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The Growth of Social Science Concepts in the
Junior-Senior High School

by

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ABSTRACT

The Growth of Social Science Concepts in the Junior-Senior High School

The purpose of this study was to discover the amount of growth in understanding of certain social science concepts that appears throughout the junior-senior high school; to compare the degrees of understanding achieved by low and high I.Q. groups; and to determine the causes of the various errors made by the students.

Two interpretive tests, based on concepts typical of those appearing in social studies text books, were constructed and administered to 371 pupils in Social Studies I, III, and V classes of representative city schools.

Results of both tests showed a gradual growth in the ability on the part of the groups tested to understand certain social concepts. On both tests there was a significant difference between the mean scores of Social Studies I, III, and V groups. In any one group there was no significant difference between boys' and girls' mean scores.

Pupils of high I.Q.'s in the Social Studies I and V groups made higher scores than did those of less ability. Coefficients of correlation between I.Q.'s and test scores of both tests also indicated that the ability to understand certain social concepts was somewhat related to intelligence.

An analysis of responses made to Test I items

revealed that errors may be caused by verbalism, over-potency of certain sentence elements, difficulties arising out of figurative language, confusion with other concepts of similar spelling or sounds, "reading errors", and a complete failure to grasp the meaning of the concept. In Test II, verbalism, "reading errors", failure to follow directions, failure to weigh evidence, failure to interpret quantitative terms, and failure to compare trends contributed to the inadequacy of responses. Little difference in causes of errors was found to exist between high and low I.Q. groups at the Social Studies I and V levels. In general, throughout the groups studied, pupils did better on questions of a straightforward, fact-finding nature than they did on those requiring interpretation of data.

Test results for the groups studied indicated that pupils need more opportunity to express themselves in writing, that is to tell in their own words what a concept means to them. Moreover, students need practice in interpretation of data exercises in order that they may learn to think critically, weigh evidence, and avoid drawing conclusions from insufficient data.

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The Growth of Social Science Concepts
in the Junior-Senior High School

Chapter I

Introduction

The making of concepts through language is an active and complicated process. Language is, indeed, the tool of thinking, and through language meanings are developed. But, as Horn points out verbal statements, oral or printed, do not give the student ideas ready made. Indeed, they merely stimulate him to construct ideas for himself.

"When the statements deal with constructs which the student has already made, the process follows the general pattern of reproductive imagination. But in school most of the language that the student reads or hears deals with new meanings, new concepts, and new problems. In such instances constructive imagination is brought into play. The attainment of a new idea, is, from the student's point of view, a creative act requiring vigorous and efficient mental effort. But while, strictly speaking, there is no such thing as passive learning, a student's activity may be so feeble, his interest so weak or vacillating, or his thought so uncritical that the constructs he makes, if he makes any at all, are¹ too vague and ill organized to be serviceable."

Concepts, particularly those of an abstract nature such as democracy, liberalism, nationalism, and so on, can be developed by the student only through a gradual building up of experiences either first hand or vicarious. When the student meets such concepts in his reading, he must use his

1. Ernest Horn, "Language and Meaning," in National Society for the Study of Education, Forty-first Yearbook, University of Chicago Press, 1942, pp. 382-383.

acquired background of experience in order to interpret the concepts. He must be able to express the concepts in terms of his own everyday speech. "We need to help every pupil to translate the English words of whatever authority he is using into his own (Johnny Jones') language. To do otherwise is to promote the twin evils of parroting and plagiarism.¹ Furthermore, as Horn stresses, both persistent effort and time are required if concepts, either simple or difficult are to be developed.

"When the concept to be formed is excessively difficult, when the instructional media are inadequate, when the student's experience, interest, ability and training are limited, or when the time for learning is short, the constructs that the student makes will necessarily be unsatisfactory. . . . Concepts are not so often un-understood, to borrow a word from Shotwell, as misunderstood, or vaguely comprehended. Some meaning is obtained, some constructs are made, but the result is vague, partial, distorted, or wholly erroneous." 2

The purpose of this study is, in general, to discover how well pupils throughout the junior-senior high school grades understand certain social science concepts, or, in other words, to find out how pupils "translate" these concepts into their own everyday language, in terms of their own experience. More specifically, the purpose of this study is threefold:

1. To determine, if there is any growth in the understanding of certain social science concepts through

1. R. B. Egerton, "Clarifying and Enriching Mean Vocabularies in Social Studies; in H. R. Anderson, ed., Teaching Critical Thinking in the Social Studies, National Council for the Social Studies, Thirteenth Yearbook, 1942, p. 108.

2. E. Horn, Methods of Instruction in the Social Studies, New York, Charles Scribner's Sons, 1937, pp. 141-142.

the junior-senior high school grades.

2. To determine if the understanding of certain social science concepts is related to intelligence.
3. To analyze students' responses to certain social science concepts and to discover the causes of the errors made.

By investigating the meanings students associate with social science concepts, typical of those appearing in current social studies materials, it is hoped to discover how vivid and real such concepts actually are to pupils, and to ascertain, if possible, just what difficulties, inherent in social studies materials may block comprehension and lead to vague, superficial or completely erroneous ideas.

Chapter II

Survey of the Literature

One of the earliest investigations dealing with the understanding of concepts is Thorndike's work on mistakes in paragraph reading.¹ In this study, Thorndike aimed "to show that reading is a very elaborate procedure, involving a weighing of each of many elements in a sentence, their organization in the proper relations to one another, the selection of certain of their connotations and rejection of others, and the cooperation of many forces to determine final response."²

Two hundred pupils in grade six attempted to answer simple questions about simple paragraphs. From the results Thorndike observed that reading may be wrong or inadequate "(1) because of wrong connections with words singly, (2) because of over-potency or under-potency of elements, or (3) because of failure to treat the ideas produced by the reading as provisional, and so to inspect and welcome or reject them as they appear."³

Thorndike particularly noted the importance of correctly weighing each element in the sentence. Indeed, he found that a very large percentage of the mistakes made was due to over-potency or under-potency of certain elements.

1. E. L. Thorndike, "Reading as Reasoning: A Study of Mistakes in Paragraph Reading," Journal of Educational Psychology, 1917, vol. 8, pp. 323-33.

2. Ibid., p. 323.

3. Ibid., p. 326.

To illustrate his point, Thorndike discussed his first question on the paragraph-reading test -- "What is the general topic of the paragraph?" A typical answer, such as "made of complete sentences," showed how the over-potency of the word paragraph affected the response made. ¹

In conclusion, Thorndike pointed out that the reading of a text or reference book should not be thought of as a mechanical or passive task. Rather, such reading demands an active selection typical of thought. "It is not a small or unworthy task to learn 'what the book says.'" ² Thorndike felt that the results of his study indicated the need of silent reading exercises to replace much oral reading.

Friedman made a study of the variety, extent, and importance of time concepts in the life of the average person, both adult and child. ³

The subjects of this study were 1364 pupils in Minneapolis Public Schools from kindergarten to grade twelve inclusive, together with 194 adults. Groups were equated on the basis of sex and I.Q. Occupations of adults and parents of pupils fell within the middle groups of the Minnesota Occupational Scale.

1. Thorndike, Journal of Educational Psychology, vol. 8 (1917), pp. 325 - 327.

2. Ibid, p. 332.

3. K. C. Friedman, "The Growth of Time Concepts," Social Education, 1944, vol. 8, pp. 29-31.

Friedman found progress with each succeeding grade in the understanding of time concepts. Children had a slight understanding of time when they first entered school. Full understanding of the conventional time system did not occur until grade six (age 11).

Children were also tested on the meaning of indefinite time phrases. Here the pupils were asked to relate something that happened "a long time ago" and something that happened "a short while ago," and then to tell just when they occurred. Here it was found that pupils understood ideas nearer to them in time and place better than they grasped those more remote. But, for both recent and early periods, highly inaccurate and greatly varying concepts were displayed.

Greatest gains in the understanding of time words and dates occurred in grades five and six. By grade ten (age 16) comprehension of these concepts approached maturity. Here scores were equivalent to adult averages.

In the field of time relationships Friedman found comprehension was generally poor. Here pupils were asked to number groups of events in chronological order. Test items were based on holidays, familiar historical events, and dates. Satisfactory understanding was not achieved until the grade-twelve level. Furthermore, the ability of adults to see time relationships either among groups of unrelated events or in a succession of related events appeared limited. Results further showed no significant sex difference, and a low correlation between I.Q.'s and test scores.

