An analysis of four junior high American history textbooks on the basis of the higher mental processes involved.

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SCHOOL OF EDUCATION

Thesis

AN ANALYSIS OF FOUR JUNIOR HIGH AMERICAN HISTORY TEXTBOOKS ON THE BASIS OF THE HIGHER MENTAL PROCESSES INVOLVED

Submitted by

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(B.S. in Ed., Bridgewater Teachers' College, 1936)

Presented in partial fulfillment of the requirements for the degree of

Master of Education

August, 1954
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Second Reader: Ethel M. Jenkins, Lecturer on Education
The writer wishes to acknowledge his indebtedness to Dr. W. Linwood Chase, Dean of the School, Professor of Education, School of Education, Boston University, for his help and guidance which have made possible the completion of this study.
CHAPTER I

INTRODUCTION

Purpose of the Study

This study was undertaken for the following reasons:

1. to examine and classify the questions and exercises in four junior high American history textbooks on the basis of the mental processes required to respond to the questions and to work out the exercises.

2. to ascertain to what extent the higher mental processes, as defined in this study, would be included in the answering of the questions and exercises.

This information in the writer's opinion, would be helpful to junior high teachers, administrators, textbook writers, and others who are engaged in leading children to their most complete mental development.

Definition of Terms

Mental Processes

In using the term mental processes in this study means the mental activities which children use to answer the questions and exercises which confront them in junior high American history textbooks.

Higher Mental Processes

The term higher mental processes is used to mean the activities other than recall, such as: organization of ideas; supplementation and use of ideas; and criticism of ideas.

The idea that the higher mental processes are usually contrasted with the lower mental processes has often been suggested. However,
Reitz 1/ states: "there is no single criterion available in the literature pertaining to the subject to distinguish definitely between the two strata". Judd 2/ claims:

The higher mental processes associate, or integrate the items and thus build up a new subjective whole. The association, or integration, of items in the higher mental processes is of a different order from the mere sequential association which appears in memorization.

In order to help clarify the matter in understandable terms, the Encyclopedia of Educational Research 3/ has evolved the following about the higher mental processes:

Although the higher mental processes constitute one of the most important divisions of psychology, no agreed upon classification of such processes is available. Among the terms used most frequently are: reasoning, thinking and judgment, with such adjectives as abstract, creative, concrete, imageless, independent, original, productive, qualitative, quantitative, scientific, simple and syllogistic. Other terms frequently encountered are: problem solving; also abstraction, application of principles, comprehension, concept formation, imagination, inference, insight, intelligence, intellectual, knowledge, learning, meaning, symbolization. Many more terms could be cited, such as cognition, comparison, classification, integration, invention, ideation and understanding.


CHAPTER II

REVIEW OF LITERATURE

Although a great deal of research has been done in this area of the thinking process, no definite conclusions have been agreed upon. In this chapter, significant studies that have been made in regard to the higher mental processes and the development of the higher mental process in children will be reviewed.

An early pioneer in the area of thinking process was Miller \(^1\) who states:

It is evident that the child does not very early make use of the elaborate and highly specialized technique of thinking which justifies us in calling it a reasoning process.

Piaget \(^2\) carried on some of the earliest work in the measurement of children's thought processes, with special reference to logical thinking. By use of a clinical method he studied the language responses of his subjects for their meaning and function in their lives. From his work he concludes that there are three tendencies in development. The first tendency is a transition from the egocentric responses of the young to the more socialized response of the older child; the second, a transition from

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reasoning in the presence of concrete objects of thought to abstract thought; and finally from "magical, animistic thought to logical, mechanistic and causal modes characteristic of adults." Piaget's techniques of attacking the problems has been criticized, but his research is still the basis of investigation in this field.

The complex phenomenon of thinking has been analyzed by Dewey_1/ into five distinct steps:

1) a felt difficulty, 2) its location and definition, 3) suggestions of possible solution, 4) development by reasoning of the bearings of suggestions, and 5) further observation and experimentation leading to acceptance or rejection of the solution.

The type of thinking using these five steps is reflection. Dewey's work is considered a pioneer contribution to the field; and his description of the origin of thought as resulting from a "felt need" is the one most commonly accepted.

Yet a simple analysis of thinking has been done by Pfänder_2/.

Thinking is a psychological phenomenon usually found in all alert and mature human beings. One can distinguish five intervariant aspects in most thinking situations:

1. There is the thinking subject or thinker.

2. This subject at some time or another thinks, i.e. manifests thinking, a process having beginning, duration, and ending.


3. There is usually a thought, notion, or meaning as a result of the thinking, sometimes called the 'content' of the thinking.

4. Man usually communicates his thoughts more or less adequately through symbolic means, the chief of which is language.

5. The thinker, the thinking, the thought and the linguistic expression always refer to some object in the most general sense of the term.

Judd 1/ in delimiting the higher mental processes finds that the individual makes comparisons, reaches a generalization, and arrives at a valid conclusion. In his eyes these higher mental processes are of major importance to the individual who is capable of them and to the race to which the individual belongs.

Judd 2/ goes on to state:

If by any means the educational system can discover how to promote even in the slightest measure the development of the higher mental processes, great advantage will be gained for civilization.

To Judd, thinking is a synthesis of ideas, not a dwelling upon isolated terms. He considers that: 3/

Where memory supplies several items, it presents these in a series which is hardly more than a temporal sequence. The higher mental processes associate, or integrate, the items and thus build up a new, subjective whole.


2/ Ibid. page 4.

3/ Ibid. page 19.
From this Judd concluders that:

The association, or integration, of items in the higher mental processes is of a different order from the mere sequential association which appears in memorization.

Tyler decries the existence of prevalent thought among students and educationists that:

Memorization of facts frequently fails to result in the development of higher mental processes. If the higher mental processes of application of principles and inference are really to be cultivated, learning conditions appropriate for their cultivation are necessary.

Students vary markedly in the ways in which they master the various processes of critical thinking as well as in the difficulties they encounter in achieving this objective.

