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The relation of sentence structure to reading comprehension.

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SCHOOL OF EDUCATION

Dissertation

THE RELATION OF SENTENCE STRUCTURE
TO READING COMPREHENSION

Submitted by

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(B.S. in Ed., 1948; M.A. in Ed., 1949; University of Maine)

In partial fulfillment of requirements for
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Second Reader: William C. Kvaraceus, Professor of Education
Third Reader: Helen A. Murphy, Professor of Education
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CHAPTER I

INTRODUCTION
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INTRODUCTION

Statement of the Problem

It is the purpose of this study to investigate the relation of sentence structure to reading comprehension, and in so doing, to expand the present knowledge of the elements influencing the readability of children's reading materials.

Source of the Problem

The reading program in the elementary school has been the recipient of extensive research during the past three decades. This research may be classified into three areas: the psychological factors within the child which help determine reading readiness and reading ability, the methods and techniques of reading instruction, and the nature of the materials to be read.

The research in the first two areas mentioned above has considerably advanced the reading program as McKee1 has indicated in the preface to a recent text:

Investigation in the third area, which may be called by the more popular term, readability, while making significant contributions, cannot boast comparable achievement. Gray¹ suggests the status of the research in this area of readability in a recent review:

The demand for readable books was never greater than today...somehow this demand must be met more efficiently and more fully than it has been thus far.

In one of the early reviews of the investigations completed in the area of readability, Lorge² presented the following values of further research:

If readability of a passage could be evaluated adequately, the estimate would have two major values: one, placing the book on some scale of comprehensibility, the other, indication to writers of books for specified populations, the nature of the difficulty of their product.

Betts³ directs attention to the implications of research in readability for the elementary school:

In general, seven year-olds range from zero level reading ability to substantial "third-reader" level, averaging about "primer" level. Ten year-olds range in reading ability from "beginning pre-primer" level to twelfth grade level. One of the


principle causes of corrective reading problems is regimentation through the use of the same or like instructional materials for all children at the same grade level. This results in frustration for about 25 to 40 per cent of the class because the material is too difficult, and for about 10 to 25 per cent because the material is "too easy" and not sufficiently challenging. Hence, educators have been confronted with the problem of evaluating the readability of instructional materials in terms of the reading levels of the pupils.

In the same article, Betts\(^1\) presents further justification for research in readability, by stating that differences have been reported between grade scores achieved on standardized tests by pupils and their ability to read instructional materials prepared for corresponding grade levels. He also reports that discrepancies have been found in the readability of books with the same grade level designation.

In a more comprehensive stand, Dale and Chall\(^2\) propose that research in readability would aid in providing proper reading materials (1) for the beginner in reading, (2) for fitting the variation in reading ability in higher grades, (3) for all levels of adult education, and (4) for widening the range of books to compete with comics, movies, and television.

In her review of known factors affecting reading comprehension, Johnson\(^3\) classified readability as one of the important

\(^{1}\)Loc. cit.


\(^{3}\)Marjorie Johnson. "Factors in Reading Comprehension." *Educational Administration and Supervision* 35: 385-406; Nov. 1949
extrinsic factors:

Readability of the particular material is a potent factor in reading success. Length and complexity of sentences, vocabulary level, quantity of personal references, etc., all combine to determine how readable the material is from the viewpoint of style.

In the latest review of readability, Dale and Chall\(^1\) present the most concise view of the status of research in this area:

One more caution: the last word has not yet been said about readability. We have objectively analyzed only a few of the factors influencing readability. The other factors should be considered, if only for the purpose of subjective evaluation.

Along with unanimously expressing the need for further research in the area of readability, the above writers discussed the various elements which have been investigated as to their relation to the ease or difficulty of reading materials. The elements which have been investigated thus far may be grouped into three general classifications: vocabulary, sentence structure, and interest or content.

Although there exists much disagreement as to which elements should represent the classifications above, there is widespread agreement that some element from each of the three classifications should be used.

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In the early studies in readability, all elements that seemed connected with reading difficulty were examined. But, in the later investigations, the emphasis shifted from an evaluation of many elements to the selection of a very few elements which could be used in regression formulas to predict the grade placement of reading materials. For example, the classification, sentence structure, is now represented in readability formulas by the single mechanical element, sentence length in words. Naturally this shift of emphasis has left unfollowed many promising implications presented by the early investigators.

Definition of Terms

At this point, the nature of the terms, readability, reading difficulty, and reading comprehension will be clarified.

Readability may be defined as "ease of reading plus interest".¹ Thus, the readability of a story is the ease or difficulty of reading that story influenced by the interest that the content has for the reader. Furthermore, the readability of a story or other piece of reading material may be considered as a constant factor fixed on a continuum of ease or difficulty when it is produced.

On the other hand, reading comprehension is a complex, variable factor. For the purposes of this study, this complex factor will be considered dependent upon the constant factor, readability, and upon the variable factors, reading ability of the reader, and conditions under which the reading is being done.

Readability cannot be measured directly. It can be measured only by having children or adults read materials and express their comprehension. This is true even when readability formulas are applied, since they were derived through this method. This method of measurement demands that the variable factors in reading comprehension be controlled so that there will be a direct relationship between reading comprehension and readability. This is a fundamental premise of all studies in this area.

In this research study, variables, other than that of sentence structure, which might have some effect on reading comprehension, are controlled as fully as possible through the design of the test materials. This design calls for the selection of a group of stories, of approximately 500 words, the adaptation of each of these stories to forms each heavily loaded with a single sentence structure, and the building of a single comprehension check for all the forms of a single story.

Thus, the above design makes possible rigorous control of these major variables known to affect reading comprehension:
vocabulary, the identical words, with the exception of connectives such as "but", "and", "when" are used in the forms of each story; and (2) story content, the ideas and actions are identical throughout the forms of each story.

The arrangements of sentence structure investigated as to their relation to reading comprehension in this study are stated and defined as follows:

1. Simple sentence- a sentence which contains one simple subject and one simple predicate.

2. Simple sentence including a verbal element- a simple sentence with a verbal element, a group of words which includes a participle, gerund, or infinitive.

3. Compound sentence- a sentence which contains two or more independent clauses.

4. Complex sentence- a sentence which contains at least one independent and one dependent clause.

5. Inverted simple sentence- a sentence in which the principle predicate verb precedes the subject.

Premises of Study

The premises upon which this research project is founded are:

1. A quantitative approach can be made to the study of the relation of selected elements of sentence structure to reading comprehension.

2. Children's comprehension can be adequately measured by the use of objective type tests.
3. The variable factors within reading comprehension can be controlled so that the readability of materials is directly related to children's reading comprehension of these materials.

4. Selected elements of sentence structure can be arranged so that variation in comprehension test scores of random groups may be attributed to variations in the readability of the sentence structure arrangements.
CHAPTER II

REVIEW OF INVESTIGATIONS OF THE RELATION
OF SENTENCE STRUCTURE TO READING COMPREHENSION
CHAPTER II

REVIEW OF INVESTIGATIONS OF THE RELATION
OF SENTENCE STRUCTURE TO READING COMPREHENSION

The investigations of the relation of sentence structure to reading comprehension fall into two categories. In the first group are those studies in the area of readability which include elements of sentence structure among the elements investigated as to their effect on the difficulty of reading materials. The second category includes those studies directly concerned with elements of sentence structure as factors affecting the difficulty of reading materials.

Investigations in Readability

The first published investigation of the first group described above was that of Vogel and Washburne.¹ The purpose of their research was to discover "an objective method of determining what reading material is appropriate for children of given reading ability". They directed the work of 20 teachers in examining 152 children's books for all elements of difficulty which might influence the reading difficulty of these books. The books were graded as to reading level by obtaining the average reading grade level from the Stanford

Achievement Test, Paragraph Meaning, of the group of children who stated that they had read and liked each book. Then those elements showing most definite rise or fall from grade to grade were chosen for further study, and the others were discarded.

Among the elements selected for the first investigation were the following which have some bearing on sentence structure:

1. Sentence use - declarative, interrogative, imperative, exclamatory.
2. Sentence form - simple, compound, complex, compound-complex.
3. Dependent clauses - noun, adjective, adverbial.
4. Phrases - adjective, adverbial, infinitive, participial.

Of the elements of sentence structure listed above, the frequency of simple sentences and of prepositions were found to have the most significant relation to the grade placement of the children's books. These two factors were placed in a regression formula with two measures of vocabulary load and used to determine the difficulty of children's reading materials.

Later, Washburne and Morphett¹ (Vogel) revised this regression formula and eliminated the preposition count, leaving only the frequency of simple sentences as a measure of the

relation of sentence structure to readability.

In 1934, Ojemann directed a similar investigation using adult reading materials. He selected sixteen 500-word samples and adapted them into test form. Then, these selections were graded in difficulty from the average scores on each by the group of subjects tested. The selections were examined for the frequency of appearance of fourteen elements which were believed to contribute to difficulty, and then the correlation between frequency of appearance of each element and difficulty level of the selections were determined. Three elements of sentence structure were examined. The elements and their correlations with the level of difficulty are as follows:

Number of simple sentences, -.61
Number of complex sentences, .13
Number of compound sentences had inadequate range for computing correlation.

Dale and Tyler conducted a study of the comprehension difficulties of reading material with adults of limited education. Two elements related to sentence structure, number of prepositional phrases and length of sentence in words were reported as significantly related to difficulty.


McCluskey\(^1\) selected passages from six subject matter areas of a college curriculum. He measured the rate of reading and level of comprehension of thirty college students on these passages. The passages were graded in difficulty by using as a criterion the average rate of reading of the group on each passage. Then the passages were examined for elements of difficulty. Among the four elements selected as contributing to the difficulty of the passages was that of average sentence length. His conclusions were that easy reading materials are composed of short, simple sentences and easy, familiar vocabulary, and that difficult reading material is made up of complex sentence structure and technical, unfamiliar vocabulary.

The most extensive study yet conducted in the area of readability was made by Gray and Leary\(^2\) in 1935. They proposed to attack the question: "What makes a book readable for a particular reader?"\(^3\) Reducing this general question to its components, they stated these two problems:

One is to ascertain what elements in reading material make it easy or difficult for adults, when the purpose of reading is defined somewhat narrowly; and the other, to discover how these elements may be used in a more accurate estimate of the difficulty of reading material of a similar sort.\(^4\)

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\(^3\)Ibid., p. 1.

\(^4\)Loc. cit.
The procedure followed by Gray and Leary was not unlike that followed by Vogel and Washburne.¹ From a survey of the current literature on readability and from letters of inquiry to librarians, publishers, and teachers, they compiled a total of 289 suggested factors related to readability. Then one aspect of readability proposed by the findings of this survey was isolated for intensive study. This relates to ease or difficulty of reading materials, as determined by the presence of certain structural elements of the writer's expression that are related to difficulty.²

Following this limiting of the scope of the study, two series of tests were devised from adult reading materials and administered to a large diversified group of adults. Each test passage was graded in difficulty according to the average score made by the group. The test passages were then searched for elements influencing their difficulty. Forty-four elements, which were capable of quantitative measurement, were discovered and each was correlated with the difficulty of the test passage in which it appeared.

¹Vogel and Washburne, op. cit.
²Gray and Leary, op. cit., p. 11.
Of these forty-four elements, those related to sentence structure and their correlations with the reading difficulty of the paragraphs in which they appeared are reported below in Table 1.¹

**Table 1. Correlations Between Elements of Sentence Structure and the Reading Difficulty Ratings of the Paragraphs in Which They Appeared**

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<thead>
<tr>
<th>Element</th>
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<tr>
<td>Average sentence length in words</td>
<td>-.522</td>
<td>.0708</td>
</tr>
<tr>
<td>Number of explicit sentences</td>
<td>.482</td>
<td>.0749</td>
</tr>
<tr>
<td>Number of simple sentences</td>
<td>.390</td>
<td>.0825</td>
</tr>
<tr>
<td>Number of prepositional phrases</td>
<td>-.345</td>
<td>.0858</td>
</tr>
<tr>
<td>Number of infinitive and prepositional phrases</td>
<td>-.283</td>
<td>.0896</td>
</tr>
<tr>
<td>Number of compound-complex sentences</td>
<td>-.205</td>
<td>.0933</td>
</tr>
<tr>
<td>Number of infinitive phrases</td>
<td>.199</td>
<td>.0957</td>
</tr>
<tr>
<td>Number of complex sentences</td>
<td>.193</td>
<td>.0937</td>
</tr>
<tr>
<td>Number of clauses introduced by subordinate conjunctions</td>
<td>-.160</td>
<td>.0949</td>
</tr>
<tr>
<td>Number of compound and compound-complex sentences</td>
<td>.141</td>
<td>.0954</td>
</tr>
<tr>
<td>Number of clauses introduced by relative pronouns</td>
<td>.117</td>
<td>.0960</td>
</tr>
<tr>
<td>Number of clauses introduced by conjunctive adverbs</td>
<td>.054</td>
<td>.0971</td>
</tr>
</tbody>
</table>

¹Gray and Leary, op. cit., p. 115.
The next readability investigation utilizing sentence structure elements was directed by Lorge.\(^1\) The main purpose was to determine the relation of previously discovered elements of difficulty, notably those of Gray and Leary,\(^2\) to a more refined criterion of difficulty, the McCall-Crabbs Standard Test Lessons in Reading.\(^3\) These are a series of 376 passages of children’s readings, graded in difficulty. The criterion was the grade-level score equivalent for a group of readers who answered correctly half the questions over each passage. Various correlations of elements were determined. As a result, Lorge concluded that vocabulary is the chief component of reading ease or difficulty and that the inclusion of additional structural elements in a regression formula for predicting level of difficulty of a passage add insignificant increments to the prediction. Yet, in his readability formula, he used average sentence length and number of prepositional phrases along with a vocabulary measure.

In 1943, Flesch\(^4\) reviewed the readability studies and produced a formula which he stated would determine more accur-

\(^1\)Irving D. Lorge. "Predicting Reading Difficulties of Selections for Children." \textit{Elementary English Review} 16: 229-233; October 1939.

\(^2\)Gray and Leary, op. cit.


\(^4\)Rudolph Flesch. Marks of Readable Style. New York: Teachers College, Columbia University, 1945. (Teachers College, Columbia University, Contributions to Education, No. 897.)
ately variation in the readability of materials at higher levels of difficulty.

Flesch gave credit to the importance of sentence structure as a factor influencing readability stating: "A measure of sentence structure appears to be a good index of readability both at the children's level and at the adult level. Above all, it is well established in language theory that we read sentence by sentence."¹

However, in his finished formula in his recent revision,² the element of sentence structure is that of sentence length in words.

The most recent published report of an investigation in the field of readability is that of Dale and Chall³ in 1948. This study had as its purpose to find a more efficient means of predicting readability. In a fashion somewhat similar to that of Lorge⁴ and Flesch,⁵ the authors used previously identified elements related to reading difficulty and attempted to produce a more efficient predictive formula.

¹Ibid., p. 17
⁴Lorge, op. cit.
⁵Flesch, op. cit.
The criterion established was identical with that used by Lorge and Flesch, the grade-level score equivalent for a group of readers who would get half the questions correct on each of the test passages of the Standard Test Lessons in Reading.¹

The 376 passages in Books II to V of the test lessons were examined for two elements: number of words outside the Dale list of 3,000 words, and average sentence length. Average sentence length was found to correlate .468 with the criterion of difficulty.

Summary

From this review of the investigations over a twenty-year span of the relation of various elements of sentence structure to reading difficulty, certain conclusions are apparent. First, the type of sentence structure elements studied from investigation to investigation changed markedly. Second, the purposes of the researches changed from that of identifying all elements of structure related to reading difficulty to that of combining previously identified elements in the most efficient predictive formula. Third, the criteria used to evaluate the degree of relation of the elements of structure to readability were greatly refined.

¹McCall and Crabbs, op. cit.
The limitations of these investigations, as a group, are these: (1) lack of adequate reliability of the criteria of reading difficulty, (2) variables other than those studied were not controlled, and (3) emphasis was placed on the mechanical aspects of reading materials.

Investigations in Reading Comprehension

The first study that was concerned directly with the relation of sentence structure to reading comprehension was made by Orndoff\(^1\) in 1925. She experimented with two groups of sixth grade pupils, administering a selection written in long sentences to one group and the same selection written in short sentences to the other. The comprehension of each group was tested but no significant differences were found.

In 1926, Ayer\(^2\) found that simplifying difficult history passages increased comprehension. The specific method used to simplify the materials was not reported.

Thompson\(^3\) did a study in 1929 similar to that by Orndoff.

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She rewrote the sentences of an exercise from the Standard Test Lessons in Reading\(^1\) in all short sentences in one test form and in all long sentences for the other form. These two forms and the original were administrated to 1,400 intermediate grade pupils. No significant differences in comprehension for the three forms were found.

In that same year, Weekes\(^2\) investigated the extent to which figurative language and involved sentence structure affect children's choices of poetry. It was found that both factors tended to obscure the meaning of the poetry and that the figurative language had a greater effect than the involved sentence structure. The form of the sentence structure was not reported.

Holland\(^3\) attacked this general problem from a different angle through an experiment using reading selections of controlled sentence structure and photographed eye movements. Ten selections of geographical prose were written in complex and compound sentences and in simple sentences. The number of students used in the experiment was twenty-four. An attempt was made to keep comprehension constant and measure the relation of the two types of sentence structure to speed of reading.

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1. McCall and Crabbs, op. cit.


No significant results were reported.

In 1935, Burk\(^1\) investigated the effect upon reading comprehension, interest, and speed of reading of several different elements of style of writing at the fourth grade level. Among the elements of style investigated were short, simple sentences and long, complex and compound sentences. Three stories, each requiring about ten minutes to read, were adapted to the several elements of style and sentence structure to be studied. The comprehension of groups of pupils, totalling 1,800, was tested by two ten-item tests. The conclusion was "the type of sentence in which a story is written appears to have no influence on the comprehension of fourth grade pupils as measured in this study."

The remaining three investigations of the relation of sentence structure to reading comprehension were done by graduate students at Boston University over a span of five years.

Henley\(^2\) and Mullen\(^3\) followed identical procedures, at different grade levels, and Halpin\(^4\) used a slight variation in


procedure in presenting and testing the comprehension of the structures chosen. The remarkable characteristic common to these three studies is the large number of structures tested. This was possible by presenting each structure only once or twice in sentences which had "chiefly as subject matter either elementary history, geography, natural science, or topics of current interest which any pupil would be expected to be familiar with in reading". The criteria of reading difficulty for each element tested was the number of errors made by a group of pupils on the item or items covering the content of each sentence in which the element appeared. Conclusions as to the effect of the various structures upon reading comprehension were based upon one and two test items per structure. The results were not subjected to statistical tests of significance.

Henley reported conclusions regarding the relation of the seventy-four constructions investigated to comprehension difficulty. Those conclusions which are considered pertinent to this study are as follows:

Elements bearing no relationship to comprehension difficulties in sentence structure

1. Sentence use - declarative, exclamatory, imperative, and interrogative.
2. Order of subject and predicate. (Inverted sentence).

1 Mullen, op. cit., p. 18.
2 Henley, op. cit., p. 63-65.
Elements easy to comprehend
1. Short sentences
2. Simple sentences
3. Compound predicate

Elements tending to cause difficulty, but not to a great extent
1. Complex sentence
2. Compound sentence
3. Elliptical statement
4. Infinitive used as an adjective
5. Infinitive at the end of sentence

Elements bearing greatest relation to comprehension difficulties
1. Long sentences
2. Compound-complex sentence
3. Compound subject
4. Infinitive used as a noun
5. Use of participle

Halpin\(^1\) investigated forty constructions as to their relation to reading comprehension. Conclusions from the Halpin study pertinent to this investigation follow:

Elements having no relationship to comprehension difficulties
1. Kind of sentence as to use - declarative, exclamatory, or imperative

Elements easy in comprehension
1. Simple sentence
2. Short sentence
3. Elliptical statement
4. Compound sentence

Elements causing an average amount of difficulty
1. Complex sentence
2. Compound subject
3. Compound predicate
4. Infinitive

---
\(^1\)Halpin, op. cit., p. 64-65.
Elements of greatest difficulty in comprehension

1. Long sentence
2. Sentence with inverted order of subject and predicate
3. Participle

Eighty-five constructions were studied by Mullen\(^1\) as to their relation to reading comprehension. Of the conclusions reported, those considered to be pertinent to this investigation are presented below:

**Factors in sentence structure apparently bearing no definite relationship to comprehension difficulties**

1. Kind, position, and number of subordinate clauses
2. Number of clauses in compound sentence

**Factors in sentence structure bearing noticeable relationship to comprehension difficulties**

1. Length of sentence
2. Number of phrases
3. Compounding of subject or predicate, or both
4. Inversion of verb and subject or object
5. Elliptical statement or question
6. Particular use of infinitive

Summary

A study of the research directly concerned with the relation of sentence structure to reading comprehension suggests these conclusions: First, there were no statistically significant results reported in any study. Second, there was a general lack of control of extraneous variables in the experimental designs of the studies. Third, inadequate measures of reading comprehension were the rule and not the exception.