Friedman suggested that this area of time concepts offers great possibilities for development, and indeed, that an acquisition of adequate time concepts should contribute to the enrichment in the outcomes of the social studies.

Iowa Studies

Several studies at the University of Iowa have dealt with the problem of children's historical concepts. One of the most significant in this field was that of Joseph C. Dewey.¹

In his study, Dewey sought to determine what children understand from their reading, why they comprehend as they do, and finally to ascertain what may be done to help children interpret the printed page correctly.

For his tests, Dewey adapted reading material from four representative American history texts for the eighth grade. He selected paragraphs with meanings which required careful, inferential thought. The words in each selection were checked against the Thorndike Word List.

Dewey constructed four types of tests -- paper-and-pencil tests, a map test, picture-choice tests, and an interview test. The paper-and-pencil tests consisted of a true-false-no-data test, a free-expression inference test, a

1. J. C. Dewey, A Case Study of Reading Comprehension Difficulties in American History, University of Iowa Studies in Education, vol. X, No. 1, 1931, cited in Alilinas, L. J., "A Review of the Research of the Historical Concepts of American Children," Educational Administration and Supervision, Baltimore, Warick and York, 1945, vol. 31, pp. 331-344.

As the original was not available, the account of Dewey's study is based on the review by Alilinas.

multiple-choice test, and a true-false inference test in which pupils indicated the specific sentences on which they had based their responses, as well as whether the inferences were true or false. In the oral interview test which Dewey endeavored to make as concrete as possible, pupils had reading selections before them. Each child was given a thirty-minute interview which was recorded verbatim by the Iowa Oral Language Recording Machine. As a safeguard against one child informing another about the interviews, no child knew during his interview whether or not he had answered the questions correctly. Furthermore, the number and variety of the questions were so great, that Dewey felt it unlikely that a pupil could remember the questions long enough to inform others.

A preliminary test was given to children in the University Elementary School to determine the most plausible alternate incorrect items for the multiple-choice test. Final tests were administered to children in two schools. Sixty-eight children from one school, which was in a town of two thousand, had I.Q.'s ranging from 80 to 125. Their reading scores on the Iowa Silent Reading Test ranged from 28.50 to 142.00. Eighty-eight pupils from the other school, in a community of sixty thousand, had I.Q.'s ranging from 73 to 126 and reading scores ranging from 24.50 to 116.50. Test results for both groups were almost equivalent.

From his test results, Dewey concluded that the more intelligent children were more logical in their responses, while those of less ability, tended to give disconnected

illogical responses. Dewey warned, however, that one should not have too much faith in the reliability of verbal tests based on a few objective items. Dewey used the picture tests to check against the meanings of words which pupils used. In some cases, pupils who responded correctly in the word tests failed to respond correctly on the picture tests.

Test results also showed that pupils did much less effective reading for inferential thinking than they did for fact finding. Their lack of experiential background was apparent when they were asked to give reasons for their responses. Irrelevant, verbal answers were particularly noticeable on matters of money and government powers. Dewey doubted that the children had had adequate opportunity in school to do inferential thinking. He felt that each pupil regarded any reading selection in terms of his own background and mind set, and that test results indicated the need for a better provision for individual differences in teaching.

On the whole, Dewey found that pupils made a larger percentage of correct responses in the oral interviews than they did in the written tests. Again he found that the brighter children were more consistent in their responses.

Dewey felt that the value of the oral interview technique lay in the fact that the investigator had a chance to make clear what he was testing. The pupil could also make plain what he was trying to say. Moreover, the interview technique aided in obtaining an accurate evaluation of

the children's reading comprehension, helped to establish the validity of the written tests, and provided a means of discovering additional information about reading difficulties.¹

Three studies dealing with the understanding of quantitative terms appearing in social studies material were carried out at Iowa University.

Short limited his study to those concepts which grow out of numbers and quantitative terms appearing in history textbooks at the grade seven level. In his analysis of the text in question, Short itemized and classified the entire book. Items were chosen on the basis of frequency in the text, their appearance in "standard vocabularies, their difficulty, and their historical significance according to a certain type of philosophy in historical authorship."²

Complete statements with as much content as necessary to insure a full meaning of their nature were selected rather than single words. These statements were used to form a completion, multiple-choice, and essay type test. Short stated that "the difficulty most strongly met was that of a sufficient refinement of questions to gain delicate shades of meaning. A slight change in content alters the

1. See L. J. Alilinas, "A Review of the Research of the Historical Concepts of American Children," Educational Administration and Supervision, Baltimore, Warick and York, 1945, vol. 31, pp. 337 - 340.

2. H. C. Short, Concepts of Certain Quantitative Terms used in Seventh Grade Social Science Materials, Master's thesis, State University of Iowa, 1933, pp. 1 - 4.

entire meaning of the word, and as soon as this occurs the same concept is no longer measured." ¹

The subjects were twenty-seven pupils of a grade-seven class in a Chicago metropolitan-area school. Each pupil had an opportunity to discuss his written responses to the test items with the examiner. Additional ideas developed by the pupil without the aid of "leading questions" were also credited to his work.

In his interpretation of the test results, Short pointed out that this investigation had two main limitations, namely; the small number of cases studied, and the difficulty in interpreting results. He concluded that:

"To say that a child whose response to such items was not the 'accepted response' was in error, is not altogether true. Such answers were not 'still more boners.' The only time that a child could make an error in this investigation was in failing to faithfully record his best answers to a question. His inconsistencies in replying to the same type of question in different settings would rather indicate accuracy of recording than error." ²

Furthermore, although correlations of .76, .70, .59, and .58 existed between the accepted responses and the Stanford Achievement Scores, the Gregory American History Test, the Compass Arithmetic Survey Test, and the Illinois Intelligence Scale, respectively, Short concluded that "it probably cannot be inferred that achievement as measured by the Stanford test is the best measure of the nature of the concepts, or that history information was more essential to the development of an 'accepted response' than was arithmetical information." ³

1. H. C. Short, p. 9

2. Ibid, p. 70

3. Ibid, pp. 73 - 74.

The whole background of experience of each pupil must be taken into account before one concludes that a child is either right or wrong in his interpretation of concepts. "Experience, possibly, may play a greater part in establishing adequate concepts, than such factors as intelligence per se, or ability to obtain high scores on standardized academic tests." ¹

In conclusion, Short found a wide variety of quantitative concepts derived from statements in their history text by the group of children tested. In regard to the children's concepts, the definite-indefinite, and indefinite items provided a richer field for determination of concepts held, than did the definite terms, which may involve only memoriter skills. Finally, Short suggested the need for a refinement of terminology and a campaign against the loose use of quantitative terms in children's reading materials. ²

A second study dealing with the comprehension of quantitative terms was carried out by Ryan. Ryan sought to determine the extent to which fifth-grade children possess reasonably accurate concepts of quantitative terms used in their geography textbooks, and secondly, to determine the frequency with which definite and indefinite quantitative terms appear in a certain geography text written for fifth-grade pupils. ³

1. H. C. Short, p. 75

2. Ibid, pp. 75 - 76.

3. G. M. Ryan, A Study of the Comprehension of Quantitative Terms in Geography at the Fifth Grade Level, Master's thesis, State University of Iowa, 1935, pp. 1 - 2.

Ryan selected one hundred quantitative terms primarily on the basis of their frequency of occurrence in the text. The accuracy of the terms was checked against statistics supplied by such authorities as the U.S. Departments of Agriculture and Commerce. Certain items were omitted because of lack of accurate information. Ryan pointed out that "this little research while covering a small area makes one cognizant of the fact that it is easy to speak and write in terms of generalities and that we all talk much about things of which we actually know little. Hence it is that textbook writers choose the paths of least resistance and cover up unknown or changing facts with indefinite statements." ¹

Ryan's tests were composed of sentences containing items printed almost verbatim from the text. Each sentence was followed by multiple-choice item or items. Ryan felt that if a child had a correct concept of the term in question, his choice of response would indicate it. A free-expression test and an oral test was also arranged, the purpose of the latter being to ascertain the inner thinking of each child. "Leading questions" in the oral tests were at all times avoided.

Tests were administered to twenty fifth-grade pupils of Franklin School, Dubuque, Iowa. In the free-expression test and interview test items were marked right if the child's response indicated that he had a fairly correct concept.