Taber believes that:

One of the important purposes of evaluating critical thinking is to improve the job of teaching it. Good teaching of critical thinking depends, first, on how clearly teachers understand what is involved in carrying on critical thinking and how it manifests itself, and, second, on the teacher's knowledge of each student's strength and weakness.

Marcham in his study states:

If it is agreed that the subject can be taught, there remains the task of marking out the goals to be aimed at in teaching it. The primary object in teaching critical thinking is to put in the pupil's hands a tool. We have attained that object when the pupil has learned...

1/ Judd, op. cit., page 19.


4/ Ibid page 45.
to recognize the skills of critical thinking and knows both the appropriate order in which to use them and the occasions when to use them.

Marcham lists six steps in critical thinking, declaring that the skillful teacher will stimulate class discussions and prepare special exercises to provide frequent opportunities to practice these steps:

1) Defining the problem.
2) Locating, selecting and organizing information.
3) Evaluating information.
4) Drawing conclusions.
5) Presenting conclusions in acceptable forms.
6) Reconsidering conclusions.

Durrell points out that "teaching to think" is an old but approved educational objective. He suggests that research in the skills of developing the higher mental process is very promising. He also recognizes the absolute dependence of thinking upon a knowledge of the concepts in the field in which the thinking is to be done. According to him, "a limited vocabulary impedes the comprehension of things being read or heard and thereby diminishes the possibility of any type of thinking about the subject."

1/ Marcham, op. cit., pages 7-38.
Glaser_1/ shares Durrell’s conviction, declaring that the ability to comprehend language accurately and with discrimination is one of the most important aspects of the ability to think critically, and reports that:

The evidence suggests that ability to learn and ability to think or to reason are not identical but are related. Learning may occur through mere repetition of given experiences while reasoning appears to require reorganization of isolated experience in terms of a goal.

Driscoll_2/ in her study points out that the social program is an area where performance and application of the higher mental processes should begin. Although it is not the only place for practice, it certainly offers excellent opportunities.

Phillips_3/ states among her conclusions that in her opinion:

It is necessary for the teacher to use a great deal of supplementary material in order to provide the proper learning experiences for training in the use of the higher mental processes.

In continuing Phillips study Johnson_4/ found that his results showed a great likeness to the results that she had obtained three years earlier.

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The early study was made on fourth grade geography textbooks and the Johnson study was on fifth grade geography workbooks. He found that the workbooks did not offer any greater contribution toward aiding pupils in the use of the higher mental processes.

Judd\(^1\) in writing about the higher mental processes in general summarized some of his conclusions in the following order:

1) Simple mental processes are conditioned in the main by external impressions.

2) Mental processes involve external impressions to a diminishing degree as these processes reach higher and higher levels.

3) Symbolic thinking is economical because it is a substitute for concrete experience, not a mere repetition or restatement in memory of such experience. Symbols make possible the combination and recombination of ideas without the necessity of holding in mind numerous concrete details of perceptual experience.

4) If symbolic thinking and other higher forms of thinking are properly carried on, they require conformity to certain rules which depend on systems of experience, not on individual items of experience.

5) An individual may acquire some of the rules of intellectual procedure without having any true understanding of the systems of experience from which the rules are derived.

6) An individual may acquire a certain limited understanding of a system of thinking without mastering the whole system. In such cases the individual frequently falls into errors which can be traced to false emphasis or inadequate comprehension.

7) Each higher mental process combines numerous factors into a single organized experience. When factors are combined into higher experiences, they take on characteristics that result from the synthetic relations in which they are bound together.

8) Because of the subjective conditioning of the higher mental processes and because of their complexity, there are wide variations in the form in which these processes take place in the experiences of different individuals.

After reading many studies and works this writer concludes by once more quoting from Judd:\footnote{Judd, op. cit., pages 4-5.}:

It must be admitted at once that psychological methods of studying the higher mental processes are at present very little developed. A few ventures into statistical analyses of these processes are recorded. There have been a number of ingenious hypotheses advanced by various writers with regard to the nature of intelligence, and there has been a great deal of energy devoted to the practical effort to arrange conditions which will aid and encourage students to cultivate the higher forms of thinking. In spite of what has been done along these lines, it remains true that the least fully elaborated division of educational psychology is that which deals with the higher mental processes.
CHAPTER III

PROCEDURE USED IN THE STUDY

This study of American history textbooks on the junior high level to determine the higher mental processes requires a classification of the various types of mental processes. The classification as set forth is derived from the study and unpublished works of Johnson and O'Connor.1/

Using the reports of those who have previously made studies in the area, the classification in this study was divided into general headings; namely, Lower Mental Processes and Higher Mental Processes. Under the heading of Lower Mental Processes, four separate divisions were set up under the headings of: aided and unaided recall, recognition and reproduction. For Higher Mental Processes, three separate divisions were set up under the headings of: organization of ideas, supplementation and use of ideas, and criticism and evaluation of ideas.

In many cases it is apparent that a certain amount of overlapping of the various classifications may occur in a single exercise. In such cases, the classification which seemed most representative of that


particular exercise was applied. In cases of doubt, the higher classification was applied.

For purposes of this study, the term "question" or "exercise" is used to denote each instance in which one complete answer or response must be made.

The procedure followed in analyzing the questions and exercises is, in general, similar to that used in previous studies by Johnson and O'Connor. 1/

The American history textbooks selected for this study are as follows:


The classification of mental processes used in this study is as follows:


I. Lower Mental Processes
   A. Aided Recall
      1. Facts in the text
      2. Facts from other sources
   B. Unaided Recall
      1. Facts in the text
      2. Facts from other sources
   C. Recognition
      1. Multiple Choice
      2. True-False
      3. Matching
      4. Location of places or facts from data on maps, charts, diagrams or tables.
   D. Reproduction
      1. Drawing pictures, maps, diagrams, or charts, according to directions given.

