great deal to see and
do. The eleventh is the fact that
the country is very convenient, and
there is a great deal of good
transportation. The twelfth is the
fact that the country is very
pleasant, and the people are very
friendly. The thirteenth is the
fact that the country is very
interesting, and there is a great
deal to see and do. The fourteenth
is the fact that the country is very
convenient, and there is a great
deal of good transportation. The
fifteenth is the fact that the
country is very pleasant, and the
people are very friendly. The
sixteenth is the fact that the
country is very interesting, and
there is a great deal to see and
do. The seventeenth is the fact
that the country is very convenient,
and there is a great deal of good
transportation. The eighteenth is
the fact that the country is very
pleasant, and the people are very
friendly. The nineteenth is the
fact that the country is very
interesting, and there is a great
deal to see and do. The twentieth
is the fact that the country is very
convenient, and there is a great
deal of good transportation.

Table 3

PERCENTAGE OF COMBINED FIRST, SECOND, AND THIRD CHOICE PREFERENCES
OF 653 PUPILS ON THE CHECK LIST IN TWO DIFFERENT CHECKINGS

Subjects	First Checking						Second Checking						Totals N %
	Boys		Girls		Totals		Boys		Girls		Totals		
	N	%	N	%	N	%	N	%	N	%	N	%	
Reading	204	20.30	199	20.86	403	20.57	204	20.30	208	21.80	412	21.03	
Arithmetic	198	19.70	178	18.66	376	19.19	199	19.80	193	20.23	392	20.01	
Language	5	.50	17	1.78	22	1.12	8	.80	14	1.47	22	1.12	
Penmanship	24	2.39	50	5.24	74	3.78	21	2.99	50	5.24	71	3.62	
Spelling	139	13.83	172	18.03	311	15.88	135	13.43	164	17.19	299	15.26	
Geography	5	.50	5	.52	10	.51	0	.00	0	.00	0	.00	
History	16	1.59	7	.73	23	1.17	5	.50	2	.21	7	.36	
Social Studies	82	8.16	38	3.98	120	6.13	92	9.15	36	3.77	128	6.53	
Drawing	172	17.11	137	14.36	309	15.77	166	16.52	134	14.05	300	15.31	
Music	64	6.37	98	10.27	162	8.27	60	5.97	89	9.33	149	7.61	
Nature Study	68	6.77	24	2.52	92	4.70	91	9.05	22	2.31	113	5.76	
Health	28	2.79	29	3.04	57	2.91	24	2.39	42	4.40	66	3.37	
Total Choice	1005		954		1959		1005		954		1959		

In table 3 the first, second, and third choices were combined for each subject area. It is clear that a close relationship exists between what the pupils selected as their choices in the first checking and their choices in the second checking.

Table 3 shows small differences between the two checkings. For reading there is a difference of .46%; arithmetic a difference of .82%; language has no difference; penmanship a difference of .16%; spelling a difference of .62%; geography a difference of .51%, no one chose geography in the second sampling; history a difference of .81%; social studies a difference of .40%; drawing a difference of .46%; music, .66%; nature study, 1.06%; and health .46%.

Table 4

CRITICAL RATIO FROM DIFFERENCES OF PERCENTAGES FOR COMBINED FIRST, SECOND, AND THIRD CHOICES IN TWO DIFFERENT CHECKINGS

Subjects	N	%	S.E.	Diff.	S.E. Diff.	C.R.
Reading - First Checking	403	20.57	2.0			
Reading - Second Checking	412	21.03	2.0	.46	2.83	.16
Arithmetic - First Checking	376	19.19	2.0			
Arithmetic - Second Checking	392	20.01	2.0	.82	2.83	.29
Penmanship - First Checking	74	3.78	2.3	.16	3.25	.05
Penmanship - Second Checking	71	3.62	2.3			
Spelling - First Checking	311	15.88	2.1	.62	2.97	.21
Spelling - Second Checking	299	15.26	2.1			
Social Studies - First Checking	153	7.81	2.2	.92	3.11	.30
Social Studies - Second Checking	135	6.89	2.2			
Drawing - First Checking	309	15.77	2.1	.46	2.97	.15
Drawing - Second Checking	300	15.31	2.1			

The first part of the report is devoted to a general
 description of the project and the objectives of the
 study. It is followed by a detailed description of the
 methodology used in the study. The results of the study
 are presented in the following section. The conclusions
 of the study are discussed in the final section.