1. G. M. Ryan, p. 14

Results of the three types of tests indicated a poor understanding of the quantitative terms used in the investigation. Only 48.3% of correct responses on the multiple-choice test were selected by the pupils. On the interview and free-expression tests 48% and 27.4% of the questions were answered correctly. A low agreement between intelligence of the pupils and their scores on these tests was also evident. Ryan felt that it was quite possible that extensive use of objective tests contributed to the pupils' lack of ability in expressing themselves in writing.

In brief, Ryan found that the textbook analysis indicated that quantitative terms, particularly of an indefinite nature, were used in profusion in the text. Both definite and indefinite terms were difficult for children to interpret. Children with higher intelligence were more consistent in giving the correct response to the same term on the different tests. Each child made his lowest score on the free-expression test. Consistency of responses corresponded with both the intelligence quotients and reading percentiles. Results implied that textbook writers should use more concrete materials in presenting facts, and that classroom teachers should endeavor to put meaning into geography terms. In addition, free-expression tests should be used to supplement those of an objective type. ¹

One of the most recent and most interesting studies at Iowa University dealing with the problem of the effect of definite and indefinite quantitative terms on the understand-

ding of social studies material has been the work of Gabel.¹

In order to test the comprehension of quantitative concepts of children, Gabel devised six one-page selections of typical social studies materials. The selections contained forty quantitative terms dealing with time, area, distance, and size. Two forms of each selection were prepared, with definite and indefinite terms. Gabel then constructed two forms of a multiple-response test in order to test the comprehension and retention of the quantitative terms used in the selections. Both forms of the test were alike in that the same questions were used in each form. Again the chief difference was that the facts in one test were stated definitely, while in the other they were presented indefinitely.²

Tests were administered to 1627 pupils in grades 6, 8, 10, and 12 in nine school systems in Illinois. The presentation of material and the testing order were alternated, so that all pupils had a chance to respond to both the definite and indefinite quantitative terms.

Gabel concluded that regardless of the type of quantitative concept, and regardless of the grade level, the definite method of presentation of quantitative terms in social studies material is more effective than the indefinite method of presentation. Coefficients of correlation between test scores and I.Q.'s were all positive, ranging from .29

1. O. J. Gabel, "The Effect of Definite Versus Indefinite Quantitative Terms Upon the Comprehension and Retention of Social Studies Material," Journal of Experimental Education, 1940-1942, vol. 9-10, pp. 177-186.

2. Ibid, pp. 177-178.

to .54 when total scores were used. These coefficients were consistent regardless of the type of quantitative concept or the type of test material involved. From this fact, Gabel concluded that there is a strong probability that the more intelligent pupils are more likely to comprehend and retain quantitative concepts in social studies material than the less intelligent ones. He further recommended that a larger number of definite quantitative terms be included in the material that children read, and suggested that text book writers should be more discriminating in their selection of terms to express concepts of quantity.¹

Columbia Studies

Columbia University studies related to the problem of children's social concepts may be represented by the work of Meltzer, Matthews, and Ayer.

Meltzer sought to discover how some cue concepts - basic concepts of contemporary life - are developed in the minds of children.² He selected thirty-one social, political and economic concepts from a larger list determined by a study of 112 issues of critical magazines spread over a period of five years, together with four books.

A straightforward information test for the concepts was constructed. The personal-interview technique was chosen as the method of testing, because Meltzer felt that such a method was less restrained and yielded more meaningful and revealing responses. Each child was tested individually.

1. O. J. Gabel, pp. 185-186.

2. H. Meltzer, Children's Social Concepts - A Study of Their Nature and Development, New York, Teachers College, Columbia University Contributions to Education, No. 192. 1925.

The child talked; the examiner did all the writing. No time limit was set. Each child was given every opportunity to say all he or she knew about the concept. Generalities lead to further questioning by the examiner.¹

The subjects were 333 pupils from grade five through high school in New York and New Jersey Schools. No great differences were found between the children's reaction to general concepts such as politics, government, industry, as contrasted to particular concepts such as Trade Union, and Wage Earner. A steady development in the children's concepts appeared from grade to grade. Mean scores ranged from 27.40 in grade five to 158.91 in grade twelve. The children's grasp of the concepts was found to correlate positively with five factors; namely, .80 with educational age, .69 with grade, .58 with mental age, .55 with chronological age, and .36 with occupational status.

The curriculum was found to have a direct and measurable influence on the children's grasp of the concepts. Children who had used the Social Science Pamphlets - a unified course in social science for the seventh, eighth, and ninth grade - were superior, with respect to the grasp of the concepts, to those who had the conventional courses in history, geography, and civics.

The number of words used and the number of correct ideas expressed increased from grade to grade. The number of words used correlated .69 with the number of correct ideas expressed, but only .31 with the grasp of the concepts.

Meltzer concluded that:

1. H. Meltzer, pp. 14-18.

"The high correlation between the number of words used and the number of ideas expressed and the low correlation between the number of words used and grasp of the concepts are interpreted as showing that the number of ideas, taken by itself, is not a satisfactory measure of the grasp of the concepts. . . . Talkativeness on a given universe of discourse as measured by the numbers of words used by the children to express their knowledge of the concepts correlated .36 - .049 with their Intelligence Quotients." 1

Matthews' purpose was to determine the extent to which pupils comprehend various types of social studies materials. 2

Concepts were chosen from materials used in a particular course of study at the junior high school level. "It was thought that the variation in difficulty which would be found in junior high school materials would insure the selection of some samples comprehended to some extent as low as the fourth grade and some so difficult as to tax the ability of the senior high school pupils." 3

From nine types of curriculum materials - episodes, descriptions, newspaper articles, bar graphs, line graphs, circular graphs, time lines, pictograms, and maps - seventy-two samples were selected and incorporated in a multiple choice and completion test. Only questions which could be answered from the specific material presented were asked.

1. H. Meltzer, p. 88

2. C. O. Matthews, The Grade Placement of Curriculum Materials in the Social Studies, New York, Teachers College, Columbia University Contributions to Education, No. 241, 1926.

3. Ibid, p. 4-5.

The subjects were 9711 pupils from throughout the United States. There were approximately 400 pupils in each of grades 4, 7, 9, and 12, with 150 in each of grades 5, 6, 8, 10, and 11. The intelligence records tended to show that the sampling of children was quite representative of the public school population of the United States. A comparison of age-grade norms of these children with norms for the country as a whole pointed to the same conclusion.

Results showed that ability to comprehend the reading and graphic selections used increased gradually throughout the grades. Of the reading materials used, the episodes were comprehended somewhat better than the other types in all grades except grades six and nine. In regards to the graphic materials, the circular graphs were easiest, the line graphs most difficult, and the bar graphs about midway between the two. Grade levels have been indicated for each selection of materials as an aid to the placement of materials in the curriculum from which they were selected. ¹

A comprehensive study on difficulties in elementary school history was undertaken by Ayer. Her purpose was to determine the extent to which children comprehend history concepts; to determine the precise nature of interfering difficulties; to compare the ability required to understand passages with the reading comprehension of children as measured by standardized reading tests; to determine how children react to history subject matter which they do not fully com-

prehend; and to determine whether failure to comprehend passages from history is due to wrong grade placement.¹

The study was conducted at the grades five and seven level. Subject matter for tests consisted of paragraphs or other units of thought that contained expressions or words that might be difficult for children, and that, in general, represented all periods of history commonly found in textbooks in use.

As passages were analyzed, the most common difficulties observed were difficult words and expressions essential to history comprehension (technical words), words and expressions not essential to history comprehension (literary embellishments), long, involved sentences, and abstract thought.

A preliminary test was given to 95 children equally divided among grades five to eight inclusive, in order to determine the nature of children's reactions to difficult terms and expressions. Paragraphs were selected from grade five histories representing the types of difficulties described. Children were asked to tell in their own words what items in these paragraphs meant to them.

From this preliminary test, it was found that some paragraphs were so difficult that they discouraged and even antagonized the children. For this reason, the most difficult items were eliminated from the final test and were replaced by comparatively easy paragraphs.

1. A. M. Ayer, Some Difficulties in Elementary School History, New York, Teachers College, Columbia University Contributions to Education, No. 212, New York, 1926, pp. 1-5.

The final test consisted of twenty paragraphs from grade five history texts. Three true and three false statements were formulated for each paragraph. False statements were taken largely from pupils' own reactions to the preliminary test.