II. Higher Mental Processes
   A. Organization of Ideas
      1. Select items pertinent to the topic
      2. Classify and arrange
      3. Find major and minor points
      4. Outline
      5. Summarize
      6. Collect pictures, articles, clippings, etc. to illustrate a topic.
      7. Prepare a special report
      8. Select sources of information
B. Supplementation and Use of Ideas

1. Find examples of applications
2. Suggest plans for activities related to topic
3. Suggest additional topics for study.
4. Show relationships
5. Apply knowledge or principles to new situations
6. Draw conclusions or inferences from data supplied in text, maps, charts, diagrams or tables.
7. Find or suggest reasons or explanations for facts or statements.
8. Make generalizations
9. Create or invent new combinations of ideas.
10. Handwork to illustrate a fact or principle
11. Make comparisons
12. Find differences or similarities

C. Criticism and Evaluation of Ideas

1. Recognizing special merit of ideas presented
2. Finding exceptions to the point made
3. Suggest limitations or precautions
4. Analyzing methods or motives
5. Discriminate between fact and opinion
6. Discovering bias or prejudice
7. Discovering over-generalization
8. Eliminate unimportant or irrelevant material
9. Evaluating evidence or explanation
10. Evaluating suitability of a presentation for a particular purpose
Sample Questions and Exercises

From the four textbooks used in this study the following questions and exercises are examples of each item in the classification of lower and higher mental processes used in this study.

I. Lower Mental Processes

A. Aided Recall

1. Facts in text

List the "firsts" mentioned in Unit One. Arrange your lists in the following way:
   First to discover the West Indies—Columbus
   First navigator to find India—Vasco da Gama

2. Facts from other sources

Perhaps you live near a large or famous bridge or have crossed one. Of what was it made? What traffic crosses it? Use reference books to get similar information about famous bridges in the United States, such as Brooklyn Bridge in New York, the George Washington Bridge across the Hudson River.

B. Unaided Recall

1. Facts in text

Both Abraham Lincoln and Robert E. Lee were remarkable leaders of men. What characteristics did they have in common?

2. Facts from other sources

Certain public property is left in the care of one generation after another. How many kinds can you think of?
C. Recognition

1. Multiple choice

Choose the words that provides the best ending for the following: The 1950 census showed that the largest population increases were in the (North, South, East, West)

2. True-False

None found

3. Matching

Match each description in the first column with the correct set of initials in the second column:

1. Put young men to work on conservation projects  
   a. RFC
2. Made loans to businesses and to the states  
   b. AAA
3. Aimed at raising farm prices  
   c. WPA
4. Women's corps of the U.S. Coast Guard  
   d. OPA
5. Provided work relief for the unemployed  
   e. TVA
6. Provided price ceilings  
   f. CCC
7. Large conservation project built by the federal government  
   g. SPAR  
   h. USO  
   i. WAC

4. Location of places or facts from data on maps, charts, diagrams or tables

On an outline map of the United States locate the homes of the most important Indian tribes at the time America was discovered.

D. Reproduction

1. Drawing pictures, maps, diagrams, charts, according to directions given.

Trace on your map: The routes most often traveled by settlers from New England as they moved westward. The routes used by people from Virginia and the Carolinas as they pushed to the West.
II. Higher Mental Processes

A. Organization of Ideas

1. Select items pertinent to the topic

Look up the references to Conservation listed in the index of this book. Make a written report summarizing the Conservation movement in this country. Try to classify the different types of Conservation.

2. Classify and arrange

Arrange the following events in the order in which they happened and then place them on a time line to show when they occurred: Compromise of 1850, Dred Scott Decision, Firing on Fort Sumter, Missouri Compromise, Lee's Surrender.

3. Finding major and minor points

What were the principal features of the Northwest Ordinance? What guiding principles for its foreign relations had the United States established by the end of President Monroe's administration?

4. Outline

A war is easy to outline by the dates of important events. Begin with the establishing of the Confederate States of America and end with the taking of the last Union troops from the Southern states. For each development give the date, the event, and the importance of the event. Try to outline the War and the Reconstruction Period in no more than twelve steps.

5. Summarize

Summarize the different efforts made to settle the slavery question peaceably.

6. Collect pictures, articles, clippings etc. to illustrate a topic.

Make a booklet entitled "The Services of American Women in World War II" include original color and pencil sketches, snapshots, or pictures cut from magazines of some of the following: a Red Cross Worker, a Navy Nurse, a Wave, a WAC, a SPAR, a Marine, and women at work in factories.
7. Prepare a special report

Prepare a written report on one of these leaders during World War II: Franklin D. Roosevelt, Winston Churchill, Joseph Stalin. Include the following points in your report:
   a) Country, b) Position, c) Achievements before World War II, d) Part played in World War II.

8. Select sources of information

Read books, stories, and poems written by the authors and poets mentioned in Chapter 14. As you read some of these writings, discover passages which you think have contributed to the greatness of these authors. These selections may be read aloud in a class period and followed by a summarizing sentence stating how this literature contributes to an understanding of American life.

B. Supplementation and Use of Ideas

1. Find examples or applications

Modern scientists assist farmers. Examples of how they assist are:

2. Suggest plans for activities related to topic

Write a newspaper article summarizing the arguments presented by Webster and Hayne in the Webster-Hayne debate, as a reporter in the gallery of the Senate in January, 1830, might have done.

3. Select additional topics for study

Find out the number and kind of magazines subscribed for in the homes of your classmates. Summarize your information and make a conclusion about the reading habits of your community as reflected in the results of your investigation.

4. Show relationships

How are the problems of our country at home and with foreign countries related to each other?
5. Apply knowledge or principles to new situations

What will be some of the changes in the government of Alaska and Hawaii if they become states?

6. Draw conclusions or inferences from data supplied in text, maps, charts, diagrams, or tables

Study the table of "Some American Dams" then answer the following questions:
   a) Who supplied the facts given in this table?
   b) Which of the dams listed is the oldest? newest?
   c) Which of the dams is the highest? lowest?

