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THE EFFECT ON COMPREHENSION OF DIFFERENT MODES OF PRESENTING MATERIAL TO SUBJECTS OF DIFFERENT AGES

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A Dissertation submitted to the Faculty of Psychology of the University of the Witwatersrand, Johannesburg, (in fulfilment of the requirements) for the degree of Master of Arts

Johannesburg

December, 1974.

I hereby declare that this dissertation is my own work, and has not been submitted or incorporated in another dissertation or thesis for any other degree.

.....

A. DOCTOR

A C K N O W L E D G E M E N T S

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A B S T R A C T

Two types of comprehension (factual and interpretative) and their dependence on the age of the subjects (children and adults) and the method of presenting a passage (silent reading, oral reading, listening and acting), are investigated. Factual comprehension was tested by open-ended questions, and the interpretative comprehension by multiple-choice questions. Results show a significant difference between the two age groups, and a significant difference between factual and interpretative comprehension. Presentation was not found to have a statistically significant effect on comprehension, but the type of comprehension was found to depend on the method of presentation. As predicted by psycholinguistic theory, differences were found between reading and listening comprehension. Children's comprehension was facilitated by listening and adults' comprehension by reading. In addition, support is found for the theory that reading and listening comprehension involve similar processes.

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C H A P T E R I

1 INTRODUCTION

The general aim of the present study was to contribute to the subject of comprehension. The experiment was designed to investigate the effect on comprehension test scores by (a) the age of the readers (children or adults); (b) the method of presenting a passage (silent reading, oral reading, listening or acting); and (c) the type of question (factual or interpretative).

In order to place the present study in perspective, it should be considered in relation to the methods, research techniques, and procedures developed and used in similar studies. The subject of comprehension is not isolated, and accordingly research in this and adjacent fields must be considered. Many concepts in the field of comprehension have been thinly built with little understanding of language or its structure. Adopted as the framework of the present study is psycholinguistic theory which was formulated by Frost (1967), Lefevre (1964, 1968), Strickland (1967), Fries (1963), and Goodman (1967, 1968, 1969), together with the similar

2/...views/...

views of information theorists (e.g. Smith, 1971, 1973, and Goodman, 1968). These theorists postulate that comprehension is basic to speaking, readi g and listening, that all are language-related proces·ses, and that meaning precedes word recognition and renders it unnecessary. They further imply that an individual's comprehension may improve with age. As mastery of the rules of language becomes automatic, Smith (1971), for instance, suggests comprehension becomes more 'immediate' and less 'mediated'. In addition, adults have an advantage over children in linguistic experience, and are expected to score higher than children. The particular focus of the present study was, however, on the relations between the age factor, the type of question, and the method of presentation.

A recurring theme in educational research has been the role in the learning process of various forms of kinesic and metalinguistic participation. Points have been made for and against this issue, but is has not been resolved. Four methods of presentation were used in the present study to test the possibility that participation in the comprehension process accounts for differences in comprehension. Ranging from the greatest to the least degree of participation, the methods of presentation were as follows: acting, oral reading, silent reading and listening. More specifically, would an actor who was listening, reading silently, and reading orally in the course of acting, comprehend more than a subject who

3/....was/...

was either listening, or reading silently, or reading orally?

During the past decades, methods of teaching reading and listening comprehension have changed. The emphasis has shifted away from factual comprehension only, and towards 'thought getting', appreciation and interpretation. (In testing factual and interpretative comprehension investigators generally agreed about what factual comprehension entailed, but interpretation is more open to speculation). Because of the change in educational techniques, subjects who have benefitted from the new methods should not show a great difference between their factual and interpretative scores.

These topics are cursorily dismissed, but will be returned to in the chapters that follow. There follows a brief exposition of the salient features of the area under examination. (This chapter is intended as a brief overview of the field so that the topics are merely introduced here, and are not discussed as fully as they are in the chapters which follow).

1.1 The nature of the field

The field of comprehension is characterised by isolated and uncoordinated findings. According to Fries (1963), the 'scientific study of education' began in 1920. Before that time, investigators tended to draw conclusions not entirely justified by their projects. They conducted

4/...their/...

their studies for practical purposes and dealt with issues arising in the classroom. Statements of opinion rather than of fact emerged, and few researchers attempted to validate the findings of others.

Exemplifying this vague approach is the status of comprehension in the research literature. Each different style of defining comprehension reflects the zeitgeist in which the definition is proposed, as well as the individual investigator's own frame of reference (see chap. 2). Very original tests of comprehension were created but the diverse findings indicate that each new project appears to tackle the same old issues without referring to previous findings. Of more basic concern, and one of the possible causes of the confusion, is the relationship between comprehension and memory. Often the format of the questions set in comprehension tests is similar to that used in recall or recognition tests. However, comprehension includes other cognitive processes, and this supports the view that comprehension and memory are not identical. Unless comprehension is regarded as being part of memory, it becomes difficult to test. The present study takes the stand that there is no definite distinction between comprehension and memory.

Controversial evidence is found for the relationship between silent and oral reading (see chap. 3). Initially oral reading was taught to a greater extent than silent

5/...reading/...

reading until the judicious use of both methods was agreed upon. Being slower than silent reading, oral reading has obvious advantages for beginners. However, it is neither the easiest nor the best method of teaching comprehension, and too great an emphasis on oral reading may lead to slow and ponderous silent reading. On the other hand, if the reader attempts to use the rapid silent reading pace while reading orally, his oral reading will suffer. As the reader grows older, silent reading, because of its speed and ease, becomes the preferred method, and oral reading is only used in special circumstances. A different proposition arises from the theory that all communication is related. (In the present context, this implies that the same cognitive processes underlie silent and oral reading). These two types of reading being similar, the reader's choice depends on the situation rather than on the method. Research studies discussed in chap. 3 have not been able to define clearly the relationship between silent and oral reading. Changing educational standards, coupled with the use of various passages and different research methods, have led to discrepancies in the findings.

The relationship between reading and listening is well documented and has been shown to take one of three forms (see chap. 3). The first, that the auditory channel is better than the visual channel for conveying information, applies to young children, inexperienced readers, and to individuals who spend more time listening than reading.

6/...The second/...

The second is that with advancing age reading becomes the preferred method. (There have been exceptional findings in studies on advertising, as shown in chap. 3. Irrespective of the subject's age, intelligence or linguistic experience, the auditory modality is more receptive than the visual). The third form of the relationship, that all communication is related, assumes no discernible difference between listening and reading.

In considering acting in relation to comprehension, the present study concentrated on the actor. Having read the script, he follows the stage directions, moving about the stage and using the props as required. While playing a role, he interacts with the other characters. Other authors have discussed the concept of role, and the differences between role-taking and role-playing (see chap. 3. Investigations have revealed that, in certain situations, conflict may arise between roles. In order to resolve this, the actor may ignore the role less acceptable to himself. If, in the context of the present experiment, this were the role of the character he was playing, his understanding of the situation might be impaired.

Metalinguistics, mentioned above, could be used in the acting and listening presentations. Comprising kinesics (non-linguistic and non-vocal actions, gestures and facial expressions) and paralanguage (vocal expressions which accompany speech without being part of it),

7/...metalinguistics/...

metalinguistics adds meaning to language. Metalinguistic expressions are learned in early childhood and are integrated into the speech patterns. The speaker may use them without being aware of it, though professional actors are adept at metalinguistics and use paralanguage and kinesics with studied perfection. Stating the relationship between linguistics and metalinguistics, Anderson (1968) wrote as follows:

> Words, when spoken, take on added meaning in accordance with inflections, intonation, facial expression and gestures. The stamp of a foot, the raise of an eyebrow, the set of the jaw, the wink of an eye or the volume or pitch of the voice can give added meaning to a word, phrase or sentence (p. 205).

Little is known about intonation. There are no set rules governing its usage and it does not necessarily accompany speech. Making use of it in oral reading may improve comprehension and an audience may benefit from listening to a skilled reader who is modulating his voice. Actors may exaggerate intonation, kinesics, and paralanguage, to achieve special effects.

To summarise, the present study of comprehension is indebted to educationalists, reading specialists, information theorists, linguists, psycholinguists and role theorists. Hitherto the discussion has centred on the parts of these theories which are relevant to the present study, for example: the view that all communication is related, and that the same structures underlie listening, reading and speaking; the alternative that silent reading

8/...and oral/...

and oral reading differ, and that reading and listening are different processes; the distinction between mediated and immediate comprehension; and the relevance to acting at role-playing, metalinguistics and intonation. In order to investigate several of these concepts in the present study, a test was designed. Aspects of it resemble tests which have been used elsewhere.

1.2 Research techniques and procedures

In testing reading comprehension, fairly short paragraph material is often presented. The Gates Basic Reading Test, for example, incorporates four tests of reading comprehension. Different forms of the Test examine the reader's ability to grasp the main idea; to evaluate content and mood; to predict circumstances from evidence implied but not given; to read intensively and accurately; to relate details to the general issue; and to note significant details in the body of a paragraph. The Gates Tests are not used exclusively, as no single battery is comprehensive, and many investigators have constructed their own tests. Most comprehension tests are designed for silent reading. Discussing oral reading tests in which the subject read the passage aloud and then answered questions, Strang McCullough and Traxler (1955) reported that subjects found these difficult.

In examining listening, the present study reflects a change in perspective: previous tests were usually reading comprehension tests in disguise. Almost any

9/...written/...

written passage can be read and adequately understood, but more discretion must be shown in selecting a passage which is to be presented aurally. Printed material is not always idiomatic and certain passages are less suitable for listening tests. In order to prevent an improper choice for the present study, an extract from a play written to be read silently or orally, and to be listened to, was selected.

The test passage having been administered, most experimenters present their subjects with a questionnaire. Many of these multiple choice and open-ended questionnaires dwell on the 'where', 'when', and 'how many' aspects of the passage, rather than on 'why' which requires more subjective assessment, and is more difficult to score. However, contemporary tests for high school and college students are attempting to remedy this by examining critical thinking as well as factual comprehension.

1.3 <u>The present study compared with other studies</u>

By utilizing a longer passage than is usual, the present study gave the subjects a complete incident, and not only an isolated paragraph. This should have enabled them to discern more easily the mood and tone of the passage, and to grasp the factual and interpretative content. The method for examining comprehension was similar to that used in other studies. The subjects either read the passage silently, or read it orally, or listened to it being read, twice in each case, and then answered the

10/...questionnaire/...

questionnaire. There was no precedent for assessing comprehension following acting. In order to standardise the procedure, the subjects read the stage directions and enacted the passage, twice, ending the session by answering the questionnaire. A questionnaire compiled for the present study, tested factual and interpretative comprehension: open-ended questions tested factual comprehension, and multiple-choice questions tested interpretation. The main difference between the present and other investigations was the combination of all the factors, several of which have been tested separately elsewhere, in a single experiment.

1.4 Hypothesis

A general investigation of the area was envisaged and a single hypothesis, subdivided into three parts, was postulated as follows:

> The number of correct answers obtained by subjects would differ with respect to:
>
> (a) the kind of question asked (factual or interpretative);
>
> (b) the age of the subjects (children or adults);
>
> and
>
> (c) the presentation of the passage (silent reading, oral reading, listening or acting).

Any interaction between the factors, resulting from the statistical analysis, would serve to qualify the hypothesis.

11/...Definitions/...

1.5 Definitions

ADULTS refers to subjects who were university students reading first year psychology.

CHILDREN refers to subjects who were schoolchildren of average age 9,4 years.

COMPREHENSION refers to the subject's understanding of the factual and interpretative content of the passage.

FACTUAL comprehension refers to the subject's understanding of the facts and details. It was based on answers to questions which could either have been answered correctly, or incorrectly. An example of a factual statement from the set passage is, 'The King of Hearts is seated on his throne....' Factual comprehension of this statement would have been correct if the answer to the question, 'Where did the King of Hearts sit?', was given as 'He sat on his throne.'

INTERPRETATION or interpretative comprehension describes the ability to evaluate and to appreciate the tone, feeling and mood of the passage. Interpretative questions tested the subject's interpretation of a character's feelings about, and his reactions to, a situation. Since a correct interpretative answer would be based on a general impression obtained from the passage as a whole, and not from an isolated segment, it is not possible to present a single statement as an example of something which was open to interpretation. An example of a question testing interpretation is, 'How did the King feel when the Cook refused to give evidence?' In order to

12/...interpret/...

interpret the King's feelings, the subject had to take into account the mood of the conversation between the Cook and the King in which the pepper-pot features.

PRESENTATION refers to the method by which the subject received the passage. The four presentations were: silent reading, oral reading, listening and acting.

SILENT READING refers to a presentation in which subjects, having been instructed not to vocalise, read the printed passage.

ORAL READING refers to a presentation in which subjects read the passage aloud.

LISTENING is used in the sense of 'auding' which refers specifically to comprehending and to responding to patterns of speech, and not to listening in the general sense of hearing.

ACTING indicates a presentation in which subjects enacted the set passage as they would in a play reading.

PASSAGE refers to an extract from Alice in Wonderland. This is further elaborated on in chap. 4., under the subheading: Material.

1.6 Plan of the present study

Chapter 2 is devoted to a review of the literature pertaining to comprehension, and chap. 3 to a review of the literature pertaining to the methods of presentation. (Historical and current aspects are covered). The methodology of the present study is detailed in chap.4.

13/...Chapter/...