In order to determine the extent to which failure to comprehend passages was due to specific difficult items in the passages, a comparison was desired between comprehension of history paragraphs in original and in simplified form. Equivalent groups were determined roughly by giving every second child one form of the test, and a different form of the same subject matter to the other children. In order to equate the children more accurately, Ayer used a "calibration test" which consisted of a paragraph followed by ten graded true and false statements. Paragraphs were then rotated through two forms of the final test. Every child had half of his paragraphs in original form and the alternating paragraphs in simplified form. His matched "twin" had the reverse.¹

The groups tested consisted of 1053 children from New York City, from a residential New Jersey area, from Frederick, Maryland (where close supervision of reading has been stressed), and from village and rural schools in New Jersey and Montana. Ayer states that the groups tested appeared representative of the country as a whole. The mean I.Q. for grade seven as measured by the Otis Intelligence

1. A. M. Ayer, pp. 16-17.

Test was 120.9, while that of grade five, as measured by the National Intelligence Test was 110.9. Such mean I.Q.'s appear to indicate, however, that the groups were of superior rather than of average ability.

Ayer further tested the children in reading comprehension in order to ascertain the correspondence between the reading grade on the Thorndike-McCall Reading Scale and the percentage of answers correct on the history test. The results indicate that to answer correctly the same numbers of questions on simplified paragraphs requires reading ability about two grades lower than that required to answer the same questions on the original paragraphs.

Finally, a free-expression test was used to determine what children do when confronted by subject matter in history which they do not understand. The free-expression test contained the same type of difficulties as did the controlled test. The group tested consisted of 77 grade-five pupils and 64 grade-seven pupils. Ayer classified responses into correct, incorrect, omitted and not paraphrased (copied exact words of the paragraph). An analysis of the responses revealed that the subjects which caused particular confusion and misinterpretation were the growing spirit of democracy, theories of governmental representation, and government terminology.

Ayer concluded that results of tests showed an astonishing inability on the part of both grade five and seven pupils to comprehend fifth grade history paragraphs. With a

possible score of six for each paragraph, the fifth grade had on the original paragraphs a mean score of 2.53, on the simplified paragraphs a mean score of 3.63, and a mean difference of 1.10. Grade seven results showed a mean score of 3.55 on the original paragraphs, a mean score of 4.66 on the simplified ones, and a mean difference of 1.11. On every paragraph but one, in both grades, the average score showed better results when paragraphs were simplified. Difficulties appeared, in general, to be caused by figurative language, abstract words, and by concepts and words not essential to history.

In general, these studies all indicate the inability of many children to comprehend adequately social concepts, time concepts, and quantitative terms. The research at Iowa University on quantitative terms points to the need for a more concrete treatment of such concepts appearing in social studies material. Dewey, in his research on children's historical concepts indicates the inability of pupils to read effectively for inferential thinking, and that more opportunity in school to do inferential thinking should be provided. Matthews' and Meltzer's studies show that there is a gradual improvement in the ability to interpret social concepts throughout the grades. Finally, the work of both Thorndike and Ayer indicates the varying causes of difficulties which in themselves may block comprehension.

Chapter III

General Procedure

The major purpose of this study, is, in general to determine the amount of growth in the understanding of certain social science concepts throughout the junior-senior high school. In order to discover the amount of growth in understanding, it was necessary to 1) select certain social concepts and 2) devise tests based on the concepts chosen.

The Materials

Typical social science concepts, representative of those appearing in the social studies text books of the secondary school level, were selected from George W. Brown's Building the Canadian Nation and Canadian Democracy in Action.¹ Significant words, phrases, charts, and graphs were chosen for interpretation. Two forty-minute tests based on these concepts were prepared.

The Tests

Test I took the form of a free-expression test. In most cases, sentences containing the concepts were used in the exact form in which they appeared in Building the Canadian Nation. Slight changes were made, however, in items two and seven of the test.²

The original sentence on which item two was based appears in Building the Canadian Nation as follows: "The French ideal of government was a despotic one, and almost

1. Permission to use materials selected from these books for testing purposes was granted by the publishers, J.M. Dent and Sons (Canada) Limited, Vancouver.

2. Copies of Test I and Test II appear in the Appendix.

every detail of the life of the colony was carefully regulated."¹

In the test, the words "ideal of" were deleted, as it was felt that such an expression gave an unnecessary added difficulty to the sentence. Similarly, a slight deletion was made in item seven. The opening sentence of the paragraph originally read "From the beginning of Cook's voyage in 1766 to the end of Vancouver's exploration only eighteen years had elapsed, but they were years filled with significant developments."²

This sentence was changed to read: "The years between Cook's voyage in 1766 and the end of Vancouver's exploration in 1784 were important ones." This avoided the difficulty inherent in the words, "significant developments." In neither case was the general meaning of the sentence affected by such deletions.

Test II consisted of two main types of questions. The first part of the test consisted of two paragraphs from Building the Canadian Nation. Pupils were required to read the paragraphs and to answer the questions, basing their answers on the content of the paragraph. The questions were of a straightforward fact-finding nature. The second half of Test II consisted of objective-type questions that required the interpretation of data contained in a table and a graph. Both the table and the graph were taken from Brown's Canadian Democracy in Action. Directions for these questions were simi-

1. G. W. Brown, Building the Canadian Nation, J.M. Dent and Sons (Canada) Limited, Vancouver, p. 52

2. Ibid., p. 162

lar to those found in the examples used in the Thirteenth Yearbook of the National Council for the Social Studies, Teaching Critical Thinking in the Social Studies.¹ Questions on the table and graph required more than the ability to find facts. Rather, such questions necessitated the careful weighing of evidence before conclusions could be drawn.

An experimental try-out on a grade-seven and a grade-nine class was given in order to obtain a general idea as to the suitability of the test material. Results indicated no need for any major change in test items. The final tests used in the actual experiment were identical with those used in the try-out test.

The Subjects

The subjects were students in representative city high schools. Tests were administered to a total of 371 students in Social Studies I, III, and V. These groups were chosen in order to have a wider range of ability than would occur among Social Studies I, II, and III classes. Table I shows the number of boys and girls in each of the three groups.

Table I

Number of Students in Social Studies I, III, and V

	Boys	Girls	Total
Social Studies I	58	54	112
Social Studies III	67	67	134
Social Studies V	73	52	125

1. H. R. Anderson, ed., "Teaching Critical Thinking in the Social Studies," National Council for the Social Studies, Thirteenth Yearbook, Washington, D.C., 1942, p. 144.

Table 2 shows the means and standard deviations of the I.Q.'s for each group.

Table 2

Means and Sigmas of I.Q.'s for Social Studies I, III, and V

	Social Studies I		Social Studies III		Social Studies V	
	Mean	Sigma	Mean	Sigma	Mean	Sigma
Boys	120.19	13.01	111.37	9.98	111.47	9.98
Girls	120.43	11.4	112.26	8.78	110.84	10.19
Boys and Girls	120.40	12.61	111.81	9.26	111.22	10.02

From Table 2 it can be seen that, on the basis of I.Q.'s, the Social Studies I group is superior. However, although superior, this group had consistently lower test results on both Test I and Test II. Thus it was concluded that an average Social Studies I group would have even less success on both the tests. For this reason, no further equating of groups was attempted.

Chapter IV

Statistical Analysis of Test Results

The Findings

Means and standard deviations of Test I and Test II scores are shown in Tables 3 and 4.

Table 3

Mean Scores and Sigmas for Test I: Maximum 32

	Social Studies I		Social Studies III		Social Studies V	
	Mean	Sigma	Mean	Sigma	Mean	Sigma
Boys	7.05	4.58	9.96	5.67	15.51	4.52
Girls	6.89	4.28	9.46	3.98	15.54	4.85
Boys and Girls	7.25	4.43	9.71	4.98	15.52	4.67

Table 4

Mean Scores and Sigmas for Test II: Maximum 25

	Social Studies I		Social Studies III		Social Studies V	
	Mean	Sigma	Mean	Sigma	Mean	Sigma
Boys	12.09	3.53	14.24	4.08	17.96	3.67
Girls	12.19	3.59	15.43	3.27	17.28	3.81
Boys and Girls	12.13	3.56	14.50	3.73	17.67	3.71

Results of both Test I and Test II show a gradual growth in the ability on the part of the group tested to understand certain social concepts. In any one group there is no significant difference between boys' and girls' mean scores.

The significance of the difference between the Test I mean scores in Social Studies I, III, and V groups is shown in Table 5.