7. Find or suggest reasons or explanations for facts or statements

Some of the sentences below state facts. The rest of them express opinions. Write the sentences that state facts and give reasons for doing so. Next, look at the sentences that express opinions. Do you agree with any of them? Why? Do you disagree with any? Why? Write your reasons for agreeing or disagreeing with them.
   a) Americans enjoy the highest standard of living in the world.
   b) Robert E. Lee was a better general than U. S. Grant.
   c) Television is less interesting than radio.
   d) Texas is the largest state in the Union.

8. Make generalizations

Why was the Dred Scott decision popular in the South?
What do you consider important in life?

9. Create or invent new combinations of ideas

Imagine you are a member of the Massachusetts Bay Colony just before the trial and banishment of Roger Williams. Write a letter to a friend in England, telling why Williams is to be tried. Tell your friend how you feel about the ideas that Williams has been preaching.
10. Handwork to illustrate a fact or principle

Make a booklet with a cover page entitled "Ranch Life." Include a map of the cattle country, sketches picturing the life of the cowboys, and accounts of the following:
The Beginning of Ranching Among Americans; Fencing the Land with Barbed Wire; The Grazing Area To-day.

11. Make comparisons

Compare the industrial ability of the North and of the South and show how this ability influenced the outcome of the struggle.

12. Find differences and similarities

People in the United States may live in large cities, in suburbs of cities, in small towns, or in the country. They do not agree on which is the best place to live. Collect pictures from magazines to show some of the ways people live in the four different places. Perhaps you can find some pictures which illustrate the advantages of each and some of the disadvantages.

C. Criticism and Evaluation of Ideas

1. Recognizing special merit of ideas presented

None found

2. Finding exceptions to the point made

None found

3. Suggest limitations or precautions

None found

4. Analyzing methods or motives

What motives brought the Pilgrims to Massachusetts to found the first New England Colony?
5. Discriminating between fact and opinion

All discussions and arguments are made up of facts and opinions. Both are important. But how can you tell them apart? How is stating a fact different from expressing an opinion?

Let's eavesdrop on two cousins, Johnny and Bill. Johnny is from Chicago, and Bill lives in New York. The boys are having a friendly argument about their home towns. Johnny claims that there are more factories in Chicago than there are in New York. Bill disagrees. How are they going to settle that argument?

Now suppose that Bill goes on to argue that the people in New York City are friendlier than the people in Chicago. How can they settle that argument?

6. Discovering bias or prejudice

None found

7. Discovering over-generalization

None found

8. Eliminate unimportant or irrelevant material

We already know that information is presented in many ways. Now we are going to look more closely at the picture on page 458. Consider it first as a whole and for the general idea. Then look for details. Use these questions for your study:
a) What time of year was the photograph taken?
b) Can you find any trees or grass?
c) Do the riders expect to be gone long?
d) Where is the rider for the empty horse?
e) In what part of the United States was this picture taken? Give reasons for your answer.

10. Evaluating suitability of a presentation for a particular purpose.

In recent years America has produced many fine artists of whom the whole country is proud. The picture above, entitled "The Tornado", was painted
by John Curry. In what part of our country do you think it was painted? Why?

This book contains pictures painted or drawn by other famous American artists:
John Trumbull, page 156; Winslow Homer, page 461.

The class should assemble pictures by American artists. Search old copies of Life Magazine for reproductions in color. Trim them carefully and paste them on cardboard with rubber cement. Then arrange for an exhibition. Include pictures by famous living painters. Prepare a report on the lives of the artists in your collection.
CHAPTER IV

ANALYSIS OF DATA

The tables in this chapter consider the data obtained on the questions and exercises in four American history textbooks under the classifications of the Mental Processes. Tables I through IV show the numerical distribution under the various classifications, while Tables V through VIII show the percentage distribution under the same classifications.

The questions and exercises classified under the heading of Lower Mental Processes are found in Table I. There were 1322 questions and exercises that were classified under this heading. Eight hundred and twenty-six of the questions and exercises were classified under Aided Recall. Of these, seven hundred and eighty-eight were classified under Aided Recall of Facts in the text and thirty-eight were classified under Aided Recall facts from other sources. One hundred and sixty-five questions and answers were classified under Unaided Recall. Of these, one hundred and twenty-one were classified under Unaided Recall of facts in the text, while forty-four were classified under Unaided Recall of facts from other sources. One hundred and eighty-two questions and exercises were classified under the heading of Recognition. Sixty-two were classified under Multiple Choice, there were no questions and exercises classified under True-False, fifty-seven were classified under Matching, and sixty-three were classified under Location of places or
facts from data on maps, charts, diagrams, and tables. One hundred and forty-nine were classified under Reproduction — drawing pictures, maps, diagrams or charts, according to directions given.
### TABLE I

Numerical distribution of questions and exercises classified under

Lower Mental Processes

<table>
<thead>
<tr>
<th>Book</th>
<th>Aided Recall</th>
<th>Unaided Recall</th>
<th>Recognition</th>
<th>Reproduction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Facts in Text</td>
<td>Facts from other sources</td>
<td>Facts in Text</td>
<td>Facts from other sources</td>
</tr>
<tr>
<td>A</td>
<td>21</td>
<td>3</td>
<td>3</td>
<td>8</td>
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<tr>
<td>B</td>
<td>242</td>
<td>5</td>
<td>58</td>
<td>21</td>
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<tr>
<td>C</td>
<td>199</td>
<td>3</td>
<td>37</td>
<td>11</td>
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<tr>
<td>D</td>
<td>326</td>
<td>27</td>
<td>23</td>
<td>4</td>
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<tr>
<td>Total</td>
<td>788</td>
<td>38</td>
<td>121</td>
<td>44</td>
</tr>
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</table>
Table II shows the numerical distribution of the questions and exercises classified in the textbooks under the heading of Organization of Ideas.