\(^1\)Mullen, op. cit., p. 64-65.
Recapitulation

The combined results of the research of both categories, those studies in readability and those in reading comprehension, which are considered pertinent for the guidance of further research in the area of the relation of sentence structure to reading comprehension, are summarized in Table 2 above.
Table 2. Summary of the Elements of Sentence Structure Studied by Investigators and the Significance of the Results

<table>
<thead>
<tr>
<th>Elements</th>
<th>Investigators</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Orndoff</td>
</tr>
<tr>
<td>Average sentence length</td>
<td>*</td>
</tr>
<tr>
<td>Number of explicit sentences</td>
<td></td>
</tr>
<tr>
<td>Number of simple sentences</td>
<td></td>
</tr>
<tr>
<td>Number of prepositional phrases</td>
<td></td>
</tr>
<tr>
<td>Number of infinitive and prepositional phrases</td>
<td></td>
</tr>
<tr>
<td>Number of compound-complex sentences</td>
<td></td>
</tr>
<tr>
<td>Number of infinitive phrases</td>
<td></td>
</tr>
<tr>
<td>Number of complex sentences</td>
<td></td>
</tr>
<tr>
<td>Number of clauses introduced by a subordinate conjunction</td>
<td></td>
</tr>
<tr>
<td>Number of compound and compound-complex sentences</td>
<td></td>
</tr>
<tr>
<td>Number of clauses introduced by a relative pronoun</td>
<td></td>
</tr>
<tr>
<td>Number of clauses introduced by conjunctive adverbs</td>
<td></td>
</tr>
<tr>
<td>Number of compound sentences</td>
<td></td>
</tr>
</tbody>
</table>

* results not statistically significant
** results statistically significant
CHAPTER III

PREPARATION OF TEST MATERIALS
CHAPTER III

PREPARATION OF TEST MATERIALS

Outline of Procedure

Briefly, the procedure followed in this study includes the adaptation of selected stories to forms, each heavily weighted with a single sentence structure, the construction of comprehension tests, the administration of the test materials, and the analysis of the test results.

Selection of Elements of Sentence Structure

As a result of the review of the research summarized above, the decision was made to investigate the relation of sentence structure to reading comprehension. Immediately the problem arose as to which elements or arrangements of sentence structure should be investigated.

An analysis of three sources was made in determining the final list of five arrangements of sentence structure chosen to be used in this study. These sources were: (1) Table 2\(^1\) of this study which presents the summary of the results of previous research dealing with sentence structure, (2) the Thorndike, et. al.,\(^2\) list of 438 English constructions, and (3)

\(^1\) Supra., p. 25.

\(^2\) Edward L. Thorndike, Annie L. Evans, and Laura H. V. Kennon. "An Inventory of English Constructions with Measures of Their Importance." Teachers College Record 28: 580-610; February 1927.
Jespersen's\textsuperscript{1} text on English grammar.

A preliminary list of sentence structure elements to be investigated was made by selecting those elements from the list in Table 2 upon which there was considerable agreement as to their importance but little agreement as to the nature of their relation to reading comprehension. This preliminary list included these structures:

1. Simple sentence
2. Compound-complex sentence
3. Complex sentence
4. Infinitive phrase
5. Compound sentence

One element, the simple sentence, upon which there was marked agreement as to the nature of its relation to reading difficulty, was retained for possible use as a basis of comparison for the other elements chosen.

This preliminary list of elements of sentence structure was then compared with the extensive list of English constructions\textsuperscript{2} prepared and awarded frequency ratings under Thorndike's direction.

The elements of the above preliminary list were found to have frequency ratings of eight or nine on the Thorndike scale.


\textsuperscript{2}Thorndike, et. al., op. cit.
of frequency. This scale of frequency was established with numerical ratings of one to nine, one being assigned to constructions of low frequency and nine to those of high frequency.

One other element, the inverted sentence, with a frequency rating of eight, was selected from the Thorndike list to be added to the list of elements of sentence structure to be considered for investigation.

The text, Essentials of English Grammar by Jesperson, added two valuable contributions to the final selection of the structure elements to be investigated. One, it presented opportunity for evaluating the elements of the preliminary list from the grammarian's viewpoint, allowing them to be subjected to syntactical analysis rather than quantitative analysis. Two, by showing likenesses and differences of the various elements, the text offered aid in classifying the structures of the preliminary list. As a result of these contributions, the following five elements or arrangements of sentence structure were chosen for investigation:

1. Simple sentence
2. Simple sentence with verbal element
3. Compound sentence
4. Complex sentence
5. Inverted sentence

---

1 Jesperson, op. cit.
2 Supra., p. 6.
This final list of elements of sentence structure includes three elements from the preliminary list: simple sentence, compound sentence, and complex sentence. A fourth, inverted sentence, was taken from the list of constructions gathered by Thorndike, and the fifth arrangement of sentence structure, simple sentence containing a verbal element, was chosen to represent the infinitive phrase on the preliminary list and the numerous infinitive, participial, and gerund constructions presented in the Thorndike list. The analysis of sentence type and function presented by Jesperson helped greatly to justify the inclusion of this last mentioned structure arrangement because from the analysis, the basic relationship of this structure to the other structures was made clear. The results of this analysis of each of the selected arrangements of sentence structure are these: (1) the simple sentence was selected as the base structure from which the other structures would be derived, (2) it was established that the compound sentence could be formed by combining certain simple sentences with a coordinating conjunction, (3) it was possible to produce complex sentences by choosing related simple sentences and subordinating one to the other, (4) the inverted sentence could be formed by placing the principal verbs of certain simple

1 Thorndike, et. al., op. cit., p. 580-610.
2 Ibid., p. 580-610.
3 Jesperson, op. cit., p. 61-63.
sentences before the simple subjects of those sentences, and
(5) the simple sentence with verbal element could be derived
by selecting appropriate simple sentences and dropping the
simple subject of one while altering the form of the verb to
the participial, infinitive, or gerund form.

Selection of Stories

In order to control all variables contributing to reading
difficulty other than the experimental variable, it was ne-
cessary to use common vehicles to carry each of the arrange-
ments of sentence structure. Narrative prose was selected to
be used as the common vehicle. The selection of the prose
stories was governed by these criteria: (1) the content of
the stories must be appropriate and interesting for children
ten years old, (2) the complete action sequence should be pre-
sent in a limited number of words, (3) the content must be far
removed from the experiential background of the children tested
in the study, (4) the content must be such that the action
sequence can be presented in each of the five arrangements of
sentence structure.

The first criterion was met by selecting stories which
librarians agreed were read widely by children about ten years
old. The second was met by selecting portions of the longer
stories and deleting descriptive sections until the desired
number of words was reached. The third criterion was reached
by selecting stories about jungle creatures and jungle people.
The fourth criterion was met in the actual revising of the original selected stories to the five arrangements of sentence structure.

Revision of Stories

The five selections chosen in the light of the above criteria were adapted to the five arrangements of sentence structure through the following procedure. First, the original selection was rewritten in the first arrangement, simple sentences. To do this, each action and description of the selection were written in separate sentences. Second, these simple sentences were revised to form the second, third, fourth, and fifth arrangements of the stories. This procedure, using the first form as a base form, insured that the same vocabulary, phrasing, actions, and descriptions appear in each of the five forms of each selection, thus, affording the needed control of extraneous variables.

Coding of Story-Forms

The revision of the five stories produced twenty-five story-forms which made necessary the use of an identifying code. Numbers from 1 to 5 were assigned the five stories and the five arrangements of sentence structure. Thus, any combination of story and arrangement, called a story-form, could be represented by a two-place number. These numbers varied from 11 to 15, 21 to 25, 31 to 35, 41 to 45, and 51 to 55. The specific numbers assigned the stories and forms are:

1See Appendix A. 2See Appendix B.
A quantitative analysis of the composition of each of the story-forms is presented in Table 3. In this table, the code numbers are used to represent the story-forms. For example, the story, *Trapped*, is represented by the number 1; therefore, its five forms are, 11, 12, 13, 14, and 15.
Table 3. A Quantitative Analysis of the Story-Forms Used in the Experimental Testing

<table>
<thead>
<tr>
<th>Code No. of Story-Form</th>
<th>Number of Sentences</th>
<th>No. of Words</th>
<th>Words per Sentence</th>
<th>Per Cent of Sentences Containing Structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>71</td>
<td>460</td>
<td>6.5</td>
<td>100</td>
</tr>
<tr>
<td>12</td>
<td>54</td>
<td>454</td>
<td>8.4</td>
<td>30</td>
</tr>
<tr>
<td>13</td>
<td>46</td>
<td>487</td>
<td>10.6</td>
<td>52</td>
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<td>471</td>
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</tr>
<tr>
<td>15</td>
<td>71</td>
<td>466</td>
<td>6.5</td>
<td>41</td>
</tr>
<tr>
<td>21</td>
<td>78</td>
<td>536</td>
<td>6.9</td>
<td>100</td>
</tr>
<tr>
<td>22</td>
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</tr>
<tr>
<td>23</td>
<td>55</td>
<td>565</td>
<td>10.4</td>
<td>46</td>
</tr>
<tr>
<td>24</td>
<td>52</td>
<td>555</td>
<td>10.9</td>
<td>50</td>
</tr>
<tr>
<td>25</td>
<td>78</td>
<td>546</td>
<td>7.0</td>
<td>44</td>
</tr>
<tr>
<td>31</td>
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<td>466</td>
<td>7.8</td>
<td>100</td>
</tr>
<tr>
<td>32</td>
<td>46</td>
<td>456</td>
<td>9.9</td>
<td>44</td>
</tr>
<tr>
<td>33</td>
<td>39</td>
<td>488</td>
<td>12.5</td>
<td>56</td>
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<tr>
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<td>474</td>
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<tr>
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<td>477</td>
<td>7.9</td>
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</tr>
<tr>
<td>52x</td>
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<td>704</td>
<td>9.6</td>
<td>44</td>
</tr>
<tr>
<td>53x</td>
<td>68</td>
<td>779</td>
<td>11.4</td>
<td>53</td>
</tr>
<tr>
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<td>75</td>
<td>761</td>
<td>10.1</td>
<td>39</td>
</tr>
<tr>
<td>55x</td>
<td>104</td>
<td>759</td>
<td>7.3</td>
<td>36</td>
</tr>
</tbody>
</table>

x These story-forms were not used in the final testing program.
The effects of the variations of sentence structure in each of the story-forms shows up clearly and consistently in the quantitative analysis of each of the forms within each story presented in Table 3. For any one story, the number of sentences in the first and fifth structure arrangements remains constant, but for each of the other three arrangements, the number increases or decreases. This increase or decrease was caused by the combining of appropriate sentences to produce the desired arrangements.

The number of words in the story-forms also shows some variation. Considering the first form, simple sentences, as the criterion, the second form shows a slight decrease in number of words and the remaining forms show increases. In the second form, the loss of words was due to the deleting of some of the simple subjects. In the third form, compound sentences, the increase was caused by the addition of the coordinating conjunctions. The increase in the fourth form, complex sentences, was due to the inclusion of subordinate conjunctions, relative pronouns, and conjunctive adverbs to produce the desired structures. The slight increase in the number of words in the fifth form, the inverted sentences, was caused by the changing of the simple subject to reduce the awkwardness of the structure. An example of this would be the changing of the word "Alug" to "The Moro boy".
The number of words per sentence was forced to increase with the decrease in the number of sentences in the second, third, and fourth forms. Yet, in all forms of all stories, the word per sentence load was kept low when compared to the Flesch\(^1\) table of average sentence length and difficulty. In this table, sentences of eight words or less are called "very easy", sentences of eleven words are called "easy", and those of fourteen words are called "fairly easy".

The per cent of sentences, in the forms other than the first form, containing the sentence structures peculiar to each form, showed some variation within stories and between stories. This variation was caused by the strict adherence to the policy of allowing the content of the specific simple sentences involved to govern the combining of the sentences to produce the desired arrangements. This policy, while allowing some quantitative variation, kept the awkwardness of the structures at a minimum.

Preparation of Comprehension Checks

Comprehension checks were constructed to measure the pupils' comprehension of the story-forms. Since the scores on these tests were to be the criterion of reading difficulty

of the story-forms, considerable care was taken in their preparation. A statement by Flesch\(^1\) to the effect that many of the existing reading comprehension tests measured retention of facts rather than understanding of the content, led the writer to the study of Davis\(^2\) and Cavin's\(^3\) investigations in the measurement of reading comprehension.

Davis attempted to identify the mental abilities involved in reading comprehension by a factor analysis. He concluded that reading comprehension is comprised of nine mental abilities, and stated further that few reading tests measured abilities other than the memory for isolated word meanings. The abilities identified are:

1. The memory for isolated word meanings.
2. The ability to manipulate concepts and ideas in relation to one another.
3. The ability to understand the writer's explicit statements without recognizing their implications.
4. The ability to infer the writer's intent, purpose, or point of view.

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5. The ability to select the appropriate meanings of words in the light of their particular contextual settings.

6. The ability to grasp the detailed statements of a passage.

7. The ability to follow the organization of a passage.

8. The ability to interpret literary devices and techniques.

9. The ability to synthesize the main ideas of a passage.

Cavin\(^1\) made an analysis of the manuals of several standardized reading tests and concluded that the following list of "abilities" were measured most frequently according to statements in the manuals:

1. The ability to comprehend a single sentence.
2. The ability to comprehend a group of sentences.
3. The ability to comprehend the total meaning or central theme of a story.
4. The ability to detect implied details.
5. The ability to discriminate between true and false details of the story.
6. The ability to determine whether or not given ideas or details were mentioned in the story.

It is interesting to note that, despite the different approaches to this problem of isolating the abilities represented in reading comprehension, there is considerable overlapping among the abilities.

The abilities listed below to be used as guides in the construction of the test items for the comprehension checks were derived from a study of these two lists. It was hoped that by following these guides, items would be avoided which

\(^{1}\)Cavin, op. cit., p. 27.
measure word meanings and retention of facts in isolation.

1. The ability to manipulate the content of several sentences.
2. The ability to grasp the total meaning of the story.
3. The ability to detect implied details.
4. The ability to grasp detailed statements.
5. The ability to restructure the main ideas of a story.
6. The ability to determine whether or not given details or ideas were mentioned in the story.

In the actual writing of the test items, the outline of techniques, rules, and procedures prepared by Durost proved to be of inestimable value. Additional guidance was obtained from Ross and the Cooperative Reading Comprehension Tests.

Comprehension checks were built for each story used in the study. Each test was designed to be used to measure the pupils' comprehension of any form of that story. Thus, five separate tests would provide for the twenty-five story forms.

Each of the comprehension checks was comprised of eighteen multiple-choice, four alternative, test items. The test items were arranged in a rough order of difficulty according to the

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4. See Appendix C.
writer's judgment. They were not placed in the sequence followed by the story because it was thought that such an arrangement might furnish clues to some of the items.

Administration of Test Materials

The administration of the test materials, presented in detail in Chapter IV of this study, included two phases. The first, the preliminary testing, was done with a small population to secure data for determining the difficulty and validity of the test materials. The second phase, the final testing, used a large population to secure data upon which to base the conclusions of the investigation.

Analysis of Data

The analysis of variance was chosen as the statistical tool to be used to examine the differences between the means of the comprehension test scores of the groups of children reading the various forms of each of the stories. The conclusions of the investigation were based upon the results of this analysis. Certain descriptive data were determined through minor analyses of the data; reliabilities of comprehension tests used, intercorrelations of test scores, and distributions of test scores. The analysis of the data is presented in detail in Chapter V.
CHAPTER IV

ADMINISTRATION AND REVISION OF TEST MATERIALS
CHAPTER IV

ADMINISTRATION AND REVISION OF TEST MATERIALS

Preliminary Testing

Since the pupils' scores on the comprehension checks were to be employed as the criterion of reading difficulty of the story-forms and, consequently, as the criterion of difficulty for the sentence structures, the decision was made to conduct a preliminary testing program to determine the difficulty of the stories and the difficulty and reliability of the test items. The data obtained from this program would be used to select the final test population and to analyze and revise the test items.

The original selections from which the story-forms were written were chosen from reading materials written for children of about ten years of age. It was thought that the reading difficulty level of the stories had been altered in their adaptation to the sentence structures, probably to lower levels of difficulty; therefore, the preliminary test population was selected to be fifth grade pupils.

Individual test booklets were formed by combining the story-forms, appropriate comprehension checks, and cover pages designed to secure certain pupil data. This produced twenty-

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See Appendix D.
five different test booklets of four pages each. These booklets were coded with the number of the story-form used in the booklet and were placed in a repeating random sequence through the use of a table or random numbers.¹

In the distribution of the test booklets to the pupils, a random procedure was also followed. This consisted of distributing the booklets up one row of pupils and down the next. These procedures made certain that the groups of pupils that received identical booklets would be true chance samples of the total population tested.

Since the purpose of this testing program was to determine the approximate difficulty levels of the five stories and the difficulty and reliability indices of the test items of the comprehension checks, the decision was made to group the results of the story-forms to get over-all results for each story. By using these composite results as the basis of the item analysis, any possibility of loading the test items toward a certain sentence structure was avoided.

Analysis of Results

The tests were scored without using a correction-for-guessing formula because the tests were administered as power tests; thus making the assumption possible that the correlation

between the number-right scores and the corrected-for-guessing scores would be high enough to make the computation unwarranted.

The preliminary testing program produced a total of 257 test booklets. The distributions of the scores from these booklets are presented below in Table 4.

Table 4. Distributions of Scores by Story from the Preliminary Testing Program

<table>
<thead>
<tr>
<th>Score</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
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<td>1</td>
<td>0</td>
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<td>16</td>
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</tr>
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</tr>
<tr>
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<td>0</td>
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</tr>
<tr>
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<td>1</td>
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</tr>
<tr>
<td>5</td>
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<td>2</td>
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</tr>
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<td>4</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

Totals | 53 | 49| 50| 56| 49|

From an inspection of the distributions of scores in Table 4, it was apparent that the test materials were not of sufficient difficulty for many of the pupils in the groups tested. The question then faced was: At which grade level should the final testing program be administered?
It was known that the socio-economic level of the community in which the preliminary testing was done was very high, which meant that the groups of pupils from which the above results came, were not representative samples of the normal fifth grade population of this section of the state. It was also known that the final testing population would be large and very nearly representative of the pupils of the chosen grade level of this area. In view of these two facts, the decision was made to use fourth grade pupils in the final testing program.

The reliabilities of the five tests used in the preliminary testing program, based on approximately fifty cases each, were determined by computing the correlations of chance-halves of the tests and correcting for length with the Spearman-Brown formula. The reliability coefficients are reported in Table 5 below.

Table 5. Split-Half Reliability Coefficients Corrected by the Spearman-Brown Formula for the Tests Used in the Preliminary Testing Program

<table>
<thead>
<tr>
<th>Story</th>
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<th>Reliability Coefficient</th>
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An item analysis was conducted for each test to determine the indices of discrimination and difficulty for the items. The results of these analyses are reported in Table 6 below.

In Table 6, the column headed "Di" contains the indices of discrimination for the test items and the column headed "Pt" contains the indices of difficulty.
Table 6. Indices of Discrimination and Difficulty of Items of Tests Used in Preliminary Testing Program

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*Items revised for use in final testing program.*

**This test was not used in final testing program.**
In Table 6 above, the column headed "Chi" contains the indices of discrimination for the test items of the several tests. These indices were computed from the chi test suggested by Cureton and reported by Davis. Of this test, Davis says,

The chi test proposed for use by Cureton is designed to determine, as designated levels of confidence, whether a sample drawn at random from the population in which the correct answer is marked by equal proportions of the two criterion groups will have the proportion of the high-scoring criterion group marking the correct answer as large as or larger than the proportion of the low-scoring criterion group marking the correct answer.

Chi was computed as follows:

\[
\text{Chi} = \frac{R_h - R_l - 1}{\sqrt{R_t \left( 1 - \frac{R_t}{N_t} \right)}}
\]

where \( R_h \) = the number of examinees in the high-scoring group who marked the item correctly,
\( R_l \) = the number of examinees in the low-scoring group who marked the item correctly,
\( R_t \) = \( R_h \) plus \( R_l \),
\( N_t \) = the number of examinees in the high-scoring and low-scoring groups.

The values of chi at the .05 level of confidence for the items used in the tests varied from 1.90 to 1.97. From inspection of Table 6, it is seen that many test items, particularly in Test 1, do not have chi values above this level. Also, it may be seen that only a fraction of these failing items were

---

selected for revision. There are two reasons why the majority of these items were not discarded or revised: (1) the chi test, like all similar tests, is designed to predict item performance on a group of examinees similar to that on which the test is conducted, and is not rigidly applicable to groups not similar, which was the case in this study, and (2) these items received high indices of difficulty, which means that so many pupils of both the high-scoring and low-scoring groups got the items correct that the items did not have a chance to discriminate. For example, an item which none of the high-scoring group failed and which two of the low-scoring group failed, would receive a chi of .74, considerably below the 1.90 value for the .05 confidence level. The assumption was made that this item, and other similar items in the tests, would receive acceptable chi values if they were used with a normal group of fourth grade pupils.

The items which were rewritten were selected on the basis of the chi value and the $P_t$ value for each item. The computation of $P_t$, the index of difficulty, is explained below. For example, item number eight of Test 2 received a chi of .00 and a $P_t$ of 61. Three pupils of the high-scoring group failed the item and four of the low-scoring group did likewise. It is obvious that the item was not too easy for the group as a whole, because the $P_t$ value is only a few points above 50, the value of a hypothetical item which half the total group would
answer correctly and half would fail. All items of this sort, five in all, were revised for use in the final testing program.

The difficulty indices for the test items are presented in the columns of Table 6 headed $P_t$, where $P_t$ means per cent of correct responses in the total criterion sample adjusted for chance success. The sample for each test was the twenty-four pupils comprising the high-scoring and low-scoring groups. The indices were determined as follows:¹

$$P_t = \frac{R_t}{N_t} \times 100$$

where $R_t =$ the number of pupils in the entire sample who answer the item correctly,

$W_t =$ the number of pupils in the entire sample who answer the item incorrectly,

$k =$ the number of choices in the item,

$N_t =$ the number of pupils in the entire sample.

An inspection of the difficulty indices reported in Table 6 reinforces the conclusion drawn from an examination of the distributions of test scores presented in Table 4, that the test materials were too easy for the select population used in the preliminary testing program.