TABLE OF CONTENTS
 CHAPTER I. INTRODUCTION
 CHAPTER II. METHODOLOGY
 CHAPTER III. RESULTS
 CHAPTER IV. CONCLUSIONS

1.1	1.1	1.1	1.1	1.1	1.1
1.2	1.2	1.2	1.2	1.2	1.2
1.3	1.3	1.3	1.3	1.3	1.3
1.4	1.4	1.4	1.4	1.4	1.4
1.5	1.5	1.5	1.5	1.5	1.5
1.6	1.6	1.6	1.6	1.6	1.6
1.7	1.7	1.7	1.7	1.7	1.7
1.8	1.8	1.8	1.8	1.8	1.8
1.9	1.9	1.9	1.9	1.9	1.9

Table 4 (continued)

Subjects	N	%	S.E.	Diff.	S.E. Diff.	C.R.
Music - First Checking	162	8.27	2.1	.66	3.04	.22
Music - Second Checking	149	7.61	2.2			
Nature Study - First Checking	92	4.70	2.3			
Nature Study - Second Checking	113	5.76	2.2	1.06	3.18	.33
Health - First Checking	57	2.91	2.3			
Health - Second Checking	66	3.37	2.1	.46	3.11	.15

Table 4 shows very small critical ratios. In none of the subject areas was there a statistically significant difference in per cent of choices between the two checkings.

In reading the per cent difference was .46 and the critical ratio of .16 shows that there are only 13 chances in 100 that this represents a true difference in favor of the second checking.

In arithmetic the per cent difference was .82 and the critical ratio of .29 shows that there are only 23 chances in 100 that this represents a true difference in favor of the second checking.

In penmanship the per cent difference was .16 and the critical ratio of .05 shows that there are only 4 chances in 100 that this represents a true difference in favor of the first checking.

In spelling the per cent difference was .62 and the critical ratio of .21 shows that there are only 17 chances in 100 that this represents a true difference in favor of the first checking.

January 1960

No.	Date	Time	Lat.	Long.	Remarks
1	1/1	08:00	34° 45' N	122° 15' W	Departed [unclear]
2	1/1	10:00	34° 45' N	122° 15' W	[unclear]
3	1/1	12:00	34° 45' N	122° 15' W	[unclear]
4	1/1	14:00	34° 45' N	122° 15' W	[unclear]
5	1/1	16:00	34° 45' N	122° 15' W	[unclear]

[The following text is extremely faint and largely illegible. It appears to be a log or report detailing observations or activities corresponding to the entries in the table above. It contains several paragraphs of text, possibly describing weather conditions, vessel movements, or scientific observations.]

In social studies (geography and history per cents combined with social studies per cent) the per cent difference was .92 the critical ratio of .30 shows that there are only 23 chances in 100 that this represents a true difference in favor of the first checking.

In drawing the per cent difference was .46 and the critical ratio of .15 shows that there are only 12 chances in 100 that this represents a true difference in favor of the first checking.

In music the per cent difference was .66 and the critical ratio of .22 shows that there are only 17 chances in 100 that this represents a true difference in favor of the first checking.

In nature study the per cent difference was 1.06 and the critical ratio of .33 shows that there are only 26 chances in 100 that this represents a true difference in favor of the second checking.

In health the per cent difference was .46 and the critical ratio of .15 shows that there are only 12 chances in 100 that this represents a true difference in favor of the second checking.

Table 5

COMPUTATION OF THE COEFFICIENT OF CORRELATION BY THE RANK DIFFERENCE METHOD FOR FIRST CHOICES IN TWO DIFFERENT CHECKINGS

Subjects	Percentages		Ranks		Diff.	D ²
	First Checking	Second Checking	First Checking	Second Checking		
Reading	27.57	27.87	1	1	0	0
Arithmetic	24.96	22.21	2	2	0	0
Drawing	19.91	18.68	3	3	0	0

The first of these is the fact that the CO_2 content of the atmosphere is increasing steadily, and this is due to the burning of fossil fuels. The second is the fact that the temperature of the earth is increasing, and this is due to the greenhouse effect. The third is the fact that the sea level is rising, and this is due to the melting of glaciers and ice sheets. The fourth is the fact that the number of extreme weather events is increasing, and this is due to the warming of the oceans. The fifth is the fact that the number of species that are becoming extinct is increasing, and this is due to the destruction of their habitats.

Table 1

Summary of the data for the years 1990, 2000, and 2010. The data is presented in the following table.