Two hundred and forty-nine questions and exercises were classified under Organization of Ideas. Of these, fifty-nine questions and exercises were classified under Select Items Pertinent to the Topic. Forty-five questions and exercises were classified under Classify and Arrange. Two questions and exercises were classified under Find Major and Minor Points. Eleven questions and exercises were classified under Outline. Three questions and exercises were classified under Summarize. Thirty-seven questions and exercises were classified under Collect pictures, articles, clippings, etc. Sixty-six questions and exercises were classified under Prepare a Special Report. Twenty-six questions and exercises were classified under the heading Select Sources of Information.
### TABLE II

**Numerical distribution of questions and exercises classified under Higher Mental Processes - Organization of Ideas**

<table>
<thead>
<tr>
<th>Book</th>
<th>Select items pertinent to the topic</th>
<th>Classify and Arrange</th>
<th>Find Major or Minor Points</th>
<th>Outline</th>
<th>Summarize</th>
<th>Collect information Pictures, etc.</th>
<th>Prepare a special Report</th>
<th>Select Sources of Information</th>
<th>Total</th>
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<tbody>
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<td>A</td>
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<td>2</td>
<td>8</td>
<td>7</td>
<td>1</td>
<td>26</td>
</tr>
<tr>
<td>Total</td>
<td>59</td>
<td>45</td>
<td>2</td>
<td>11</td>
<td>3</td>
<td>37</td>
<td>66</td>
<td>26</td>
<td>249</td>
</tr>
</tbody>
</table>
Table III shows the numerical distribution of the questions and exercises found in the textbooks that were classified under the general heading of Supplementation and Use of Ideas.

There were a total of three hundred and sixty-one questions and exercises classified under Supplementation and Use of Ideas. Of these, eighty-three questions and exercises were classified under Suggested Plans for Activities related to the topic. Seventy-two questions and exercises were classified under Draw Conclusions or Inferences from Data. Fifty-eight questions and exercises were classified under Make Generalizations. Forty-two questions and exercises were classified under Make Comparisons. Thirty questions and exercises were classified under Find Reasons or Explanations for Facts or Statements. Twenty-six questions and exercises were classified under Create or Invent New Combinations. Seventeen questions and exercises were classified under Handwork to Illustrate a Fact or Principle. Eleven questions and exercises were classified under Suggested Additional Topics for Study. Seven questions and exercises were classified under Find Similarities or Differences. Six questions and exercises were classified under Show Relationships. Five questions and exercises were classified under Apply Knowledge or Principles to New Situations. Four questions and exercises were classified under Find Examples or Applications.
TABLE III

Numerical distribution of questions and exercises classified under
Higher Mental Processes - Supplementation and Use of Ideas

<table>
<thead>
<tr>
<th>Book</th>
<th>Find examples or Applications</th>
<th>Suggested plan or activity</th>
<th>Suggested additional topics for study</th>
<th>Show relationships</th>
<th>Apply knowledge or principles to new situations</th>
<th>Draw conclusions or inferences from data</th>
<th>Find reasons or explanations for facts</th>
<th>Make generalizations</th>
<th>Create or invent new combinations</th>
<th>Handwork to illustrate a fact</th>
<th>Make comparisons or similarities or differences</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0</td>
<td>29</td>
<td>6</td>
<td>0</td>
<td>12</td>
<td>7</td>
<td>5</td>
<td>3</td>
<td>1</td>
<td>5</td>
<td>1</td>
<td>69</td>
</tr>
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<td>B</td>
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<td>36</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>14</td>
<td>15</td>
<td>4</td>
<td>5</td>
<td>7</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>C</td>
<td>0</td>
<td>14</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>42</td>
<td>0</td>
<td>0</td>
<td>9</td>
<td>1</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>D</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>8</td>
<td>49</td>
<td>9</td>
<td>8</td>
<td>20</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>4</td>
<td>83</td>
<td>11</td>
<td>6</td>
<td>5</td>
<td>72</td>
<td>30</td>
<td>58</td>
<td>26</td>
<td>17</td>
<td>42</td>
<td>7</td>
</tr>
</tbody>
</table>
Table IV shows the numerical distribution of questions and exercises found in the textbooks that were classified under the general heading of Criticism and Evaluation of Ideas.

There were a total of one hundred and sixty-four questions and exercises classified under Criticism and Evaluation of Ideas. Of these, thirty-one questions and exercises were classified under Eliminating Unimportant or Irrelevant Material. Twenty questions and exercises were classified under Evaluating Evidence or Explanations. Eleven questions and exercises were classified under Analyzing Methods or Motives. One question was classified under Discriminating Between Fact and Opinion. One exercise was classified under Evaluating Suitability for a particular purpose. No questions or exercises were found under the classifications: Recognizing Special Merit of Ideas Presented, Finding Exceptions to Point Made, Suggesting Limitations or Precautions, Discovering Bias or Prejudice, and Discovering Over-Generalizations.
TABLE IV

Numerical distribution of questions and exercises classified under

Higher Mental Processes - Criticism and Evaluation of Ideas

<table>
<thead>
<tr>
<th>Book</th>
<th>Recognizing special merit of ideas presented</th>
<th>Finding exceptions to point made</th>
<th>Suggesting Limitations, or Precautions</th>
<th>Analyzing Methods or Motives</th>
<th>Discriminating Between Fact and Opinion</th>
<th>Discovering Bias or Prejudice</th>
<th>Discovering Overgeneralizations</th>
<th>Eliminating Unimportant or Irrelevant Material</th>
<th>Evaluating Suitability for a particular Purpose</th>
<th>Evaluating Evidence or Explanations</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>31</td>
<td>1</td>
<td>0</td>
<td>37</td>
</tr>
<tr>
<td>B</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>C</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>11</td>
<td>1</td>
<td>13</td>
</tr>
<tr>
<td>D</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>11</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>31</td>
<td>20</td>
<td>1</td>
<td>64</td>
</tr>
</tbody>
</table>
Table V shows the percentage distribution of questions and exercises found in the textbooks that were classified under the general heading of Lower Mental Processes. There were a total of 1322 questions and exercises classified under this general heading. Of these, 61.73 per cent were classified under Aided Recall. Under this heading 59.61 per cent were classified under Aided Recall of facts in the text and 2.12 per cent were classified under Aided Recall of facts from other sources. A total of 12.56 per cent were classified under the heading of Unaided Recall. Of these, 9.23 per cent were classified under Unaided Recall of facts in the text, and 3.33 per cent were classified under Unaided Recall of facts from other sources. There was a total of 13.77 per cent classified under the heading of Recognition. Of these, 4.69 per cent were classified under Multiple Choice, no questions or answers were found under True-False, 4.31 per cent were classified under Matching, 4.77 per cent were classified under Location of facts and places from maps, charts, diagrams, tables and pictures. Under Reproduction - drawing maps, pictures and diagrams according to directions the percentage was 11.27.
### TABLE V