Chapter 5 presents an analysis of the data which is discussed in chap. 6, in relation to previous studies and other theories. The implications of the present study, conclusions, and some new hypotheses, are presented in the final chapter.

14/...Chapter II/...

C H A P T E R II

2 COMPREHENSION

Both chapters devoted to reviewing the literature consider conceptual aspects, such as theories and opinions, and research findings from studies presenting data. These topics will be dealt with separately in this chapter, beginning with the conceptual literature.

2.1 Definitions

At the outset it should be noted that while comprehension is usually discussed in relation to reading, the comments that follow could apply to aural comprehension as well. Awareness of the fundamental part played by comprehension in reading has prevailed since the appearance of John Hart's book: "A Methode or comfortable beginning for all vnlearned, (sic) whereby they may bee (sic) taught to read English, in a very short time, with pleasure" (1570). Unfortunately, writers have differed in their conception of the term 'comprehension', possibly because '...meaning is practically everything.... Apparently we are never directly conscious of anything but meaning' (Pillsbury,

15/...1908/...

1908, p. 156). Reflecting a broader view of the nature of the reading process, later definitions recognised the relationship between reading on the one hand, and accuracy and thoroughness in comprehension on the other. Comprehension did not refer to the reader's reactions or to his discovery of the significance of the passage of importance was his ability to grasp meaning. A third definition compensated for previous deficiencies by postulating that the reader recognised the facts, was able to evaluate them and was able to reflect on them critically. Jenkins (1964) and Smith (1965) proposed that reading implied thinking in the sense of understanding implications and 'reading between the lines'. At its most sophisticated level, comprehension includes appreciation of the aesthetic elements of language and involves 'feeling while thinking'.

2.2 Theories

Several theories have been formulated in an attempt to coordinate the different findings and to present new ideas.

2.2.1 Prior to the psycholinguistic epoch

For centuries, according to Fries (1963), a letter method of teaching reading and comprehension had been advocated. No concessions were made to children's ability to comprehend adequately through listening, and often this was not recognised at all. The letter method

16/...operated/...

operated by the reader vocalising each letter separately, and then combining the letters to form words. Objecting to this alphabetic approach, as it was also known, Hart (1570) initiated the phonic system, based on the phonetic alphabet. This method continued to be used until the eighteenth century when it was replaced by the sentence method. The impetus of this method was generated by men like Rousseau, Pestalozzi, Herbart and Froebel who wanted to make all types of instruction more meaningful, and it was further developed by Farnham (1881). Farnham influenced by the psychological studies of the mind which suggested that the unit of thinking was a thought, proposed that the sentence was the unit of reading comprehension. He insisted that comprehension was the primary purpose of reading, the secondary purpose being oral expression of thoughts, and he emphasised the need for the thought embedded in the reading material to reach the reader.

Farnham observed that knowledge of speech assisted reading, and that the fluent reader could comprehend more than the reader who identified words separately. Anticipating the Gestalt approach to reading, as outlined by Diack (1960), he observed that meaning accrues from the whole, not only from part of the sentence, and a direct line may be traced from Farnham to the psycholinguists through this Gestalt theory. Other similarities between Farnham and the psycholinguists are apparent: both studied sentence pattern, intonation, and other

17/...elements/...

elements of the structural system of English. Although Farnham did not use the term 'redundancy', he observed that 'we are dependent on the logical arrangement of language' (Fries, 1963, pp. 25. 26). His innovation was that he realised that the sentence, not the word or the letter, was the most important unit for comprehension, a view subsequently elaborated on by the psycholinguists.

2.2.ii The psycholinguistic and information-processing approaches to comprehension

Emerging from recent work in cognitive psychology and linguistics, the psycholinguistic theory of reading and comprehension is closely related to the theory put forward by information theorists, many of whom are often classed as psycholinguists. Smith (1973) objected to the term 'psycholinguistics', maintaining that there cannot be a psychological or psycholinguistic method of teaching reading comprehension, and that such terms encourage misconceptions about the nature of the theory. (It is useful to have an all-embracing term to describe the theory, and the term will be used for this purpose only).

Psycholinguistics offered '... a new look at reading that was dramatic and even iconoclastic' (Smith, 1973, p. 5). The theory explains and predicts, and is an alternative to, and an improvement on, the continually changing definitions which were offered during each past decade which preceded it. Davies (1973) suggested that the

18/...emphasis/...

emphasis on linguistic rather than on visual aspects reflected a complete transformation, a refocussing of research, and not merely an alternative view. The psycholinguists challenged long held beliefs, and tried and trusted methods of instruction. (Even though reading had been studied more scientifically from 1920 onwards, few new practices had emerged). They rejected the traditional view of reading as a process of combining letlets into words and words into sentences from which meaning derived, and favoured the assumption that meaning precedes and renders unnecessary the identification of individual words. Pointing to psychological studies, Goodman and Smith (1973) showed that there are perceptual limitations on the amount of acoustic or visual 'surface structure' which may be processed; that memory is constrained; and that it would not be possible to understand speech or writing if words had to be analysed individually.

According to Miller (1964, 1965) the central task of the psycholinguist is to describe the psychological processes that function when people use language. Chomsky (1957) postulated that language has two levels, a surface structure comprising the sounds or written representations of language, and a deep structure which carries meaning. The two levels are related through the complex rules of language. These rules must be learned so that they may be applied in an oral situation. Reading has been described as 'a secondary representation of oral language' (Goodman,

19/...1968/...

1968, p. 16) and, as a prerequisite for comprehension, the reader must have a knowledge of the structure of spoken language. Once his mastery of the rules has become automatic, his dependence on the printed text decreases. Information-processing theory takes this a step further. The reader uses language to interact with the printed words (or the 'graphic input'), so that he can reconstruct the message encoded by the writer (Goodman, 1973). Using his experiential and conceptual background, and his knowledge of the rules, he creates a meaningful context in which to recreate the message. If he lacks the relevant background knowledge, he cannot supply the semantic component necessary for comprehension. In this sense, all readers, regardless of their general reading proficiency, may be incapable of understanding some literature in their native language.

Smith (1971, 1973) has contributed substantially to the study of meaning. Extrapolating from the theory of word identification, he postulated (1971) that the identification of meaning may be mediated or immediate. If letters and words have to be identified separately before meaning is reconstructed, then comprehension is mediated. This is characteristic of beginners or of readers who meet material which goes beyond their previous experience; it is disruptive and may cause loss of information because it slows the speed of reading and overloads the visual processing and memory systems. If the reader decodes meaning directly from the visual or acoustic

20/...features/...

features of the words, his comprehension is immediate. Neisser (1967) showed that meaning can be obtained without paying attention to individual words. The fluent reader utilizes his knowledge of language to overcome the channel capacity limits of the visual system. Redundancy enables the reader or listener to supplement the visual or acoustic input with past experience. He easily and successfully "fills in" letters and words which he may not have paid especial attention to, and is able to accomplish this because English is 50 per cent redundant.

Considering another aspect of meaning, Goodman observed that the amount which the reader comprehends depends on him, as well as on the nature of the passage. This opinion is implicit in Smith's (1971) definition of comprehension as 'the reduction of uncertainty' and in Bormuth's (1969) definition of comprehension as 'a set of generalized knowledge-acquisition skills which permit people to acquire and exhibit information gained as a consequence of reading printed language' (p. 50) and it allies comprehension to information which has also been defined as the reduction of uncertainty. The amount of uncertainty which may be reduced depends on how much the reader knows about the topic when he begins reading, and varies from reader to reader, and from passage to passage, making generalizations impossible.

To summarise, the psycholinguists and information theorists have suggested that reading and comprehension are language-related processes. Further, they have

21/...

pointed out that knowledge of the rules of language helps comprehension and that comprehension may be mediated or immediate, depending on the reader, but they have shown that information is not restricted to the printed words: redundancy, punctuation, intonation and a general conceptual and experiential background aid comprehension.

2.2.iii Intonation

Intonation has been studied for approximately two decades and is still not fully understood: it is part of the semantic structure of language; it has been defined as '...the generic term for significant and distinctive patterns of pitch, stress and juncture' (Lefevre, 1964, p. xvi); and it has been called 'the punctuation of speech' by Betts (1963), with Strickland (1967) remarking that meaning '... is not found in the marks but in the speech which the marks represent' (p. 206). It has been suggested that by paying attention to the intonation patterns which carry part of the meaning of the sentence, the reader can comprehend what he is reading. Intonation patterns are intricate: some features are obligatory, others are optional. In order to improve comprehension by means of intonation, Goodman (1968) proposed underlining or italicising the words which are to be read as one unit, and marking primary stresses and pitch changes. These mechanical aids may be more effective with children than with adults, although mastery of intonation at a younger

22/...age may/...

age may improve adults' comprehension. The child uses intonation patterns in speech without being aware of it. Lefevre proposed employing oral reading to teach children to use intonation patterns, and the speech melodies and rhythms that delineate the shape and pattern of sentences. He found that their oral reading was guided by intonation patterns which they had learnt in speech. Having selected a particular pattern at the beginning of a sentence, they used it to anticipate the remainder of the sentence. If one pattern proved inexpedient, they would read the sentence again, abandoning that pattern in favour of another.

Theoretically, the intonation patterns learnt in oral reading are transferred to silent reading, and are expected to improve comprehension. The use of intonation patterns does not imply complete understanding: awkward intonation distorts meaning. Dropping the voice after each fragment of a sentence may cause broken oral reading which may result in disjointed silent reading and a habit of reading words separately. On the other hand, reading, in the general sense is not affected by the absence of intonation: one can read a meaningless string of words as well as a meaningful one, but, '... just as the person who hears but does not comprehend is not listening, so the reader who calls words but does not comprehend is not reading' (Goodman, 1967, p. 210).

2.3 Other issues

The preceding sections have dealt with definitions and

23/...theories/.....

theories. Theories are relatively new in this area, and many investigators have tended to describe comprehension in terms of range, accuracy, level, rate and type. Accuracy may vary with some readers noting every detail, but reading slowly and ponderously at the expense of general understanding; others may be satisfied with a degree of accuracy that fails to meet high standards, but which permits rapid reading. There are limits to the range and level of the material which the reader can understand, and no amount of teaching will enable him to comprehend material beyond his level. This seems to be unrelated to age, but depends on intelligence, mastery of the mechanics of reading, acquisition of new words to increase vocabulary, and on the special techniques necessary to analyze rather complicated language.

2.3.i Types of comprehension

As mentioned above, comprehension was, for a long time, discussed by others in terms of word, sentence and paragraph comprehension, with the emphasis on literal meaning. Nowadays, two broad categories may be distinguished. The first entails noting details and their sequence, following directions, and ordering the reading material in order to make it easier to remember. The second, called interpretation or interpretative comprehension in the present study, is not as easily categorised. It has been treated by many authors who have called it 'critical reading' and it has been compared to thinking.

24/...It has/...

It has been argued that it is one of the most advanced of the comprehension processes. Authors such as Gates (1947) and Bond and Wagner (1960) have emphasised different facets of interpretative comprehension and have suggested that in order to comprehend successfully, the reader should apprehend the main idea or general impression and he should be able to sense the author's attitude. Gates (1947) and De Boer (1946) pointed out that the reader should use the facts to evaluate the quality of the reading matter and to form an opinion about it, and that he should be able to compare different sources. Fries (1963) stated that interpretation required understanding of the emotive and expressive aspects of the material. Bormuth (1969) distinguished between literal and inferential comprehension, but he excluded critical evaluation and aesthetic appreciation from this category. He maintained that evaluation and aesthetic appreciation are impossible without literal comprehension and argued that although these types of comprehension could not be taught, they must develop, being the essential first steps in comprehension. Russell's (1965) view concurred with Bormuth's, but they differed in that Russel aimed at instructing the child to master the mechanics of reading so that he could reach those higher levels of comprehension. Apart from these differences, most authors agree that ultimately interpretation involves reasoning, and the ability to make or suspend judgement depending on the facts. Interpretation and aesthetic appreciation may be assisted by

25/...awareness/...

awareness of tone. Tone has been defined by Altick (1960) as 'the total emotional and intellectual effect of a passage of writing' (p.243). It is found in connotation, diction and rhythm, as well as in typographical aids such as quotation marks. italics, bold face type, parentheses, footnotes or glossaries. It is a cue to the author's intention and meaning and moulds the reader's attitude towards the subject matter.

To summarise, factors such as the nature of the passage and the reader's purpose dictate whether he should concentrate only on comprehending factually, or also on evaluating, reasoning, forming opinions and reaching conclusions. At times he may do none of these, and comprehension may be minimal. Prejudice and subjectivity, as well as the reader's blind acceptance of the author's opinions, may hinder understanding and distort interpretation.

It remains to discuss the theoretical issues surrounding the tests which have evolved to assess comprehension.

2.4 Assessing comprehension

The method selected to measure comprehension depends on the investigator's impression of the field, and more particularly, on how he regards memory in relation to comprehension. Many tests of comprehension measure the quantity that the reader remembers rather than the quality of his understanding. Durrell (1956), on the other hand, attested to the fact that comprehension

26/...tests/...

tests do not probe memory because reading involves the ability to answer specific factual or general questions, to summarize the main points, and to give complete unaided oral or written answers. A compromising, but more acceptable stance is taken by authors such as Ruddell (1969) who argue that memory is inherent in comprehension: short-term memory creates chunks out of the language units for transformational and rewriting purposes, and long-term memory holds previous information which can then be used in semantic interpretation.