¹Davis, op. cit., p. 280.
Revision of Test Booklets for Final Testing

The test booklets were revised considerably for the final testing.\(^1\) The greater portion of the revision lay in format changes. Since the purposes of the final testing were more complex than those of the preliminary testing, in that comparisons of intra-pupil performance as well as inter-pupil performance were desired, the number of story-forms used by each pupil had to be increased. Considering the average-pupil-time-per-story-form of twelve minutes, determined from the preliminary testing, the decision was made to include four story-forms and their comprehension checks in each test booklet. These would be administered in two sittings with two story-forms being completed in each sitting. The decision to include four story-forms in a single booklet made necessary the elimination of one complete set of story-forms. Since the forms of the story, Seven Spears, were considerably longer than the other story-forms,\(^2\) these forms were selected as those to be dropped.

The elimination of five story-forms reduced the total number to twenty. Since each test booklet was to contain four of the story-forms, the use of a design pattern was necessary. After some experimentation, the design presented in Table 7 below was adapted.

\(^1\)See Appendix D.

\(^2\)See Table 3, p. 35.
Table 7. The Design of the Test Booklets Used in the Final Testing Program

<table>
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<tr>
<th></th>
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<td>17 15 25 31 41</td>
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<td></td>
</tr>
<tr>
<td>3</td>
<td>11 12 21 22 34 35 44</td>
<td>13 14 24 31 41</td>
<td></td>
<td>18 15 25 32 42</td>
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<tr>
<td>4</td>
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<td>13 14 24 33 44</td>
<td></td>
<td>20 15 25 34 44</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The use of the design presented in Table 7 made possible the inclusion of each of the twenty different story-forms four times in the twenty different test booklets. Furthermore, this design made possible the pairing of story-forms so that two sentence structures would appear twice each in a single test booklet. For example, in booklet 9, the compound sentence structure appears in the first two stories, and the simple sentence structure appears in the last pair of stories; and, in booklet 10, the same initial structure, compound sentence, is paired with the second type of sentence structure, the simple sentence with verbal element.

Besides the obvious advantage, the quadrupling of the number of test scores, this design made possible the comparison of pupil performance on two stories, each written in the same structure, as well as pupil performance on stories written in different structures.

Final Testing Population

The final testing population consisted of the entire fourth grades of four eastern Massachusetts communities. One of these communities, a small seacoast, residential town contributed 165 cases. The second, a small industrial city produced more than half of the total number of cases used in the study, 811. The third community, a combination residential and rural town, gave 152 cases to the study; and 272 cases were found in the last community, a combination residential and
industrial town. These four communities, when regarded as a total group, were considered as very nearly representative of the entire eastern Massachusetts population.

Final Testing Program

The final testing program extended over a period of two weeks, in February 1951. This extended period was caused by the problems of distribution and collection of the test booklets in the different communities. As in the preliminary testing, all tests were administered by the classroom teachers. Two sittings of about thirty minutes each were used, occurring on consecutive mornings. The tests were not timed and the children were allowed to work at their own rate.

A total of 1,750 booklets were distributed to the schools but pupil absences and incomplete booklets reduced the number of usable test booklets to 1,400.
CHAPTER V

ANALYSIS OF DATA
CHAPTER V

ANALYSIS OF DATA

Introduction

The purpose of this chapter is to present the procedures and statistical techniques used in the analysis of the data secured from the final testing program.

The analysis of variance technique was the principal statistical tool used in the analysis of the data. Through the use of this technique, the fundamental question raised in this study "Does the structure of a sentence affect the comprehension of that sentence by the reader?" was answered, insofar as this investigation is concerned.

The following data were determined from a further analysis of the data and are reported in this chapter: (1) reliabilities of the tests used with the stories, (2) correlations of test scores, and (3) distributions of test scores.

Analysis of Test Results

The procedures followed in the design, construction, and revision of the experimental materials used in this study produced four stories, each written in five types of sentence structure, and a reading comprehension test to accompany each story. Thus, with the completion of the administration of these materials, there were available data for four independent estimates of the effect of sentence structure upon reading
comprehension.

The four scores from each of the 1,400 test booklets were grouped to obtain two half-total scores, the sum of the first and second tests and the sum of the third and fourth tests. These scores and sums for each pupil were punched in Hollerith cards, along with identifying data. The four test scores were transferred into another deck of cards and all squares and cross-products of the scores were determined and punched in the deck in a machine operation. The two half-total scores, or sums, were treated in the same manner. Thus, for each pupil, the following data was available in Hollerith cards: (1) four test scores, one for each story used in the study, the squares and cross-products of these scores, and (2) two half-total scores, one for each half of the test booklet, the squares and cross-products of these two scores.

These decks of cards were sorted into groups with respect to story, sentence structure, booklet number and the data recorded in them were counted and summed in machine operation. These operations produced the number of pupils in the various groups, the sum of the scores, the sum of the squares of these scores, and the sum of the cross-products of these scores for the various groups, all the necessary data for the analysis of variance and the intercorrelations of the test scores.

From the above data, the distributions of scores and totals by story-form; and the means, standard errors of the
means, and standard deviations of the scores for each story-form were determined and are presented in Tables 8 through 11.
Table 8. Distributions by Story-Forms of Scores from the Final Testing Program

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<td>8</td>
<td>9</td>
<td>8</td>
<td>8</td>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td>5</td>
<td>12</td>
<td>9</td>
<td>6</td>
<td>12</td>
<td>9</td>
<td>15</td>
<td>15</td>
<td>16</td>
<td>11</td>
<td>13</td>
<td>6</td>
<td>4</td>
<td>6</td>
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<td>6</td>
<td>7</td>
<td>6</td>
<td>11</td>
<td>11</td>
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<td>4</td>
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<td>7</td>
<td>4</td>
<td>4</td>
<td>12</td>
<td>7</td>
<td>16</td>
<td>7</td>
<td>12</td>
<td>11</td>
<td>4</td>
<td>5</td>
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<td>8</td>
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<tr>
<td>3</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>9</td>
<td>9</td>
<td>7</td>
<td>2</td>
<td>12</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>5</td>
<td>2</td>
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<td>2</td>
<td>3</td>
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<tr>
<td>2</td>
<td>3</td>
<td>2</td>
<td>7</td>
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<td>4</td>
<td>6</td>
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<td>7</td>
<td>7</td>
<td>3</td>
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<td>2</td>
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<td>1</td>
<td>0</td>
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<tr>
<td>1</td>
<td>1</td>
<td>3</td>
<td>0</td>
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<td>0</td>
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<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</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>0</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Total  278 287 284 271 280 278 287 284 271 280 284 277 269 283 282 284 277 269 288 282
From inspection of Table 8 above, it is apparent that the difficulty of the stories varied somewhat. Stories 1 and 2, Trapped and The Narrow Escape, produced nearly normal distributions,¹ whereas Stories 3 and 4, The Wicked Bankivas and The Wolf Pups, were not sufficiently difficult for all the pupils of the groups concerned and produced negatively skewed distributions. On the whole, the tests had sufficient ceiling as less than one per cent of the groups received perfect scores on the first two tests and about two per cent on the last two.

It was not surprising that there should be scores below four correct because the groups included a cross section of fourth grade pupils and some pupils included were so lacking in reading ability that their test scores were chance scores.

The total number of the scores for each story-form, story, and form are summarized in Table 9 below.

¹Appendix E contains Normal Percentile Charts on which selected distributions of scores are presented.
Table 9. Numbers and Totals of Pupils Reading Story-Forms

<table>
<thead>
<tr>
<th>Sentence Structure</th>
<th>Story 1</th>
<th>Story 2</th>
<th>Story 3</th>
<th>Story 4</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>278</td>
<td>278</td>
<td>284</td>
<td>284</td>
<td>1124</td>
</tr>
<tr>
<td>2</td>
<td>287</td>
<td>287</td>
<td>277</td>
<td>277</td>
<td>1128</td>
</tr>
<tr>
<td>3</td>
<td>284</td>
<td>284</td>
<td>269</td>
<td>269</td>
<td>1106</td>
</tr>
<tr>
<td>4</td>
<td>271</td>
<td>271</td>
<td>288</td>
<td>288</td>
<td>1118</td>
</tr>
<tr>
<td>5</td>
<td>280</td>
<td>280</td>
<td>282</td>
<td>282</td>
<td>1124</td>
</tr>
<tr>
<td>Totals</td>
<td>1400</td>
<td>1400</td>
<td>1400</td>
<td>1400</td>
<td>5600</td>
</tr>
</tbody>
</table>

The number of pupils reading the various story-forms varies slightly, from 269 to 288. Since all pupils read all stories, the totals for the stories are the same, 1,400. Another effect of the experimental design which is evidenced in this table is the identical totals for corresponding forms of the pairs of stories, Stories 1 and 2, and Stories 3 and 4. Also, it may be seen that, when the scores by form, or sentence structure, are grouped for all the stories, there are over 1,100 scores for each form.
From an inspection of the means presented in Table 10, it may be seen that the magnitudes of the differences between pairs of means within columns, or within stories, vary from .01 to .79 raw score points. The column headed weighted average includes the average scores, for the four stories combined, of the forms of sentence structure. These means and averages are based on the corresponding numbers of cases presented in Table 9.

The standard errors of the means of the story-forms presented above in Table 10 were computed and are presented to give partial meaning to the differences among the pairs of means within the columns of Table 10.

From an inspection of Table 10, it may be observed that many of the differences among the specified means do not exceed the standard error of either mean. For example, in Story 1, Trapped, the difference between the means for forms 1 and 2,
simple sentence and simple sentence with verbal element, is .15 raw score points and the smaller standard error, that for for 1, is .206. From this comparison, it is obvious that no statistical technique would reveal a significant difference between these two means. However, differences do exist among the column means which require accurate statistical consideration.

Table 11. Standard Deviations of Scores on Story-Forms

<table>
<thead>
<tr>
<th>Sentence Structure</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3.43</td>
<td>3.45</td>
<td>3.45</td>
<td>3.73</td>
</tr>
<tr>
<td>2</td>
<td>3.51</td>
<td>3.30</td>
<td>3.28</td>
<td>3.60</td>
</tr>
<tr>
<td>3</td>
<td>4.17</td>
<td>3.74</td>
<td>3.35</td>
<td>3.69</td>
</tr>
<tr>
<td>4</td>
<td>3.44</td>
<td>3.66</td>
<td>3.42</td>
<td>3.52</td>
</tr>
<tr>
<td>5</td>
<td>3.62</td>
<td>3.99</td>
<td>3.37</td>
<td>3.60</td>
</tr>
</tbody>
</table>

The standard deviations of the distributions of scores for the story-forms, presented above in Table 11, vary from 3.43 to 4.17 raw score units, the greatest amount of variation occurring in Story 1, Trapped. From an inspection of these standard deviations, it would appear that the variabilities of the several groups of scores are within the limits of chance.

The amount of variation of these standard deviations was very important because the primary restriction of the analysis
of variance technique was that the variability of the test scores for each story-form must be the same, or within the limits of chance variation. If this restriction had not been met, that is, if the variability of the test scores for the various forms of each story were not within chance limits, then no further legitimate testing of statistical hypotheses could have been made.

The hypothesis, then, that the standard deviation of the scores for each form of Story 1, Trapped, was equal to the standard deviation of the normal parent population, was tested by an application of the L₁ test. Story 1, Trapped, was selected to be tested in this manner because its forms had the greatest range of standard deviations and it was assumed that, if this story verified the hypothesis tested by the L₁ test, all other stories would do the same.

The numbers and sums used in the computation of the L₁ test are presented in Table 12.
Table 12. Calculation of $L_1$ for Story 1, Trapped

<table>
<thead>
<tr>
<th>$N_f$</th>
<th>log $N_f$</th>
<th>$N_f\log N_f$</th>
<th>$\theta_f$</th>
<th>log $\theta_f$</th>
<th>$N_f\log \theta_f$</th>
</tr>
</thead>
<tbody>
<tr>
<td>278</td>
<td>2.44404</td>
<td>679.44312</td>
<td>3.279.30</td>
<td>3.51577</td>
<td>977.58406</td>
</tr>
<tr>
<td>287</td>
<td>2.45788</td>
<td>705.41156</td>
<td>3.533.92</td>
<td>3.54888</td>
<td>1018.51756</td>
</tr>
<tr>
<td>284</td>
<td>2.45332</td>
<td>696.74288</td>
<td>4.938.75</td>
<td>3.69360</td>
<td>1048.98240</td>
</tr>
<tr>
<td>271</td>
<td>2.43297</td>
<td>659.33497</td>
<td>3.212.36</td>
<td>3.50682</td>
<td>950.34322</td>
</tr>
<tr>
<td>280</td>
<td>2.44716</td>
<td>685.20480</td>
<td>3.677.85</td>
<td>3.56559</td>
<td>998.36520</td>
</tr>
</tbody>
</table>

$N = \log N = 3426.13723$  $\log \theta_f = 18.647.18$  $N_f\log \theta_f = 4993.59744$

The value of $L_1$ was determined by computing the value of log $L_1$, where

$$\log L_1 = \log N - \frac{1}{N} \sum N_f \log N_f + \frac{1}{N} \sum N_f \log \theta_f - \log (\sum \theta_f),$$

$N_f =$ the number of test scores for each story form, and

$\theta_f =$ the "within" forms sum of squares for each story-form, taken from column five of Table 12,

and then $L_1$ was found from a table of antilogarithms as follows:

$$\log L_1 = 3.14615 - 2.44724 + 3.56685 - 4.27061$$

$$= 9.99613 - 10$$

$$L_1 = .988$$
The next step in the L₁ test was to determine the harmonic mean of the number of cases for each form of the story, which was

$$\frac{5}{\frac{1}{278} + \frac{1}{287} + \frac{1}{284} + \frac{1}{271} + \frac{1}{280}}, \text{ or } 279.892$$

Referring to Nayer's tables¹ with $k = 5$ and with 280 degrees of freedom, it was found that $P > .05$. Thus, the hypothesis was accepted and it was concluded that the scores on the various forms of Story 1, Trapped, were of equal variability.

The analysis of variance was then applied to test the significance of the variation of the form means for each story, presented in Table 10 above. Of the analysis of variance, Johnson² says,

The efficiency of its (analysis of variance) use in testing if a group of samples may be regarded as having come from the same homogeneous population, is clearly illustrated by comparison with the traditional biometric method used for such purposes. In the latter, it is customary to calculate independently a standard error for each of the possible comparisons of the means of the several samples. The labor involved in this procedure is not its only objection. The chief objection is that in many cases, the obtained estimates of standard errors may not differ beyond merely sampling errors. In such cases, it may be concluded that the larger part of the observed differences is attributable to random sampling errors, and that a more accurate as well as much less complicated analysis would result by pooling the sums of


²Ibid., p. 216-217.
squares of deviations from the different means and by applying the combined estimate in the test of significance. This change introduced by the analysis-of-variance-method serves to provide an exact test of the null hypothesis and hence is used habitually by the modern research worker.

The analysis of variance technique will be presented in detail for Story 1, Trapped; for the other three stories, the analysis will be presented in summary form.

The null hypothesis was established that there were no differences in the form means for Story 1, presented in Table 10 above, other than could be attributed to chance fluctuations. Put more precisely, the hypothesis stated that the five groups of test scores for the story-forms were drawn from the same normal parent population, and that the groups of scores do not differ from one another except through chance variations from sampling.

All sums and sums of squares necessary for the analysis of variance were available from the machine operations described above. These sums were manipulated according to the following notation:

\[(y - \overline{y}) = (\overline{y}_t - \overline{y}) + (y - \overline{y}_t)\]  

(1)

where  
\[y = \text{the sum of squares of the scores for all forms of Story 1},\]

\[\overline{y} = \text{the squared sum of the scores for all forms of Story 1 divided by the number of scores},\]

\[\overline{y}_t = \text{the sum of the squared sum of scores for each form of Story 1 each divided by the number of scores}\]
Notation 1 may be read as stating that the total sum of squares, that is, the sum of squares of the deviations of the 1,400 scores from their grand mean, is equal to the "between" forms sum of squares, the sum of squares of the form means around the grand mean, plus the "within" forms sum of squares, the sum of squares of the deviations of the scores of each form around the form means. Table 13 below presents the sums and sums of squares necessary to test the significance of the variation of the form means of the story, Trapped, through the analysis of variance method.

Table 13. Sums and Sums of Squares of Scores for the Forms of Trapped

<table>
<thead>
<tr>
<th>Form Code Number</th>
<th>Number of Pupils</th>
<th>Sum of Scores</th>
<th>Sum of Squares of Scores</th>
<th>Sum of Squares About Means</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$N_f$</td>
<td>$\sum X$</td>
<td>$\sum X^2$</td>
<td>$\sum X^2 - \frac{(\sum X)^2}{N_f}$</td>
</tr>
<tr>
<td>1</td>
<td>278</td>
<td>3,072</td>
<td>37,226</td>
<td>3,279.30</td>
</tr>
<tr>
<td>2</td>
<td>287</td>
<td>3,029</td>
<td>35,507</td>
<td>3,538.92</td>
</tr>
<tr>
<td>3</td>
<td>284</td>
<td>3,054</td>
<td>37,780</td>
<td>4,938.75</td>
</tr>
<tr>
<td>4</td>
<td>271</td>
<td>2,918</td>
<td>34,632</td>
<td>3,212.36</td>
</tr>
<tr>
<td>5</td>
<td>280</td>
<td>2,922</td>
<td>34,171</td>
<td>3,677.85</td>
</tr>
<tr>
<td>Totals</td>
<td>1400</td>
<td>14,995</td>
<td>179,316</td>
<td>18,647.18</td>
</tr>
</tbody>
</table>

From Table 13, the following values may be given the parts of notation 1,
The values under the heading "Mean Square" were obtained by dividing the value for the sum of squares by the corresponding degrees of freedom. The value for F was found from the ratio of the two mean squares, between forms divided within forms. The Table of F was entered with 4 and 1935 degrees of freedom and the value of F at the .05 level of significance was found to be 2.37. Since the computed value of F for this story was 1.15, the null hypothesis was accepted.

Then, for the first story considered in detail above, Trapped, the effect of the different sentence structures upon the reading comprehension of the five groups of pupils did not
produce significant differences in the test scores of those groups.

The analyses of variance for the remaining three stories are presented in standard analysis of variance form in Tables 15 through 17 below.

Table 15. Analysis of Variance of Scores on Different Forms of Story 2, *A Narrow Escape*

<table>
<thead>
<tr>
<th>Variance</th>
<th>d.f.</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F</th>
<th>Hypothesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between forms</td>
<td>4</td>
<td>35.41</td>
<td>8.85</td>
<td>.63</td>
<td>Accepted</td>
</tr>
<tr>
<td>Within forms</td>
<td>1395</td>
<td>19,567.62</td>
<td>14.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1399</td>
<td>19,603.03</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 16. Analysis of Variance of Scores on Different Forms of Story 3, *The Wicked Bankivas*

<table>
<thead>
<tr>
<th>Variance</th>
<th>d.f.</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F</th>
<th>Hypothesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between forms</td>
<td>4</td>
<td>96.11</td>
<td>24.03</td>
<td>2.09</td>
<td>Accepted</td>
</tr>
<tr>
<td>Within forms</td>
<td>1395</td>
<td>15,996.03</td>
<td>11.47</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1399</td>
<td>16,092.14</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 17. Analysis of Variance of Scores on Different Forms of Story 4, *The Wolf Pups*

<table>
<thead>
<tr>
<th>Variance</th>
<th>d.f.</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F</th>
<th>Hypothesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between forms</td>
<td>4</td>
<td>48.39</td>
<td>12.09</td>
<td>.91</td>
<td>Accepted</td>
</tr>
<tr>
<td>Within forms</td>
<td>1395</td>
<td>18,469.51</td>
<td>13.24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1399</td>
<td>18,517.90</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From inspection of Tables 15 through 17, it may be seen that, for each of the stories, the null hypothesis, that there were no significant differences among the form means of each of the stories, was accepted. Thus, the results of the four independent parts of this investigation are in agreement that the sentence structures used in the several forms of the stories did not affect the reading comprehension of the groups of pupils reading those forms to the extent that significant differences among the means of these groups were produced.

Following suggestions from McNemar,\(^1\) the means of the forms of each story\(^2\) are presented in graph form in Figure 1 in order to afford a comparison of the effects of the various sentence structures on the reading comprehension of the four stories. In addition, the weighted averages of the form means are presented.


\(^2\)See Table 7, p. 53.
Figure 1. Lines of Story-Form Means and Weighted Averages
The lines of means presented in Figure 1 above reveal in general high similarity among the effects of the several sentence structures on the reading comprehension of the forms of the four stories. The average trend of these effects for the stories together is best reflected in the composite line, or line of weighted averages.

Although no statistically significant conclusions may be drawn from these lines portrayed in Figure 1, there are definite trends presented as to the general effect of the structures on the comprehension of the forms of the stories.

These trends are: (1) the compound sentence produced the easiest reading, (2) the simple sentence and the complex sentence were tied for producing the next easiest reading, (3) the simple sentence with verbal element produced the next to hardest reading, and (4) the inverted sentence produced the hardest reading. Again it is stated that these are trends and are not statistically significant results.
Reliability of Tests

The reliability of the tests used in the final testing program was determined in the following manner. A random sample of 140 test booklets, or one-tenth of the total number of test booklets, was selected, and the correlations of the chance-halves of each of the four tests contained in these booklets were computed. The results, corrected by the Spearman-Brown Formula, are reported in Table 18.