Percentage distribution of questions and exercises classified under

Lower Mental Processes

<table>
<thead>
<tr>
<th>Book</th>
<th>Aided Recall</th>
<th>Unaided Recall</th>
<th>Recognition</th>
<th>Reproduction</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Facts in Text</td>
<td>Facts from other Sources</td>
<td>Facts in Text</td>
<td>Facts from other Sources</td>
<td>Multiple Choice</td>
</tr>
<tr>
<td>A</td>
<td>12.21</td>
<td>01.73</td>
<td>01.73</td>
<td>04.65</td>
<td>36.05</td>
</tr>
<tr>
<td>B</td>
<td>63.68</td>
<td>01.32</td>
<td>15.26</td>
<td>05.53</td>
<td>00.00</td>
</tr>
<tr>
<td>C</td>
<td>62.78</td>
<td>00.95</td>
<td>11.67</td>
<td>03.47</td>
<td>00.00</td>
</tr>
<tr>
<td>D</td>
<td>71.96</td>
<td>05.96</td>
<td>05.08</td>
<td>00.88</td>
<td>00.00</td>
</tr>
<tr>
<td>Ave.</td>
<td>59.61</td>
<td>02.12</td>
<td>09.23</td>
<td>03.33</td>
<td>04.69</td>
</tr>
</tbody>
</table>
Table VI shows the percentage distribution of questions and exercises found in the textbooks that were classified under the general heading of Organization of Ideas.

There were two hundred and forty-nine questions and exercises classified under the heading Organization of Ideas. Of these, 26.51 per cent were classified under Prepare a Special Report. Under Select Items Pertinent to the Topic were classified 23.69 per cent of the questions and exercises classified under Organization of Ideas. Under Classify and Arrange were classified 18.07 per cent of the questions and exercises classified under Organization of Ideas. Under Collect Information, Pictures, etc. to Illustrate a Topic were 14.36 per cent of the questions and exercises classified under Organization of Ideas. Under Select Sources of Information were 10.44 per cent of the questions and exercises classified under Organization of Ideas. Under Outline were classified 4.41 per cent of the questions and exercises classified under Organization of Ideas. Under Summarize were 1.21 per cent of the questions and exercises classified under Organization of Ideas. Under Find Major and Minor Points were 0.31 per cent of the questions and exercises classified under Organization of Ideas.
<table>
<thead>
<tr>
<th>Book</th>
<th>Select items pertinent to the topic</th>
<th>Classify and Arrange</th>
<th>Find Major or Minor Points</th>
<th>Outline</th>
<th>Summarize</th>
<th>Collect Information, Pictures, etc.</th>
<th>Prepare a Special Report</th>
<th>Select Sources of Information</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>51.58</td>
<td>7.16</td>
<td>00.00</td>
<td>00.00</td>
<td>00.00</td>
<td>14.72</td>
<td>14.72</td>
<td>11.58</td>
<td>100%</td>
</tr>
<tr>
<td>B</td>
<td>13.85</td>
<td>29.23</td>
<td>00.00</td>
<td>04.62</td>
<td>01.54</td>
<td>03.07</td>
<td>30.77</td>
<td>16.92</td>
<td>100%</td>
</tr>
<tr>
<td>C</td>
<td>00.00</td>
<td>23.81</td>
<td>00.00</td>
<td>11.11</td>
<td>00.00</td>
<td>20.64</td>
<td>39.68</td>
<td>04.76</td>
<td>100%</td>
</tr>
<tr>
<td>D</td>
<td>03.85</td>
<td>15.38</td>
<td>07.69</td>
<td>03.85</td>
<td>07.69</td>
<td>30.77</td>
<td>26.92</td>
<td>03.85</td>
<td>100%</td>
</tr>
<tr>
<td>Ave.</td>
<td>23.69</td>
<td>18.07</td>
<td>00.81</td>
<td>04.41</td>
<td>01.21</td>
<td>14.86</td>
<td>26.51</td>
<td>10.44</td>
<td>100%</td>
</tr>
</tbody>
</table>
Table VII shows the percentage distribution of questions and exercises found in the textbooks that were classified under the general heading of Supplementation and Use of Ideas.