This section completes the review of the conceptual literature. Many of the opinions expressed have generated research, and these findings are discussed below.

Several studies have compared factual and interpretative comprehension. Dewey (1931) compiled a questionnaire to test the acquisition of facts and inferences, and found that students were considerably better at answering factual questions than at making inferences. Similarly, Blayne (1949) showed that college students experienced difficulty in detecting irony, interpreting allusions and metaphors, and evaluating the influence of context on word meaning. Derrick (1953) investigated factual, inferential and judgemental items in three passages of differing lengths. Factor analysis of the results revealed no differences due to the type of item or to the length of the passage. There were some differences between

27/...factual/...

factual and more complex items, but scarcely any between inferential and judgemental items. Piekarz (1958) tested subjects in the sixth grade. They were matched for intelligence, critical thinking, personal adjustment, and selected environmental factors. She divided them into two groups of higher and lower level readers, her criterion being the accuracy with which they understood a passage dealing with child-parent relationships: higher level readers made more responses and were more involved in the reading process (involvement was not defined); lower level readers concentrated on literal surface meaning rath r than on implications; they became personally involved in the passage, saw the situation entirely in their own terms and ignored the author's intention. However, many of the subjects commented that the passage dealt with teenagers and was not relevant to them. Piekarz argued that subjects may have been affected by their attitudes to their parents and explained one lower level subject's performance in terms of her negative attitude towards her parents. Piekarz explained that this subject's attitude prevented her from viewing the passage 'objectively and rationally'. She was perhaps unjustly critical of subjective answers. Osgood (1955) condoned private interpretation and indicated that some individual interpretation may be due to the concomitant meaning or feeling tones which surround literal understanding. Subjects may recall words which they value highly with ease, and these values may colour their interpretation.

28/...Similarly/....

Similarly, Hayakawa (1944) and La Brant (1949) showed that the relevance of facts is often fixed by personal values and that interpretation may be a private affair. Piekarz failed to distinguish adequately between higher and lower level readers. However, her conclusions that (a) the emotive influence of the reading matter on the reader, depending on his prior experience, should be evaluated and (b) that readers should be taught to distinguish between the authors' attitudes and their own opinions, are valid.

Vernon (196?) presented a sample of 20-year old American and British college students with passages of different lengths followed by a questionnaire which tested factual information as well as inference and judgement. His hypothesis, that there would be a difference between factual and inferential scores, was confirmed by the American subjects, but not by the British.

Meaning in general terms has been investigated. Kolers (1969), testing bilingual English and French subjects, had them read an English text which was interspersed with French words. Instead of reading these printed French words, the subjects vocalised their English meaning. This accords with the psycholinguistic contention that meaning, not phonemic transcription, guides comprehension.

Several authors have examined the causes of good and poor interpretative comprehension. They have shown that feelings may be communicated by facial expression. According

29/...to Davitz/...

to Davitz (1964), this is difficult to test. The task requires the subject to guess emotions from looking at a picture of a person. Results have shown that feelings are communicated beyond chance expectation, and that some feelings are more easily identifiable than others (Davitz and Davitz, 1959a). Joy and hate were the most difficult of nine categories of emotion to distinguish (Pfaff, 1953). Similar feelings, such as anger and impatience, are more difficult to recognize than dissimilar ones, such as anger and shame, and stronger feelings are communicated more accurately than weaker ones (Davitz and Davitz, 1959b).

Levy (1964) investigated the identification of feelings expressed vocally by others, and the vocal expression of feelings to others. No sex differences were found and an inverse relationship was obtained between age and the ability to identify the expression of feelings by others.

In selecting several skills which were each necessary, but not sufficient for emotional sensitivity, Davitz (1964) included the ability to differientiate between pitch, loudness, time and timbre; an understanding of abstract symbols, knowledge of the vocal characteristics which signify emotions; verbal intelligence; and the ability to identify emotions aurally.

Little attention has been paid to developmental aspects of identification of emotions. Gates (1927) briefly

30/...discussed/...

discussed the finding that the ability was positively related to age, grade, school experience and intelligence. Since then, Dimitrovksy (1964) has studied children's identification of anger, happiness, love and sadness. These feelings were presented to the subject orally, by male or female readers using standard paragraph material. After they had listened to the passage, the children, aged from 5 to 12 years, were given drawings of stick figures, each portraying a different emotion, and they were asked to select the figure which best portrayed the emotion expressed in the passage. (Before the experiment began, Dimitrovsky trained the children on the figures so that each was associated with a particular feeling). The results indicate a progressive increase with age, expecially between the ages of 5 and 12, in sensitivity and the ability to identify the emotional meaning of vocal expressions.

In general, studies have shown that subjects deal more easily with factual questions than with inferences. It was also suggested that poor interpretation may result from the discrepancy in the degree of success in communicating different feelings. It may be possible to distinguish between readers, as Piekarz attempted to do, in terms of whether they attend to the ideas presented in the passage, or whether they restrict themselves to lateral meaning and see the passage subjectively. Such subjectivity is not necessarily a handicap and the reader's opinions and his interpretation of the passage

31/...merit/...

merit consideration. More time should be given to instructing readers and listeners in the use of vocal cues, rate, ratio of pause time to phonation time, and range and rate of changing pitch, as these may facilitate factual and interpretative comprehension.

The importance of assessing both factual and interpretative comprehension has not waned since 1570 when it was first attempted. This discussion has shown that comprehension was studied in a classroom setting for many years and the range, level and type of comprehension, and other similar issues, have been investigated and measured. The model of comprehension put forward in the theories of psycholinguists and information theorists has formed the framework of many studies which consider the application of linguistic principles to comprehension, as well as the nature of intonation and the identification of meaning by children and adults.

C H A P T E R III

3 METHODS OF PRESENTING A PASSAGE

3.1 Historical background

The alphabet method of spelling and pronouncing syllables, monosyllables, and words, was one of the earlies' [illegible] for teaching reading. Good spelling was prized highly than thorough comprehension, and hence the reader often memorized meaningless and boring material. Consequently, it was difficult to ascertain whether he had understood what he had read, or whether he was merely regurgitating in parrot-fashion. Later, in the early nineteenth century, the word method was introduced and publicised in text books. The reader learnt nonsense syllables or words associated with pictures, and then read a printed passage in which these words appeared. Phonic systems were devised but they had little success in teaching children to spell by sound. The phonetic system, a modification of the phonic system, provided a symbol for each sound, but meaning was lost because this method entailed so much deciphering. Although

33/...phonics/...

phonics and phonetics fell into disuse, they were not entirely neglected, and oral reading remained the favoured method. Rudolph Flesch, in 1955 and Bloomfield and Barnhart, in 1961, advocated a return to the phonics method. They proposed that a combination of the resources of the eye and ear was basic to reading, and, more particularly, to the automatic translation of letters into sounds and sounds into meaning.

From 1910 to 1920, more attention was paid to silent reading than before. Its advantages were discussed in the 16th and 18th yearbooks of the National Society for the Study of Education and it was experimentally examined between 1920 and 1930. The 20th Yearbook, part II (1921) was entirely devoted to the Society's report on silent reading, and it was proclaimed superior to oral reading in speed and comprehension. Some writers suggested abandoning oral reading, but the 24th Yearbook, part I (1925) commended the judicious use of both methods. Today the criterion is meaningful reading, and more emphasis is given to studies of listening, intonation and linguistics. A more detailed description of the four methods of presentation used in the present study follows.

3.2.i Silent reading

As evidenced by studies of the 'eye-voice span', the skilled reader can identify the meaning of the words before articulating them (Levin and Turner, 1966;

34/...Geyer/...

Geyer, 1968). Speed is an asset of silent reading and Durrell (1966) recommended that children should be taught to read silently at elementary school. In order to augment his comprehension, the reader should attend to the intonation patterns in the passage. The greater part of the literature dealing with silent reading pertains to comparing it with oral reading, and this is discussed below.

3.2.ii Oral reading

Oral reading is often chosen for teaching beginners (Brooks, 1926; Durrell, 1956). Children enjoy listening to their own voices and Durrell submitted that they feel 'secure' when reading orally. Psycholinguists have noted that the child comes to school experienced in language and that practice in oral reading of familar patterns '...with emphasis upon the native intonations' (Lefevre, 1964, p. 43, his italics), is possibly the best method of teaching reading. Others have argued this point, and Betts (1963) considered that some linguists may have overemphasised oral reading instead of silent reading, and structural as opposed to referential meaning in teaching beginners to read.

Stone (1926) suggested that oral reading assists appreciation of rhythm, melody and alliteration in poetry, a view shared by Brooks (1926), and by Lefevre (1964), but Stone, and also Beattie (1973) maintained that oral reading could not improve comprehension of purely factual material.

35/...They/...

They warned that oral reading in the absence of an audience could become mechanical. Besides comprehension, oral reading is assumed to develop poise, self-confidence, improved breath control and posture, voice quality, flexibility of speech, distinct articulation, variety of expression, and correct pronunciation. (Pappas (1970), while agreeing with Horn and Curtis (1949) that the 'chief function of oral reading is to develop worthwhile skills in communicating ideas read from a printed page' (pp.257 - 258), pointed out that oral reading, as it is taught in schools, seldom develops these skills, and Beattie added that it could produce embarrassment.

There are similarities between silent and oral reading, the most fundamental being that both require recognition of symbols and comprehension and interpretation. Anderson and Fairbanks (1937), Rogers (1957), and Anderson and Dearborn (1952) found that effective silent readers were also good oral readers, and that poor oral readers were bad silent readers, while Anderson and Swanson (1937) discovered a closer relationship between silent and oral reading for poor readers than for good readers. Durrell (1956) pointed out that although the two processes have much in common, success in one does not imply success in the other. While the initial stages of silent and oral reading are comparable, Goodman (1968) suggested that at a certain point, recoding and decoding of the stimulus input becomes simultaneous for silent readers but not for oral readers. He explained that:

36/...except/...

> ...except in passages where the phrasing is complex or ambiguous, the silent reader is virtually decoding meaning directly from the graphic input (p. 17).

and continued:

> The silent reader perceives whole graphic phrases in an instant, processes the information and moves on. He is not limited ... to the small area of type which he can perceive completely and accurately, since he can decode from partially incompleted and partially accurate perceptions (p. 19).

On the other hand, the oral reader perceives each word, and decodes and encodes it separately. The difference between the two methods is usally noticeable in the third grade when oral reading is much slower than silent reading.

Other authors (e.g. Edfeldt, 1968), maintained that silent reading and oral reading were quite different. Edfeldt cited Head's (1926) study of patients with motor aphasia. Though able to read and comprehend silently, they were unable to read orally. Completely accurate oral reading may demand a higher level of proficiency, perhaps even a special skill. In order to encode orally at the same time as he is decoding, the oral reader must change his normal reading pace and his method of processing information. Goodman (1968) submitted that many adults who were proficient silent readers never acquired the special skills necessary for oral reading. In accordance with the view that all language processes are related, Anderson and Dearborn (1952)

37/...proposed/...

proposed that oral reading could assist other types of reading, and Lefevre (1964), who represents the opinions of other psycholinguists as well, regarded oral reading as being the basis for later silent reading.

3. 2. iii Listening

Several authors (Rankin, 1926, 1930; Wilt, 1950, and Bird, 1953, cited by Wilkinson, 1970) have shown that that more time is spent listening than reading or writing, and it is curious that relatively little attention has been paid to this topic. Those studies which have been undertaken, use the terms 'listening', 'auding' and 'listening comprehension' interchangeably. More specifically,

> Listening is the wilful or deliberate attention to the hearing act .... When we interpret sounds and react to them with appreciation, criticism, or analysis, we refer to the procedure as auding. In other words, auding is putting listening to use in our thinking and living (Anderson, 1968, p. 83, his italics).

The findings from listening tests reveal vast individual differences in listening proficiency which many studies have failed to consider. These differences may be an artifact of the experiment in that the passage, while being quite suitable as a reading comprehension test, may be too difficult for a test of listening, or it may consist of information which is not suited to the listeners' experiences or interests.

38/...3.2.iv Listening/...

3.2.iv Listening and reading

One of three positions is usually held when listening and reading are discussed. They are:

(a) auditory comprehension surpasses visual comprehension;

(b) visual comprehension is superior to auditory comprehension;

and

(c) they are related.

These positions overlap considerably and experiments such as those discussed below show that visual comprehension surpasses aural comprehension, often reveal that with a different set of subjects, or with another passage, aural comprehension is better than visual comprehension.

(a) Auditory comprehension surpasses visual comprehension. Treneman (1950) stated that 'the scores of the listeners are... very slightly higher than those of the readers at all educational levels, for both immediate and delayed recall'. (p. 257, his italics). Similarly, psycholinguistic theory prescribed that the listener should receive more information than the reader. If the reader (in this case, to whom the audience listens) is skilled, he can provide the audience with the correct intonations, pauses, changes of pitch, stress and pace. Mark van Dören, cited by Anderson (1968) remarked that 'A good oral reader enters the heart of the listener' (p. 4). Witty and Sizemore (1958) were more restrictive and

39/...concluded/...

concluded that listeners could not comprehend all types of passages. Easy ones may be understood equally well by listeners or by readers, but comprehension of more difficult passages is facilitated by reading.