Table 18. Split-Half Reliability Coefficients Corrected by the Spearman-Brown Formula for the Tests Used in the Final Testing Program

<table>
<thead>
<tr>
<th>Story</th>
<th>Code of Test</th>
<th>Reliability Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trapped</td>
<td>1</td>
<td>.670</td>
</tr>
<tr>
<td>A Narrow Escape</td>
<td>2</td>
<td>.857</td>
</tr>
<tr>
<td>The Wicked Bankivas</td>
<td>3</td>
<td>.788</td>
</tr>
<tr>
<td>The Wolf Pups</td>
<td>4</td>
<td>.741</td>
</tr>
</tbody>
</table>

Correlations of Test Scores

The correlations of scores on the tests used with pairs of stories in the final testing were computed. For example, Test 1, used with all forms of Story 1, Trapped, and Test 2, used with all forms of Story 2, A Narrow Escape, were taken by five independent groups of pupils, one group for each form of

---

1Greene and Crawford, op. cit., p. 139.
sentence structure in which the stories were written. The correlations of the scores on Test 1 and Test 2 for each of these five groups of pupils are presented in Table 19.

Correlations of scores on Tests 3 and 4 were computed in the same manner and are presented in Table 19.

The groups of pupils are identified in Table 19 below by the code numbers of the story forms which they read.

Table 19. Correlations of Scores for Groups of Pupils on the Four Tests Used in the Final Testing Program

<table>
<thead>
<tr>
<th>Group</th>
<th>Number of Pupils</th>
<th>Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>11 - 21</td>
<td>278</td>
<td>.617</td>
</tr>
<tr>
<td>12 - 22</td>
<td>287</td>
<td>.611</td>
</tr>
<tr>
<td>13 - 23</td>
<td>284</td>
<td>.631</td>
</tr>
<tr>
<td>14 - 24</td>
<td>271</td>
<td>.618</td>
</tr>
<tr>
<td>15 - 25</td>
<td>280</td>
<td>.637</td>
</tr>
<tr>
<td>31 - 41</td>
<td>284</td>
<td>.714</td>
</tr>
<tr>
<td>32 - 42</td>
<td>277</td>
<td>.718</td>
</tr>
<tr>
<td>33 - 43</td>
<td>269</td>
<td>.749</td>
</tr>
<tr>
<td>34 - 44</td>
<td>288</td>
<td>.703</td>
</tr>
<tr>
<td>35 - 45</td>
<td>282</td>
<td>.763</td>
</tr>
</tbody>
</table>
CHAPTER VI

SUMMARY AND CONCLUSIONS
CHAPTER VI

SUMMARY AND CONCLUSIONS

Restatement of Purpose and Procedures

The purpose of this study was to investigate the relation of sentence structure to reading comprehension. A review of the research completed in this area revealed certain sentence structure arrangements which warranted further investigation. These arrangements of sentence structure were: (1) simple sentence, (2) simple sentence with verbal element, (3) compound sentence, (4) complex sentence, and (5) inverted sentence.

Five stories were selected for preliminary experimentation. Each story was adapted to the five arrangements of sentence structure. In other words, each of the five forms of each story was loaded with a single sentence structure, the amount of loading being governed by the adaptability of the story content to the specific structure involved.

Five reading comprehension tests, of eighteen multiple-choice items each, were constructed, one for each story. Thus, a single test was used with the five forms of each story.

The preliminary experimentation took place with fifth grade pupils. As a result of this trial testing, the decision was made to use fourth grade pupils in the final testing. A further result was the dropping of one story, Seven Spears from the study.
From the final testing program, data was secured from 1,400 pupils. These data were manipulated through punched card methods and the variations of pupils' scores on the various forms of each story were determined and tested for significance.

Conclusions

The differences among the means of the pupils' scores on the forms of each story were small, ranging from .01 to .79 raw score points. For example, for the story Trapped, the mean score of 278 pupils on form one, written in simple sentences, was 11.05 ± .206. The mean score of 287 pupils on form two of Trapped, loaded with simple sentences containing verbal elements, was 10.90 ± .207. The difference between these means was .15 raw score points.

The means presented above are representative of the means for the other forms of Trapped and for the other three stories used in this study. In many cases, as in the example presented above, the difference between pairs of means did not exceed the standard error of the means.

In view of these small differences among the form means, the logical conclusion seemed to be that there were no real differences in pupils' comprehension of the various sentence structures.

An exact test of significance, the analysis of variance, was applied to the results on each of the stories to determine
if there were statistically significant differences among the form means. The results of the analysis of variance for each story agreed with the surmised conclusion; that there were no variations in the pupils' scores on the various forms of the stories which could not be attributed to chance fluctuations.

However, when the effects of the sentence structures on the pupils' comprehension of the stories were averaged definite trends were noted. These trends were: (1) the compound sentence produced the highest comprehension scores, (2) the simple sentence and the complex sentence were equal in producing the next highest scores, (3) the simple sentence with verbal element produced the next to lowest comprehension scores, and (4) the inverted sentence produced the lowest scores. The reader is reminded that these were trends and not statistically significant results.

Limitations

The findings of this investigation were surprising but not entirely unexpected. They were surprising because they were contrary to logical thinking in that the simpler structures were not found to be easier to comprehend than the more complex structures. The findings were not unexpected because no significant results were reported in any of the previous investigations devoted entirely to the relation of sentence structure
to reading comprehension.¹

In the paragraphs following, those factors are discussed which seem to have contributed to the lack of significant variation among the pupils' scores on the forms of the stories.

First, the reliabilities of the tests used to measure the reading comprehension of the story-forms varied from .67 to .85. It is possible that the magnitude of these reliabilities was such as to obscure possible differences in the test scores.

Second, it is possible that the content of the stories was such that the pupils were able to grasp it without relying upon the structure of the sentences.

Third, it is possible that some of the items in the comprehension checks did not measure pupils' comprehension of broad concepts and relations within the story content.

Fourth, it was not possible to adapt all sentences of a single story to the various arrangement of sentence structure, except in the case of the first form of each story, that including the simple sentence. In the other forms of the stories those sentences which were not suited to the specific arrangement of sentence structure were left as simple sentences. Thus, a substantial portion of each form was written in the same form of sentence structure, the simple sentence.

¹The group of studies to which reference is made are those listed under the heading Investigations of Sentence Structure and Reading Comprehension in Chapter II of this study.
Fifth, although this study involved only fourth grade pupils, there were a few pupils for whom the test materials were too easy and a larger group for whom the test materials were too difficult. The test scores of the latter group tended to be chance scores, the presence of which possibly contributed to the obscuring of any real differences among the groups of scores.

Limitations of the study in terms of the representativeness of the findings include: (1) the use of a single grade level on which to secure the test data, (2) the limited use of arrangements of sentence structure, and (3) the restricted range of content of the stories used.
Suggestions for Further Research

Suggestions for further research in this field lie in two areas: (1) suggestions for those interested in further study of the relation of the sentence structure used in this study to reading comprehension, and (2) for those interested in studying the relation of other elements of sentence structure to reading comprehension.

In the first area, the use of stories of varied content and varied form of presentation might produce useful results. Also, experimentation with different grade levels could be valuable. The use of longer stories and longer tests would increase reliability of the tests and make possible the detection of more minute differences in levels of reading comprehension. The selection of different arrangements of sentence structure for experimentation could well produce needed information.

In the second area, further investigation of the relation of sentence length to comprehension seems warranted at the elementary grade level. Also, investigation in the relation of story content to comprehension should produce valuable results; or investigation of various combinations of content, sentence length, and sentence structure and comprehension may be worthwhile.
BIBLIOGRAPHY


Cooperative Test Service of the American Council on Education. The Cooperative Reading Comprehension Tests. New York, 1940.


Davis, Frederick B. "Fundamental Factors of Comprehension in Reading." Unpublished Doctor's Dissertation, Harvard University, Graduate School of Education, 1941.

Durost, Walter N.  The Measurement Notebook. Published by the

Flesch, Rudolph.  Marks of Readable Style. New York: Teachers
College, Columbia University, 1943. (Teachers College,
Columbia University, Contributions to Education, No. 897).

Flesch, Rudolph.  The Art of Plain Talk. New York: Harper and
Brothers, 1946.  p. 34.

Garrett, H. E. and Zubin, J.  "The Analysis of Variance in
Psychological Research." Psychological Bulletin 40: 233-
267; 1943.

Grant, D. A.  "On 'The Analysis of Variance in Psychological
Research'." Psychological Bulletin 41: 158-166; March 1944.

Gray, William S.  "Progress in the Study of Readability."

Gray, William S. and Leary, Bernice E.  What Makes A Book

Greene, Harry A. and Crawford, John R.  Workbook in Educational
Measurements and Evaluation. New York: Longmans, Green and


Halpin, Frances.  "Comprehension Difficulties of Various Sen-
University School of Education, 1945.

Henley, Ruth E.  "Comprehension Difficulties of Various Sen-
University School of Education, 1938.

Holland, B. F.  "The Effect of Length and Structure of Sentence
on the Silent Reading Process." Psychological Bulletin 50:
668-669; November 1933.

Jesperson, Otto.  Essentials of English Grammar. New York:

Johnson, Marjorie.  "Factors in Reading Comprehension." Educa-
tional Administration and Supervision 35: 385-406; November
1949.


APPENDIX A

ORIGINAL SELECTIONS
Ahead of them loomed a heavy forest of verdant breadfruit and mimosa. Into it the leader plunged, with the herd following close in his wake. To either side the forest was dark and almost impenetrable, but directly to the front there was a broad and well-worn trail that seemed to lead far ahead.

Along this trail the elephants pounded. The frightening call of the native hunters still echoed far behind them. And Jamba, though he was filled with grave misgivings, could do nothing but go with them. The trees blotted out the waning sunlight, leaving all in semi-darkness which added to his trepidation. Then too, there was something about this forest which was unlike all other forests he had ever seen.

The trail was too straight. It was cleft through the tall trees as though a giant bolt of lightning had cut it clear in a single swath. And how could the trail be so free and clear of obstacles when the trees on both sides were so close together that an elephant could not pass between them?

Then the trail, which at first had been so broad and inviting, began to dwindle. Narrower and narrower it grew. The elephants, which at first had been traveling four and five abreast, had to slow down and form a line two abreast.

Shoulder to shoulder with his neighbor, Jamba was more suspicious than ever. Then he saw something ahead which gave him a vast sense of relief.

The trail, he could see, came to its narrowest point; then it broadened into a wide clearing which seemed to go on for a long distance.

The leader pounded through the narrow gap and out into the open. Jamba, not far behind, took his turn through the opening, glad to be rid of the tightening trail which gave him an unpleasant sense of confinement and seemed even to press against his breath.

Though it was dusk and the gloom was thickening, Jamba could see that he had entered a broad clearing surrounded on all sides by closely-spaced trees. He followed the leader now in blind faith, trusting him to find a trail out. Behind him one elephant after another came through the narrow gateway.

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until at last every one of them had entered.

Boom!

A sudden tremendous thumping sound made Jamba plunge in wild fear. It seemed to come from the rear, back where he had entered the clearing. Trying to check his panic which threatened to engulf him, Jamba craned his neck to look backward and see what had made the noise. And it was then that his worst fears were realized.

A moment before there had been a narrow gateway there, where Jamba and his fellow elephants had entered the clearing.

Now the entrance was gone! It was closed. In its place were solid trees, side by side.

Moro Boy

The trail led across a wide, sluggish river. The water was murky with mud; the banks were high and sloping. There was one place where the mudbank was worn to a smooth slant as if something had slid down it many times. Alug sat on the smooth place, and he skidded down it into the warm water with a shout. He waded slowly, in order to enjoy the water and the feel of the soft mud on his feet. In the middle of the stream the water was deeper; it came just under his arms. He pushed steadily toward the opposite side, feeling ahead of him with his foot so that he would not step unexpectedly into a hole.

The water was still fairly deep when he reached the other bank and a rough brown log lay across the path he wanted to climb out. He put his hands on the log to pull himself up on tip of it. The log gave a jerk. One of the rough places on it flew open. It was an angry red eye. The front end of the log swung around and Alug saw an ugly, pointed head and sharp white teeth shining in the big mouth.

He screamed and sprang back into the deeper water, his heart pounding wildly. He was too frightened to move any farther. The big head swung around and the short scaly legs began to dig into the soft mud. The long body began to slide slowly forward.

into the water.

"Why it's a crocodile--it must be a crocodile," Alug gasped. "Of course, it's a crocodile. It couldn't be anything else."

He stood staring at the great body as it glided over the smooth bank. The front legs and half the body were in the water before he even thought to reach for his barong. Then he snatched it from its sheath and swung it with all his might at the moving animal. There was a crunching sound and the last twelve inches of the crocodile's tail stayed behind; the rest of him disappeared with a swirl into the muddy water.

Alug scrambled out onto the grass and pulled the tail along after him. His knees knocked so with excitement that he had to sit down. He watched the river for a long time to see if the crocodile would come back; but after the ripples cleared away, there were no signs of life at all. He began to wonder if the crocodile would die, or if it might already be dead. Now that he thought about it, he didn't really want the crocodile to die. Perhaps with such a long tail, losing just a small piece of it would not hurt too much.

He had forgotten to put his barong back in its sheath and it lay on the ground beside him. The shining blade was splotched with dark blood. A strange feeling sang inside him as he looked at it, a feeling as strange as the jungle itself, and as wild.

"My blade is blooded," he shouted. "My blade is blooded." He did not know where the old belief had arisen, but every Moro thought that blood on his barong made the blade cut better. Alug scrubbed his weapon clean with a handful of grass, thrust it deep in the ground and polished it on his trousers. It sparkled and flashed in the sunlight as he put it back in its sheath.

His task was done now. He could think of nothing more that needed his attention. He could think of going back to his home now, if he could find it, and of telling the story of his adventures.
The Wicked Bankiva

The best known of all the birds of the Philippines is the jungle fowl, or bankiva. But if the mothers of children have hatred in their hearts for this bird it is not strange. They tell the story of the bankiva to the little ones to warn them to shun this evil bird.

Once in the first times the gods and goddesses were under obligation to the bankiva. To pay their indebtedness to him, he demanded that they give him power to bewitch little children. In that way he could be able to have revenge upon men for his constant killing of the jungle fowl. The gods gave their grudging consent, but decreed that the bankiva should have this supernatural power but one day out of the year.

On that day the mothers soon learned to guard their children and warn them not to leave the house. In fear and trembling they would listen and try to hear the strange sweet music of the bankiva's song. But alas, the danger was still there, for it is not within the power of older persons to hear the fowl's voice. Only the children hear that song, and when parents are unaware of the bird's presence, the little ones, if not watched, will answer that call.

The bankivas always selected the largest and most handsome of their flock as their leader. Hundreds of birds assembled for the strangest dance in all the jungle. With heads held high, the bankivas strutted about until each had found its place in the formation. Then when all was ready and the signal was given by the leader, out of the jungle they came, half marching, half dancing.

When the strange procession neared the edge of the village, their weird wild call was heard by the children. Unable to resist, all the boys and girls who could, answered that song, and ran from their houses toward the sound. First they could see the leader strutting toward them, singing his strange sweet song. Behind the leader came hundreds of others, all dancing and singing. The children watched, fascinated, first from a distance and then drawing closer. And as they listened to the enchanting music of the birds and watched the rhythmic steps of their dance, a strange power seemed to draw them closer to the bankivas. At last all had joined the birds and, like them, were dancing and singing.

When all the children had joined the dancers, the leader of
the bankivas turned away from the village and began making his
way back into the jungle. The other birds turned also, following
their leader. Then the children followed too, bewitched by the
birds. Joyfully they went along, all the boys and girls, big and
little; and even babies, toddling after brothers and sisters,
tried to keep up with the others. On and on they danced, going
deeper and deeper into the darkness of the forest.

But when night fell, the spell of the bankivas was broken.
With harsh cruel cries the jungle fowls flew away, leaving the
children alone in the jungle. And when they had gone the child-
dren seemed to awake as from a sweet dream. Finding themselves
in almost total darkness in a strange place, they huddled together
fearfully. Older ones tried in vain to comfort the cries of the
little ones, telling them that when morning came they would find
their way home again.

But some of the children never reached home again. And now
when that day of the year comes round when the bankivas will
again possess their evil power, the mothers gather their children
close and tell them, as a warning, of the little ones who never
came back because they listened to the birds' evil song.

Bo the Cave Boy

One day Ja, my father, came early to the caves. As I ran to
the campfire to meet him I saw that fastened to his shoulders was
the fresh skin of a wolf. When he slipped the wolfskin to the
ground it moved as if it were alive.

With my eyes almost jumping out of my head, I stepped back
until I saw the furry little creatures shaken out on the ground.
They, my father said, were the young pups of the wolf he had
killed.

"That is how we get our dogs, Little Bo. Some of the dogs
that now live with us were once wolves. Sometimes we feed them
but when our food does not satisfy their hunger, they go out into
the woods and find small animals for their meat.

"The wolf has only teeth with which he can fight. He must

1. W. W. Fiske, Bo the Cave Boy. Boston: Ginn and Company,
1941. pp. 20-23.
slash and tear, so that he can kill quickly, before his prey can escape. He is a fierce fighter. If he were not a good fighter, many times he would go hungry.

"These baby wolves will be your friends. When they are older they will hunt with you; and if you are attacked, they will fight like wolves to protect you."

Then Ja rolled the wolf cubs up again in the skin of their mother and carried them to our cave.

"They have had much milk from their mother," Ja told me, as he placed them on the wolf skin, "but now they cannot get that, and not yet have they strong teeth to tear the kind of food we can give them.

"I will scrape off some bits of raw meat for them, but not very much today. When they have eaten, they will sleep on the wolf skin. They will smell their mother and think she is near them. As they get used to meat, and as their teeth grow stronger, each day they shall have more to eat."

When the baby wolves had eaten, my father placed them down on the skin, with the soft side toward them. Then he took the moccasins I had worn on my feet that day and laid one beside each puppy.

"They will play with these, Little Bo," he told me, "and they will smell you while they play. Soon the smell of their mother will grow less, but your smell will be big, for you will always be with them. Then they will forget their mother and belong only to you.

"They will come to you when you call, and to no one else will they go, for you are the one they will always remember. When you are older, they will hunt with you and guard you from danger. They will not be like those lazy dogs that have lived too long around the men's campfires."

The next day my little friends did not leave our cave. Many times I scraped off a little meat for them, since Ja had said that mine must be the hand to feed them. Then I would fasten two gourds around my neck and bring them water from a shallow place in the river where we all drank. At the first, they did not seem to know how to drink, but as I pushed their heads close to the water, they reached out with their little red tongues and, after a taste or two, lapped the water until they had taken enough. Then they pushed their wet noses against my hand, and I was very happy.

I was not lonely now, and I sat and watched them as they tuck ed their little noses under their tails and went to sleep. On the fur that still smelled strongly of their mother, they
they slept comfortably. Each day they ate more of the meat, then tried their little teeth on the moccasins I no longer wore.

When they were older, Ja helped me carry them to the foot of our cave cliff, and there we played together until it was time for me to return to the cave. Not yet could they live down on the ground with the camp dogs.

Seven Spears

Tiki stood at the edge of the jungle listening. He shaded his eyes. His three feet eight inches of height made it hard to see over the bush, and the sunshine hurt his eyes, for Tiki lived in the gloom of the great Ituri jungle.

Silently Tiki faded into the jungle. The green dusk swallowed his bare, brown body completely. High above his head flowers rioted in the sunshine, clinging to the topmost branches of the giant trees. But in spite of the flowers, Tiki could smell the pungent taint of wild elephants.

He, Tiki, who had yet to win his place among the men of the clan, had located the elephants. He had done better than any of the men Igwa had sent out. Through him the pygmy clan would be able to hunt the rogue elephant, the old female who had destroyed their village.

Tiki raised his small bow and tested the creeper which served as a bowstring. He laughed, but in laughing he made no sound. When he was a baby, he had been able to cry without making a sound. The little people of the Ituri jungle were a silent people, except, of course, when safe in a village. Tiki laughed because he was happy. He had located the elephants. Igwa would let him go with the hunters.

Wrinkling his nose, he listened. The sounds he heard were faint, the rustling of leaves as the elephants moved their huge ears. Then there was a rumbling sound, a loud sound which rolled through the jungle. The rumbling came from the stomach of the huge elephant. Tiki laughed again, his silent laugh. The old

1. Rutherford Montgomery, "Seven Spears", Story Parade. 15, No. 7 : 16-20 (September, 1950)

* The forms of this story were not used in the final testing program.
one could walk through the thickest bush without making a sound, but she could not keep her stomach from telling the world where she was hiding.

Moving silently as a leopard, Tiki ran through the green twilight. Once he halted to listen to sounds coming from beyond the green wall to his right. The sound was a loud drumming, which beat on his ears like heavy blows. Tiki usually ran away as fast as he could when he heard a gorilla drumming and bellowing but today he had work to do.

Making sure that there was no chance of meeting the old silver-back on the dim trail, Tiki ran on. Before he saw any of the elephants, he smelled them, and then heard the loud stomach rumblings. He counted the separate sounds. Five elephants, two old and three smaller. Tiki paused beside a giant tree.

A huge form loomed above him. He was standing within ten paces of the old female elephant. Her savage disposition had caused the other elephants to let her stand alone. Tiki peered past her and saw a big bull and three smaller animals standing close together. The bull had a fine set of tusks. Tiki looked up at the cow. Her tusks were not so good and would buy less salt and arrow points, but she was the one they must kill, because she might return and attack the village again.

Tiki stood silently, checking the ground, planning the kill. Igwa would want to know how the beasts were standing, what the ground was like, where the trees stood, and how much open bush they would have to work with. Tiki fixed the scene in his mind before he turned away. When he did turn he ran swiftly. Igwa and his hunting scouts had returned to the village. In passing the small street the old elephant had torn down every hut. She had not gotten her trunk on a single pygmy, because they had darted into the jungle when they first heard her savage screams. Already the women and girls were rebuilding the huts, tying the bamboo canes together and covering the framework with leaves. They had been working less than an hour but most of the little houses were finished.

Igwa and his men were seated around a fire-pit. Their faces were gloomy. Then Tiki came running out of the jungle. No one asked any questions until he had spoken, but the gloom vanished from their faces.