Table 5
Significance of the Difference between Mean Scores in
Social Studies I, III, V: Test I

Social Studies	Difference between Means	Standard Error of the Difference	t-ratio	t at the 1% level of significance
III - I	2.46	.61	4.03	2.59
V - I	8.27	.59	14.02	2.59
V - III	5.81	.60	9.70	2.59

It may be seen that on Test I there is a significant difference between the mean scores of Social Studies I and III, I and V, and III and V groups.

The significance of the difference between the mean scores for Test II is shown in Table 6.

Table 6

Significance of the Difference between Mean Scores in
Social Studies I, III, V: Test II

Social Studies	Difference between Means	Standard Error of the Difference	t-ratio	t at the 1% level of significance
III - I	2.37	.47	5.04	2.59
V - I	5.44	.48	11.13	2.59
V - III	3.17	.47	6.50	2.59

Again, it may be observed that there is a significant difference between the mean scores of all groups.

In marking Test I, the free-expression test, an effort was made to differentiate between degrees of comprehension achieved by the pupils. Each response was rated as follows:

- I) No comprehension shown,
- II) Some comprehension shown,
- III) Adequate comprehension shown.

A response showing no comprehension was given a score of zero, one showing some comprehension, one, and finally, a response showing adequate comprehension, two. A response was considered adequate when the pupil showed a reasonable grasp of the concept. Table 7 indicates the percentage of pupils achieving the varying degrees of comprehension on each item of Test I.

Table 7

Percentage of Pupils Achieving No, Some,
or Adequate Comprehension on Test I Items

Concept	Social Studies I			Social Studies III			Social Studies V		
	No	Some	Adequate	No	Some	Adequate	No	Some	Adequate
<u>sea-dogs</u>	5	3	92	5	1	94	3	2	95
<u>monopolize trade</u>	71	3	26	52	1	47	9	2	89
<u>despotic</u>	97	0	3	96	1	3	74	6	20
<u>census</u>	55	4	41	60	4	36	17	2	81
<u>elected assembly</u>	77	19	4	56	35	9	27	33	40
<u>no taxation without representation</u>	48	30	22	58	20	22	29	7	67
<u>became a magnet</u>	63	5	32	50	6	44	30	5	65
<u>America's Pacific Coast had been brought into the stream of world affairs</u>	65	12	23	47	16	37	60	9	31
<u>self sufficient</u>	50	5	45	18	12	70	10	2	88
<u>Responsible Government</u>	98	2	0	86	14	0	69	31	0
<u>minority rule</u>	93	4	3	69	13	18	29	46	25
<u>statesmanship</u>	98	0	2	92	2	6	75	4	21
<u>negotiated a reciprocity treaty</u>	98	2	0	94	1	5	92	2	6
<u>legislature</u>	74	14	12	87	10	3	69	11	20
<u>constitution</u>	93	3.5	3.5	81	14	5	40	33	27
<u>federal</u>	98	2	0	87	11	2	92	2	6

It may be observed that sea-dogs is the only concept which students of all groups readily understood. On the other hand, no student in any group displayed adequate comprehension of the term Responsible Government, while only a few pupils in Social Studies III and V possessed an understanding of federal and negotiated a reciprocity treaty. Lastly, pupils showed a more steady improvement in their understanding of the concepts monopolize trade, census, became a magnet, and self sufficient.

In general, a surprisingly large percentage of pupils showed no grasp whatsoever of the concepts they were asked to explain. Although some of the errors made can be classified into certain well defined categories, many others can be thought of only as "foolish answers." On the other hand, there is a gradual improvement from the grade-seven level of the Social Studies I group to the grade-eleven and twelve level of Social Studies V.

An effort was made to determine the relationship of intelligence to the ability to interpret the social science data contained in both the free-expression and the objective test. As the coefficient of correlation was only .40 between the scores of Tests I and II at the Social Studies V level, and .52 at the Social Studies I level, the two tests were treated separately. In the Social Studies V group, Pearsonian r's of .33 and .20 were found between I.Q.'s and test scores of the free-expression test, Test I

and the objective test, Test II, respectively. At the Social Studies I level, there were correlation coefficients of .41 between I.Q.'s and test scores of both Tests I and II. Thus, although the relationship is small, there is some indication that the understanding of certain social concepts is related to test intelligence.

A comparison of the degrees of understanding achieved was then made between high and low I.Q. levels in both Socials Studies I and V groups. From the Socials Studies I group, test scores of 22 students with I.Q.'s ranging from 90 to 109, and those of 21 students with I.Q.'s ranging from 130 to 149 were compared. Similarly from the Socials V group, 26 students with I.Q.'s ranging from 80 to 104 and 26 students with I.Q.'s from 120 to 139 were selected for study. Table 8 shows the mean scores and standard deviations of the low and high I.Q. groups on both tests.

Table 8

Test Results of Students of High and Low
I.Q. Levels in the Social Studies I and V Groups

	Social Studies I				Social Studies V			
	Low I.Q. Group		High I.Q. Group		Low I.Q. Group		High I.Q. Group	
	Mean	Sigma	Mean	Sigma	Mean	Sigma	Mean	Sigma
Test I	5.91	3.6	10.71	5.4	12.40	4.3	18.19	4.1
Test II	9.95	3.6	13.90	3.9	16.23	3.6	19.30	3.7

Table 9 shows the significance of the differences between the mean scores in low and high I.Q. groups for Test I.

Table 9
Significance of the Difference between
Mean Scores in Low and High I.Q. Groups: Test I

Social Studies	I.Q.	Difference between Means	Standard Error of the Difference	t-ratio	t at the 1% level of significance
I	High-Low	4.80	1.43	3.4	2.70
V	High-Low	5.79	1.18	4.9	2.68

It may be seen that on Test I there is a significant difference between the mean scores of the low and high I.Q. groups in both Social Studies I and V.

The significance of the differences between the mean scores for Test II appear in Table 10.

Table 10
Significance of the Difference between Mean
Scores in Low and High I.Q. Groups: Test II

Social Studies	I.Q.	Difference between Means	Standard Error of the Difference	t-ratio	t at the 1% level of significance
I	High-Low	3.95	1.16	3.4	2.70
V	High-Low	3.07	1.03	2.9	2.68

Similarly, on Test II, the difference between the mean scores of high and low I.Q. groups is significant.

Results here indicate that the pupils of high I.Q.'s selected from the Social Studies I and V groups do make higher scores on the two tests, and thus may be said to have achieved a greater degree of understanding of certain social science concepts than do the students of less ability.

Chapter V

Subjective Analysis of Test Results

An analysis of the children's reactions to the items appearing on the free-expression test, Test I, reveals, besides a large group of miscellaneous answers, certain well-defined types of responses. Although, throughout the entire groups, it is evident that children do attempt to use cues in their effort to interpret the concepts, they may, on the other hand, make no attempt to paraphrase and resort to copying out the exact words of the sentence. Such verbalism appeared frequently in item four of the test. Here, the pupils were asked to explain the concept, elected assembly. In general, pupils made no attempt to express this concept in their own words. Thus, many answers consist merely of the words an assembly elected by the people. It is interesting to note that one grade nine pupil copied out the exact words of each of the fifteen sentences. No attempt whatsoever was made at interpretation. Furthermore, in connection with item four, pupils fail to be specific enough. All three groups tend to describe this concept in exceedingly general or widesweeping terms, such as government, parliament, a provisional government, a sort of government. In the Social Studies V group, some students suggest that elected assembly means that people were elected by the prime minister. On the other hand, pupils made some attempt at explanation, by suggesting the word voted in place of elected.

When responding to the concept No taxation without representation, pupils again tended to repeat the exact words used in the concept as is illustrated by such a response as won't pay taxes without representation. However, most errors made centred around a lack of knowledge of what the term representation implies. In the Social Studies I and III groups such answers as no taxes without a reason, no taxes without a meaning for it, no taxation without permission or a license were common. The idea that a person could not be taxed unless he is a property owner also appears as an answer at the Social Studies III level. One grade nine student appeared to connect the phrase "rights of Englishmen" with the idea of "right to be English." His response -- They would not pay unless they were given the rights to be English -- suggests perhaps an undue stress on that particular element of the sentence, "rights of Englishmen." The over-potency of this phrase seems to have coloured the response made. Social Studies V students also fail to convey the meaning of representation in their responses. No taxes without the tax being put before the government and similar answers appear, while one amusing answer from a grade eleven student was give us rights if we're to pay for the upkeep of England!