Listening is a better modality for children than for adults because most of their linguistic experience has so far been aural. However, the initial superiority of listening over reading decreases as the child becomes a proficient reader. By the time he reaches junior high school, his visual comprehension may be more accurate than his aural comprehension. This is illustrated by Larsen and Feder's (1940) study. They tested 151 university freshmen on reading and listening comprehension. The tests were selected from forms A and B of the Nelson-Denny Reading Test, and were approximately 200 words long. The passages were grouped into three levels of difficulty, with three passages to each level. They contained factual information of comparable standards. The passages in form A were listened to once, the passage being read by a trained speaker; those in form B were read once by the subjects. The subjects were then required to answer multiple-choice questions on the passage. Better oral readers, as well as students of high scholastic ability, were found to comprehend relatively better after reading than after listening. This applied regardless of whether the passage was moderately or extremely difficult. Students of low ability did slightly, though not significantly, better by listening

40/.....to easy/...

to easy material. The modality did not appear to make much difference with more difficult material.

Carver (1934) reported unusual findings. While a non-student adults sample found passages easier to comprehend when presented visually, college students preferred aural presentations, although if the passage was difficult, they scored higher after visual presentation.

The persuasive impact of listening was noted by McGuire (1969) and Beighley (1952) wrote that "The greater persuasive efficacy of heard over read speech is somewhat surprising, since it is generally found that comprehension is greater with reading than hearing" (p. 251). In studies of advertising, Stanton (1934), De Wick (1935), and Elliott (1936) found listening superior to reading for subjects who were expected to remember fictitious trade names of advertised articles, and the content of the advertisements.

(b) Visual comprehension is superior to auditory comprehension. Travers (1970) and Carroll (1964) submitted that reading has functional advantages over listening in the greater capacity of the eye for acquiring information, and in the speed of reading. Other authors have concurred (e.g. Corey, 1934). Tinker and McCullough (1962) found that visual and auditory comprehension of skilled readers and of subjects of higher mental ability were either equal, or that visual comprehension was better. Beighley's

41/...(1952) study/...

(1952) study is one which fits both position (a) - discussed above - and position (b), and is an example of an investigation which shows that in certain cases reading is best, but that in others listening is best. In addition to comparing adults' silent reading and listening, Beighley also studied the effect of the oral reader's vocal skill on the audience. Several skilled and unskilled readers read a passage once to themselves, and once aloud to the audience who then answered multiple-choice questions. The skilled readers improved the audience's comprehension more than the unskilled readers but Beighley concluded that the influence of delivery on increasing an audience's comprehension may have been overrated. Even though skilled readers were more vocally competent than unskilled readers, the audience did not always comprehend significantly more from them. In addition, silent reading, the comparative condition, was superior to listening for comprehension.

In terms of information processing, the receiver may have a more difficult task than the sender. The information which he receives consists of more than the printed symbols or sound waves (depending on whether he reads or listens): in addition to having to interpret elements which are unknown to him, he is unable to control the speed at which the information is transmitted or the channel noises which may interfere with his reception.

Several studies have investigated the reasons for the

42/...decrease/...

decrease in auditory comprehension with age. Nichols (1948) and Brown (1949) suggested that college students comprehend half, or less, of the basic matter of lectures, and Wilkinson (1970) agreed that many people listen below their full capacity, but proposed that listening efficiency could be learned. Wilkinson and Stratta (1972) blamed poor listening in lectures on the 'passive role required of the listener' (p. 3) and recommended abolishing long lectures in favour of situations in which listening took place in short intervals, with the listener interrupting the speaker, as in a tutorial. He admonished that 'The longer people listen the less they are able to listen' (Wilkinson, 1972, p. 3). Pratt (1956) advocated inspecting other factors which may improve aural comprehension, such as watching the speaker's facial expression and gestures, and inculcating in subjects a willingness to listen and to think about the ideas expressed.

It has been suggested that if listening is to be effective it should be directed. Vernon (1962) found that if subjects were not told they were to be tested after a broadcast, they comprehended little of it. Belson (1952) questioned this finding in a study in which only half the sample - the directed listeners - knew that they would be tested after listening. There was no significant difference between the two groups. The directed listeners recalled 28% of the ideas, and the undirected listeners, 20%.

43/...(c) Auditory/...

(c) Auditory and visual comprehension are related.

The theory that all communication is related and that the structures which underlie listening and speaking also underlie reading, has been discussed by several authors. Strang, McCullough and Traxler (1965) found a high correlation between listening and reading comprehension. Lefevre (1964) viewed language as being related to its graphic counterparts, viz. : '<u>language is audio-lingual</u>, a matter of mouth and ear. Writing and printing are based on speech and derived from it' (p. 4, his italics). Neisser (1967) related seeing, hearing and remembering. In his opinion, all were

> acts of construction.... The constructive processes are assumed to have two stages of which the first is fast, crude, wholistic, and parallel, while the second is deliberate, attentive, detailed and sequential (p. 10).

The first stage is a relatively passive, preattentive stage which guides the more active process of synthesis. Reading for meaning may be a type of analysis-by-synthesis, a construction which builds a non-sensory structure just as 'lower levels of cognition synthesize visual figures or spoken words', so that 'reading is externally guided thinking' (Neisser, 1967, p. 130).

The correlation between reading and listening for primary schoolchildren was calculated as being 0,5 and 0,6 (Caffrey, 1955; Hollow, 1955; and Pratt, 1956). High correlations were found at high school level (0,72 and 0,68).

Using two forms of the Inglis tests of English Vocabulary, Anderson and Fairbanks (1937) found a correlation of 0,8 between listening and reading comprehension. They concluded that 'It appears that vocabulary ability is a general function which, on the average, operates independent of the mode of presentation of the material.' (p. 313). Evidence from correlational studies is not conclusive as some studies reported high correlations, while others reported low, or no correlations. Witty and Sizemore (1958) found high correlations in the ability to learn through visual, auditory and kinaesthetic modalities. They suggested that there was little relationship between method of presentation and retention of information. Gates (1947) regarded listening and reading comprehension as being fundamentally the same, differing only in that they employed different sense organs, and pointed out that children use the same selecting, evaluating, organizing and thinking mechanisms in both.

Several authors have discussed the simultaneous visual and aural presentation of material. Originally Travers (1966) suggested that by 'bombarding' the subject from two sensory modalities he would learn more quickly, and Witty and Sizemore (1959a) found that learning could be improved through simultaneous auditory and visual presentations. Later Travers (1967) referred to literature which indicated that there was no advantage in simultaneous employment if the eye and ear have to carry a lot of information, and by 1970 he had decided that this

45/...could/...

could cause perceptual blocking and so interfere with comprehension.

The general conclusion from these studies is that auditory comprehension is easier for younger subjects and/or when simple material is used. Otherwise, visual presentation yields better results, though this trend has not been found in all studies, and especially not in advertising. The factors responsible for the discrepancy between findings are difficult to disentangle as they vary for different studies. They include the nature and difficulty of the passage, the individual differences between subjects, the quality of the visual and auditory situations, and the methods used to equate the two.

3.2.v Acting

Play reading creates a functional form of oral reading and the actor has a purpose in reading aloud to an audience. It may therefore be more natural and more satisfying for children than is oral reading of narrative material, according to Pappas (1970), and children require few instructions in order to act. Durrell(1956) pointed out that the script may be read and read again without losing its novelty: interest in it is sustained because actors impersonate the characters, while comprehension and interpretation are assured because every line has meaning in the context of the development of character and plot.

46/...Acting/...

Acting also differs from oral reading in that the participants play roles. Role theory originated from the stage and took its terminology from there, but little is known about comprehension in acting or play-reading situations. In such instances, participants are acting ing while simultaneously reading lines which they must make meaningful in order to interact successfully with other characters. Each participant should be aware of his character's mood, and by playing a role, the actor learns to understand his own role in relation to those of others (cf. Bowman, 1949; Maier, 1952; Allport, 1954). Biddle and Thomas (1966) suggested that in achieving this awareness, the actor's scope is limited 'by the script, the director's instructions, the performance of fellow actors, and the reaction of the audience, as well as by the talents of the players' (p. 4).

The concept of 'role' has been discussed by Linton (1947) who used the term to describe those behaviours associated with a certain position, while Turner (1956, p. 317) regarded a role as being 'behaviour rather than position' which could be enacted but not occupied. Coutu (1951) distinguished between 'role-playing' and 'role-taking' as follows:

> Role-taking... is a psychological concept referring to a mental or cognitive process while role-playing is a sociological concept referring to a social function which all people holding a particular position or status are expected to perform in overt conduct (p. 181, his italics).

47/...Thus/...

Thus in taking a role the actor pretends he is the character, while in playing a role he overtly performs acts dictated by and associated with his social status. Even less is known about 'playing at', an elementary form of role-taking found in make-believe or in play-acting in which the actor 'plays-at' roles which he would never actually play in reality. Some authors insist that a role cannot be 'played-at' properly unless the player had previously seen someone else acting it, but Turner (1956) submitted that the role may be inferred from three factors: knowledge of the situation; the supposed status of the character; and his or her presumed values. Nevertheless, an actor who plays a role 'blind', without previous experience of it, may have more difficulty in doing so than one who has some previous knowledge of the role.

Having decided on how to occupy the role, the actor must put this into practice. Role enactment has been defined as the 'overt performances of persons... (which) include among other segments of behaviour, gross skeletal movements, the performance of verbal and motoric gestures, posture and gait, styles of speech and accent...' (Sarbin, 1959, p. 232). Roles may be acted at seven levels of involvement, ranging from the casual to the moribund (at which level roles are often irreversible). Dramatic acting occupies the second and third levels, and may be mechanical or 'heated'. Mechanical acting implies that

48/...the actor/...

the actor is not totally involved, but he identifies with his character sufficiently to be able to make consistent responses. Acting is 'heated' when an actor 'lives' the role and behaves as if he actually is the character in the drama.

An actor faces role conflict if he takes a new role which turns out to be incompatible with his own role. The severity of the conflict depends on the relative incompatibility of the two roles, and the vigour with which the expectations accompanying them are defined. Getzels and Guba (1955) stated that 'an actor who is in conflict must necessarily ignore some of the expectations of one or more of the roles'. Conflict may be resolved by abandoning one role in favour of another; by compromising both roles; or by withdrawing physically or psychologically from both roles. The most effective choice is the first alternative. The major role (as it has been called by Ackerman (1951)) will be selected on the ground that it is most significant to the actor's self-concept and also most congruent with his needs and expectations, and other minor roles will be assimilated into it.

Role theory has been applied in therapy (Moreno, 1946; Perls, 1971; Slade, 1954). Slade stressed its importance for the playing out of traumatic events, but Perls argued that it was 'phony' for subjects to 'play games, play roles' (Perls, 1971, p. 20). He asserted that in such

49/...situations/...

situations behaviour was characterized by a hypothetical 'as if' quality which had nothing in common with reality. Several educationalists, like Valentine (1960), recommended play methods for backward children, but not for the intellectually elite. Bowman (1949) commended play techniques, arguing that they led to active rather than vicarious participation and stating that '... (it) is axiomatic in educational theory that we learn by doing' (p. 197).

To summarise, there is a fairly high correlation between silent and oral reading. Oral reading is assumed to be a better medium for children than silent reading, and the reverse applies to adults. In comparing reading and listening, three positions are taken: one proposes that they are related and the other two outline the superiority of one over the other. Children prefer aural comprehension and adults prefer visual comprehension (though this relationship is affected by other factors such as the nature of the passage and the intelligence and age of the subjects). As regards acting, no conclusions may be drawn as it has not been compared with other methods. The question remains unanswered whether the actor's playing of a role, the role conflict which he may experience, and/or the acting situation, may facilitate comprehension or make it more difficult.

C H A P T E R I V

4 METHOD

4.1 Design

The design of the present study was a 2 x 4 x 2 factorial analysis of variance with repeated measures on one factor. This design was chosen in order to determine whether there were significant differences between children's and adult's factual and interpretative comprehension related to the following four conditions: silent reading, oral reading, listening or acting. Mean factual and interpretative scores were calculated for all treatments of the factors involved, and these mean scores were used in the statistical analysis. Factor A had two levels which related to the different age groups, children and adults. Factor B had four levels, each of which corresponded to a method of presenting the passage, i.e. silent reading, oral reading, listening and acting. Factor C referred to the type of comprehension, and had two levels, factual and interpretative. This factor was a repeated measure

51/...as each/...

as each subject answered identical factual and interpretative questions after receiving information according to one of the levels of factor B. The design is presented in fig. 1.

4.2 Subjects

The sample comprised 120 subjects: 61 females and 59 males. They were divided into two groups, one comprising sixty schoolchildren, and the other comprising sixty first-year university students. The children were selected from the standard one pupils attending a private primary school in Cape Town, and the adults from the first-year psychology students at the University of Cape Town. All subjects were chosen by means of a table of random numbers. They were all English-speaking and the experiment was conducted in English.

52/...Figure 1/...

A Age group	B Method of presentation	Subjects	C Type of comprehension	
			c_1 factual	c_2 interpretative
a_1 Subjects aged 9,4 years to 9,7 years	b_1 = silent reading	1 : 15		
	b_2 = oral reading	16 : 30		
	b_3 = listening	31 : 45		
	b_4 = acting	46 : 60		
a_2 Subjects aged 19,7 years	b_1 = silent reading	61 : 75		
	b_2 = oral reading	76 : 90		
	b_3 = listening	91 : 105		
	b_4 = acting	106 : 120		

FIG. 1. Design of the three-factor mixed design with repeated measures on one factor.