Tiki tried hard not to show how excited he was. "There are five. They sleep," he said.

Igwa got to his feet. He was the tallest man in the clan. He stood four feet, five inches, and weighed eighty-seven pounds.

"How do they sleep," he asked.
Tiki described the elephants, how they stood, where the trees stood, and where the open bush spread. When he had finished, Igwa nodded.

"We will take seven spears." He smiled at Tiki. "You have earned a choice. What will you do?"

Tiki gripped his small bow. He pulled himself up very straight. "I will speak to the elephant," he said.

"That you have earned," Igwa agreed. Tiki was asking for the task which Igwa usually performed himself because it was the most dangerous art of the elephant hunt. But Igwa was wise. Tiki might think better of his choice before long.

The hunters got to their feet. They picked up their little bows and examined the small metal points to make sure the poison was still on the blades. Seven of them picked up long spears tipped with iron blades. They looked at the blades to make sure that they were well smeared with poison made from the roots of the kilabo.

Igwa led his men into the jungle. There were fourteen hunters, fourteen little brown fellows going out to kill a rogue elephant. They moved like silent shadows with Tiki leading the way.

Tiki led them in a circle to get the wind right. He remembered the gorilla and avoided that clearing. When he was near the elephants, he lifted one hand. The hunters crowded around Igwa and an excited talk took place, all through signs. Igwa settled the argument and gave a signal.

The small hunters moved toward the thick foliage which hid the elephants. When the seven spearmen were ten paces from the sleeping female, they halted. She loomed above them, swaying gently back and forth, unaware of her danger.

No pygmy had strength enough to drive a spear through the tough old elephant's hide, but they had a plan. They planted their spears in the ground, with the blades slanting towards the elephant. They set them so close together there was barely room even for a pygmy to squeeze between the shafts. When the spears were set, they slipped back to where Igwa stood with the other hunters.

Igwa waved a hand. He looked at Tiki. Tiki smiled at him, but he was cold and was not sure he would be able to move. Igwa waited.

Tiki knew that if he did not move, Igwa would take his place, and everyone in the clan would know he was afraid. He looked at the sleeping elephant. Her stomach rumbled loudly. Her great tusks curved out toward him. Tiki started to move toward the elephant.
When he reached the planted spears, he slipped between them. Slowly he walked toward the huge beast. He was in the open now; the sun shone on his brown body. He halted just beyond the reach of the deadly trunk.

With a loud yell, Tiki leaped into the air. He jumped up and down as he yelled. The elephant's eyes opened. Her trunk lifted and her great ears flapped. Her savage scream filled the jungle. Then she charged, her trunk reaching for the little fellow who dared to challenge her.

Tiki whirled and fled. He ducked between the spears like a rabbit, then dodged to his right and dived into a bush. The instant he landed in the bush, he was up and away, darting and ducking. Behind him the screams of the elephant changed from angry squeals to the roar of a wounded beast. She had plunged upon the planted spears, and her own had done what the pygmies could never have managed to do.

Tiki circled and came back toward the scene of the attack. He found the hunters following the trail of the wounded elephant. Her companions had crashed away and were smashing down trees and brush far below. Igwa was listening. After a minute he gave a signal. The hunters started along the path the rogue elephant had made through the jungle.

The hunters ran along for less than a half-mile before coming upon the elephant. Her great bulk lay at the foot of a tree. Igwa walked up to her and placed a bare foot against her side. When she did not move, a great shout went up from the hunters. Little whistles were taken from thongs at the belts of the hunters. The jungle rang with the shrill piping. Soon the whistle signals were answered from the bush. The rest of the pygmies would soon arrive.

Tomorrow there would be a great feast to celebrate the death of their enemy, the savage rogue elephant. And because the poison would not harm the meat, they would gorge themselves on elephant meat, which the pygmies consider a great delicacy.

Tiki climbed upon the mountain of meat and danced a little dance. From now on, he would be a hunter.
APPENDIX B

REVISED STORY-FORMS
A heavy forest of breadfruit and mahogany loomed ahead of the elephants. The leader plunged into it. The herd followed close in his wake. To either side the forest was dark. It was almost impenetrable. A broad, well-worn trail led directly to the front. It stretched far ahead. The elephants thought so, anyway.

The elephants hurried along this trail. They heard the calls of the hunters behind them. Jamba, a husky young elephant, was filled with doubt. But he went on with the herd. The trees blotted out the sunlight. Everything was left in semi-darkness. This added to Jamba's fear. Then too, something was strange about this forest. Jamba had seen many other forests. This one was unlike all the others. The trail was too straight. It went on a line through the tall trees. Maybe a giant bolt of lightning had cut it with a single stroke. The trail was free of obstacles. The trees on both sides were close together. An elephant could not fit between them.

Now the broad trail was dwindling. It had been so inviting. It grew narrower and narrower. The elephants slowed down to a walk. They had been traveling four and five abreast. Now they formed a line of two abreast.

Jamba was walking shoulder to shoulder with his neighbor. He felt very suspicious. Then he saw something ahead. This gave him a great feeling of relief. The trail came to its narrowest point. Then it broadened into a wide clearing. The clearing would hold the entire herd of elephants.

The leader rushed through the narrow gap. He pounded out into the open. Jamba, not far behind, took his turn through the opening. He was glad. Now he was rid of the tight trail. That tightness had given him an unpleasant feeling. He had felt confined. The trail had pressed against his breath.

It was dusk. The gloom was thickening. Jamba looked around the clearing. He was in the center of it. Trees surrounded it on all sides. The trees were very close together. He had followed the leader in blind faith. He still had faith in him. The leader would find a trail out. Behind him one elephant after another came through the narrow gateway. At last every one of them had entered.

Slam!

Jamba heard a sudden thumping sound. The noise came from the rear. It came from the entrance to the clearing. Jamba plunged in wild fear. He checked his panic. He craned his neck. He looked backward. His worst fears were realized.

A narrow gateway had been there before. Jamba and his fellow elephants had entered through it into the clearing. Now the entrance was gone. It was closed. A huge door of trees was in its place. Jamba was trapped.
A heavy forest of breadfruit and mahogany loomed ahead of the elephants. The leader plunged into it with the herd following close in his wake. To either side the forest was dark. It was almost impenetrable. A broad, well-worn trail, stretching far ahead, led directly to the front. The elephants thought so, anyway.

Hurrying along this trail, the elephants heard the calls of the hunters behind them. Jamba, a husky young elephant, was filled with doubt. But he went on with the herd. The trees blotted out the sunlight, leaving everything in semi-darkness. This darkness added to Jamba's fear. Then, too, something was strange about this forest. Jamba had seen many other forests. This forest was unlike all the others. The trail, going on a line through the tall trees, was too straight. Maybe a giant bolt of lightning had cut it with a single stroke. The trail was free of obstacles. The trees on both sides were close together. An elephant would not be able to fit between them.

Now the narrow trail was dwindling. After having been so inviting, it grew narrower and narrower. The elephants slowed down to a walk. After having traveled four and five abreast, they formed a line of two abreast.

Shoulder to shoulder with his neighbor, Jamba, feeling very suspicious, saw something ahead. This gave him a great feeling of relief. After coming to its narrowest point, the trail broadened into a wide clearing. The clearing would hold the entire herd of elephants.

Rushing through the narrow gap, the leader pounded out into the open. Jamba, not far behind, took his turn through the opening. He was glad to be rid of the tight trail. That tightness had given him an unpleasant feeling. He had felt confined, the trail having pressed against his breath.

It was dusk. The gloom was thickening. Jamba looked around the clearing. He was in the center of it. Trees surrounded it on both sides. The trees were very close together. Having followed the leader in blind faith, Jamba still had faith in him. The leader would find a way out. Behind him one elephant after another came through the narrow gateway. At last every one of them had entered.

Slem!

Jamba heard a sudden thumping sound coming from the rear. It came from the entrance to the clearing. After plunging in wild fear, Jamba checked his panic. Grasping his neck, he looked backward. His worst fears were realized.

A narrow gateway had been there before. Through it Jamba and his fellow elephants had entered the clearing. Now the entrance was gone. It was closed. A huge door of trees was in its place. Jamba was trapped.
A heavy forest of breadfruit and mahogany loomed ahead of the elephants. The leader plunged into it, and the herd followed close in his wake. To either side the forest was dark and it was almost impenetrable, but a broad, well-worn trail led directly to the front. It stretched far ahead. The elephants thought so, anyway.

The elephants hurried along this trail. They heard the calls of the hunters behind them, and Jamba, a husky young elephant, was filled with doubt, but he went on with the herd. The trees blotted out the sunlight, and everything was left in semi-darkness. This added to Jamba's fear and then, too, something was strange about this forest. Jamba had seen many other forests, but this was unlike all the others. The trail was too straight. It went on a line through the tall trees. Maybe a giant bolt of lightning had cut it with a single stroke. The trail was free of obstacles, and the trees on both sides of the trail were close together. An elephant could not fit between them.

Now the broad trail was dwindling, and it had been so inviting. It grew narrower and narrower, and the elephants slowed down to a walk. They had been traveling four and five abreast, and now they formed a line of two abreast.

Jamba was walking shoulder to shoulder with his neighbor. He felt very suspicious, and then he saw something ahead. This gave him a great feeling of relief. The trail came to its narrowest point, and then it broadened into a wide clearing. The clearing would hold the entire herd of elephants.

The leader rushed through the narrow gap and he pounded out into the open. Jamba, not far behind, took his turn through the opening. He was glad. Now he was rid of the tight trail. That tightness had given him an unpleasant feeling. He had felt confined. The trail had pressed against his breath.

It was dusk and the gloom was thickening. Jamba looked around the broad clearing. He was in the center of it. Trees surrounded it on all sides, and the trees were very close together. He had followed the leader in blind faith, and he still had faith in him. The leader would find a way out. Behind him one elephant after another came through the narrow gateway, and at last every one of them had entered.

Slam!

Jamba heard a sudden thumping sound. The noise came from the rear. It came from the entrance to the clearing. Jamba plunged in wild fear. He checked his panic. He craned his neck. He looked backward and his worst fears were realized.

A narrow gateway had been there before. Jamba and his fellow elephants had entered the clearing through it, and now the entrance was gone. It was closed and a huge door of trees was in its place. Jamba was trapped.
A heavy forest of breadfruit and mahogany loomed ahead of the elephants. After the leader had plunged into it, the herd followed close in his wake. To either side, the forest, which was dark, was almost impenetrable. A broad, well-worn trail led directly to the front. It stretched far ahead. The elephants thought so, anyway.

As they hurried along this trail, the elephants heard the calls of the hunters behind them. Jamba, a husky young elephant, was filled with doubt. But he went on with the herd. As the trees blotted out the sunlight, everything was left in semi-darkness. This added to Jamba's fear. Then, too, something was strange about this forest. Although Jamba had seen many forests, this was unlike all the others. The trail, which went on a line through the tall trees, was too straight.

Maybe a giant bolt of lightning had cut it with a single stroke. The trail was free of obstacles. The trees on both sides were so close together that an elephant could not fit between them.

Now the broad trail was dwindling after it had been so inviting. As it grew narrower and narrower, the elephants slowed down to a walk. Whereas they had been traveling four or five abreast, now they formed a line of two abreast.

Jamba was walking shoulder to shoulder with his neighbor. He felt very suspicious, until he saw something ahead that gave him a great feeling of relief. After the trail came to its narrowest point, it broadened into a wide clearing which would hold the entire herd of elephants.

The leader rushed through the narrow gap. After the leader had pounded out into the open, Jamba, not far behind, took his turn through the opening. He was glad now that he was rid of the tight trail. That tightness had given him an unpleasant feeling. He had felt confined. The trail had pressed against his breath.

It was dusk. The gloom was thickening. Jamba looked around the clearing. He was in the center of it. The trees, which surrounded it on all sides, were close together. He had followed the leader in blind faith. He still had faith in him. The leader would find a trail out. Behind him one elephant after another came through the narrow gateway, until, at last, every one of them had entered.

Slam!

Jamba heard a sudden thumping sound which came from the rear. The noise came from the entrance to the clearing. Jamba plunged in wild fear. He checked his panic. He craned his neck. He looked backward. His worst fears were realized.

A narrow gateway had been there before, through which Jamba and his fellow elephants had entered the clearing. Now the entrance was gone. It was closed. A huge door of trees was in its place. Jamba was trapped.
Ahead of the elephants loomed a heavy forest of breadfruit and mahogany. Into it plunged the leader. Close in his wake followed the herd. Dark was the forest to either side. It was almost impenetrable. A broad well-worn trail led directly to the front. It stretched far ahead. So thought the elephants anyway.

Along this trail hurried the elephants. They heard the calls of the hunters behind them. Filled with doubt was Jamba, a husky young elephant. But on with the herd went he. The trees blotted out the sunlight. Everything was left in semi-darkness. This added to Jamba's fear. Then too, something was strange about this forest. Many other forests had Jamba seen. Unlike all the others was this. Too straight was the trail. It went on a line through the tall trees. Maybe a giant bolt of lightning had cut it with a single stroke. The trail was free of obstacles. Close together were the trees on both sides. An elephant could not fit between them.

Now the broad trail was dwindling. It had been so inviting. Narrower and narrower grew the trail. Down to a walk slowed the elephants. They had been traveling four and five abreast. Now they formed a line of two abreast.

Jamba was walking shoulder to shoulder with his neighbor. He felt very suspicious. Then he saw something ahead. This gave him a great feeling of relief. To its narrowest point came the trail. Then the trail broadened into a wide clearing. The clearing would hold the entire herd of elephants.

Through the narrow gap rushed the leader. Out into the open pounded the leader. Jamba, not far behind, took his turn through the opening. He was glad. Now he was rid of the tight trail. That tightness had given him an unpleasant feeling. He had felt confined. The trail had pressed against his breath.

It was dusk. Thickening was the gloom. Around the broad clearing looked Jamba. In the center of it was he. Trees surrounded it on all sides. Very close together were the trees. He had followed the leader in blind faith. He still had faith in him. The leader would find a trail out. Through the narrow gateway behind him came one elephant after another. At last every one of them had entered.

Slam!

Jamba heard a sudden thumping sound. From the rear came the noise. It came from the entrance to the clearing. In wild fear plunged Jamba. He checked his panic. He craned his neck. He looked backward. Realized were his worst fears.

A narrow gateway had been there before. Through it into the clearing had entered Jamba and his fellow elephants. Now gone was the entrance. It was closed. In its place was a huge door of trees. Trapped was Jamba.
The trail led across a wide, sluggish river. The water was murky with mud. The banks were high and sloping. In one place the mudbank was worn to a smooth slant. Something had slid down it many times. Alug, a Moro boy, sat on the smooth place. With a shout he skidded down the bank into the warm water. He waded slowly. He enjoyed the water. He liked the feel of the soft mud on his feet. In the middle of the stream the water was deeper. It came just under his arms. He pushed steadily toward the opposite side. Alug felt ahead carefully with his foot. Otherwise he might have stepped unexpectedly into a hole.

Now the young Moro reached the other bank. The water was still fairly deep. He crawled out. A rough brown log lay across the path. He put his hand on the log. Then he pulled himself up on top of it. The log gave a jerk. One of the rough places on it flew open. It was an angry red eye. The front end of the log swung around. Alug saw an ugly, pointed head. He also saw sharp white teeth in the big mouth.

The Moro boy screamed. He sprang back into the deeper water. Alug was frightened. His heart pounded wildly. He could not move any farther. The big head swung around. The short, scaly legs dug into the soft mud. The long body slid slowly forward into the water. Then the young Moro knew. It was a crocodile. It could not be anything else.

The great body slid over the smooth bank. Alug stared at the beast. The front legs were in the water. Then half the long body was in the water. Finally Alug reached for his barong. He snatched it from its sheath. The Moro boy swung at the crocodile with all his might. He heard a crunching sound. The last twelve inches of the crocodile's tail stayed behind. The rest of him disappeared with a swirl into the muddy water.

The Moro boy scrambled out onto the grass. He pulled the tail along after him. His knees were knocking with excitement. He sat down. He watched the river for a long time. He watched for the crocodile. Then the ripples cleared away. He saw no signs of life. He wondered about the crocodile. He felt sorry for him. The crocodile might still be alive. He might be dead. Perhaps he would not miss such a small piece of his long tail. Maybe the wound did not hurt too much.

His new barong lay on the ground beside him. He had forgotten it in his excitement. Now he looked at it. The shiny blade was splotched with blood. A new feeling sang inside the Moro boy. This feeling was very strange and wild. His blade was blooded. Alug had heard the old Moro belief. A bloodied blade cuts better. Alug scrubbed his weapon clean with a handful of grass. He thrust it deep into the ground. Then he polished it on his trousers. The barong sparkled and flashed in the sunlight. Then he carefully put it back in its sheath.

Now he was going back to his home. His adventure would make a fine story.
The trail led across a wide, sluggish river. The water was murky with mud. The banks were high and sloping. In one place the mudbank was worn to a smooth slant, something having slid down it many times. Sitting on the smooth place, Alug, a Moro boy, skidded down it with a shout into the warm water. Wading slowly, he enjoyed the water. He liked to feel the soft mud on his feet. In the middle of the stream the water was deeper, coming just under his arms. Pushing steadily toward the opposite side, Alug felt ahead carefully with his foot not wanting to step unexpectedly into a hole.

Now he reached the other bank, the water being still fairly deep. He crawled out. A rough brown log lay across the path. Putting his hand on the log, he pulled himself up on top of it. The log gave a jerk, one of the rough places on it flying open. It was an angry red eye. The front end of the log swung around. Alug saw an ugly, pointed head. He also saw sharp white teeth in the big mouth.

Screaming, Alug sprang back into the deeper water. He was frightened. His heart pounding wildly, he could not move any farther. The big head swung around. The short, scaly legs digging into the soft mud, the long body slid slowly into the water. Then the Moro boy knew. It was a crocodile. It could not be anything else.

Alug stared at the great body sliding over the smooth bank. The front legs were in the water. Then half the body was in the water. Finally Alug reached for his barong. Snatching it from its sheath, the young Moro swung at the crocodile with all his might. He heard a crunching sound. The last twelve inches of the crocodile's tail stayed behind, the rest of him disappearing with a swirl into the water.

Scurrying out onto the grass, the Moro boy pulled the tail along after him. His knees knocking with excitement, he sat down. He watched the river a long while, looking for the crocodile. Then the ripples cleared away. He saw no signs of life. Wondering about the crocodile, Alug felt sorry for him. The crocodile might still be alive. He might be dead. Perhaps he would not miss such a small piece of his long tail. Maybe the wound did not hurt too much.

His new barong lay on the ground beside him. Having forgotten it in his excitement, he looked at it now. The shiny blade, splotched with blood, made a new feeling sing inside him. The feeling was very strange and wild. At last his blade was blooded. Alug had heard the old Moro belief. A blooded blade cuts better. After scrubbing his weapon clean with a handful of grass, Alug thrust it deep into the ground. Then, after having been polished on Alug's trousers, the barong sparkled and flashed in the sunlight. He carefully put it back in its sheath.

Now he was going back to his home. His adventure would make a fine story.
The trail led across a wide, sluggish river. The water was murky with mud. The banks were high and sloping, but in one place the mudbank was worn to a smooth slant. Something had slid down it many times. Alug, a Moro boy, set on the smooth place, and with a shout he skidded down the bank into the warm water. He waded slowly. He enjoyed the water and he liked the feel of the soft mud on his feet. In the middle of the stream the water was deeper. It came just under his arms, but he pushed steadily toward the opposite side. Alug felt ahead carefully with his foot. He did not want to step unexpectedly into a hole.

The Moro boy reached the other bank, but the water was still fairly deep, and he had to crawl out. A rough brown log lay across the path. He put his hand on the log, and then he pulled himself up on top of it. The log gave a jerk, and one of the rough places on it flew open. It was an angry red eye. The front end of the log swung around, and Alug saw an ugly, pointed head. He also saw sharp white teeth in the big mouth.

The young Moro screamed, and he sprang back into the deeper water. Alug was frightened. His heart bounded wildly, and he could not move any farther. The big head swung around, and the short, scaly legs dug into the soft mud. The long body slid slowly forward into the water. Then Alug knew. It was a crocodile. It could not be anything else.

The great body slid over the smooth bank, and Alug stared at the beast. The front legs were in the water, and then half the body was in the water. Finally Alug reached for his barong. He snatched it from its sheath, and he swung at the crocodile with all his might. He heard a crunching sound, and the last twelve inches of the crocodile's tail stayed behind. The rest of him disappeared with a swirl into the muddy water.

The Moro boy scrambled out onto the grass and he pulled the tail along after him. His knees were knocking with excitement, and he set down. He watched the river for a long time. He watched for the crocodile. Then the ripples cleared away, but he saw no signs of life. He wondered about the crocodile, and he felt sorry for him. The crocodile might be still alive, or he might be dead. Perhaps he would not miss such a small piece of his long tail, and maybe the wound did not hurt too much.

His barong lay on the ground beside him. He had forgotten it in his excitement. Now he looked at it. The shiny blade was splattered with blood. A new feeling sang inside the Moro boy. The feeling was very strange and wild. At last his blade was blooded. Alug had heard the old Moro belief. A blooded blade cuts better. Alug scrubbed his weapon clean with a handful of grass. He thrust it deep into the ground, and then he polished it on his trousers. The barong sparkled and flashed in the sunlight. Then he carefully put it back in its sheath.

Now he was going back to his home. His adventure would make a fine story.
The trail led across a wide, sluggish river the water of which was murky with mud. The banks were high and sloping. In one place, where something had slid down it many times, the mudbank was worn to a smooth slant. Alug, a Moro boy, sat on the smooth place. With a shout he skidded down the bank into the warm water. He waded slowly because he enjoyed the water. He liked the feel of the soft mud on his feet. The water was deeper in the middle of the stream where it came just under his arms. As he pushed steadily toward the opposite side, Alug felt ahead carefully with his foot so that he would not step unexpectedly into a hole.