Over-potency of certain words or elements in the sentence also contributed to the errors made. Here, pupils failed to weigh the various elements in the sentence, and as a result, based their answers on incorrect cues. For example,

item two of the test reads as follows: " The French government was a despotic one, and almost every detail of the life of the colony was carefully regulated." In all groups there appear to be attempts to define the word despotic, using the words carefully regulated as the cue. Such responses as careful and strict, careful and efficient, carefully governed, the government controlled almost everything, and it ruled nearly everything suggest how a particular sentence element has assumed an over-potent position in relation to the sentence as a whole. The phrase carefully regulated also seems to suggest to the pupils the idea of good government. In contrast, however, answers such as poor, and not very good occur. In Grade eleven, students suggest the idea of rule by one person, the ideas of godly, and divine right, or attempt to define despotic by saying ruled by one man known as a despot or ruler. Yet none of these answers adequately conveys the concept of an absolute authority.

Further instances of the over-potency of a word are found when analyzing errors made in item eight. The sentence reads: "Living in an age of rapid transportation, it is hard for us to understand how nearly self sufficient the local community had to be a century ago." In this instance, the word transportation seems to receive undue emphasis. Students attempt to explain the concept in terms of buses and streetcars. In general, however, this particular concept was well explained.

Failure to understand phrases expressed in figurative language also contributes to errors made. Examples of this type of error may be found upon analyzing responses made to items six and seven. In item six students were asked to tell the meaning of the phrase "The sea otter became a magnet" Typical responses made by Social Studies I and III groups were: became a menace, became plentiful, became scarce, became permanent, and became popular or famous. In all grades the idea of the sea otter being an emblem, flag, sign, symbol or mascot representing the country appeared. In addition, the sentence element, on North America's Pacific Coast appears to influence responses. Pupils stress that the sea otter lived on the Pacific Coast, but make no attempt to explain the concept became a magnet.

The figurative language in item seven, namely: America's Pacific Coast had been brought into the stream of world affairs makes an added difficulty for some students. One grade seven student attempted to answer as follows: They had been entered just as you enter a dog in a dog show. They had been allowed to have an important place in world affairs. In the Social Studies V group inadequate answers appear to be due to a lack of explanation of what the term world affairs conveys, rather than to confusion over the figurative language. Answers in all groups tend to be exceedingly vague and say no more than became important, everyone was interested in it, or America's Pacific Coast was important to all.

Confusion with other concepts of similar spelling or sound creates difficulty for some students. In Social Studies III and V groups, some confusion with the concept censor appears. The responses, a census is when someone reads over something before it is given to the public to read and he takes out things that are not allowed to be there and a board which will let a newspaper write certain things and to what theatre a show will play at show this confusion of thought. Most responses in connection with the interpretation of census defy classification. Such miscellaneous responses as law, Government, taxes, rule, church, flag, boat, map, colony, and paper money seem to suggest random guessing.

Another example of confusion with a concept of similar spelling is found in item ten. Here students were asked to explain Minority Rule. A few grade-seven pupils convey the idea of "the state of being a minor" in such responses as the rule of people under twenty-one and when you are a minor you can't vote or anything because you are under twenty-one. The tendency of students, on the whole, in connection with this item is to fail to express themselves in a precise fashion. In the three groups, most attempts at definition get no farther than a smaller group ruling or a few people ruling. Students in all groups also suggest that minority rule means rule by a small upper class, the nobility. This idea is particularly noticeable in the Social Studies V group.

Another group of responses might be best labelled as "reading errors." Such errors may be caused by poor reading comprehension or perhaps may be merely due to carelessness. Such appears to be the case when students define statesman instead of statesmanship, and legislation instead of legislature.

Many of the responses made on Test I do not fall into any particular category. They appear to be of a miscellaneous nature arising out of failure to grasp the concept adequately. For example, no adequate comprehension of the term Responsible Government appears in any of the groups. Some attempt is made to explain the concept by the phrase responsible to the people. Other than that, the answers show complete lack of comprehension. Such answers as a government responsible for themselves, a government that could be trusted, and they have to be responsible for a lot of things are typical of all groups. There seems to be no evidence of any understanding of what is implied by a system of Responsible Government.

In the phrase, negotiated a reciprocity treaty, the difficulty appears to center around the word, reciprocity. Students do not get much farther in their attempts to define than made or brought about a trade or friendship treaty. Others try to express themselves by using the idea of the products mentioned (fish and agricultural products) as in A treaty which stated rights for the U. S. fishermen and

farmers. Some suggestion of trade regulations appears in the Social Studies V group as such an answer as no arms could be carried by either country in trading.

In regards to the concept Constitution, most answers fail to be specific enough and show only a 'hazy' understanding of what the term implies. Government, rules, laws, and a number of rules for the people illustrate this tendency towards vague generalities. Neither is any clear understanding of federal system of government in evidence. Students mention either the central government or the 'provincial governments. They fail to see the relationship between the two in the federal system of government. Inadequate comprehension of the concept monopolize trade, appears in all grades with get trade, develop trade, carry on trade, and have trade, being the rather mild substitutes suggested for monopolize. Finally, a very few students failed to interpret sea dogs. There were some instances of no response together with such answers as navy and mean men.

An analysis of the responses made on the History I test, thus reveals that errors made appear to be caused by verbalism, over-potency of certain elements, difficulties arising out of figurative language, confusion with other concepts of similar spelling or sound "reading errors," and finally a complete failure to grasp the meaning of the concept.

A study of the responses made to Test II items also reveals certain error patterns. In the first section of the test, which consisted of paragraphs and fact-finding questions based on the paragraphs, failure to follow directions, "reading errors," and verbalism contributed to the inadequacy of many of the responses.

In all grades, errors are caused by failure to follow directions. Directions of the test read as follows:

"Underneath the paragraph are some questions. Read the paragraph carefully. Then answer the questions, basing your answers on what the paragraph tells you."

Item one of the first paragraph asks the students to name one of the famous explorers who reached the North Pacific Coast. Although the explorers mentioned in the paragraph are Cook and Vancouver, such answers as Balboa and Mackenzie appear. Similarly, when asked to give the reason why the Montreal fur traders looked for new lands in the west, Social Studies V students, in particular, based their answers not on what was stated in the selection, but on other associations, both related and unrelated. Such an answer as the fur trade was being exploited in the east illustrates this point.

Responses to the questions dealing with the second paragraph provide further instances of this failure to follow directions. Although no mention is made of transportation costs in the paragraph, students seem to be pre-

occupied with the idea of cheaper and shorter trade routes. The first four questions, (1) Why did the Prairie farmers desire a short route to the sea? (2) What was the main result of the building of the Hudson Bay Company Railway? (3) Of what value is the Panama Canal to Canada? and (4) Why did the Welland Canal help Canadian transportation? evoke such responses as to lower freight cost, it was cheaper, cheaper shipping to England, and it was cheaper to ship wheat from the lake head to Montreal by boat than by rail.

Failure to read the question carefully and to understand what the question asks causes further erroneous responses. Item four of the first paragraph asks pupils to name the countries that became interested in the North West Pacific Coast. Pupils from all groups list nationalities instead of countries in their answers. Another "reading error" occurs in connection with item five which asks for one result of the Loyalist migration. Here students give, instead, the results of the American Revolution. Students also hit on the last sentence of the paragraph and copy it out verbatim as their answer to the question. So prevalent is this response that it appears that pupils may have decided that the final sentence of the selection must be the answer required for the final question! Lastly, pupils misinterpret the question, "What part of Canada exports goods by way of the Panama Canal?" and as a result state goods exported, such as cattle, fish, fruit, and lumber, regardless of the fact

that such items are not discussed in the paragraph.

Verbalism was noticeably apparent in responses to the question "What effect did the Panama Canal have on the port of Vancouver?" A stimulus was given appears as a favourite answer to this item. Other responses such as a great effect, improved it, tremendous effect, and helped it grow are extremely general in nature.

Other errors of a miscellaneous nature appear. To the question, "What part of Canada exports goods by way of the Panama Canal?" such responses as opened up a section of Northern Ontario, and the Welland Canal built suggests a confusion of the various ideas expressed in the paragraph. One Social Studies III answer to the item "Of what value is the Panama Canal to Canada?" shows failure to grasp the phrase Canadian traffic. The response reads For traffic, the exporting and importing of Canada.