There were three hundred and sixty-one questions and exercises classified under the heading of Supplementation and Use of Ideas. Of these, 22.99 per cent were classified under Suggest Additional Topics for Study. Under Draw Conclusions or Inferences from data were classified 19.94 per cent. Under Show Relationships were classified 16.61 per cent. Under Apply Generalizations were classified 16.07 per cent. Under Apply Knowledge or Principles to New Situations were classified 13.35 per cent. Under Find Differences and Similarities were classified 11.63 per cent. Find Examples or Applications were 11.08 per cent. Under Find Reasons or Explanations for Facts or Statements were 8.58 per cent. Under Create and Invent New Combinations of Ideas were classified 7.20 per cent of the questions and exercises classified under Supplementation and use of Ideas. Under Handwork to illustrate a fact or principle were classified 4.71 per cent. Under Suggest Additional Topics for Study were classified 3.05 per cent. Under Find Differences or Similarities were classified 1.94 per cent of the questions and exercises classified under Supplementation and Use of Ideas.
<table>
<thead>
<tr>
<th>Book</th>
<th>Find examples or Applications</th>
<th>Suggested plan or activity allied to topic</th>
<th>Suggested additional topics for study</th>
<th>Show relationships</th>
<th>Apply Knowledge or Principles to New Situations</th>
<th>Draw conclusions or inferences from data</th>
<th>Find Reasons or explanations for Facts or Statements</th>
<th>Make generalizations</th>
<th>Create or invent new combinations</th>
<th>Hand Work to illustrate a Fact</th>
<th>Make comparisons</th>
<th>Find Similarities or differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>00.00</td>
<td>42.03</td>
<td>08.55</td>
<td>00.00</td>
<td>00.00</td>
<td>17.39</td>
<td>10.14</td>
<td>07.25</td>
<td>04.35</td>
<td>01.45</td>
<td>07.75</td>
<td>01.45</td>
</tr>
<tr>
<td>B</td>
<td>00.00</td>
<td>37.50</td>
<td>02.08</td>
<td>02.08</td>
<td>04.17</td>
<td>14.58</td>
<td>15.63</td>
<td>04.17</td>
<td>05.21</td>
<td>07.29</td>
<td>06.25</td>
<td>01.04</td>
</tr>
<tr>
<td>C</td>
<td>00.00</td>
<td>16.67</td>
<td>01.19</td>
<td>02.48</td>
<td>00.00</td>
<td>50.00</td>
<td>00.00</td>
<td>00.00</td>
<td>10.71</td>
<td>01.19</td>
<td>13.10</td>
<td>04.52</td>
</tr>
<tr>
<td>D</td>
<td>03.57</td>
<td>03.57</td>
<td>01.79</td>
<td>01.79</td>
<td>00.89</td>
<td>03.57</td>
<td>07.14</td>
<td>43.75</td>
<td>08.04</td>
<td>07.14</td>
<td>17.86</td>
<td>00.89</td>
</tr>
<tr>
<td>Ave.</td>
<td>11.08</td>
<td>22.99</td>
<td>03.05</td>
<td>16.61</td>
<td>13.85</td>
<td>19.94</td>
<td>08.58</td>
<td>16.07</td>
<td>07.20</td>
<td>04.71</td>
<td>11.63</td>
<td>01.94</td>
</tr>
</tbody>
</table>
Table VIII shows the percentage distribution of questions and exercises found in the textbooks that were classified under the general heading of Criticism and Evaluation of Ideas.

There were sixty-four questions and exercises classified under Criticism and Evaluation of Ideas. Of these, 48.44 per cent were classified under Eliminate Unimportant or Irrelevant Material. Under Evaluating Evidence or Explanations were classified 31.25 per cent of the questions and exercises classified under Criticism and Evaluation of Ideas. Under Analyzing Methods or Motives were classified 18.15 per cent of the questions and exercises classified under Criticism and Evaluation of Ideas. Under Discriminate between Fact and Opinion were classified 1.56 per cent of the questions and exercises classified under Criticism and Evaluation of Ideas. Under Evaluating Suitability for a particular purpose were classified 1.56 per cent of the questions and exercises classified under Criticism and Evaluation of Ideas. There were no questions or exercises classified under Recognizing Special Merit of Ideas Presented, Finding Exceptions to the Point Made, Suggest Limitations or Precautions, Discovering Bias or Prejudice, and Discovering Over-Generalizations.
**TABLE VIII**

Percentage Distribution of Questions and Exercises Classified Under

Higher Mental Processes - Criticism and Evaluation of Ideas

<table>
<thead>
<tr>
<th>Book</th>
<th>Recognizing special merit of ideas presented</th>
<th>Finding exceptions to points made</th>
<th>Suggesting Limitations, or Precautions</th>
<th>Analyzing Methods or Motives</th>
<th>Discriminating Between Fact &amp; Opinion</th>
<th>Discovering Bias or Prejudice</th>
<th>Discovering Generalizations</th>
<th>Eliminating Unimportant or Irrelevant Material</th>
<th>Evaluating Evidence or Explanations</th>
<th>Evaluating Suitability for a particular purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>00.00</td>
<td>00.00</td>
<td>00.00</td>
<td>10.82</td>
<td>02.70</td>
<td>00.00</td>
<td>00.00</td>
<td>83.78</td>
<td>02.70</td>
<td>00.00</td>
</tr>
<tr>
<td>B</td>
<td>00.00</td>
<td>00.00</td>
<td>00.00</td>
<td>00.00</td>
<td>00.00</td>
<td>00.00</td>
<td>00.00</td>
<td>100%</td>
<td>00.00</td>
<td>00.00</td>
</tr>
<tr>
<td>C</td>
<td>00.00</td>
<td>00.00</td>
<td>00.00</td>
<td>07.69</td>
<td>00.00</td>
<td>00.00</td>
<td>00.00</td>
<td>84.62</td>
<td>00.00</td>
<td>07.69</td>
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<td>00.00</td>
<td>00.00</td>
<td>40.00</td>
<td>00.00</td>
</tr>
<tr>
<td>Ave.</td>
<td>00.00</td>
<td>00.00</td>
<td>00.00</td>
<td>18.15</td>
<td>01.56</td>
<td>00.00</td>
<td>00.00</td>
<td>48.44</td>
<td>31.25</td>
<td>01.56</td>
</tr>
</tbody>
</table>
Table IX shows the numerical and percentage distribution of the total number of questions and exercises found in the four American history textbooks used in this study under the general classifications: Lower Mental Processes and the Higher Mental Processes, Organization of Ideas, Supplementation and Use of Ideas, and Criticism and Evaluation of Ideas.