As the Moro boy reached the other bank, the water was still fairly deep. He crawled out toward a rough brown log which lay across the path. He put his hand on the log. As he pulled himself up on top of it, the log gave a jerk. One of the rough places on it flew open. It was an angry red eye. As the front end of the log swung around, Alug saw an ugly, pointed head. He also saw sharp white teeth in the big mouth. The Moro boy screamed. He sprang back into the deeper water. Alug's heart pounded wildly because he was frightened. He could not move any farther. As the big head swung around, the short, scaly legs dug into the soft mud. The long body slid slowly forward into the water. Then the Moro boy knew that it was a crocodile. It could not be anything else.

As the great body slid over the smooth bank, Alug stared at the beast. The front legs were in the water. Then half the body was in the water. Finally Alug reached for his barong. He snatched it from its sheath. As the young Moro swung at the crocodile with all his might, he heard a crunching sound. The last twelve inches of the crocodile's tail stayed behind, as the rest of him disappeared with a swirl into the muddy water.

As the Moro boy scrambled out onto the grass, he pulled the tail along after him. He sat down because his knees were knocking with excitement. He watched the river for a long time. He watched for the crocodile. He saw no signs of life. He wondered about the crocodile because he felt sorry for him. The crocodile might still be alive. He might be dead. Perhaps he would not miss such a small piece of his long tail. Maybe the wound did not hurt too much.

Alug's new barong lay on the ground beside him because he had forgotten it in his excitement. Now he looked at it. Because the shiny blade was splotched with blood, a new feeling sang inside the Moro boy. The feeling was very strange and wild. His blade was blooded. Alug had heard the old Moro belief that a blooded blade cuts better. After Alug had scrubbed his weapon clean with a handful of grass, he thrust it deep into the ground. After he had polished the barong on his trousers, it sparkled and flashed in the sunlight. He carefully put it back into its sheath.

Now he was going back to his home, where his adventure would make a fine story.
Across a wide, sluggish river led the trail. Murky with mud was the water. High and sloping were the banks. In one place worn to a smooth slant was the mudbank. Something had slid down it many times. Alug, a Moro boy, set on the smooth place. Down the bank with a shout skidded he into the warm water. He waded slowly. He enjoyed the water. He liked the feel of the soft mud on his feet. Deeper was the water in the middle of the stream. Just under his arms came the water. Steadily toward the opposite side pushed the Moro boy. Alug felt ahead carefully with his foot. Otherwise he might have stepped unexpectedly into a hole.

Now Alug reached the other bank. Still fairly deep was the water. He crawled out. Across the path lay a rough brown log. The young Moro put his hand on the log. Then he pulled himself up on top of it. The log gave a jerk. Open flew one of the rough places on it. It was an angry red eye. Around swung the front end of the log. Alug saw an ugly, pointed head. He also saw sharp white teeth in the big mouth.

He screamed. Back into the deeper water sprang the Moro boy. Frightened was Alug. Wildly pounded his heart. He could not move any farther. Around swung the big head. Into the soft mud dug the short, scaly legs. Slowly forward into the water slid the long body. Then Alug knew. It was a crocodile. Nothing else could it be.

Over the smooth bank slid the great body. At the beast stared Alug. In the water were the front legs. Then half the body was in the water. Finally for his barong reached Alug. He snatched it from its sheath. He swung at the crocodile with all his might. He heard a crunching sound. Behind stayed the last twelve inches of the crocodile's tail. With a swirl into the muddy water disappeared the rest of him.

Out onto the grass scrambled the Moro boy. He pulled the tail along after him. His knees were knocking with excitement. Down sat the Moro boy. He watched the river for a long while. He watched for the crocodile. Then away cleared the ripples. He saw no signs of life. He wondered about the crocodile. He felt sorry for him. The crocodile might still be alive. He might be dead. Perhaps he would not miss such a small piece of his long tail. Maybe the wound did not hurt too much.

On the ground beside him lay his new barong. He had forgotten it in his excitement. Now he looked at it. Splotched with blood was the shiny blade. Inside the Moro boy sang a new feeling. Very strange and wild was this feeling. Blooded was his blade. Alug had heard the old Moro belief. A blooded blade cuts better. The Moro boy scrubbed his weapon clean with a handful of grass. He thrust it deep into the ground. Then he polished it on his trousers. In the sunlight sparkled and flashed the barong. Then Alug carefully put it back into its sheath.

Now back to his home was he going. His adventure would make a fine story.
The best known of all the birds of the Philippines is the jungle fowl, or bankiva. All the mothers of the Philippines have in their hearts a fear of this bird. This is not strange. Their children must stay away from this evil bird. They tell this story to their little ones.

Once, long ago, the jungle gods were indebted to the bankivas. The bankivas demanded payment. The gods could not pay the bankivas. So they gave the evil birds a great power.

The bankivas could have the great power on only one day of each year. On that day the bankivas could bewitch little children.

The Filipino mothers were not told of the bankivas' evil power. They did not keep their children in the houses on that special day. They did not warn them about the wicked bankivas' song. They could not hear the song. Only the children could hear it. It could call to them mysteriously. It could bewitch them.

The first special day came. Hundreds of birds gathered in the jungle. They selected the most beautiful of their flock for their leader. Then with their heads erect, they strutted about in the jungle. They gloated over their evil power. Soon it was twelve o'clock, noon. Then they followed their leader toward a small village.

The strange procession of bankivas approached the edge of the village clearing. They were singing their weird music. The children heard the music. They looked at the evil birds. They could see the beautiful leader. He was strutting toward them. He was singing the sweet song. The children watched from a distance. They liked this music. Then they moved closer. They joined the long parade of bankivas.

Soon all the children had joined the birds. Then the leader danced off into the jungle. The bankivas and children followed him. Soon they were far from the village. They were still singing joyfully. They danced on to the wildest part of the forest. Back in the village the mothers were looking for their children. They could not find them. Evening was approaching.

The parade went on and on. Then it was dark. The bankivas flew off into the trees with cruel cries. The children were left alone in the jungle. They awakened from their bewitchment. Their cries echoed through the jungle.

They cried all night. Morning came. The children looked for their homes. They became very tired. No one knew the way out of the forest. Only a few children wandered back to the village. The others never reached their homes again.

Now, each year, on the special day of the bankivas, the Filipino mothers gather their children close to them. They tell them this sad story of the wicked bankivas and the lost children.
The best known of all the birds in the Philippines is the jungle fowl, or bankiva. All the mothers of the Philippines have in their hearts a fear of this bird. This is not strange. Their children have to stay away from this jungle bird. They tell this story to their little ones.

Once, long ago, the jungle gods were indebted to the bankivas. The bankivas demanded payment. The gods were not able to pay the bankivas. So they gave the evil birds a great power. The bankivas were able to have this great power on only one day of each year. On that day the bankivas were able to bewitch little children.

The Filipino mothers were not told of the bankivas' evil power. They did not keep their children in the houses on that special day. They did not warn them about the wicked bankivas. The mothers did not know about the sweet music of the bankivas' song. They were not able to hear the song. Only the children were able to hear it. It could call to them mysteriously. It could bewitch them.

The first special day came. Hundreds of birds gathered in the jungle to select the most beautiful of their flock for their leader. Holding their heads high, they strutted about in the jungle, gloating over their evil power. Soon it was twelve o'clock, noon. Then they followed their leader toward a small village.

The strange procession of bankivas, singing their weird music, approached the edge of the village clearing. The children, hearing the music, looked at the evil birds. They could see the beautiful leader strutting toward them, singing the sweet song. The children, watching from a distance, liked this music. Moving closer, they joined the long parade of bankivas.

Then all the children having joined the birds, the leader danced off into the jungle. The bankivas and children followed him. Soon they were far from the village, still singing joyfully. They danced on to the wildest part of the forest.

Back in the village the mothers, looking for their children, were not able to find them. Evening was approaching.

The parade went on and on. Then it was dark. The bankivas flew off into the trees with cruel cries, leaving the children alone in the jungle. They awakened from their bewitchment. Their cries echoed through the jungle.

They cried all night. Morning came. The children, looking for their homes, became very tired. None of them knowing the way out of the jungle, only a few children wandered back to the village. The others never reached their homes again.

Now, each year, on the special day of the bankivas, the Filipino mothers gather their children close to them, telling them this sad story of the wicked bankivas and the lost children.
The best known of all the birds of the Philippines is
the jungle fowl, or bankiva. All the mothers of the Philippines
have in their hearts a fear of this bird and this is not strange.
They must keep their children away from this evil bird. They
tell this story to their little ones.

Once, long ago, the gods were indebted to the bankivas.
The bankivas demanded payment, but the gods could not pay the
bankivas. So they gave the evil birds a great power. The
bankivas could have this great power on only one day of each
year, but on that day they could bewitch little children.
The Filipino mothers were not told about the bankivas' evil power. They did not keep their children in the houses
on that special day, and they did not warn them about the wicked
bankivas. The mothers did not know about the sweet music of
the bankivas' song. They could not hear the song. Only the
children could hear it. It could call to them mysteriously
and it could bewitch them.

The first special day came, and hundreds of birds gathered
in the jungle. They selected the most beautiful of their flock
for their leader, and, with their heads erect, they strutted
about in the jungle. They gloated over their evil power. Soon
it was twelve o'clock, noon, and then they followed their leader
toward a small village.

The strange procession of bankivas approached the edge of
the village clearing, and they were all singing their weird
music. The children heard the music and they looked at the
evil birds. They could see the beautiful leader. He was strutting
toward them and he was singing the sweet song. The children
watched from a distance and they liked this music. Then they
moved closer and they joined the long parade of bankivas.

Soon all the children had joined the birds. Then the
leader danced off into the jungle, and the bankivas and children
followed him. Soon they were far from the village, but they
were still singing joyfully. They danced on to the wildest
part of the forest.

Back in the village the mothers were looking for their
children, but they could not find them. Evening was approaching.
The parade went on and on. Then it was dark and the
bankivas flew off into the trees with cruel cries. The children
were left alone in the jungle. They awakened from their bewitch-
ment, and their cries echoed through the jungle.

They cried all night. Morning came and the children
looked for their homes, but they became very tired. No one
knew the way out of the forest, and only a few children wandered
back to the village. The others never reached their homes again.

Now, each year, on the special day of the bankivas, the
Filipino mothers gather their children close to them, and they
tell them this sad story of the wicked bankivas and the lost
children.
The best known of all the birds of the Philippines is the jungle fowl, or bankiva. That all the mothers of the Philippines have in their hearts a fear of this bird is not strange, because their children must stay away from this evil bird. They tell this story to their little ones.

Once, long ago, the jungle gods were indebted to the bankivas. The bankivas demanded payment. Because the gods could not pay the bankivas, they gave the evil birds a great power. The bankivas could have this great power on only one day of each year. On that day the bankivas could bewitch little children.

Since the Filipino mothers were not told of the bankivas' evil power, they did not keep their children in the houses on that special day. They did not warn them about the wicked bankivas. They did not know about the sweet music of the bankivas' song because they could not hear the song. Only the children could hear it. It could call to them mysteriously. It could bewitch them.

When the first special day came, hundreds of bankivas gathered in the jungle. After they had selected the most beautiful of their flock for their leader, they strutted about in the jungle with their heads erect. They gloated over their evil power. As soon as it was twelve o'clock, noon, they followed their leader toward a small village.

As the strange procession of bankivas approached the edge of the village clearing, they were all singing their weird music. When the children heard the music, they looked at the evil birds. They could see the beautiful leader as he was strutting toward them. He was singing the sweet song. The children watched from a distance. Because they liked this music, they moved closer. They joined the long parade of bankivas.

When all the children had joined the birds, the leader danced off into the jungle. The bankivas and children followed him until they were far from the village. They were still singing joyfully as they danced on to the wildest part of the forest.

Back at the village the mothers were looking for their children. They could not find them. Evening was approaching.

The parade went on and on until it was dark. Then the bankivas flew off into the trees with cruel cries. The children were left alone in the jungle. When they awakened from their bewitchment, their cries echoed through the jungle.

They cried all night. When morning came, the children looked for their homes. They became very tired. Because no one knew the way out of the forest, only a few children wandered back to the village. The others never reached their homes again.

Now, each year, on the special day of the bankivas, the mothers gather their children close to them, as they tell them this sad story of the wicked bankivas and the lost children.
The best known of all the birds of the Philippines is the jungle fowl, or bankiva. All the mothers of the Philippines have in their hearts a fear of this bird. Not strange is this. Their children must stay away from this evil bird. They tell this story to their little ones.

Once, long ago, indebted to the bankivas were the jungle gods. The bankivas demanded payment. Pay the bankivas the gods could not. So they gave the evil birds a great power. The bankivas could have the great power on only one day of each year. On that day the bankivas could bewitch little children.

The Filipino mothers were not told of the bankivas' evil power. Keep their children in the houses on that special day they did not. Warn them about the wicked bankivas they did not. The mothers did not know about the sweet music of the bankivas' song. Hear the song they could not. Only the children could hear it. Call to them mysteriously it could. Bewitch them it could.

Came the first special day. In the jungle gathered hundreds of birds. They selected the most beautiful of their flock for their leader. Then with their heads erect, they strutted about in the jungle. They gloated over their evil power. Soon it was twelve o'clock, noon. Then after their leader toward a small village followed the bankivas.

To the edge of the village clearing approached the strange procession of bankivas. They were all singing their weird music. The children heard the music. They looked at the evil birds. See the beautiful leader they could. Strutting toward them was he. He was singing the sweet song. The children watched from a distance. They liked this music. Then closer moved the children. They joined the long parade of bankivas.

Soon all the children had joined the birds. Then off into the jungle danced the leader. Following him were the bankivas and children. Soon they were far from the village. Still singing joyfully were they. On to the wildest part of the forest danced the children.

Back in the village, looking for their children were the mothers. Find them they could not. Evening was approaching.

On and on went the parade. Then it was dark. Off into the trees flew the bankivas with cruel cries. Alone in the jungle were left the children. They awakened from their bewitchment. Through the jungle echoed their cries.

They cried all night. Morning came. The children looked for their homes. They became very tired. No one knew the way out of the forest. Only a few children wandered back to the village. Never did the others reach their homes again.

Now, each year, on the special day of the bankivas, the Filipino mothers gather their children close to them. They tell this sad story of the wicked bankivas and the lost children.
Bo was playing by the campfire. He looked toward the dark forest. He saw someone at the edge of the trees. It looked like his father. The cave boy scrambled to his feet. He ran toward the forest. Yes, it was his father, Ja. Ja was carrying a fresh wolf-skin. They walked together toward the fire. Bo asked many questions. His father said nothing.

Now they were at the fire. Ja slipped the wolfskin to the ground. It moved. Bo was scared by this strange movement. With wide-open eyes he watched the wolfskin. His father shook it gently. Two furry little animals fell out on the ground. They were the young pups of the dead mother wolf.

Then Bo understood. His father was giving him the little pups. They were his now. The cave boy jumped with joy. He would train the wolf pups. In a few months they would be his hunting dogs. With their large teeth they could kill real game for him.

The cave boy rolled the pups up once more in the skin of their mother. He carried them up the cliff to the cave. The little wolves were very hungry. They had always had plenty of milk from their mother. Now their mother could give them no more. Bo scraped small bits from a large strip of dried deermeat for them. He gave them only a little. Their teeth were still tiny and weak.

Soon the pups got very sleepy. Then Bo wrapped them in the skin of their mother with the furry side next to them. The little wolves were very hungry. They had always had plenty of milk from their mother. Now their mother could give them no more. Bo scraped small bits from a large strip of dried deermeat for them. He gave them only a little. Their teeth were still tiny and weak.

For the next few weeks, Bo kept the pups in the cave. Each day he scraped off more meat for the little wolves. Only Bo fed them. They would love only Bo in return.

Then the day came. Bo carried the pups down the cliff to his favorite hollow. Here the pups wrestled in the sun. Sometimes they would bite Bo's ears playfully. The cave boy was very happy. The pups were growing very fast. In a few months he would have two real hunting dogs. He could hunt many animals with them. Perhaps he would become a truly great hunter.
Bo, playing by the campfire, looked toward the dark forest. He saw someone at the edge of the trees. It looked like his father. Scrambling to his feet, the cave boy ran toward the forest. Yes, it was his father, Ja. Ja was carrying something over his shoulder. Bo met his father. Ja was carrying a fresh wolfskin. They walked together toward the fire, Bo asking many questions, his father saying nothing.

Now they were at the fire. Ja slipped the wolfskin to the ground. It moved. Scared by this strange movement, Bo with his eyes open wide, watched the wolfskin. With his father shaking it gently, two furry little animals fell out on the ground. They were the young pups of the dead mother wolf.

Then Bo understood. His father was giving him the little pups. They were his now. The cave boy jumped with joy. He would train the wolf pups. In a few months they would be able to kill real game for him.

After rolling the pups up once more in the skin of their mother, the cave boy carried them up the cliff to the cave. The little wolves were very hungry, having always had plenty of milk from their mother. Now their mother could give them no more. Bo scraped small bits from a large strip of dried deermeat for them. He gave them only a little, their teeth being still tiny and weak.

Soon the pups got very sleepy. After wrapping them in the skin of their mother with the furry side next to them, Bo put one of his worn-out moccasins in with them. Now they would lie all night with the smell of their mother and Bo's moccasin in their noses. This was a good thing. The smell of their mother would ward off their fear. The smell of Bo's moccasin would acquaint them with him. In a few weeks the smell of their mother would die away, only the smell of Bo remaining. Then they would belong completely to the cave boy. They would love him. They would obey him. They would hunt with him.

For the next few weeks, Bo kept the pups in the cave, each day scraping off more meat for the little wolves. With Bo alone feeding them, they would love only Bo in return.

Then the day came. Bo carried the pups down the cliff to his favorite hollow. Here the pups wrestled in the sun, sometimes biting Bo's ears playfully. The cave boy was very happy. With the pups growing very fast, he would have two real hunting dogs in a few months. He could hunt many animals with them. Perhaps he would become a truly great hunter.
Bo was playing by the campfire. He looked toward the dark forest and he saw someone at the edge of the trees. It looked like his father. He scrambled to his feet and he ran toward the forest. Yes, it was his father, Ja, and he was carrying something over his shoulder. Bo met his father. Ja was carrying a fresh wolfskin. They walked together toward the campfire. Bo asked many questions, but his father said nothing.

Now they were at the fire and Ja slipped the wolfskin to the ground. It moved and Bo was scared by this strange movement. With wide-open eyes he watched the wolfskin. His father shook it gently, and two furry little animals fell out on the ground. They were the young pups of the dead mother wolf.

Then Bo understood. His father was giving him the little pups. They were his now. The cave boy jumped with joy. He would train the wolf pups. In a few months they would be his hunting dogs, and with their large teeth, they could kill real game for him.

The cave boy rolled the pups up once more in the skin of their mother, and he carried them up the cliff to the cave. The little wolves were very hungry. They had always had plenty of milk from their mother, but now their mother could give them no more. Bo scraped small bits from a large strip of dried deermeat for them. He gave them only a little. Their teeth were still tiny and weak.

Soon the pups got very sleepy. Then Bo wrapped them in the skin of their mother with the furry side next to them, and he put one of his worn-out moccasins in with the pups. Now they would lie all night with the smell of their mother and Bo's moccasin in their noses. This was a good thing. The smell of their mother would ward off their fear, and the smell of Bo's moccasin would acquaint them with him. In a few weeks the smell of their mother would die away, and only the smell of Bo would remain. Then they would belong completely to the cave boy and they would love him. They would obey him and they would hunt with him.

For the next few weeks, Bo kept the pups in the cave, and each day he scraped off more meat for the little wolves. Only Bo fed them and they would love only Bo in return.

Then the day came and Bo carried the pups down the cliff to his favorite hollow. Here the pups played in the sun. Sometimes they would bite Bo's ears playfully. The cave boy was very happy. The pups were growing very fast, and in a few months he would have two real hunting dogs. He could hunt many animals with them, and perhaps he would become a truly great hunter.
As Bo was playing by the campfire, he looked toward the dark forest. He saw at the edge of the trees someone who looked like his father. The cave boy scrambled to his feet. He ran toward the forest. Yes, it was his father, Ja. Ja was carrying something over his shoulder. Bo met his father. Ja was carrying a fresh wolfskin. As they walked together toward the fire, Bo asked many questions. His father said nothing.

When they were at the fire, Ja slipped the wolfskin to the ground. It moved. Bo was scared by this strange movement. With wide-open eyes, he watched the wolfskin as his father shook it gently. Two furry little animals that were the young pups of the dead mother wolf fell out on the ground.

Then Bo understood that his father was giving him the little pups. They were his now. The cave boy jumped with joy. He would train the wolf pups. In a few months they would be his hunting dogs. With their large teeth, they could kill real game for him.

The cave boy rolled the pups up once more in the skin of their mother. He carried them up the cliff to the cave. The little wolves were very hungry because they had always had plenty of milk from their mother. Now, because their mother could give them no more, Bo scraped small bits from a large strip of dried deermeat for them. He gave them only a little because their teeth were still tiny and weak.

Soon the pups got very sleepy. Then Bo wrapped them in the skin of their mother with the furry side next to them. The cave boy put one of his worn-out moccasins in with the pups so that they would lie all night with the smell of their mother and Bo's moccasin in their noses. This was a good thing because the smell of their mother would ward off their fear and the smell of Bo's moccasin would acquaint them with him. In a few weeks the smell of their mother would die away. Since only the smell of Bo would remain, they would belong completely to the cave boy. They would love him. They would obey him. They would hunt with him.

For the next few weeks Bo kept the pups in the cave. Each day he scraped off more meat for the little wolves. Since only Bo fed them, they would love only Bo in return.