In the second section of Test II, interpretation of a table and a graph was required. Here, errors made are caused by failure to weigh evidence, failure to interpret quantitative terms, and failure to compare trends. By far the greatest number of errors fall into the first category, that of drawing inferences from insufficient evidence. Students state as true, items three, four, five, and eight, based on the table of Canadian municipalities, and items four and five of the graph Canada's Cost of Living in Two Wars. An examination of the table and the graph¹ will indicate

1. See Appendix

that there is no evidence whatsoever for the conclusions reached. For example, students assume that because the index of Canada's cost of living in World War I is higher than that of World War II, that more goods were manufactured in Canada during World War I than during World War II.

Failure to interpret quantitative terms appears to be the cause of errors made on items two, six and seven of the table, where the concepts of one third and twice as many cause the difficulty. In item one, lack of comprehension of the concept ratio leads to errors. Finally, failure to compare trends results in faulty responses to item six of the graph. Pupils fail to see the similarities in the 1939-1941 and the 1914-1916 index lines for Canada.

An analysis of the responses made to both Test I and II items, thus reveals that certain difficulties block the understanding of the concepts contained in the two tests. Figurative language, the over-potency of certain sentence elements, and technical terms contribute to the difficulty of the social studies materials used, with the result that responses made show no clear grasp of the concepts, and indeed, may consist of a repetition of the exact words used in the selection. Further errors are caused by the failure of students to follow directions, to weigh evidence, to compare trends, and to interpret quantitative terms. Lastly, pupils give inadequate explanations of the concepts because they make "reading errors" or confuse a particular concept

with another of similar spelling or sound.

An analysis of the causes of errors in both high and low I.Q. groups at the Social Studies I and V levels was made in order to ascertain if intelligence was a major factor in determining the types of errors made. Table 7 shows the percentage¹ of Test I errors due to verbalism, over-potency of sentence elements, and figurative language, while Table 8 notes the percentage of Test II errors due to failure to follow directions, failure to read and interpret the question correctly, and failure to weigh evidence. In regard to causes of errors, little difference appears to exist between the low and high I.Q. groups studied at both the Social Studies I and V level. Greatest differences between high and low I.Q. students appear in the Social Studies V group. Results also indicate that the largest percentage of errors in all groups appears in the interpretation of data section of History Test II as is shown by the large percentage of errors due to failure to weigh evidence.

1. In calculating this percentage, the number of errors of a particular type was divided by the total number of erroneous responses.

Table 7

Causes of History Test I Errors in Low and High I.Q. Groups

History Test I	Social Studies I		Social Studies V	
	Low I.Q. Group	High I.Q. Group	Low I.Q. Group	High I.Q. Group
<u>Percentage of Errors due to Verbalism</u>	6.3%	7.1%	4.8%	0%
<u>Percentage of Errors due to Over-Potency of Sentence Elements</u>	3.1%	4.4%	6.5%	1.3%
<u>Percentage of Errors due to Figurative Language</u>	9.4%	4.4%	8.9%	4.3%

Table 8

Causes of History Test II Errors in Low and High I.Q. Groups

History Test II	Social Studies I		Social Studies V	
	Low I.Q. Group	High I.Q. Group	Low I.Q. Group	High I.Q. Group
<u>Percentage of Errors due to Failure to Follow Directions</u>	3.4%	2.4%	7.2%	4.2%
<u>Percentage of Errors due to Failure to Read Question Carefully</u>	2.8%	3.8%	3.3%	3.5%
<u>Percentage of Errors due to Failure to Weigh Evidence</u>	32.4%	34.4%	38.7%	23.1%

Chapter VI

Summary

The development of concepts through language is an active and complicated process. Such concepts or meanings can be built up only through the acquisition of a wide background of experience. The purpose of this study was to discover the amount of growth in understanding of certain social science concepts throughout the junior-senior high school; to compare the degrees of understanding achieved by low and high I.Q. groups; and to determine the causes of the various errors made by the students.

Concepts, typical of those appearing in social studies text books, were selected from Brown's Building the Canadian Nation and Canadian Democracy in Action. Two interpretive tests, based on these concepts, were constructed and administered to pupils in Social Studies I, III, and V classes of representative city schools. Results of the tests lead to the following conclusions:

1. There is a gradual growth in understanding certain social science concepts throughout the junior-senior high school.

2. Results of the free-expression test indicated the inability of the pupils in all groups tested to interpret and to explain in their own words certain social science

concepts.

3. Pupils of high I.Q.'s in the Social Studies I and V groups made higher scores than did those of less ability. Coefficients of correlation between I.Q.'s and test scores of both tests also indicated that the ability to understand certain social concepts is somewhat related to intelligence.

4. An analysis of responses made to Test I items revealed that errors may be caused by verbalism, over-potency of certain sentence elements, difficulties arising out of figurative language, confusion with other concepts of similar spelling or sound, "reading errors," and a complete failure to grasp the meaning of the concept. In Test II, verbalism, "reading errors," failure to follow directions, failure to weigh evidence, failure to interpret quantitative terms, and failure to compare trends contributed to the inadequacy of responses. Little difference in causes of errors made was found to exist between high and low I. Q. groups at the Social Studies I and V levels. In general, throughout the groups studied, pupils did better on questions of a fact-finding nature than they did on those requiring interpretation of data.

Test results for the groups studied indicated that pupils need more opportunity to express themselves in writing, that is, to tell in their own words what a concept means to them. Moreover, students need more practice in interpretation of data exercises in order that they may learn to think

critically, weigh evidence, and avoid drawing conclusions from insufficient data. Indeed, it might prove both worthwhile and interesting to investigate more fully pupils' ability to think critically, to interpret current magazine and newspaper articles, to recognize propaganda, and so on. Further investigations, wider in scope than this study, might reveal differences among students of various socio-economic levels in their ability to understand social science concepts. Some indication might then be had of how students' experiential backgrounds limit or develop their understanding of concepts. Lastly, an analysis of students' errors, designed to reveal what types of reading materials are most readily understood, and what types of materials require a more comprehensive treatment, might prove a useful guide in selecting text books and other social studies materials.

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Appendix

Test I

Directions:

Read the following sentences carefully. Then tell in your own words what the underlined words, phrases or sentences mean.

1. Sir Francis Drake was one of those Elizabethan sea-dogs who was not content to see Spain monopolize trade with the West Indies and Central America.
2. The French government was a despotic one, and almost every detail of the life of the colony was carefully regulated.
3. In 1666 Canada's first census was prepared under Talon's own supervision.
4. Each English colony had an elected assembly and some control of its own affairs.
5. The famous Stamp Act of 1765 brought a storm of argument and rioting in the Thirteen Colonies. The colonists protested against the "rights of Englishmen" being taken from them, and raised the cry so familiar in English history, "No taxation without representation."
6. The sea-otter became a magnet on North America's Pacific Coast, just as the beaver had been on the Atlantic.
7. The years between Cook's voyage in 1766 and the end of Vancouver's exploration in 1784 were important ones. The coast of British Columbia had been revealed to the world, and a vigorous trade begun. Spain's monopoly was ended; and in its place, four nations now had their claims--Spain in the south, Russia in the north, and between them Britain and the United States. America's Pacific Coast had been brought into the stream of world affairs.
8. Living in an age of rapid transportation, it is hard for us to understand how nearly self-sufficient the local community had to be a century or more ago.
9. The introduction of Responsible Government was the great advance made in British North America by 1850.
10. Minority rule was bound to be challenged.
11. Confederation was a triumph of statesmanship, for only a minority in any province was really ready for it.

12. Lord Elgin negotiated a reciprocity treaty which greatly encouraged trade with the United States in fish and agricultural products.
13. When the two provinces were united in 1841 they had been given equal representation in the legislature although Canada East then had the larger population.
14. With good reason the Quebec Conference has been called the most important political gathering in the history of Canada, for it worked out the plan of union which is now the basis of Canada's Constitution.
15. The most important feature of the British North America Act, was its description of the new federal system of government.

Test II

A. Directions:

Underneath the paragraphs are some questions. Read the paragraph carefully. Then answer the questions, basing your answers on what the paragraph tells you.