53/...Children/...

4.2.i Children

The sixty children (33 females and 27 males) ranged in age from 8 years and 9 months to 10 years and 3 months, the average age of the sample being 9,4 years. A table of random numbers was used to assign the subjects to the four experimental conditions, each of which comprised fifteen subjects. Each group of fifteen subjects responded to the passage in a different way, by reading silently, by reading orally, by listening or by acting, according to the experimenter's instructions. Distribution of the sexes was only of importance in the acting condition because there were three male roles and two female roles to be played. Since the passage was to be acted thrice, each time by a different five subjects, nine males and six females were randomly selected from the sixty children for this condition.

4.2.ii Adults

The sixty adults (28 females and 32 males) ranged in age from 17 years and 5 months to 26 years and 4 months. The average age for the sample was 19,7 years. The method described above was employed to assign adults to the four experimental conditions.

4.3 Materials

A passage of 1284 words was compiled from a combination of M. Gardner's Lewis Carrol's The Annotated Alice (1960, pp. 143 - 152) and C. Dane's Lewis Carrol's Alice's

54/...Adventures/...

Adventures in Wonderland and Through the Looking Glass (1944, pp. 44 - 47). The passage is contained in appendix A. pp.128 - 132. It was selected because the story is popular with adults and children. (Although the book sometimes is regarded as a complex mathematical and philosophical treatise, no specialised knowledge was required in order to answer the questionnaire).

4.4 The Pilot Study

The passage and questionnaire were tried out in a pilot study for which subjects were randomly selected from Johannesburg schoolchildren and university students. They conformed to the description of the subjects described above. The pilot study investigated the materials which were to be adopted for the present study in the following way:

(a) The passage: The same passage was used in both the pilot and the present studies, with the exception of the factors mentioned below. (A comparison of appendix A, pp. 128 - 132, which contains the present study's passage, and appendix B, pp. 133 - 137, which contains the pilot study's passage, shows how they differed). Consisting of stage directions written in prose style and a conversation among five characters written in dialogue, the passages both comprised factual and interpretative content. The following excerpt shows what was termed 'interpretative', although for complete interpretative comprehension, the whole passage had to be assimilated:

55/...KING/...

KING: But what else did the March Hare say?

MAD HATTER: That I can't remember.

KING: You must remember, or I'll have you executed. Off with his head!

MAD HATTER: (dropping his teacup and bread-and-butter and falling onto his knees)

I'm a poor man, your Majesty...

KING: You're a very poor speaker. If that's all you know about it, you may stand down.

This extract illustrates several aspects of interpretation. Primarily it shows that the subject must be aware of who said what, whom or what the characters are discussing, and what they do, before he can fit the meaning into the broader context of the whole situation and so interpret properly. Once the sequence of events and utterances is clear to the subject, he may use the facts to determine that the King is pressing the Mad Hatter for an answer, and is threatening him. The fact that the Mad Hatter drops his teacup and bread-and-butter, and falls on his knees, is evidence that he is afraid and should be interpreted in that way.

The next excerpt illustrates the factual content:

> The KING OF HEARTS is seated on his throne, in the centre of the courtroom, towards the back. He wears a wig under his crown. The MARCH HARE stands on his left, holding a trumpet in one hand and a scroll in the other. In the middle of the courtroom, in front of the KING OF HEARTS, is a table with a dish of tarts on it...

This extract sets the scene and is particularly factual though it is not entirely devcid of interpretative content. Before the subject reads the whole passage, he has certain values associated with kings and court-rooms. However, in order to interpret this particular passage correctly, the subject must pay attention to the facts as they are presented here. He must note the order in which they are given, as well as their sequence, and also information given about the characters, for example, where they are positioned, what they wear, etc.

(b) Vocabulary: In order to ascertain whether the subjects knew the meaning of all the words in the passage, the pilot study subjects were asked whether there were any words which they had not understood. In this way such words were isolated, the passage was revised, and the difficult words were explained. Children did not know the meaning of 'the accused' or 'parchment'. Consequently, in the passage used in the present study, 'the accused' was explained by 'The accused, that is, the person who was believed to have done something wrong...', and 'parchment', by adding a definition: 'Parchment is a type of paper made out of animal skin'. Other words which were difficult for the children were 'verdict', 'evidence', 'sensation' and 'dunce'. These words were either replaced by similar words (e.g. 'fool' for 'dunce'), or explained by elaboration or definition. (Again, a comparison between the passage used in the pilot study - appendix B, pp. 133 - 137,- and the one

57/...used in/...

used in the present study - appendix A, pp. 128 - 132 clarifies which words were explained and which were eliminated).

(c) Number of times the passage was read: In order to assess which facilitated comprehension more - a single reading or two readings, some of the subjects in the pilot study read the passage once and others read it twice. Subjects comprehended little from a single reading, and in the present study the subjects all received the passage twice.

(d) Question form: Two possible methods of assessing factual and interpretative comprehension were tried by the pilot study. The first used only open-ended questions, and the second used open-ended questions to test factual comprehension, and multiple-choice questions to assess interpretation. Although open-ended factual questions were answered equally well by adults and children and were easy to score - they could be correct or incorrect - both groups had difficulty in answering open-ended interpretative questions, and, in addition, these answers were too diverse to score accurately. Consequently, in the present study, factual questions were open-ended and interpretative questions were multiple-choice.

Multiple-choice questions are usually associated with recognition and open-ended questions with recall. Recognition and recall are comparable, according to

58/...Underwood/...

Underwood and Freund (1968), and Adams (1967) has stated that 'the Memory Trace hypothesis says that the same memory trace is the basis for both recall and recognition...' (p. 264).

As regards recognition, Underwood and Freund (1968) suggested that the items which form the choices should be made up of the correct word, a high associate of the correct word, a formally similar word and a neutral word. This prescription was adhered to in formulating the questionnaire for the present study. Underwood and Freund found that the high associate of the correct word complicated the subject's task, and Kintsch (1970) agreed that 'in all recognition tests the similarity between the learning items and the distractor items is a very powerful variable' (p. 221).

In recall, 'relationships among items are all-important ... Recall involves a search and retrieval process, the efficiency of which depends on how well the learning material has been organised in memory' (Kintsch, 1970, p. 243). As regards the relation between recall and multiple-choice questions, Durrell (1956) maintains that:

> Recall is easiest when multiple-choice questions are given, harder when the pupil must write short answers, still harder when a series of answers must be given to a single question, and hardest when an oral or written summary is demanded without the aid of questions (pp. 116 - ..7).

(e) Questionnaire items: The questionnaire used in the pilot study comprised 28 questions which tested

59/...comprehension/...

comprehension of factual information, and twenty questions which tested the subject's ability to interpret the facts (see appendix D, pp. 142 - 146). Items which were too difficult or too easy for subjects in the pilot study were discarded as such items do not provide any information about the test performance. Items which were answered correctly by approximately 50% of the children and adults in the pilot study (p = ,5) were retained. Anastasi ('068) suggested that such items differentiate among subjects. Some items which were included were slightly easier and could be answered by 70% to 80% of the sample, and some were slightly more difficult and were only answered by 30% to 40% of the sample. All question items were checked for reliability and for face and content validity. The factual and interpretative questions selected for the present study had been found to be of comparable difficulty for children and for adults in the pilot study. The final test questionnaire comprised twenty items. Ten dealt with factual comprehension and the remainder with interpretation. The questionnaire is contained in appendix C, pp. 138 - 141.

4.5 Procedure

Prior to the testing, the subjects who had been drawn in the random sample were asked to participate in an experiment but they were not told anything about it. The procedure to be described below was used with children and adults, and both groups were tested separately. The

60/...The children/...

The children were tested in a class-room at school in the mornings, over a period of a month; the adults were tested in a lecture-theatre at university in the afternoons, over a period of two weeks.

The specific procedure for each condition was as follows:

4.5.i Silent reading:

Fifteen subjects were seated in the class-room or lecture-theatre, and each one was handed five typed sheets on which the passage was printed. They were instructed as follows:

> Please read the passage which has been handed to you. There are five pages you must read them all, silently. When you have finished reading, please raise your hands. You need only read the passage once. Please turn the papers over now, and begin reading.

Once the subjects had indicated that they had read the passage, they were instructed again:

> Now please read the passage again, silently, and raise your hands when you have finished.

After each subject had completed the second reading, the passage was collected and the questionnaires distributed. Administration of the questionnaire was the same for all groups, and will be dealt with separately under the heading 'Administration of the questionnaire'.

4.5.ii Oral reading:

In this condition only, subjects were tested individually, and the following instructions were given:

61/...Please/...

> Please read the passage in front of you. It has pages and you must read them all aloud.

The experimenter remained within listening distance to ensure that the subject was reading orally. After the subject had read the passage once, he was requested to read it for the second time, aloud. Thereafter, it was collected and the questionnaire administered.

4.5.iii Listening:

All fifteen subjects, simultaneously, were instructed by the experimenter as follows:

> I am going to read a passage to you. Please listen carefully.

The experimenter read the passage using modulation, intonation, and various techniques of voice production in order to suggest the different characters and nuances of mood. Having read the passage once, the experimenter informed the subjects that she would read it again. After the second presentation, the questionnaire was administered to all subjects at the same time.

4.5.iv Acting:

Conforming to the directions in the script, the room in which testing took place was provided with a throne and three chairs, and a table with a dish of tarts upon it (see appendix E. p. 147) for a diagram of the stage as set). Five subjects were instructed at a time and each was to play the role of one of the characters in the

script. Females played Alice and Cook, and males played the King, the Mad Hatter and the March Hare. After the subjects had been informed that they were to take part in an enacted playreading they were cast for the parts and were handed their props: a crown, wig and note-book for the King of Hearts; a trumpet and scroll for the March Hare; a hat, teacup and bread-and-butter for the Mad Hatter; and a pepper-pot for the Cook.

The actors were instructed as follows:

> I want you to act out this passage as if you were acting in a play. The props which you see in the room - the throne, chairs, table, dish of tarts, and those objects which you have been handed, are all mentioned in the script. Do exactly what the script says, and try to be the character you are playing. The script will direct you where to stand. The Mad Hatter should take off his shoes and carry them, and he should wait at the door because he only enters later. Begin acting as soon as I start reading the stage directions. I shall read all the stage directions aloud while you act and read your parts.

After acting the passage once, the subjects were asked to repeat their performances, this time reading the stage directions for themselves without the experimenter's intervention. Thereafter, the passage was collected, the questionnaire answered, and the next five subjects called in to repeat the procedure.

4.6 Administration of the questionnaire

The first page of the questionnaire contained instructions to the subjects and examples of test items. The experimenter read this to the subjects, pausing for them to

63./...fill in/...

fill in what was necessary, and helping the children to calculate their ages. Subjects were asked to complete the examples in order to make sure that they understood the instructions. Mainly for the sake of the children, instructions were detailed and less concise than they might have been, had only adults been included. Having assessed that all was understood, the experimenter asked the subjects to turn over the first page of the questionnaire and to answer the questions. After this the experimenter answered no more queries.

The following are examples of a factual and of an interpretative question and answer:

(i) Factual

Q. WHO WAS THE FIRST WITNESS?

A. The Mad Hatter.

(ii) Interpretative

Q. WHEN ALICE BEGAN TO GROW, SHE WAS

A. (puzzled; dazed; confused; happy; pleased)

(The complete questionnaire appears in appendix C, pp. 138 - 141). All subjects complied with the instructions and completed the questionnaire.

4.7 Scoring

Correct answers scored one, incorrect answers zero. No half marks were given and answers were either right or wrong. Answers to open-ended questions may be unexpected and were therefore scored quite flexibly. For

64/...some/...

some questions several answers were accepted as correct.

Question 5 dealt with the correct location of the King. It was not precise enough to answer that he was seated in the court-room, but two or more of the following were counted as correct: 'on the throne', 'next to Alice', 'next to the March Hare', 'next to Alice and the March Hare', 'behind the tarts', or 'in the centre of the court-room, towards the back'.

Question 11 ('What did the Mad Hatter carry?') could have been answered correctly by 'a teacup and bread-and-butter', though this together with 'his shoes' was also accepted: the actors playing the role of the Mad Hatter had been instructed to enter carrying shoes as well as the teacup and bread-and-butter.

A variety of answers was accepted for question 17 which dealt with the Mad Hatter's position on the stage. It could have been answered by 'he stood between Alice and the tarts, facing the King', or 'at the door', but 'before the King', 'between Alice and the King', or 'between the King and the tarts', were too imprecise to score a point.

Three answers were accepted for question 19 ('Why wouldn't the Mad Hatter take off his hat?'). Each of the answers, 'because it isn't his', 'he is keeping it to sell', or 'he is a hatter', had the same implication in the context of the passage, i.e. that because he was keeping the hat for sale it did not belong to him, and, similarly, although

65/...it was in/...

it was in his possession, it was not his property, and they were all accepted.

The only correct answer to question 9 ('What did the March Hare do before reading from his scroll?') was 'He blows three blasts on the trumpet.' A portion of that - 'he blows the trumpet' - was not accepted because the subject could have referred back to the instructions page of the questionnaire where the question, 'What does the March Hare carry?', together with the correct answer 'He carries a trumpet and a scroll.' appeared as an example of how to answer a factual question. The subject would have seen that the March Hare carried a trumpet and could have deduced that the thing to do with a trumpet would be to blow it. The answer required greater detail, and in order to score, the subject had to mention the three blasts.