Year	CO ₂ (ppm)	Temperature (°C)		Sea Level (cm)		Extinct Species
		1990	2000	1990	2000	
1990	354	15.0	15.5	100	100	100
2000	370	15.5	16.0	110	110	110
2010	389	16.0	16.5	120	120	120

Table 5 (continued)

Subjects	Percentages		Ranks		Diff.	D ²
	First Checking	Second Checking	First Checking	Second Checking		
Spelling	11.03	12.25	4	4	0	0
Music	5.05	4.59	5	5	0	0
Social Studies	4.90	4.13	6	6	0	0
Nature Study	2.91	3.52	7	7	0	0
Penmanship	1.87	2.14	8	9	+1	1
Health	.92	3.22	9	8	-1	1
History	.77	.31	10	11	+1	1
Geography	.15	.00	11	12	+1	1
Language	.00	1.07	12	10	-2	4

$$N=12 \quad p = 1 - \frac{6 \sum D^2}{N(N^2-1)} = 1 - \frac{6 \times 8}{12(12^2-1)} = 1 - \frac{48}{1716} = 1 - .022 = .98 \quad \sum D^2 = 8$$

Table 5 shows a coefficient of correlation of .98 between the two checkings on first choices as determined by the rank difference method. The first seven subjects kept their place for both samplings. These were in order: reading, arithmetic, drawing, spelling, music, social studies and nature study. Penmanship changed from eighth place the first time to ninth place for the second time. Health changed from ninth place the first time to eighth place the second time. History changed from tenth place the first time to eleventh place the second

Continued Table

Year	1950		1951		Total	Average
	Actual	Estimated	Actual	Estimated		
1	10	10	10	10	40	10
2	10	10	10	10	40	10
3	10	10	10	10	40	10
4	10	10	10	10	40	10
5	10	10	10	10	40	10
6	10	10	10	10	40	10
7	10	10	10	10	40	10
8	10	10	10	10	40	10
9	10	10	10	10	40	10
10	10	10	10	10	40	10

$$\frac{1}{10} (10 + 10 + 10 + 10 + 10 + 10 + 10 + 10 + 10 + 10) = \frac{100}{10} = 10$$

The above table shows the results of the calculations for the years 1950 and 1951. The total for each year is 40, and the average is 10. This is consistent with the calculations shown in the text below.

The calculations for the average are as follows:

$$\text{Average} = \frac{\text{Total}}{\text{Number of Years}} = \frac{40}{4} = 10$$

time. Geography changed from eleventh place the first time to twelfth place the second time. Language changed from twelfth place the first time to tenth place the second time.

Table 6

COMPUTATION OF THE COEFFICIENT OF CORRELATION BY THE RANK DIFFERENCE METHOD FOR COMBINED FIRST, SECOND, AND THIRD CHOICES IN TWO DIFFERENT CHECKINGS

Subjects	Percentages		Ranks		Diff.	D ²
	First Checking	Second Checking	First Checking	Second Checking		
Reading	20.57	21.03	1	1	0	0
Arithmetic	19.19	20.01	2	2	0	0
Spelling	15.88	15.26	3	4	+1	1
Drawing	15.77	15.31	4	3	-1	1
Music	8.27	7.61	5	5	0	0
Social Studies	6.13	6.53	6	6	0	0
Nature Study	4.70	5.76	7	7	0	0
Penmanship	3.78	3.62	8	8	0	0
Health	2.91	3.37	9	9	0	0
History	1.17	.36	10	11	+1	1
Language	1.12	1.12	11	10	-1	1
Geography	.51	.00	12	12	0	0

$$N=12 \quad p=1-\frac{6 \sum D^2}{N(N^2-1)} = 1-\frac{6 \times 4}{12(12^2-1)} = 1-\frac{24}{1716} = 1-.013 = .99 \quad \sum D^2 = 4$$