Then the day came when Bo carried the pups down the cliff to his favorite hollow. Here the pups wrestled in the sun. Sometimes they would bite Bo's ears playfully. The cave boy was very happy. Since the pups were growing very fast, in a few months he would have two real hunting dogs. He could hunt many animals with them. Perhaps he would become a truly great hunter.
Playing by the campfire was Bo. He looked toward the dark forest. He saw someone at the edge of the trees. It looked like his father. To his feet scrambled the cave boy. He ran toward the forest. Yes, it was his father, Ja. Ja was carrying something over his shoulder. Bo met his father. Ja was carrying a fresh wolfskin. They walked together toward the fire. Many questions asked Bo. His father said nothing.

Now they were at the fire. Ja slipped the wolfskin to the ground. It moved. Scared by this strange movement was Bo. With wide-open eyes he watched the wolfskin. His father shook it gently. Out on the ground fell two furry little animals. They were the young pups of the dead mother wolf.

Then Bo understood. His father was giving him the little pups. They were his now. With joy jumped the cave boy. Train these little wolves he would. In a few months they would be his hunting dogs. With their large teeth they could kill real game for him.

The cave boy rolled the pups up once more in the skin of their mother. He carried them up the cliff to the cave. Very hungry were the little wolves. They had always had plenty of milk from their mother. Now their mother could give them no more. Bo scraped small bits of meat from a large strip of dried deermeat for them. He gave them only a little. Still tiny and weak were their teeth.

Soon the pups got very sleepy. Then, Bo wrapped them in the skin of their mother with the furry side next to them. The cave boy put one of his worn-out moccasins in with the pups. Now they would lie all night with the smell of their mother and Bo's moccasin in their noses. A good thing was this. The smell of their mother would ward off their fear. The smell of Bo's moccasin would acquaint them with him. In a few weeks the smell of their mother would die away. Only the smell of Bo would remain. Then, belong to the cave boy completely they would. Love him they would. Obey him they would. Hunt with him they would.

For the next few weeks, Bo kept the pups in the cave. Each day he scraped off more meat for the little wolves. Only Bo fed them. In return, only Bo would they love.

Then came the day. Bo carried the pups down the cliff to his favorite hollow. Here in the sun wrestled the pups. Sometimes they would bite Bo's ears playfully. Very happy was the cave boy. Growing very fast were the pups. In a few months he would have two real hunting dogs. He could hunt many animals with them. Perhaps he would become a truly great hunter.
APPENDIX C

COMPREHENSION CHECKS
Who was Jamba?
1 an elephant trader 2 an elephant 3 a native hunter 4 a young native boy... ( ) ( ) ( ) ( ) ( )

The trail was made by --
1 many animals using it 2 the giant bolt of lightning 3 native hunters 4 a great forest fire... ( ) ( ) ( ) ( )

Why were the elephants hurrying along the trail?
1 they were going home 2 it was getting dark 3 they were afraid of the hunters 4 they liked to run in the forest... ( ) ( ) ( ) ( )

The herd could have escaped by --
1 running off through the trees 2 taking the other trail out of the clearing 3 turning around on the trail 4 sleeping in the clearing... ( ) ( ) ( ) ( )

Who shut the gate of the trap?
1 the native hunters 2 the wind 3 the last elephant through 4 the leader of the elephants... ( ) ( ) ( ) ( )

It was dark in the forest because --
1 it was nearly midnight 2 the sun had not come up yet 3 the trail was so straight 4 the trees shut out the light... ( ) ( ) ( ) ( )

Why was Jamba suspicious?
1 it was getting dark 2 he knew he would be trapped 3 the trees were so tall 4 the trail was too straight... ( ) ( ) ( ) ( )

Why did Jamba follow the leader?
1 he had faith in him 2 he was afraid of him 3 the other elephants followed him 4 he could do nothing else... ( ) ( ) ( ) ( )

Why did Jamba think that this forest was strange?
1 he was very frightened 2 the trees were close together 3 the forest was very dark 4 he had no leader... ( ) ( ) ( ) ( )

Why did the elephants run shoulder to shoulder?
1 the trail was narrow 2 it was safer that way 3 the trees were so straight 4 the clearing was so small... ( ) ( ) ( ) ( )
1. Why was Jamba glad when he got into the clearing?
   1 he wanted to be captured
   2 he had followed the leader
   3 he was proud of the herd
   4 he had plenty of room

2. Where was Jamba when the door was shut?
   1 on the trail near the clearing
   2 near the entrance to the clearing
   3 in the center of the clearing
   4 on the far side of the clearing

3. The author wrote this story to tell the reader --
   1 how the elephants lived in the jungle
   2 how the natives caught wild elephants
   3 how Jamba followed the trail
   4 how the jungle got dark at night

4. The sudden loud sound was made by --
   1 the shutting of the gate
   2 the bellowing of the herd
   3 the shooting of the guns
   4 the falling of the huge trees

5. Jamba's father and mother were --
   1 trapped with the herd
   2 not mentioned in the story
   3 in a circus in America
   4 far away from the clearing

6. How did the hunters frighten the elephants?
   1 by long whips
   2 by shooting guns
   3 by waving flags
   4 by loud calls

7. When did Jamba realize that he was trapped?
   1 when he saw the closed gate
   2 when he saw the straight trail
   3 when he was told by the leader
   4 when he was running with his neighbor

8. The gate to the clearing was closed when --
   1 the leader gave the signal
   2 the herd was in the clearing
   3 the herd was asleep
   4 the herd was on the trail
This story tells about --
1. the killing of a crocodile
2. Alug's adventure with the crocodile
3. the life of a crocodile
4. Alug swimming the river

Alug's father --
1. was not living
2. helped Alug kill the crocodile
3. was not mentioned in the story
4. gave Alug the barong

Alug used the new barong to --
1. cut the grass along the river
2. kill the crocodile
3. cut off the crocodile's tail
4. feel his way across the river

How does the author describe the crocodile?
1. smooth
2. friendly
3. ugly
4. beautiful

The author wrote the story to tell the reader --
1. how Alug cut off the crocodile's tail
2. how Alug killed the crocodile
3. how Alug lost his new barong
4. how Alug got across the river

Why did the crocodile wake up?
1. Alug struck him with his barong
2. he was hungry
3. Alug slid down the bank with a shout
4. Alug grabbed him by mistake

Why was Alug so frightened?
1. his barong was covered with blood
2. the water was over his head
3. the mud was very soft
4. he thought the crocodile was going to bite him

What had made the river bank so smooth in that one place?
1. the crocodile had slid down it many times
2. Alug slid down it
3. the river made it smooth
4. the wind made it smooth

The old Moro belief said that --
1. the barong must be kept clean
2. a blooded barong cuts better
3. a clean barong sparkles in the sun
4. the barong should not be cleaned

Why did Alug feel sorry for the crocodile?
1. he had no tip on his tail
2. he was dead
3. he would not fight back
4. he would not wake up
1. Why did Alug have to sit down on the river bank?
   1 he was tired
   2 he sat down to clean his barong
   3 his leg hurt
   4 his knees were knocking

2. Why did the crocodile slide down the bank and into the water?
   1 the sun was too hot
   2 his tail hurt
   3 Alug startled him
   4 he was thirsty

3. Why did Alug pull on the crocodile?
   1 he wanted to wake up the crocodile
   2 he thought the crocodile was a log
   3 he was seeking an adventure
   4 he did not see the crocodile

4. What was the "barong"?
   1 a heavy knife
   2 a sharp stick
   3 a war club
   4 a heavy spear

5. Why did Alug wade carefully across the river?
   1 he was watching the crocodile
   2 he did not want to step in a hole
   3 he enjoyed the warm water
   4 he could not swim

6. What happened after the ripples cleared away?
   1 bubbles came up
   2 blood stained the water
   3 the fish swam around madly
   4 nothing happened

7. Why did Alug stare at the crocodile?
   1 he was frozen with fear
   2 he was stuck in the mud
   3 he was watching the blood
   4 he was cleaning his barong

8. The crocodile --
   1 watched Alug wade across the river
   2 was asleep on the river bank
   3 bit Alug in the arm
   4 chased Alug across the river
1. "Bankiva" is another name for the --
   1 Philippines  2 jungle fowl  3 native village  4 deep jungle

2. When did the bankivas have their strange power?
   1 every day of the leap-year  2 the first day of each month
   3 on one day of each year  4 every other year

3. Why did the gods give the bankivas the power?
   1 they liked the bankivas  2 the bankivas were beautiful
   3 they owed the bankivas' debt  4 the bankivas were trustworthy

4. The children were bewitched by --
   1 their fear of the forest  2 the gods
   3 the bankivas' singing  4 the bankivas' beauty

5. The leader of the bankivas --
   1 was very beautiful  2 liked the little children
   3 would not leave the children alone  4 stayed with the mothers all day

6. Why did the children join the line of bankivas?
   1 they wanted to leave the village  2 they were seeking adventure
   3 they liked the dark jungle  4 they were bewitched

7. Why did the children never reach home again?
   1 they were happy in the jungle  2 their mothers did not look for them
   3 they lived forever after with the bankivas  4 no one knew the way out of the forest

8. Why do the Filipino mothers tell this story to their children?
   1 to keep them away from the jungle  2 to amuse them
   3 to make them eat their meals  4 to get them to take walks in the jungle

9. Why were the Filipino mothers not bewitched?
   1 they could not dance  2 they could not hear the music
   3 they did not like the jungle  4 they were asleep in the village

10. The bankivas were called "wicked" because --
    1 they left the children in the forest  2 the gods did not like them
    3 the other birds were afraid of them  4 they were so beautiful
1. This story is --
   1 a true story
   2 told by the fathers
   3 history
   4 a fairy story

2. The fathers of the lost children --
   1 were all killed in the war
   2 looked for the lost children
   3 were not mentioned in the story
   4 were bewitched when they were children

3. Why did the bankivas wait until 12 o'clock, noon?
   1 the mothers were asleep then
   2 their power began at that time
   3 the children were playing then
   4 the sun was bright at that time

4. Why is the bankiva the best known bird of the Philippines?
   1 this story is told many times
   2 the bankivas now live in zoos
   3 this story is true
   4 there are no more bankivas

5. The children awakened from their enchantment when --
   1 the mothers found them in the forest
   2 the bankivas flew away
   3 morning came
   4 they lost the path

6. Why were the jungle gods indebted to the bankivas?
   1 the gods had borrowed money from them
   2 the bankivas were beautiful
   3 the bankivas had saved the gods' lives
   4 the story does not say

7. What did the bankivas do before 12 o'clock came?
   1 they gloated
   2 they slept
   3 they flew about the forest
   4 they watched the children

3. Why did not the mothers warn their children to stay away from the bankivas on that first day?
   1 they were too busy
   2 they did not know about the danger
   3 they did not care what happened
   4 they were sleeping
1. **Bo** was playing --
   - 1 by the river
   - 2 by the campfire
   - 3 in the cave
   - 4 with his friends

2. When did the wolf pups get sleepy?
   - 1 after wrestling in the sun
   - 2 after smelling Bo's moccasin
   - 3 after they had eaten
   - 4 after they were warmed by the fire

3. This story tells about --
   - 1 the wolf pack
   - 2 life in the future
   - 3 life long ago
   - 4 the killing of a wolf

4. How did Ja carry the little wolves?
   - 1 in a large bag
   - 2 in his arms
   - 3 in a wolf skin
   - 4 in his pockets

5. Bo's mother --
   - 1 was not mentioned in the story
   - 2 was not living
   - 3 helped Ja kill the mother wolf
   - 4 helped Bo feed the little wolves

6. How long did Bo keep the pups in the cave?
   - 1 several months
   - 2 a few days
   - 3 over a year
   - 4 a few weeks

7. The pups would belong completely to Bo --
   - 1 when the smell of their mother was gone
   - 2 when they were in the wolfskin
   - 3 when the moccasin was taken away
   - 4 when they were hungry

8. Why did Bo want hunting dogs?
   - 1 his father had hunting dogs
   - 2 he wanted someone to play with
   - 3 his brother was a great hunter
   - 4 he wanted to be a real hunter

9. In time the wolf pups would --
   - 1 be turned loose to roam in the forest
   - 2 become Bo's hunting dogs
   - 3 become fat and lazy
   - 4 become wild and disobedient

10. Why was Bo very happy?
    - 1 he would have two hunting dogs
    - 2 the pups were happy
    - 3 the pups belonged to his father
    - 4 he liked to live in the cave
1. This story was written to tell the reader --
   1 that wolves were fierce animals
   2 how men built the first campfire
   3 about animals that lived many years
   4 how the cavemen got their hunting dogs

2. Why were the wolf pups hungry?
   1 they had had no meat all day
   2 they had not eaten for weeks
   3 their mother could give them no milk
   4 they had been wrestling

3. Bo wrapped the pups in their mother's skin so that they --
   1 would be warm
   2 would not be afraid
   3 would be afraid of Ja
   4 would hate their mother

4. Why did the pups eat just a small amount of meat?
   1 their teeth were not strong
   2 they were not hungry
   3 they disliked meat
   4 they had no teeth

5. Why did Bo put his moccasin in with the pups?
   1 because Ja told him to do it
   2 so they would learn his smell
   3 so they would learn to chew leather
   4 because he wanted to get rid of the moccasin

6. What were the pups afraid of?
   1 the skin of their mother
   2 the campfire
   3 the full-grown hunting dogs
   4 the cave people

7. Why would the wolf pups become good hunting dogs?
   1 they would be fierce and obedient
   2 they would be small and tame
   3 they would be wild and hungry
   4 they would be quiet and timid

8. Why would the pups love only Bo?
   1 he slept with them
   2 he fed them
   3 he loved them
   4 he kept them in the cave
APPENDIX D

SAMPLE TEST BOOKLETS
Reading Comprehension Test
Trial Form
Lincoln Fish
Boston University

me__________________________________________ School__________________________

x____Age on last birthday____ Number of months since last birthday

wm or City________________________________ Date______________________________

_________________________ __________________________

reactions:

In this test there is one story for you to read. After the story is a short test over the story. Read the story through carefully and then answer the questions. You may not look back to the story after you have finished reading it.

Each question has four possible answers, but only one of these is correct. You should choose the answer that you think is better than the others. Notice the number of the answer that you choose. Find the number on the right side of the page and put an X in the space below the number.

nple story and questions:

Johnny went for a walk in the woods. He crossed a small brook. Tall tree grew beside the brook. Johnny set down under the tree to sit a minute. Then a furry little animal with a long bushy tail ran down the tree. Johnny tried to pat the little animal. The little animal bit his finger and ran back up the tree. Johnny was very disappointed. He walked home very sadly.

Johnny was sitting ---
1 on a rough log 2 by a small brook 3 on the tree stump 1 2 3 4
4 in the edge of the water ..............................................( )( ) ( )

Why did Johnny walk home sadly?
1 the rabbit had run away 2 his hand hurt
3 the squirrel had not trusted him 1 2 3 4
4 he got his feet wet ....................................................( )( ) ( ) ( )
The best known of all the birds of the Philippines is the jungle fowl, or bankiva. All the mothers of the Philippines have in their hearts a fear of this bird. This is not strange for they must keep their children away from this evil bird. They tell this story to their little ones.

Once, long ago, the gods were indebted to the bankivas. The bankivas demanded payment, but the gods could not pay the bankivas. So they gave the evil birds a great power. The bankivas could have this great power on only one day of each year.

The Filipino mothers were not told about the bankivas' evil power. They did not keep their children in the houses on that special day, and they did not warn them about the wicked bankivas. The mothers did not know about the sweet music of the bankivas' song, for they could not hear the song. Only the children could hear it, and it could call to them mysteriously. It could bewitch them.

The first special day came and hundreds of birds gathered in the jungle. They selected the most beautiful of their flock for their leader, and, with their heads held high, they strutted about in the jungle. They gloated over their evil power. Soon it was twelve o'clock, noon. Then they followed their leader toward a small village.

The strange procession of bankivas approached the edge of the village clearing and they were all singing their weird music. The children heard the music and they looked at the evil birds. They could see the beautiful leader, for he was strutting toward them. He was singing the sweet song. The children watched from a distance and they liked this music. Then they moved closer and they joined the long parade of bankivas.

Soon all the children had joined the birds. Then the leader danced off into the jungle, and the bankivas and children followed him. Soon they were far from the village, but they were still singing joyfully. They danced on to the wildest part of the forest.

Back in the village the mothers were looking for their children, but they could not find them. Evening was approaching.

The parade went on and on. Then it was dark and the bankivas flew off into the trees with cruel cries. The children were left alone in the jungle. They awakened from their bewitchment, and their cries echoed through the jungle.

They cried all night. Morning came and the children looked for their homes, but they became very tired. No one knew the way out of the forest, and only a few children wandered back to the village. The others never reached their homes again.

Now, each year, on the special day of the bankivas, the Filipino mothers gather their children close to them, and they tell them this sad story of the wicked bankivas and the lost children.
"bankivas" is another name for the ---
1 Philippines  2 jungle fowl
3 native village  4 deep jungle ................. ( ) ( ) ( ) ( )

When did the bankivas have their strange power?
1 every day of the leap year
2 the first day of each month
3 on one day of each year
4 every other year ................................ ( ) ( ) ( ) ( )

Why did the gods give the bankivas the power?
1 they liked the bankivas
2 the bankivas were beautiful
3 they owed the bankivas a debt
4 the bankivas were trustworthy ............... ( ) ( ) ( ) ( )

The children were bewitched by ---
1 the bankivas' beauty  2 the gods
3 the bankivas' singing  4 their fear of the forest...
........................................................................ ( ) ( ) ( ) ( )

The leader of the bankivas ---
1 was very beautiful  2 liked the little children
3 would not leave the children alone
4 stayed with the mothers all day ............... ( ) ( ) ( ) ( )

Why did the children join the line of bankivas?
1 they wanted to leave the village
2 they were seeking adventure
3 they liked the dark jungle
4 they were bewitched ................................ ( ) ( ) ( ) ( )

Why did the children never reach home again?
1 they were happy in the jungle
2 their mothers did not look for them
3 they lived forever after with the bankivas
4 no one knew the way out of the forest ........ ( ) ( ) ( ) ( )

Why do the Filipino mothers tell this story to their children?
1 to keep them away from the jungle
2 to amuse them  3 to make them eat their meals
4 to get them to take walks in the jungle ........... ( ) ( ) ( ) ( )

Why were the Filipino mothers not bewitched?
1 they could not dance  2 they could not hear the music
3 they did not like the jungle
4 they were asked in the village .................... ( ) ( ) ( ) ( )

The bankivas were called "wicked" because ---
1 they left the children in the forest
2 the gods did not like them
3 the other birds were afraid of them
4 they were so beautiful ................................ ( ) ( ) ( ) ( )
This story is
1 a true story 2 told by the fathers 3 history 4 a fairy story
The fathers of the lost children
1 were all killed in the war 2 looked for the lost children 3 were not mentioned in the story 4 were bewitched when they were children
Why did the bankivas wait until 12 o'clock, noon?
1 the mothers were asleep then 2 their power began at that time 3 the children were playing then 4 the sun was bright at that time
Why is the bankiva the best known bird of the Philippines?
1 this story is told many times 2 the bankivas now live in zoos 3 this story is true 4 there are no more bankivas
The children awakened from their enchantment when
1 the mothers found them in the forest 2 the bankivas flew away 3 morning came 4 they lost the path
Why were the jungle gods indebted to the bankivas?
1 the gods had borrowed money from them 2 the bankivas were beautiful 3 the bankivas had saved the gods' lives 4 the story does not say
What did the bankivas do before 12 o'clock came?
1 they gloated 2 they slept 3 they flew about the forest 4 they watched the children
Why did not the mothers warn their children to stay away from the bankivas on that first day?
1 they were too busy 2 they did not know about the danger 3 they did not care what happened 4 they were sleeping

Please close your test booklet so your teacher will know that you are finished.
Reading Comprehension Test
Lincoln Fish
Boston University

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Name________________________________________School____________________________________

Sex____ Age on last birthday____ Number of months since
last birthday______________________________

Town or City______________________________Date____________________________

Directions:

In this test there are four stories for you to read. You will read the first two now and the last two later today. After each story there is a short test over the story. Read the story through carefully and then answer the questions. You may not look back to the story after you have finished reading it.

Each question has four possible answers, but only one of these is correct. You should choose the answer that you think is better than the others. Notice the number of the answer that you choose. Find this number on the right side of the page and put an X in the space below the number.

Sample story and questions:

Johnny went for a walk in the woods. He crossed a small brook. A tall tree grew beside the brook. Johnny sat down under the tree to rest a minute. Then a furry little animal with a long bushy tail came down the tree. Johnny tried to pet the little animal. The little animal bit his finger and ran back up the tree. Johnny was very disappointed. He walked home very sadly.

1. Johnny was sitting —
1 on a rough log  2 by a small brook
3 in the edge of the water  4 on a tree stump ....... ( ) ( ) ( ) ( )

2. Why did Johnny walk home sadly?
1 the rabbit had run away  2 his hand hurt
3 the squirrel had not trusted him  4 he got his feet wet ....... ( ) ( ) ( ) ( )
A heavy forest of breadfruit and mahogany loomed ahead of the elephants. The leader plunged into it with the herd following close in his wake. To either side the forest was dark. It was almost impenetrable. A broad, well-worn trail, stretching far ahead, led directly to the front. The elephants thought so, anyway.

Hurrying along this trail, the elephants heard the calls of the hunters behind them. Jamba, a husky young elephant, was filled with doubt. But he went on with the herd. The trees blotted out the sunlight, leaving everything in semi-darkness. This darkness added to Jamba's fear. Then, too, something was strange about this forest. Jamba had seen many other forests. This forest was unlike all the others. The trail, going on a line through the tall trees, was too straight. Maybe a giant bolt of lightning had cut it with a single stroke. The trail was free of obstacles. The trees on both sides were close together. An elephant would not be able to fit between them.