C H A P T E R V

5 RESULTS

The questionnaire items served as the basis for a general investigation of the factors considered by the present study. Each subject obtained two scores, one based on factual answers and the other on interpretative answers. The raw scores are presented in appendix F, pp. 148. Mean scores were derived from the raw scores and are presented in table 1. (Subsequent tables were derived from this grand table.) (Unless otherwise stated, all figures in this, and in the following chapters, refer to mean scores.)

67/...Table 1/...

TABLE 1

Mean number of correct scores obtained by subjects in all conditions

A	B	C		Total
Age	Method of presenting the passage	Comprehension		(Max. $\bar{X}$ = 10)
		c_1 factual (Max.$\bar{X}$=10)	c_2 interpretative (Max.$\bar{X}$=10)	
a_1 Children	b_1 = silent reading	4,400	4.400	4.400
	b_2 = oral reading	4,200	4,800	4,500
	b_3 = listening	6,067	4,330	5,200
	b_4 = acting	5,867	4,467	5,167
MEAN TOTAL		5,133	4,500	4,816
a_2 Adults	b_1 = silent reading	6,333	6,330	6,333
	b_2 = oral reading	6,667	6,000	6,334
	b_3 = listening	5,800	5,567	5,734
	b_4 = acting	5,400	5,267	5,834
MEAN TOTAL		6,300	5,817	6,069
GRAND MEAN Total		5,717	5,159	5,438

68/...Table 2 shows/...

Table 2 shows the mean number of correct factual and interpretative answers given by children and adults and averaged over the four presentations. Adults' scores were higher than children's scores, and the difference between the two groups was greater for interpretation (1,317) than for factual comprehension (1,167).

TABLE 2

Comparison between mean scores obtained by children and adults for factual and interpretative comprehension averaged over the four presentations

	Factual	Interpretative
Adults	6,300	5,817
Children	5,133	4,500
DIFFERENCE	+1,167	+1,317
+ indicates difference in favour of adults		

A comparison between adults' and children's factual scores for each method of presentation is made in table 3. Adult oral readers scored highest (6,667) and adult listeners scored lowest (5,8), while children scored highest after listening (6,067) and lowest after reading orally (4,2). Thus, the greatest difference between the two age groups' factual comprehension resulted from oral reading (difference = 2,467), and the least difference resulted from listening (0,267), the latter being the

69/...only/...

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69/...only/...

TABLE 3

Comparison between children's and adults' mean factual scores for each presentation

FACTUAL SCORES				
	Method of presentation			
Age	Silent reading	Oral reading	Listening	Acting
Adults	6,333	6,667	5,800	6,400
Children	4,400	4,200	6,067	5,867
DIFFERENCE	+1,933	+2,467	-0,267	+0,533

+ indicates difference in favour of adults
- indicates difference in favour of children

only presentation in which children scored higher than adults. Considering the scores of each age group separately, there was little difference between the adults' scores for silent reading, oral reading and acting (6,333; 6,667; and 6,4 respectively). Children's silent reading and oral reading scores were similar (4,4 and 4,2 respectively) and lower than their listening and acting scores (6,067 and 5,867 respectively).

Adults' and children's interpretative scores for each presentation are compared in table 4. Adults' interpretative scores were higher than children's interpretative scores for each presentation. The greatest

70/...difference/...

TABLE 4

Comparison between children's and adults' mean interpretative scores for each presentation

INTERPRETATIVE SCORES				
Age	Method of presentation			
	Silent reading	Oral reading	Listening	Acting
Adults	6,333	6,000	5,667	5,267
Children	4,400	4,800	4,333	4,467
DIFFERENCE	+1,933	+1,200	+1,334	+0,800
+ indicates difference in favour of adults				

difference between the two groups' mean scores was for silent reading (1,933): the adults scored highest for this presentation (6,333) and it was the children's second lowest score (4,4). The least difference between the two groups came after acting (0,8), for which the adults obtained their lowest, and the children their second highest scores (i.e. 5,267 (adults); 4,467 (children)). The difference between the age groups for the remaining presentations were as follows: oral reading, 1,2; and listening, 1,334.

If the age groups are considered separately, there

71 /...appears/...

appears to be little variation among the adults' scores which range from 6,333 (silent reading) to 5,267 (acting). Adults' oral and silent reading scores were most similar (6,333 and 6,0 respectively) and higher than their listening and acting scores which were also similar (5,667 and 5,267 respectively). There was even less difference between children's scores which range from 4,8 (oral reading) to 4,333 (silent reading).

In order to inspect the relationship between factual and interpretative comprehension the mean scores of adults and children were combined. Table 5, in which children's and adults' factual and interpretative scores are combined, shows that the highest factual mean score was obtained by actors (6,134), followed by listeners (5,934), oral readers (5,433), and silent readers (5,367). The The highest interpretative mean score was obtained by oral readers (5,4) followed by silent readers (5,367), listeners (5,0) and actors (4,867). The factual scores are almost the reverse of the interpretative scores: consequently, there was no difference between the two types of comprehension following silent reading; the difference for oral reading was 0,033; for listening, 0,934, and the greatest difference was for acting, 1,267.

72/...Table 5/...

TABLE 5

Comparison between total mean scores obtained by subjects for factual and interpretative comprehension for each presentation

Comprehension	Silent reading	Method of presentation		
		Oral reading	Listening	Acting
Factual	5,367	5,433	5,934	6,134
Interpretative	5,367	5,400	5,000	4,867
DIFFERENCE	---	+0,033	+0,934	+1,267
+ indicates difference in favour of factual comprehension				

In order to consider the age groups' factual and interpretative mean scores separately for each of the presentations, a comparison of children's mean scores is made in table 6. The order of the factual and interpretative scores, from highest to lowest follows a different pattern to that of the overall comparison discussed above, and was as follows for factual scores: listening, acting, silent reading and oral reading, and for interpretation: oral reading, acting, silent reading and listening. As in table 5, there are no differences between factual and interpretative comprehension for silent reading (both = 4,4), but their interpretative mean score was higher than their

73/...factual/...

TABLE 6

Comparison between mean scores obtained by children for factual and interpretative comprehension

Comprehension	Method of presentation			
	Silent reading	Oral reading	Listening	Acting
Factual	4,400	4,200	6,067	5,867
Interpretative	4,400	4,800	4,333	4,467
DIFFERENCES	---	-0,600	+1,734	+1,400

+ indicates difference in favour of factual comprehension
- indicates difference in favour of interpretative comprehension

factual mean score for oral reading (4,8 : 4,2). In the other presentations, factual comprehension scores were higher than interpretative scores (listening = 6,067 : 4,333; and acting = 5,867 : 4,467). The difference between the two was greatest for listening (1,734), less for acting (1,4) and least for oral reading (0,6).

Adults' factual and interpretative mean scores for each presentation were compared and the differences noted in table 7. Again in this comparison, the order of the scores differed from the overall comparison in table 5.

74 /...The highest/...

TABLE 7

Comparison between mean scores obtained by adults for factual and interpretative comprehension

Comprehension	Method of presentation			
	Silent reading	Oral reading	Listening	Acting
Factual	6,333	6,667	5,800	6,400
Interpretative	6,333	6,000	5,667	5,267
DIFFERENCE	---	+0,667	+0,133	+1,133
+ indicates difference in favour of factual comprehension				

The highest factual score was obtained by oral readers, followed by actors, silent readers and listeners. The pattern for the interpretative scores was, in decreasing order: silent reading, oral reading, listening and acting. As in the case of the children's scores, there was no difference between factual and interpretative scores for silent readers, and for all other subjects, factual scores were higher than interpretative scores, viz.: oral reading = 6,667 : 0; listening = 5,8 : 5,667; and acting = 6,4 : 5,267. The least difference between factual and interpretative comprehension was found for listeners (0,133) and the greatest for actors (1,133). All the adult

75/...scores/...

scores for factual and interpretative comprehension were similar, and range from 5,267 to 6,333.

In order to ascertain whether any differences between the mean scores were statistically significant, the data were analysed by means of an analysis of variance test, summarised in table 8. Results at, or beyond, the ,05 level of significance were accepted as confirmation of the hypothesis. Two-tailed tests were used. For the age and comprehension effects, as well as for the age x comprehension interaction to be judged statistically significant, the value of $\underline{F}$ had to exceed 3,92, (i.e. the value of $\underline{F}_{,05}$ associated with 1,112 degrees of freedom). For the presentation effect, the age x presentation interaction, the presentation x comprehension interaction, and the age x presentation x comprehension interaction to be judged statistically significant, the value of $\underline{F}$ had to exceed 2,68 (the value of $\underline{F}_{,05}$ associated with 3,112 degrees of freedom).

Significant effects were obtained for age ($\underline{F}$ = 21,61; $\underline{df}$ = 1; $\underline{p} < ,05$), comprehension, ($\underline{F}$ -8,57; $\underline{df}$ = 1; $\underline{p} - < ,05$), and for the presentation x comprehension interaction ($\underline{F}$ = 2,82; $\underline{df}$ = 3; $\underline{p} = < ,05$). (The age and comprehension effects were also significant at the ,01 level). The significant age effect indicated that the difference between the means represented a difference in the population and was not a function of sampling error. The direction of this difference was in favour

76/...of the adults/...

TABLE 8

Summary of results of analysis of variance for the data

Source of variance	Error term	SS	df	MS	F	p*+
Mean	S(AB)	7095,94	1	7095,94	1657,33	
A (age)	S(AB)	92,50	1	92,50	21,61	,01*
B (presen-tation)	S(AB)	0,61	3	0,20	0,05	,05
C (compre-hension)	SC(AB)	18,70	1	18,70	8,57	,01*
AB	S(AB)	24,91	3	8,30	1,94	,05
AC	SC(AB)	,34	1	,34	0,15	,05
BC	SC(AB)	18,45	3	6,15	2,82	,05*
(Subj. w. groups. Error (between))	S(AB)	479,53	1[illegible]	4,28		
ABC	SC(AB)	15,55	3	5,18	2,37	,05
(C x subj. w. groups. Error (within))	SC(AB)	244,47	112	2,18		

+ significant at the ,05 level
* significant at the ,01 and ,05 levels

of the adults who generally scored higher than the children. This is illustrated in fig. 2 which is based

77/...on table/...

on table 3, for factual scores, and in fig. 3, which is based on table 4, for interpretative scores. (Although it is not strictly correct to join the different points in the graph so that they form continuous lines, McGuigan (1968) favours this practice because it illustrates the point more vividly. The lines have been broken before and after the points to show that the data were not continuous).

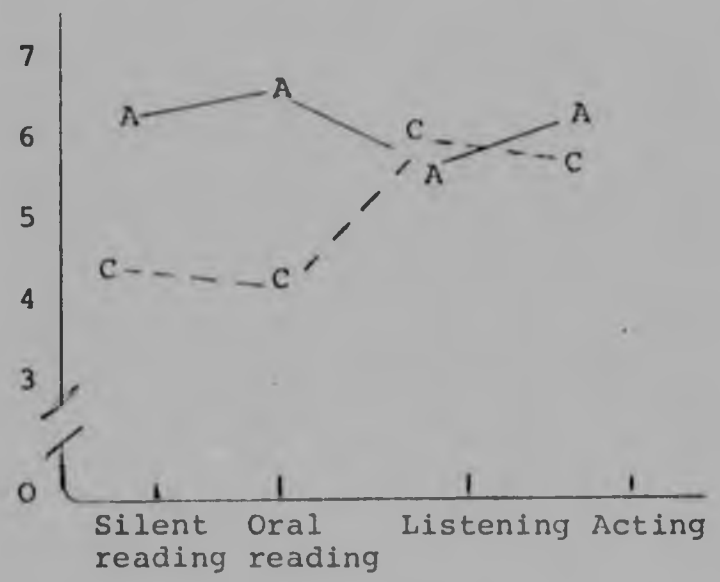


FIG. 2. Adults' (A) and children's (C) mean factual scores.

Inspection of fig. 2 reveals that the difference between the two age groups' factual scores, was greater for silent reading (1,933 in table 3) and oral reading (2,467) than it was for listening (0,267) and acting (0,533). Fig. 3 shows that the difference between the two age groups' interpretative scores was greater for silent reading (1,933 in table 4) than for any other

presentation. Clearly, the differences between the age groups vary, but at times they are too small to account for the significant effects. Further investigation was required in order to ascertain how the statistically significant results for the age factor had occurred.

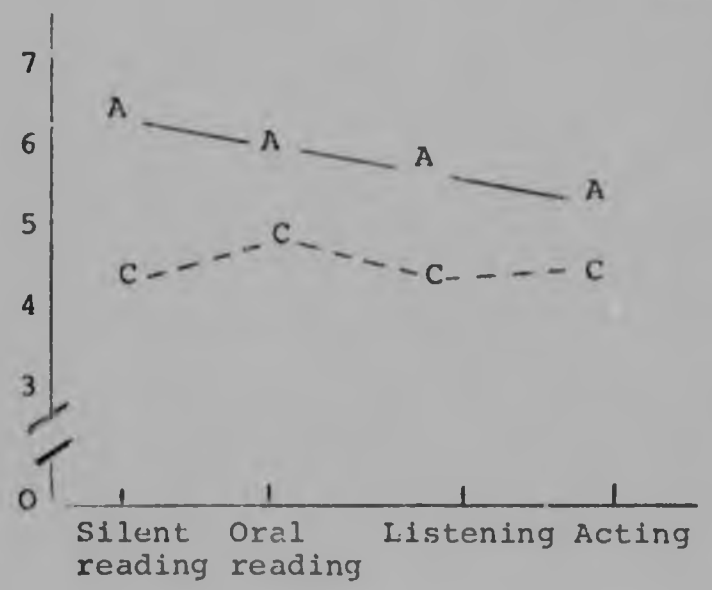


FIG. 3 Adults' (A) and children's (C) mean interpretative scores.