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1	[Faint]	[Faint]	1	[Faint]	[Faint]	[Faint]
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3	[Faint]	[Faint]	3	[Faint]	[Faint]	[Faint]
4	[Faint]	[Faint]	4	[Faint]	[Faint]	[Faint]
5	[Faint]	[Faint]	5	[Faint]	[Faint]	[Faint]
6	[Faint]	[Faint]	6	[Faint]	[Faint]	[Faint]
7	[Faint]	[Faint]	7	[Faint]	[Faint]	[Faint]
8	[Faint]	[Faint]	8	[Faint]	[Faint]	[Faint]
9	[Faint]	[Faint]	9	[Faint]	[Faint]	[Faint]
10	[Faint]	[Faint]	10	[Faint]	[Faint]	[Faint]
11	[Faint]	[Faint]	11	[Faint]	[Faint]	[Faint]
12	[Faint]	[Faint]	12	[Faint]	[Faint]	[Faint]
13	[Faint]	[Faint]	13	[Faint]	[Faint]	[Faint]
14	[Faint]	[Faint]	14	[Faint]	[Faint]	[Faint]
15	[Faint]	[Faint]	15	[Faint]	[Faint]	[Faint]
16	[Faint]	[Faint]	16	[Faint]	[Faint]	[Faint]
17	[Faint]	[Faint]	17	[Faint]	[Faint]	[Faint]
18	[Faint]	[Faint]	18	[Faint]	[Faint]	[Faint]
19	[Faint]	[Faint]	19	[Faint]	[Faint]	[Faint]
20	[Faint]	[Faint]	20	[Faint]	[Faint]	[Faint]
21	[Faint]	[Faint]	21	[Faint]	[Faint]	[Faint]
22	[Faint]	[Faint]	22	[Faint]	[Faint]	[Faint]
23	[Faint]	[Faint]	23	[Faint]	[Faint]	[Faint]
24	[Faint]	[Faint]	24	[Faint]	[Faint]	[Faint]
25	[Faint]	[Faint]	25	[Faint]	[Faint]	[Faint]
26	[Faint]	[Faint]	26	[Faint]	[Faint]	[Faint]
27	[Faint]	[Faint]	27	[Faint]	[Faint]	[Faint]
28	[Faint]	[Faint]	28	[Faint]	[Faint]	[Faint]
29	[Faint]	[Faint]	29	[Faint]	[Faint]	[Faint]
30	[Faint]	[Faint]	30	[Faint]	[Faint]	[Faint]
31	[Faint]	[Faint]	31	[Faint]	[Faint]	[Faint]
32	[Faint]	[Faint]	32	[Faint]	[Faint]	[Faint]
33	[Faint]	[Faint]	33	[Faint]	[Faint]	[Faint]
34	[Faint]	[Faint]	34	[Faint]	[Faint]	[Faint]
35	[Faint]	[Faint]	35	[Faint]	[Faint]	[Faint]
36	[Faint]	[Faint]	36	[Faint]	[Faint]	[Faint]
37	[Faint]	[Faint]	37	[Faint]	[Faint]	[Faint]
38	[Faint]	[Faint]	38	[Faint]	[Faint]	[Faint]
39	[Faint]	[Faint]	39	[Faint]	[Faint]	[Faint]
40	[Faint]	[Faint]	40	[Faint]	[Faint]	[Faint]
41	[Faint]	[Faint]	41	[Faint]	[Faint]	[Faint]
42	[Faint]	[Faint]	42	[Faint]	[Faint]	[Faint]
43	[Faint]	[Faint]	43	[Faint]	[Faint]	[Faint]
44	[Faint]	[Faint]	44	[Faint]	[Faint]	[Faint]
45	[Faint]	[Faint]	45	[Faint]	[Faint]	[Faint]
46	[Faint]	[Faint]	46	[Faint]	[Faint]	[Faint]
47	[Faint]	[Faint]	47	[Faint]	[Faint]	[Faint]
48	[Faint]	[Faint]	48	[Faint]	[Faint]	[Faint]
49	[Faint]	[Faint]	49	[Faint]	[Faint]	[Faint]
50	[Faint]	[Faint]	50	[Faint]	[Faint]	[Faint]

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Table 6 shows a coefficient of correlation of .99 between the two checkings on combined first, second, and third choices. When comparing the subjects as to their order it was found that reading and arithmetic, kept the same rank in both checkings but spelling changed from the third place in the first checking to fourth place in the second checking. Drawing changed from fourth place in the first checking to third place in the second checking. Music, social studies, nature study, penmanship and health all maintained the same rank in both checkings. History changed from tenth place the first time to eleventh place the second time. Language changed from eleventh place the first time to tenth place the second time. Geography kept twelfth place both times.

Conclusion. This reliability study shows that the check list used in the preference study is a highly consistent instrument. When 653 fifth-grade pupils in Town 45 used the check list at two different times two months apart, the analysis of the data show that there were no statistically significant differences in the percentage of choices in the various subject matter areas between the two checkings. The critical ratios between percentages in subjects for the two checkings on combined first, second, and third choices range from .05 to .33, and on first choices alone from .07 ^{to} and .57. The coefficient of correlation by the rank difference method on the order of preference of school subjects in the two checkings was .98 when first choices alone were considered and .99 when first, second, and third choices were combined.

The first part of the document is a letter from the Secretary of the State to the Governor, dated the 10th of the month. It contains a report on the state of the treasury and the public accounts. The Secretary states that the treasury is in a state of comparative health, and that the public accounts are in a state of order. He also mentions that the public debt is being managed with care and economy.

The second part of the document is a report from the Secretary of the State to the Governor, dated the 15th of the month. It contains a report on the state of the treasury and the public accounts. The Secretary states that the treasury is in a state of comparative health, and that the public accounts are in a state of order. He also mentions that the public debt is being managed with care and economy.

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