Now the narrow trail was dwindling. After having been so inviting, it grew narrower and narrower. The elephants slowed down to a walk. After having traveled four and five abreast, they formed a line of two abreast.

Shoulder to shoulder with his neighbor, Jamba, feeling very suspicious, saw something ahead. This gave him a great feeling of relief. After coming to its narrowest point, the trail broadened into a wide clearing. The clearing would hold the entire herd of elephants.

Rushing through the narrow gap, the leader pounded out into the open. Jamba, not far behind, took his turn through the opening. He was glad to be rid of the tight trail. That tightness had given him an unpleasant feeling. He had felt confined, the trail having pressed against his breast.

It was dusk. The gloom was thickening. Jamba looked around the clearing. He was in the center of it. Trees surrounded it on both sides. The trees were very close together. Having followed the leader in blind faith, Jamba still had faith in him. The leader would find a way out. Behind him one elephant after another came through the narrow gateway. At last every one of them had entered.

Slem!

Jamba heard a sudden thumping sound coming from the rear. It came from the entrance to the clearing. After plunging in wild fear, Jamba checked his panic. Craning his neck, he looked backward. His worst fears were realized.

A narrow gateway had been there before. Through it Jamba and his fellow elephants had entered the clearing. Now the entrance was gone. It was closed. A huge door of trees was in its place. Jamba was trapped.
Who was Jamba?
1 an elephant trader  
2 an elephant  
3 a native hunter  
4 a young native boy  
1 2 3 4

The trail was made by --
1 many animals using it  
2 the giant bolt of lightning  
3 native hunters  
4 a great forest fire  
1 2 3 4

Why were the elephants hurrying along the trail?
1 they were going home  
2 it was getting dark  
3 they were afraid of the hunters  
4 they liked to run in the forest  
1 2 3 4

The herd could have escaped by --
1 running off through the trees  
2 taking the other trail out of the clearing  
3 turning around on the trail  
4 sleeping in the clearing  
1 2 3 4

Who shut the gate of the trap?
1 the native hunters  
2 the wind  
3 the last elephant through  
4 the leader of the elephants  
1 2 3 4

It was dark in the forest because --
1 it was nearly midnight  
2 the sun had not come up yet  
3 the trail was so straight  
4 the trees shut out the light  
1 2 3 4

Why was Jamba suspicious?
1 it was getting dark  
2 he knew he would be trapped  
3 the trees were so tall  
4 the trail was too straight  
1 2 3 4

Why did Jamba follow the leader?
1 he had faith in him  
2 he was afraid of him  
3 the other elephants followed him  
4 he could do nothing else  
1 2 3 4

Why did Jamba think that this forest was strange?
1 he was very frightened  
2 the trees were close together  
3 the forest was very dark  
4 he had no leader  
1 2 3 4

Why did the elephants run shoulder to shoulder?
1 the trail was narrow  
2 it was safer that way  
3 the trees were so straight  
4 the clearing was so small  
1 2 3 4
1. Why was Jamba glad when he got into the clearing?
   1 he wanted to be captured
   2 he had followed the leader
   3 he was proud of the herd
   4 he had plenty of room .............................................( ) ( ) ( ) ( ) 11

2. Where was Jamba when the door was shut?
   1 on the trail near the clearing
   2 near the entrance to the clearing
   3 in the center of the clearing ..................................( ) ( ) ( ) ( ) 12

3. The author wrote this story to tell the reader --
   1 how the elephants lived in the jungle
   2 how the natives caught wild elephants
   3 how Jamba followed the trail ................................... ( ) ( ) ( ) ( ) 13

4. The sudden loud sound was made by --
   1 the shutting of the gate
   2 the bellowing of the herd
   3 the shooting of the guns
   4 the falling of the huge trees ......................................( ) ( ) ( ) ( ) 14

5. Jamba's father and mother were --
   1 trapped with the herd
   2 not mentioned in the story
   3 in a circus in America
   4 far away from the clearing .............................................( ) ( ) ( ) ( ) 15

6. How did the hunters frighten the elephants?
   1 by long whips
   2 by shooting guns
   3 by waving flags
   4 by loud calls .............................................( ) ( ) ( ) ( ) 16

7. When did Jambe realize that he was trapped?
   1 when he saw the closed gate
   2 when he saw the straight trail
   3 when he was told by the leader
   4 when he was running with his neighbor ...............( ) ( ) ( ) ( ) 17

8. The gate to the clearing was closed when --
   1 the leader gave the signal
   2 the herd was in the clearing
   3 the herd was asleep
   4 the herd was on the trail .............................................( ) ( ) ( ) ( ) 18
The trail led across a wide, sluggish river. The water was murky with mud. The banks were high and sloping. In one place the mudbank was worn to a smooth slant, something having slid down it many times. Sitting on the smooth place, Alug, a Moro boy, skidded down it with a shout into the warm water. Wading slowly, he enjoyed the water. He liked to feel the soft mud on his feet. In the middle of the stream the water was deeper, coming just under his arms. Pushing steadily toward the opposite side, Alug felt ahead carefully with his foot not wanting to step unexpectedly into a hole.

Now he reached the other bank, the water being still fairly deep. He crawled out. A rough brown log lay across the path. Putting his hand on the log, he pulled himself up on top of it. The log gave a jerk, one of the rough places on it flying open. It was an angry red eye. The front end of the log swung around. Alug saw an ugly, pointed head. He also saw sharp white teeth in the big mouth.

Screaming, Alug sprang back into the deeper water. He was frightened. His heart pounding wildly, he could not move any farther. The big head swung around. The short, scaly legs digging into the soft mud, the long body slid slowly into the water. Then the Moro boy knew. It was a crocodile. It could not be anything else.

Alug stared at the great body sliding over the smooth bank. The front legs were in the water. Then half the body was in the water. Finally Alug reached for his barong. Snatching it from its sheath, the young Moro swung at the crocodile with all his might. He heard a crunching sound. The last twelve inches of the crocodile's tail stayed behind, the rest of him disappearing with a swirl into the water. Scrambling out onto the grass, the Moro boy pulled the tail along after him. His knees knocking with excitement, he sat down. He watched the river a long while, looking for the crocodile. Then the ripples cleared away. He saw no signs of life. Wondering about the crocodile, Alug felt sorry for him. The crocodile might still be alive. He might be dead. Perhaps he would not miss such a small piece of his long tail. Maybe the wound did not hurt too much.

His new barong lay on the ground beside him. Having forgotten it in his excitement, he looked at it now. The shiny blade, splotched with blood, made a new feeling sing inside him. The feeling was very strange and wild. At last his blade was blooded. Alug had heard the old Moro belief. A blooded blade cuts better. After scrubbing his weapon clean with a handful of grass, Alug thrust it deep into the ground. Then, after having been polished on Alug's trousers, the barong sparkled and flashed in the sunlight. He carefully put it back in its sheath.

Now he was going back to his home. His adventure would make a fine story.
This story tells about --
1. the killing of a crocodile
2. Alug's adventure with the crocodile
3. the life of a crocodile
4. Alug swimming the river

1 2 3 4

Alug's father --
1. was not living
2. helped Alug kill the crocodile
3. was not mentioned in the story
4. gave Alug the barong

1 2 3 4

Alug used the new barong to --
1. cut the grass along the river
2. kill the crocodile
3. cut off the crocodile's tail
4. feel his way across the river

1 2 3 4

How does the author describe the crocodile?
1. smooth
2. friendly
3. ugly
4. beautiful

1 2 3 4

The author wrote the story to tell the reader --
1. how Alug cut off the crocodile's tail
2. how Alug killed the crocodile
3. how Alug lost his new barong
4. how Alug got across the river

1 2 3 4

Why did the crocodile wake up?
1. Alug struck him with his barong
2. he was hungry
3. Alug slid down the bank with a shout
4. Alug grabbed him by mistake

1 2 3 4

Why was Alug so frightened?
1. his barong was covered with blood
2. the water was over his head
3. the mud was very soft
4. he thought the crocodile was going to bite him

1 2 3 4

What had made the river bank so smooth in that one place?
1. the crocodile had slid down it many times
2. Alug slid down it
3. the river made it smooth
4. the wind made it smooth

1 2 3 4

The old Moro belief said that --
1. the barong must be kept clean
2. a blooded barong cuts better
3. a clean barong sparkles in the sun
4. the barong should not be cleaned

1 2 3 4

Why did Alug feel sorry for the crocodile?
1. he had no tip on his tail
2. he was dead
3. he would not fight back
4. he would not wake up

1 2 3 4
1. Why did Alug have to sit down on the river bank?
   1. he was tired
   2. he sat down to clean to clean his barong
   3. his leg hurt
   4. his knees were knocking

2. Why did the crocodile slide down the bank and into the water?
   1. the sun was too hot
   2. his tail hurt
   3. Alug startled him
   4. he was thirsty

3. Why did Alug pull on the crocodile?
   1. he wanted to wake up the crocodile
   2. he thought the crocodile was a log
   3. he was seeking an adventure
   4. he did not see the crocodile

4. What was the "barong"?
   1. a heavy knife
   2. a sharp stick
   3. a war club
   4. a heavy spear

5. Why did Alug wade carefully across the river?
   1. he was watching the crocodile
   2. he did not want to step in a hole
   3. he enjoyed the warm water
   4. he could not swim

6. What happened after the ripples cleared away?
   1. bubbles came up
   2. blood stained the water
   3. the fish swam around madly
   4. nothing happened

7. Why did Alug stare at the crocodile?
   1. he was frozen with fear
   2. he was stuck in the mud
   3. he was watching the blood
   4. he was cleaning his barong

8. The crocodile --
   1. watched Alug wade across the river
   2. was asleep on the river bank
   3. bit Alug in the arm
   4. chased Alug across the river
STOP

THIS IS AS FAR AS YOU ARE TO GO AT THIS TIME. PLEASE CLOSE YOUR BOOKLET AND HOLD UP YOUR HAND SO YOUR BOOKLET MAY BE COLLECTED.
The best known of all the birds of the Philippines is the jungle fowl, or bankiva. That all the mothers of the Philippines have in their hearts a fear of this bird is not strange, because their children must stay away from this evil bird. They tell this story to their little ones.

Once, long ago, the jungle gods were indebted to the bankivas. The bankivas demanded payment. Because the gods could not pay the bankivas, they gave the evil birds a great power. The bankivas could have this great power on only one day of each year. On that day the bankivas could bewitch little children.

Since the Filipino mothers were not told of the bankivas' evil power, they did not keep their children in the houses on that special day. They did not warn them about the wicked bankivas. They did not know about the sweet music of the bankivas' song because they could not hear the song. Only the children could hear it. It could call to them mysteriously. It could bewitch them.

When the first special day came, hundreds of bankivas gathered in the jungle. After they had selected the most beautiful of their flock for their leader, they strutted about in the jungle with their heads erect. They gloated over their evil power. As soon as it was twelve o'clock, noon, they followed their leader toward a small village.

As the strange procession of bankivas approached the edge of the village clearing, they were all singing their weird music. When the children heard the music, they looked at the evil birds. They could see the beautiful leader as he was strutting toward them. He was singing the sweet song. The children watched from a distance. Because they liked this music, they moved closer. They joined the long parade of bankivas.

When all the children had joined the birds, the leader danced off into the jungle. The bankivas and children followed him until they were far from the village. They were still singing joyfully as they danced on to the wildest part of the forest.

Back at the village the mothers were looking for their children. They could not find them. Evening was approaching.

The parade went on and on until it was dark. Then the bankivas flew off into the trees with cruel cries. The children were left alone in the jungle. When they awakened from their bewitchment, their cries echoed through the jungle.

They cried all night. When morning came, the children looked for their homes. They became very tired. Because no one knew the way out of the forest, only a few children wandered back to the village. The others never reached their homes again.

Now, each year, on the special day of the bankivas, the mothers gather their children close to them, as they tell them this sad story of the wicked bankivas and the lost children.
"Bankiva" is another name for the —
1 Philippines 2 jungle fowl 3 native village 4 deep jungle ...
1 2 3 4

When did the bankivas have their strange power?
1 every day of the leap-year 2 the first day of each month 3 on one day of each year 4 every other year ...
1 2 3 4

Why did the gods give the bankivas the power?
1 they liked the bankivas 2 the bankivas were beautiful 3 they owed the bankivas a debt 4 the bankivas were trustworthy ...
1 2 3 4

The children were bewitched by —
1 their fear of the forest 2 the gods 3 the bankivas' singing 4 the bankivas' beauty ...
1 2 3 4

The leader of the bankivas —
1 was very beautiful 2 liked the little children 3 would not leave the children alone 4 stayed with the mothers all day ...
1 2 3 4

Why did the children join the line of bankivas?
1 they wanted to leave the village 2 they were seeking adventure 3 they liked the dark jungle 4 they were bewitched ...
1 2 3 4

Why did the children never reach home again?
1 they were happy in the jungle 2 their mothers did not look for them 3 they lived forever after with the bankivas 4 no one knew the way out of the forest ...
1 2 3 4

Why do the Filipino mothers tell this story to their children?
1 to keep them away from the jungle 2 to amuse them 3 to make them eat their meals 4 to get them to take walks in the jungle ...
1 2 3 4

Why were the Filipino mothers bewitched?
1 they could not dance 2 they could not hear the music 3 they did not like the jungle 4 they were asleep in the village ...
1 2 3 4

The bankivas were called "wicked" because —
1 they left the children in the forest 2 the gods did not like them 3 the other birds were afraid of them 4 they were so beautiful ...
1 2 3 4
1. This story is --
   1 a true story  
   2 told by the fathers  
   3 history  
   4 a fairy story ........... ( ) ( ) ( ) ( ) 11

2. The fathers of the lost children --
   1 were all killed in the war 
   2 looked for the lost children 
   3 were not mentioned in the story 
   4 were bewitched when they were children .... ( ) ( ) ( ) ( ) 12

3. Why did the bankivas wait until 12 o'clock, noon?
   1 the mothers were asleep then 
   2 their power began at that time 
   3 the children were playing then 
   4 the sun was bright at that time ............. ( ) ( ) ( ) ( ) 13

4. Why is the bankiva the best known bird of the Philippines?
   1 this story is told many times 
   2 the bankivas now live in zoos 
   3 this story is true 
   4 there are no more bankivas ................. ( ) ( ) ( ) ( ) 14

5. The children awakened from their enchantment when --
   1 the mothers found them in the forest 
   2 the bankivas flew away 
   3 morning came 
   4 they lost the path ......................... ( ) ( ) ( ) ( ) 15

6. Why were the jungle gods indebted to the bankivas?
   1 the gods had borrowed money from them 
   2 the bankivas were beautiful 
   3 the bankivas had saved the gods' lives 1 2 3 4
   4 the story does not say .................... ( ) ( ) ( ) ( ) 16

7. What did the bankivas do before 12 o'clock came?
   1 they gloated 
   2 they slept 
   3 they flew about the forest 
   4 they watched the children ................. ( ) ( ) ( ) ( ) 17

8. Why did not the mothers warn their children to stay away from the bankivas on that first day?
   1 they were too busy 
   2 they did not know about the danger 
   3 they did not care what happened 
   4 they were sleeping ....................... ( ) ( ) ( ) ( ) 18
As Bo was playing by the campfire, he looked toward the dark forest. He saw at the edge of the trees someone who looked like his father. The cave boy scrambled to his feet. He ran toward the forest. Yes, it was his father, Ja. Ja was carrying something over his shoulder. Bo met his father. Ja was carrying a fresh wolfskin. As they walked together toward the fire, Bo asked many questions. His father said nothing.

When they were at the fire, Ja slipped the wolfskin to the ground. It moved. Bo was scared by this strange movement. With wide-open eyes, he watched the wolfskin as his father shook it gently. Two furry little animals that were the young pups of the dead mother wolf fell out on the ground.

Then Bo understood that his father was giving him the little pups. They were his now. The cave boy jumped with joy. He would train the wolf pups. In a few months they would be his hunting dogs. With their large teeth, they could kill real game for him.

The cave boy rolled the pups up once more in the skin of their mother. He carried them up the cliff to the cave. The little wolves were very hungry because they had always had plenty of milk from their mother. Now, because their mother could give them no more, Bo scraped small bits from a large strip of dried deermeat for them. He gave them only a little because their teeth were still tiny and weak.

Soon the pups got very sleepy. Then Bo wrapped them in the skin of their mother with the furry side next to them. The cave boy put one of his worn-out moccasins in with the pups so that they would lie all night with the smell of their mother and Bo's moccasin in their noses. This was a good thing because the smell of their mother would ward off their fear and the smell of Bo's moccasin would acquaint them with him. In a few weeks the smell of their mother would die away. Since only the smell of Bo would remain, they would belong completely to the cave boy. They would love him. They would obey him. They would hunt with him.

For the next few weeks Bo kept the pups in the cave. Each day he scraped off more meat for the little wolves. Since only Bo fed them, they would love only Bo in return.

Then the day came when Bo carried the pups down the cliff to his favorite hollow. Here the pups wrestled in the sun. Sometimes they would bite Bo's ears playfully. The cave boy was very happy. Since the pups were growing very fast, in a few months he would have two real hunting dogs. He could hunt many animals with them. Perhaps he would become a truly great hunter.
Bo was playing --
1 by the river   2 by the campfire           1 2 3 4
3 in the cave    4 with his friends          .......... ( ) ( ) ( ) ( )

When did the wolf pups get sleepy?
1 after wrestling in the sun
2 after smelling Bo's moccasin
3 after they had eaten
4 after they were warmed by the fire .......... ( ) ( ) ( ) ( )

This story tells about --
1 the wolf pack   2 life in the future           1 2 3 4
3 life long ago   4 the killing of a wolf .... ( ) ( ) ( ) ( )

How did Ja carry the little wolves?
1 in a large bag  2 in his arms               1 2 3 4
3 in a wolf skin  4 in his pockets ........... ( ) ( ) ( ) ( )

Bo's mother --
1 was not mentioned in the story
2 was not living
3 helped Ja kill the mother wolf
4 helped Bo feed the little wolves ............. ( ) ( ) ( ) ( )

How long did Bo keep the pups in the cave?
1 several months
2 a few days
3 over a year
4 a few weeks .................................... ( ) ( ) ( ) ( )

The pups would belong completely to Bo --
1 when the smell of their mother was gone
2 when they were in the wolf skin
3 when the moccasin was taken away
4 when they were hungry ........................... ( ) ( ) ( ) ( )

Why did Bo want hunting dogs?
1 his father had hunting dogs
2 he wanted someone to play with
3 his brother was a great hunter
4 he wanted to be a real hunter ............... ( ) ( ) ( ) ( )

In time the wolf pups would --
1 be turned loose to roam in the forest
2 become Bo's hunting dogs
3 become fat and lazy
4 become wild and disobedient ............... ( ) ( ) ( ) ( )

O. Why was Bo very happy?
1 he would have two hunting dogs
2 the pups were happy
3 the pups belonged to his father
4 he liked to live in the cave ............... ( ) ( ) ( ) ( )
1. This story was written to tell the reader --
   1 that wolves were fierce animals
   2 how men built the first campfire
   3 about animals that lived many years
   4 how the cavemen got their hunting dogs

2. Why were the wolf pups hungry?
   1 they had had no meat all day
   2 they had not eaten for weeks
   3 their mother could give them no milk
   4 they had been wrestling

3. Bo wrapped the pups in their mother's skin so that they --
   1 would be warm
   2 would not be afraid
   3 would be afraid of Ja
   4 would hate their mother

4. Why did the pups eat just a small amount of meat?
   1 their teeth were not strong
   2 they were not hungry
   3 they disliked meat
   4 they had no teeth

5. Why did Bo put his moccasin in with the pups?
   1 because Ja told him to do it
   2 so they would learn his smell
   3 so they would learn to chew leather
   4 because he wanted to get rid of the moccasin

6. What were the pups afraid of?
   1 the skin of their mother
   2 the campfire
   3 the full-grown hunting dogs
   4 the cave people

7. Why would the wolf pups become good hunting dogs?
   1 they would be fierce and obedient
   2 they would be small and tame
   3 they would be wild and hungry
   4 they would be quiet and timid

8. Why would the pups love only Bo?
   1 he slept with them
   2 he fed them
   3 he loved them
   4 he kept them in the cave
APPENDIX E

NORMAL PERCENTILE CHARTS OF DISTRIBUTIONS OF SCORES FROM SELECTED STORY-FORMS
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**NORMAL PERCENTILE CHART**

**STOPY-FOH/Vf II**

**PERCENTILE SCALE**

The chart shows the distribution of scores for the Variable II measure (Stopy-Foh/Vf II). The data includes the number of cases (277), the form (Form II), and the percentile scale for normal distribution. The graph represents the distribution of scores across different intervals, with the percentile values ranging from 0 to 100. The chart is used for educational and psychological assessments to interpret scores and compare them with the normal distribution.
### Normal Percentile Chart

<table>
<thead>
<tr>
<th>Group No. of cases</th>
<th>Measure (Examination)</th>
<th>Form</th>
<th>Date</th>
<th>Examiner</th>
<th>Graphs by</th>
<th>School</th>
<th>City</th>
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</thead>
<tbody>
<tr>
<td>282</td>
<td>STORY-FORM</td>
<td>35</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Percentile Scale

- **Score Intervals**: 0, 1, 2, 3, 4, 5
- **Frequencies**: 0, 1, 2, 3, 4, 5
- **Subtotals**: 0, 1, 2, 3, 4, 5
- **Percentages**: 0, 10, 20, 30, 40, 50, 60, 70, 80, 90, 95, 96, 97, 98, 99, 100

- **Median**: 0.5
- **Standard Deviations**: -3σ, -2σ, -σ, +σ, +2σ, +3σ

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