All the presentations may have contributed to causing an additive result, alternatively, a particular, large difference between the two age groups for one presentation may have accounted for the larger part of the variance, while masking other, non-significant differences. This was resolved by an a posteriore decision to compare the two age groups' factual and interpretative scores for each presentation. Analysis of the treatment by Scheffé's test revealed a statistically significant difference

79/...between/...

between children's and adults factual scores for oral reading ($F = 20,93$; $p < ,10$). This presentation had led to the children's lowest, and to the adult's highest factual mean scores. As regards the level of significance taken for the Scheffé's Test, it was pointed out that the ,10 level was selected, instead of the more customary ,05 level. This is Scheffé's (1959) recommendation. According to Ferguson (1966):

> Concern may attach to the fact that the Scheffé procedure is more rigorous than other procedures, and will lead to fewer significant results. Because this is so, the investigator may choose to employ a less rigorous significance level in using the Scheffé procedure; that is, the .10 level may be used instead of the .05 level (Ferguson, 1966, p. 297).

The other statistically significant main effect, comprehension, confirmed that factual and interpretative comprehension scores differed. That this may be so is illustrated in fig. 4, which is based on table 6, for children's scores and in fig. 5, which is based on table 7, for adults' scores. Fig. 4 illustrates several points: children's factual and interpretative scores differed most for listening (1,734, in table 6); slightly less for acting, and there was no difference for silent reading. There was little difference between oral readers' scores (0,6) and this was the only difference which was in favour of interpretation.

Fig. 5, based on table 7, shows that the difference between adults' factual and interpretative scores was

80/...slight/...

slight or nonexistent, the greatest being 1,1333 for acting.

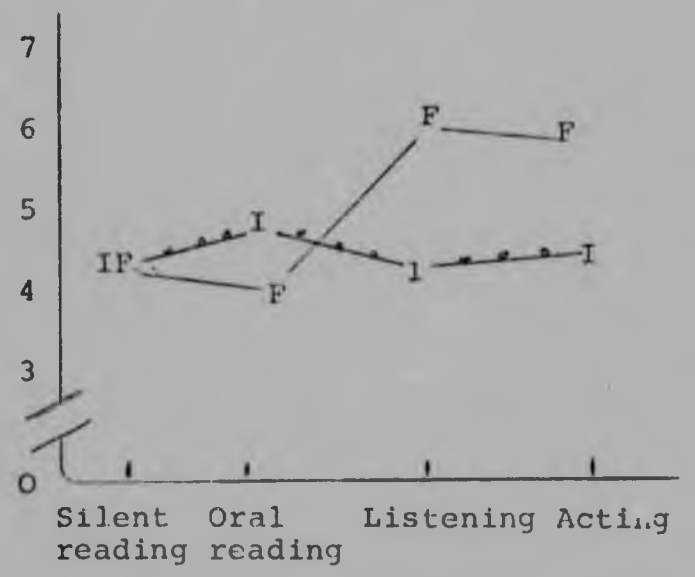


FIG. 4. Children's factual (F) and interpretative (I) mean scores

Because the presentation x comprehension interaction was statistically significant, the significant comprehension effect must be considered in conjunction

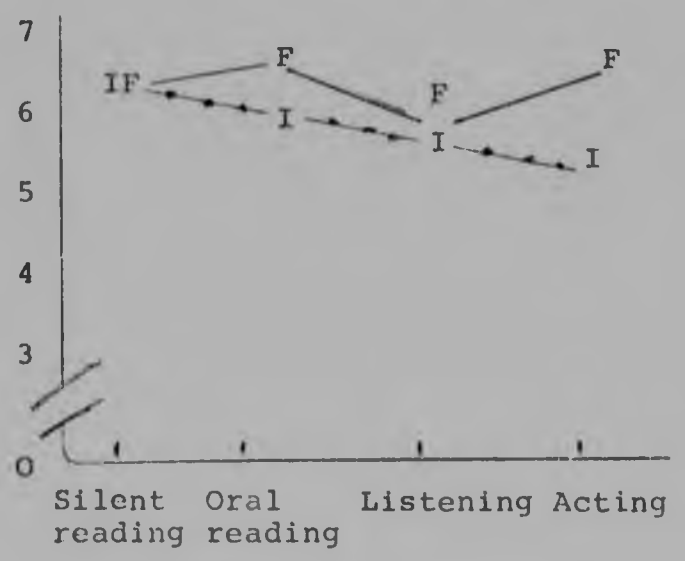


FIG. 5. Adults' factual (F) and interpretative (I) mean scores.

81 /...with/...

with the non-significant presentation effect. This non-significant result indicated that the subject's scores did not depend on the method of presentation alone. Instead, the outcome was that the combination of all levels of the presentation and comprehension factors generated results which would not have been predicted by knowing about the effects of each factor separately. Overall, the significant interaction indicated that the method of presentation affected the scores, and that the effect for one factor differed over all the levels of the other factor. This interaction is presented graphically in fig. 6, which is based on the mean scores presented in table 5, and

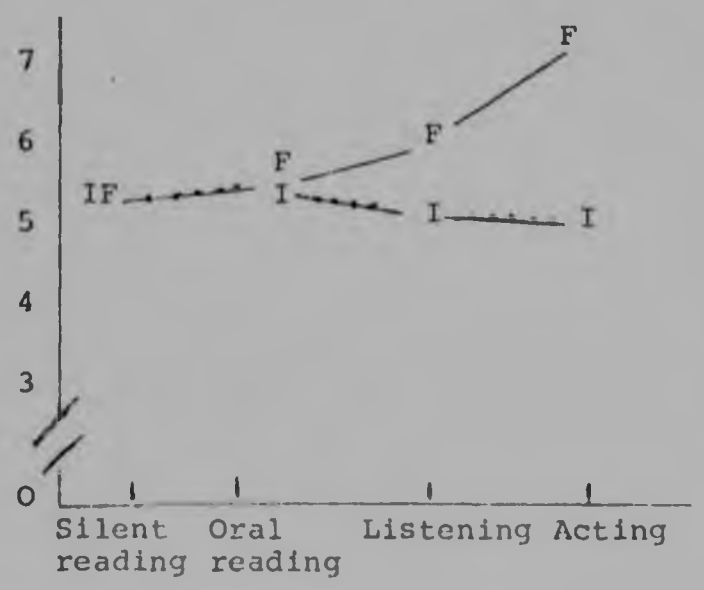


FIG. 6. Factual (F) and interpretative (I) scores averaged over age.

82/...gives the/...

gives the mean scores averaged over children's and adults' mean scores. The lines in these three graphs are not parallel which shows that the differences between the factual and interpretative scores were not the same, within the limits of random sampling, for silent reading, oral reading, listening and acting. (The concept of interaction and problems which may arise in dealing with interactions, are discussed at the end of chap. 6).

The concluding section does not deal with scores obtained by subjects, but assesses how many subjects answered each type of question. The number of subjects who answered factual questions was calculated and is given in table 9, separately for children and adults, and table 10 gives separately the number of adults and children who answered interpretative questions. The columns refer to the presentation, i.e. silent reading, oral reading, listening, acting and a 'total', and the rows refer to the questions by number. The maximum possible in the 'total' column was 60, and in each of the other columns it could have been 15.

The purpose of this comparison is to ascertain how many subjects answered the questions for each presentation, and particularly, looking at each question separately, which presentation led to most subjects answering questions correctly, and which led to least subjects answering questions correctly. Most subjects scored

83/...for the first/...

for the first question and few answered question 17 correctly. More adults than children answered questions correctly, except for question 5 where this was reversed.

5.1 Factual

TABLE 9

Number of adults and children answering factual questions correctly

	ADULTS					CHILDREN				
Q. no.	SR	OR	L	A	TOTAL	SR	OR	L	A	TOTAL
1	15	15	13	15	58	13	14	14	14	55
3	11	12	15	11	49	6	7	12	13	38
5	10	8	12	9	39	13	10	14	12	49
7	12	11	8	4	35	8	8	7	6	29
9	4	10	9	13	36	4	5	3	6	18
11	11	10	7	9	37	4	7	13	10	34
13	10	12	12	7	41	4	4	5	7	20
15	11	8	5	10	34	8	6	11	6	31
17	2	5	1	6	14	2	3	1	3	9
19	9	8	5	8	30	3	3	12	9	27

The factual questions fell into certain categories. Questions 1 ('Who was the first witness?') and 9 ('What did the March Hare do before reading from the scroll?') tested the subject's ability to note the sequence of events: all adults, except two who listened, scored for question 1; only two children who read silently, and one in each of the other conditions, did not score.

84/...Twice/...

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5.1 Factual

TABLE 9

Number of adults and children answering factual questions correctly

	ADULTS					CHILDREN				
Q. no.	SR	OR	L	A	TOTAL	SR	OR	L	A	TOTAL
1	15	15	13	15	58	13	14	14	14	55
3	11	12	15	11	49	6	7	12	13	38
5	10	8	12	9	39	13	10	14	12	49
7	12	11	8	4	35	8	8	7	6	29
9	4	10	9	13	36	4	5	3	6	18
11	11	10	7	9	37	4	7	13	10	34
13	10	12	12	7	41	4	4	5	7	20
15	11	8	5	10	34	8	6	11	6	31
17	2	5	1	6	14	2	3	1	3	9
19	9	8	5	8	30	3	3	12	9	27

The factual questions fell into certain categories. Questions 1 ('Who was the first witness?') and 9 ('What did the March Hare do before reading from the scroll?') tested the subject's ability to note the sequence of events: all adults, except two who listened, scored for question 1; only two children who read silently, and one in each of the other conditions, did not score.

84/...Twice/...

Twice the number of adults (36) compared to children (18) scored for question 9: only four adults scored after silent reading but over nine or more answered this question after each the other presentations; six of the sixty children answered after acting and three of the sixty after listening. The same number of adults and children answered after reading silently (4).

Questions 3 ('What did the second witness carry?'), 11 ('What did the Mad Hatter carry?') and 13 ('Give the exact day and month when the Mad Hatter began drinking his tea?') tested the subject's ability to note details. Twice as many adults as children answered question 13 (41 : 20); eleven more adults than children answered question 3 and three more adults than children answered question 11. At least eleven adults in each condition scored for question 3. Six children who read silently answered this question, as did twelve listeners and thirteen actors. Approximately the same number of children and adults scored for question 11 after reading orally, listening or acting, although only four children were able to answer this question after reading silently. For question 13, most adults, except actors, scored (silent readers = 10; oral readers = 12; listeners = 12; actors = 7). Seven adults and seven children scored for acting, and fewer children scored for this question in the other presentations (4 silent and oral readers and 5 listeners).

85/...Question 5/...

Question 5 ('Where does the King sit?') and question 17 ('Where did the Mad Hatter stand?') tested the subject's ability to follow directions. Ten more children than adults answered question 5 correctly. Twelve adults and fourteen children who listened, and eight adults and ten children who read orally answered it correctly. Few subjects scored for question 17; six adult actors, three children who read orally and who acted, and only one adult and one child who listened.

Questions 7 ('How did Alice know what a court of justice was?'), 15 ('What was wrong with the hat that the Mad Hatter was wearing, according to the King?'), and 19 ('Why couldn't the Mad Hatter take off his hat?') tested the subject's use of facts to reach conclusions. At least half of the adults answered these questions correctly, and slightly less than half of the children answered them correctly. Most adults scored for silent reading, and few for listening and acting. Most children scored for listening and few for acting and silent reading.

5.2 Interpretation

Forty-six of the sixty adults answered questions 14 and 18, and forty-one of the sixty children answered question 6. Only six adults and two children answered question 16. Overall, more adults than children answered the questions, but more children than adults

86/...answered/...

answered questions 2 (36 : 32), 4 (31 : 28), and 20 (34 : 33). Forty-one subjects in both groups answered question 6.

TABLE 10

Number of adults and children answering interpretative questions

	ADULTS					CHILDREN				
Q. no.	SR	OR	L	A	TOTAL	SR	OR	L	A	TOTAL
2	8	8	7	9	32	8	11	8	9	36
4	10	7	6	5	28	10	9	4	8	31
6	11	12	9	9	41	12	11	10	8	41
8	11	10	11	11	43	9	4	8	6	27
10	4	7	10	7	28	2	4	3	4	13
12	9	10	9	10	38	2	8	9	2	21
14	11	13	11	11	46	7	5	6	6	24
16	5	1	-	-	6	2	-	-	-	2
18	12	12	14	6	46	7	9	8	13	37
20	9	9	8	7	33	8	10	7	9	34

Questions 4 ('How did the Mad Hatter feel when the King said that he would cut his head off?'), and 10 ('When the March Hare corrects the King, he (the March Hare) is...') tested the subject's ability to apprehend the main idea, and to gain a general impression. Twenty-eight adults answered both these questions. Thirty-one children answered question 4, but only thirteen answered question 10. A more detailed analysis of the number of

87/...subjects/...

subjects answering question 4 reveals that ten adults and children answered it after reading silently, five adults answered after acting, and four children after listening. For question 10, ten adults scored after listening, and four children scored after oral reading and acting, and four adults and two children answered after reading silently.