One thousand and nine hundred and ninety-six questions and answers were the total number in the four textbooks in this study. Of these, one thousand three hundred and twenty-two questions and exercises, or 66.23 per cent, were classified under Lower Mental Processes. Three hundred and sixty-one questions and exercises, or 18.09 per cent, were classified under Supplementation and Use of Ideas. Two hundred and forty-nine questions and exercises, or 12.47 per cent, were classified under Organization of Ideas. Sixty-four questions and exercises, or 3.21 per cent, were classified under Criticism and Evaluation of Ideas.

Table X shows the distribution by number and per cent of the total number of questions and exercises under the two major classifications: Lower Mental Processes and Higher Mental Processes. There were a total of one thousand three hundred and twenty-two questions and exercises, or 66.23 per cent, classified under Lower Mental Processes. There were a total of six hundred and seventy-four questions and exercises, or 33.77 per cent, classified under Higher Mental Processes.
TABLE IX
Numerical and Percentage Distribution of the Total Number of Questions and Exercises Found in the Four Textbooks Used in This Study

<table>
<thead>
<tr>
<th>Lower Mental Processes</th>
<th>Higher Mental Processes</th>
<th>Total Number of Questions and Exercises</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Processes</strong></td>
<td><strong>Organization of Ideas</strong></td>
<td><strong>Supplementation and Use of Ideas</strong></td>
</tr>
<tr>
<td>Total number of questions and exercises</td>
<td>1322</td>
<td>249</td>
</tr>
</tbody>
</table>

Per Cent of Questions and Exercises  

<table>
<thead>
<tr>
<th>Lower Mental Processes</th>
<th>Higher Mental Processes</th>
<th>Total Number of Questions and Exercises</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Processes</strong></td>
<td><strong>Organization of Ideas</strong></td>
<td><strong>Supplementation and Use of Ideas</strong></td>
</tr>
<tr>
<td>Total number of questions and exercises</td>
<td>66.23</td>
<td>12.47</td>
</tr>
</tbody>
</table>

TABLE X
Distribution of Number and Per Cent of the Total Number of Questions and Exercises Under Two Major Classifications

<table>
<thead>
<tr>
<th>Distribution by Number</th>
<th>Distribution by Per Cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower Mental Processes</td>
<td>1322</td>
</tr>
<tr>
<td>Higher Mental Processes</td>
<td>674</td>
</tr>
</tbody>
</table>
CHAPTER V

SUMMARY AND CONCLUSIONS

The writer of this study analyzed and classified the questions and exercises in four junior high American history textbooks to ascertain to what extent various mental processes were required in their solution. The development of the power of critical thinking which is classified under Higher Mental Processes in this study was analyzed to determine to what extent it was used in the textbook material of the pupil.

In this study the mental processes are in two main classifications and those used in this study are borrowed from Johnson and O'Connor. The various questions and exercises were analyzed according to those classifications. The main classifications used were the Lower Mental Processes of Recall, recognition and reproduction and the Higher Mental Processes of organization of ideas, supplementation and use of ideas, and criticism and evaluation of ideas.

In most cases one ability was recorded for an exercise, however in some exercises two or more abilities were required for their solution. In

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that manner all the questions and exercises in four junior high American textbooks were analyzed and classified. Tables were then set up to compare the numerical distribution and the percentage distribution of the questions and exercises under the main classifications and the various subclassifications of the main classifications.

Certain conclusions which can be drawn from this study depend on combining certain data into a summarizing table. This table follows:

**Table XI**

PERCENTAGE DISTRIBUTION OF QUESTIONS AND EXERCISES CLASSIFIED UNDER LOWER MENTAL PROCESSES AND HIGHER MENTAL PROCESSES FOR EACH OF THE FOUR TEXTBOOKS

<table>
<thead>
<tr>
<th>Book</th>
<th>Lower Mental Processes</th>
<th>Higher Mental Processes</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>46.11</td>
<td>53.89</td>
<td>100%</td>
</tr>
<tr>
<td>B</td>
<td>69.72</td>
<td>30.28</td>
<td>100%</td>
</tr>
<tr>
<td>C</td>
<td>66.46</td>
<td>33.54</td>
<td>100%</td>
</tr>
<tr>
<td>D</td>
<td>75.37</td>
<td>24.63</td>
<td>100%</td>
</tr>
<tr>
<td>Ave.</td>
<td>66.23</td>
<td>33.77</td>
<td>100%</td>
</tr>
</tbody>
</table>

From the summarizing table and the other tables of this thesis the following conclusions were reached:
1. The study revealed that there were a total of 1996 questions and exercises in the four history textbooks. Of these, 1322 were classified under Lower Mental Processes and 674 were classified under Higher Mental Processes.

2. In the four textbooks analyzed the questions and exercises classified under Lower Mental Processes had a percentage distribution of 66.23 per cent and the questions and exercises classified under Higher Mental Processes had a percentage distribution of 33.77.

3. One textbook was found to be superior to the others in stressing the Higher Mental Processes with 53.89 per cent of the questions and exercises devoted to that major classification.

4. One textbook was found to be superior to the others in stressing the Higher Mental Processes with 53.89 per cent of the questions and exercises devoted to that major classification.

5. On the lower mental level, recall was used most frequently with aided recall from facts in the text, the most commonly used.

6. On the higher mental level, the questions and exercises stressing supplementation and use of ideas was the most common.

7. The results of this study indicate that by far the larger part of the questions and exercises in the four American history textbooks analyzed necessitate only the use of the Lower Mental Processes, especially recall. Only a relatively small part make use of the skills associated with Critical Thinking.

8. A higher percentage of the questions and exercises in the junior high American history textbooks is devoted to lower mental processes than is devoted to those processes by junior high history workbooks as shown by O'Connor.

9. The authors of the textbooks have reached no agreement in regard to the skills that should be in the questions and exercises required for the solving of the mental processes on the higher mental levels.

10. Further research in this field could be done by comparing the Mental Processes required to solve the questions and exercises in the workbooks which accompany the history textbooks, to the Mental Processes required to solve the questions and exercises in the textbooks.
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