The American Revolution created also a new British North America. Thousands of Loyalists, determined to remain under the British flag, sought homes in Nova Scotia and Canada, altering the character of their populations and bringing about the organization of two new provinces. The Revolution changed, moreover, the direction of Canada's fur trade. Gradually it dwindled south of the boundary, and Montreal traders sought more and more the richer fur lands of the far North West. Organizing themselves into a company and pushing dauntlessly through forests and mountains, the Nor'Westers blazed their trails toward the Pacific. Others, too, were reaching the West Coast, however--Russians skirting Alaska, New Englanders rounding the Horn, and from England two of Britain's most famous navigators, Captain Cook and Vancouver. The North Pacific coast was placed on the map, and with it can be seen the first faint outline of a British North America stretching from sea to sea.

1. Who was one of the famous explorers who reached the North Pacific Coast?
2. Why did the Loyalists decide to move to Nova Scotia and Canada?
3. Why did the Montreal fur traders look for new fur lands in the west?

4. What countries became interested in the North West Pacific Coast?
5. What was one of the results of the Loyalist migration?

B. Directions:

Underneath the paragraph are some questions. Read the paragraph carefully. Then answer the questions, basing your answers on what the paragraph tells you.

Three works which influenced Canadian transportation should be mentioned. In answer to the demand of the Prairie farmers for a short route to the sea, the Hudson Bay Railway was built by the Dominion government from The Pas to Churchill. While it never fulfilled its purpose as a grain exporting route, it did open up a section of Northern Manitoba. At the same time the new Welland Canal was built. Capable of holding the largest lake freighters, and with only seven locks to overcome a drop of 326 feet, it was one of the great engineering feats of the world. The third work, the Panama Canal, is not Canadian, but it began to affect Canadian traffic in an important way after World War I. In 1920 a trial shipment of prairie wheat was sent from the Pacific coast through the Panama Canal to England. Within a few years a considerable part of Western Canada's exports and imports went by this route, and a tremendous stimulus was given to the ports of Vancouver, New Westminster, and Prince Rupert.

1. Why did the Prairie farmers desire a short route to the sea?
2. What was the main result of the building of the Hudson Bay Company Railway?
3. Of what value is the Panama Canal to Canada?
4. Why did the Welland Canal help Canadian transportation?
5. What part of Canada exports goods by way of the Panama Canal?
6. What effect did the Panama Canal have on the port of Vancouver?

C. Directions:

Study the following table carefully. In the brackets at the left of each sentence:

- Mark (1) If these data alone are sufficient to make the statement true.
- Mark (2) If these data alone are not sufficient to indicate whether there is any degree of truth or falsity in the statement.
- Mark (3) If these data alone are sufficient to make the statement false.

The Canada Year Book classifies the Canadian municipalities for 1942 as follows:

	Cities	Towns	Villages	Rural	Total
Prince Edward Island	1	7	--	--	8
Nova Scotia	2	43	--	24	69
New Brunswick	3	20	2	15	40
Quebec	26	112	312	1056	1506
Ontario	27	148	156	571	902
Manitoba	4	31	23	116	174
Saskatchewan	8	82	389	302	781
Alberta	7	52	145	133	337
British Columbia	33	--	22	28	83
<hr/>					
	111	495	1049	2245	3900

- () 1. The ratio of towns to cities is larger in Nova Scotia than in New Brunswick.
- () 2. Approximately one third of all municipalities in British Columbia are listed as rural.
- () 3. Quebec has the largest farming population of any of the provinces.
- () 4. More people live in Cities in British Columbia, than live in cities in Alberta.
- () 5. The large number of cities in British Columbia indicates that industry is more important than agriculture in this province.
- () 6. Altogether there are approximately twice as many cities, towns, villages, and rural municipalities in Alberta than in Manitoba.
- () 7. One third of all Canadian municipalities are found in Ontario.
- () 8. The majority of the Canadian population lives in rural and village municipalities.

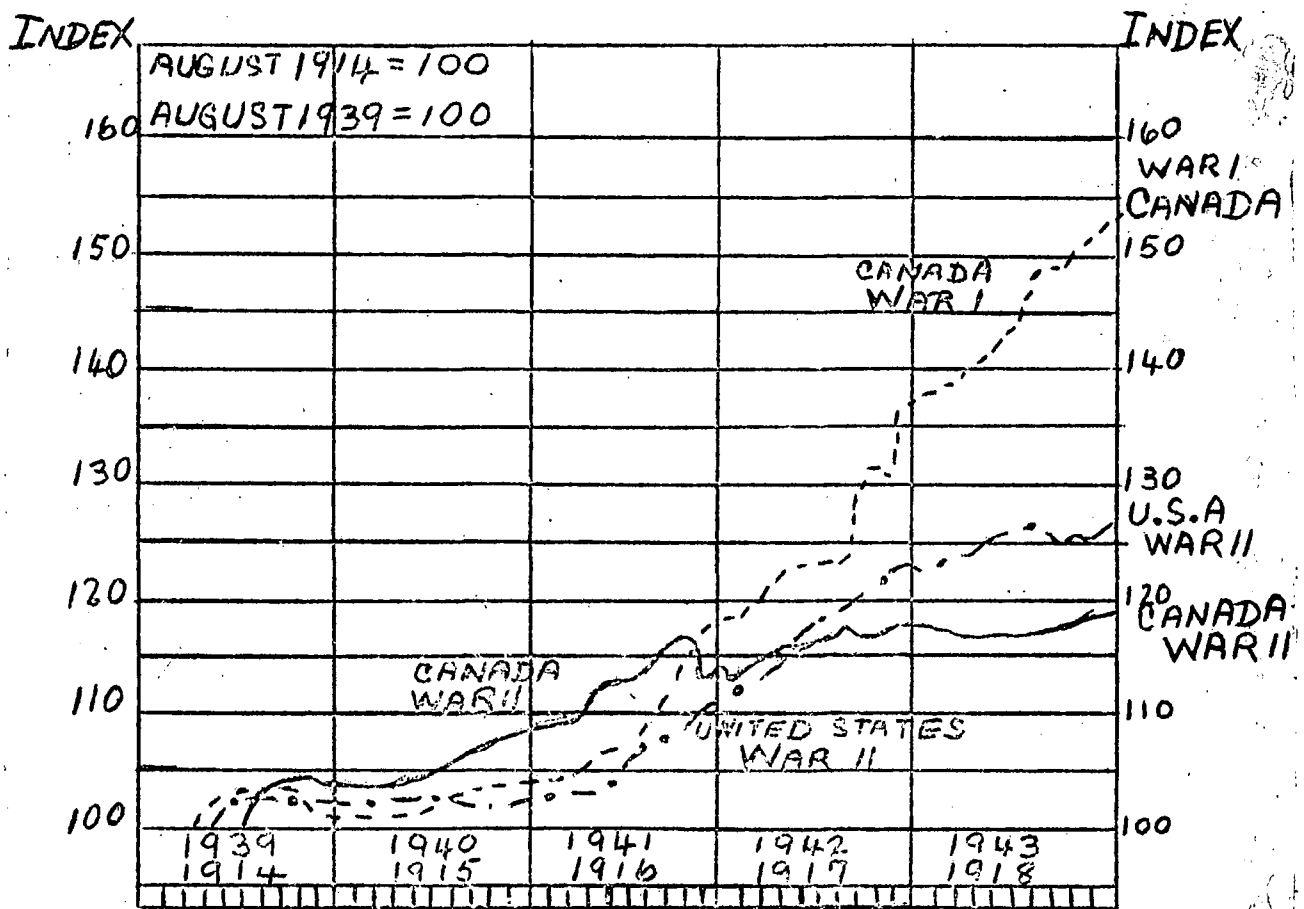
D. Directions: Study the following graph carefully. In the brackets at the left of each sentence:

Mark (1) If these data alone are sufficient to make the statement true.

Mark (2) If these data alone are not sufficient to indicate whether there is any degree of truth or falsity in the statement.

Mark (3) If these data alone are sufficient to make the statement false.

CANADA'S COST OF LIVING IN TWO WARS



This chart shows the influence of the Canadian price controls which were put into effect near the end of 1941.

- () 1. During World War II, in the years 1942 and 1943, the index of the cost of living was higher in the United States than in Canada.
- () 2. In Canada, price controls began to exert an influence at the end of 1941.

- () 3. During World War II, the index of the cost of living was always higher in the United States than in Canada.
- () 4. During World War II, food prices in Canada were higher than in the United States.
- () 5. More goods were manufactured in Canada during World War I than during World War II.
- () 6. In Canada, between 1939 and 1941, the index of the cost of living rose in much the same way as it did in Canada between 1914 and 1916.