Question 2 ('How does the first witness feel about the date on which he began his tea?'), tested the subject's ability to make or suspend judgement. Approximately half of the subjects scored for this question after each presentation (thirty-two adults and thirty-six children).

Almost twice as many adults as children (46 : 24) were able to sense the author's attitude, as tested by question 14 ('When the King opened the trial did you feel that he wanted to..?'). Thirteen adults and five children answered this question after reading orally.

Questions 6 ('How did Alice feel when she realised that she knew the names of nearly everything in court?'), 8 ('What did the Mad Hatter feel when the King said that he had stolen something?'), 18 ('The Cook moved away because she...') and 20 ('When Alice began to grow she was...'), tested the subject's understanding of the emotive and expressive aspects of the passage. At least half of the sample answered questions 6, 18 and 20 correctly. Forty-one adults and forty-one children scored for question 6. Approximately the

88/...same/...

same number of children and adults answered for each presentation, i.e. silent reading: eleven adults, twelve children; oral reading: twelve adults, eleven children; listening: nine adults, ten children; acting: nine adults, eight children. Forty-six adults and thirty-seven children answered question 18. Fourteen adults scored after listening and for both silent and oral reading separately, twelve scored correctly. Eight adults scored correctly after acting. Thirteen children scored after acting, and a similar number scored after silent reading, oral reading and listening (7, 9, and 8, respectively). Thirty-three adults and thiry-four children scored question 20 correctly, and the number of subjects who scored correctly for each presentation was similar. More adults (43) than children (27) scored question 8 correctly. A similar number of adults scored correctly for each presentation (11, 10, 11, 11). A similar number of children scored for silent reading and listening (9 and 8, respectively) and for oral reading and acting (4 and 6, respectively).

Question 12 ('How did the King feel when he closed his note-book quickly?') and question 16 ('How did the King feel when he asked the Cook what tarts are made of?') tested the subject's ability to identify with a character. Thirty-eight adults and twenty-one children answered question 12. A similar number of adults answered after each presentation (9, 10, 9, 10). Only

89/...two children/...

two children answered correctly after silent reading and acting, but eight answered the question correctly after reading orally and listening. Only eight subjects, six adults and two children, were able to answer question 16 correctly. No subjects answered after listening or acting.

5.3 Summary

Mean scores were computed for the adults' and children's factual and interpretative answers following each presentation. The similarities and differences between these scores have been discussed, and they have been tested by an analysis of variance.

The following hypotheses were confirmed:

(i) The number of correct answers obtained by subjects differed with respect to the type of question, i.e. whether it was factual or interpretative ($p > ,01$). Children's factual comprehension scores equalled their interpretative comprehension scores for silent reading. For all other presentations, excepting oral reading, the factual comprehension score was higher than interpretative comprehension score. Adults' factual and interpretative comprehension scores were also equal for silent reading, but factual comprehension scores were higher than interpretative comprehension scores for all other presentations.

(ii) The number of correct answers obtained by

90/...subjects/...

subjects differed with respect to their age i.e., whether they were children or adults ($p > ,05$). Adults generally scored higher than children, although children's listening score for factual comprehension was higher than adults' listening scores for factual interpretative comprehension.

Further analysis by means of Scheffé's Test showed that children's and adults' scores for oral reading differed significantly ($p > ,1$).

The interaction between presentation and comprehension which had to be considered in the light of the significant comprehension factor, and the non-significant presentation factor clarified the relationship between these two main effects. They were found to depend on each other and the effect for one factor differed over all levels of the other factor.

(iii) The hypothesis that the number of correct scores obtained by subjects would differ with respect to the method of presentation, was not confirmed.

91/...Chapter VI/...

C H A P T E R VI

6 DISCUSSION OF RESULTS

6.1 The questionnaire

The open-ended questionnaire produced several unexpected answers. For example, the expected answer to question 11, 'What did the Mad Hatter carry?', was 'A teacup and bread-and-butter.'. However, several actors answered 'His shoes.', and this was accepted because the script had directed the actor playing the role of the Mad Hatter to enter barefoot, carrying his shoes as well as the other articles. In the event, only a few more actors than other subjects answered this question correctly (actors: nine adults, ten children; listeners: seven adults, thirteen children; oral readers: ten adults, seven children; and silent readers: eleven adults, four children), and, in all, thirty-seven adults and thirty-four children answered this question.

Similarly, an expected and acceptable answer to Question 17, 'Where did the Mad Hatter stand?' was 'He

92/...stood/...

stood between Alice and th_ tarts, facing the King.' The unexpected response, 'At the door.', given mainly by actors, was counted correct. Those who had played the role of the Mad Hatter had stood at the door for a few minutes before coming on stage. This question might have confused these subjects who did not know which location was referred to by the question - the one on-stage, or the one off-stage. This question was answered by only twenty-three subjects. Of these, six adults and three children scored after acting.

It was apparent that actors, being more aware of the directions in the script, and of having to carry them out precisely, also had more information from which to select an answer. Both age groups obtained their second highest factual scores after acting.

6.1.i Factual questions

Table 9, which gives the number of subjects to answer factual questions correctly, shows that adults and children were able to note the sequence of events. Over the whole questionnaire, adults answered most factual questions after oral reading (99/150), followed by silent reading (95/150), acting (92/150) and listening (87/150). Children answered most factual questions after listening (92/150) and acting (86/150), and less after reading orally (67/150) and silently (65/150). Both adults and children found it easiest to follow the sequence of events, and most difficult to follow

93/...directions/...

directions, although more children than adults were able to follow directions. More than half the children and adults noted details but adults were better at this than children. Slightly less than half the children and adults were successful at using the facts to reach a conclusion.

6.1.ii Interpretative questions

As shown by table 10, both age groups were able to make or suspend judgement depending on the facts. Twice as many adults as children were able to sense the author's attitude (46 : 24) and subjects in both age groups were able to understand the emotive and expressive aspects of the passage questions which required aesthetic appreciation. They seemed to find this easier than understanding the general tone. Adults answered most interpretative questions after reading silently (90/150) and fewer after reading orally (89/150), listening (85/150) and acting (77/150). Children answered most interpretative questions after reading orally (71/150) and this decreased slightly for silent reading (67/150), acting (65/150) and listening (63/150).

Besides revealing how many items were responded to, the questionnaire answers may have theoretical implications. The present study regarded comprehension as being central to reading, and examined the ability of subjects to evaluate facts, to note details and to grasp the meaning embedded in the written symbols and

94 /...vocal/...

vocal cues. As reflected by the choice of questionnaire form, it accepted that comprehension, recall and recognition are related. This discussion of the results outlines the extent to which the general hypothesis was supported by the statistical analysis. In addition, inferences may be drawn from the interaction of the various factors and from the parts of the hypothesis which were not confirmed.

The significant age effect ($p < .05$) confirmed part of the general hypothesis which postulated that the number of correct answers obtained by subjects would differ depending on their age. It was shown in chap. 5 that a Scheffé's test carried out in order to ascertain whether the differences between the age groups were caused by any particular combination of factors revealed that children's factual scores differed significantly from adults' factual scores for oral reading ($p < .10$). This suggests that the oral reading presentations accounted for a greater part of the variance, though the other presentations also contributed towards the significant effect.

According to Smith (1971) fluent readers' comprehension differs from that of readers who are not fluent, and the significant age effect supports this. Another difference is that children's comprehension is mediated and slow, and information is more easily lost to them before they have processed it. Adults' information

95/...processing/...

processing systems are not overloaded in this way, and their comprehension is immediate.

Another explanation of the difference between the age groups may lie in the passage which may not have been ideally suited to the subjects. Although Alice in Wonderland was selected on the assumption that it would interest children and adults, it may have been too elementary, undemanding and of little interest for the adults. On the other hand, it may have been too long and complicated for the children. (The pilot study has shown, however, that children were able to manage the passage as well as the adults and this most parsimonious explanation may not be the only, or the correct one). The second and third parts of the hypothesis must be considered together because the presentation x comprehension interaction was statistically significant. ($p < ,05$). The second part of the general hypothesis postulated that there would be a difference between factual and interpretative comprehension, and this was confirmed. The third part of the hypothesis was not supported. It postulated that the number of correct scores obtained by subjects would differ depending on the method of presentation. No statistically significant differences were found between any of the presentations, but inspection of the scores revealed that the adults' mean factual and interpretative scores were similar to each other, and the children's mean interpretative scores were similar to each other, but that the

96/...children's/...

children's factual mean scores fell into two groups, reading (i.e. silent and oral) in one group, and listening and acting in another, the former being generally lower than the latter.

Consequently the significant presentation x comprehension interaction indicated that the mean factual and interpretative scores differed for some presentations. The results showed that adults' scores were higher after reading than after the other two presentations (All scores refer to means). Their mean factual score for reading, (i.e. silent and oral) was 6,5; and for listening and acting together it was 6,1. Their mean interpretative score for reading was 6,165 and for listening and acting it was 5,47. Children's interpretative scores were similar for all presentations and their factual comprehension scores were higher after listening and acting (5,97) tnan after reading (silent and oral), (4,3). The Scheffé's Test revealed no significant differences within each age group for a compari on of any two presentations.

Apart from the effect of age on the scores, adults' comprehension appeared to be facilitated more by reading than that of children, though the Scheffe's Test did not reveal significant differences between the age groups, except the oral reading condition mentioned above.

97/... There is/...

There is support for the contention that visual presentation did not improve children's comprehension but that their comprehension improved with listening and acting. In the acting presentation, the set, props, other characters and other situational variables associated with acting may have compensated for the children's reading and so have overcome the disadvantage that reading appeared t create in the other presentations. A more detailed discussion of children's and adults' performances follows:

6.1.iii Children

The children obtained their highest factual score for listening. This supports Treneman (1950) and Witty and Sizemore (1958), among others mentioned in chap. 3, who found that children scored better for listening than for reading. The nature of the test passage may have assisted the listener. Heeding Wilkinson and Stratta's (1972) criticism of several tests of listening which used material suitable for tests of reading but not for listening comprehension, the passage used in the present study was in the form of dialogue which was written to be spoken. The present study supports the psycholinguistic assumption that at this age, most of the children's experience with language is aural and therefore that more information is gained through listening than through reading. It should be noted though, that children's interpretative comprehension

98/...for listening/...

for listening yielded their lowest mean scores. They may have been concentrating on the factual content and were unable to interpret at the same time.

Children who acted obtained the second highest mean score for factual and interpretative comprehension. Acting incorporates all the aspects of reading and listening and adds non-verbal communication, movement and gesture. By introducing props, casting characters, and making the situation more realistic, the acting presentation may have created a meaningful context which made reading easier for the actors than it was for oral or silent readers. The high scores obtained for both factual and interpretative comprehension indicate that the paralinguistic features of the acting situation, and especially the use of gesture and facial and vocal expression, are important sources of information for children.

The high scores indicate that the children were aware of the actions in which they took part, and they were able to interact meaningfully with the other characters as they played their roles. They appeared to be involved in the acting and reported that they had enjoyed themselves. They idenfified with the roles which they played and there did not appear to be any conflict between their roles as schoolchildren and as actors. The difference in the ease with which the children and the adults acted was apparent. The children, perhaps

99 /... because/...

because they are accustomed to playing games, acting and make-believe, were less self-conscious and embarrassed, and made greater and more natural use of paralinguistics and kinesics. More will be said about this later in the chapter.

There was no difference between children's factual and interpretative scores for silent reading. These factual scores were slightly higher than their factual scores for oral reading (4,4 : 4,2), and the interpretative scores slightly lower than their interpretative scores for oral reading (4,4 : 4,8). These children were at the stage when silent and oral reading are still similar processes and because of the small difference between comprehension resulting from the two, and the greater efficiency of silent reading, there does not appear to be any reason for wasting time in the classroom on practicing oral reading, in order to improve comprehension by this method. Moreover, the experimenter observed that the children's oral reading was monotonous and that they paid little attention to modulation, intonation and stress. Oral readers gave a far less animated performance than actors who also read orally. Although oral reading was mechanical and the children seemed to be bored, they achieved their highest interpretative score, overall, from this presentation. Their slightly lower factual score suggests that they may not have been concentrating on facts while reading

orally, but that they were able to make interpretations.

The low comprehension scores for both silent and oral readers, may indicate that the children were not paying attention while they were reading, and that they were unable to organize the ideas or to remember the details. It also implies that oral reading is no guarantee that the reader understands what he is reading and is not merely calling meaningless words. The children's general inexperience in reading may have meant that they were calling or reading silently words which they neither knew nor recognised, and this may have hampered their comprehension. Some subjects read too rapidly and called the wrong words in their hurry and others read expressively but disregarded meaning in favour of expression and rapid reading.

6.1.iv Adults

Adults' factual and interpretative mean scores for silent reading were equal (the same occurred with the children's mean scores), suggesting that this method of presentation transmits a constant amount of information, irrespective of its nature. As with children, there was not much difference between adults' silent and oral reading. This was contrary to the expected finding that silent reading would be better than oral reading because adults seldom read orally and frequently read silently. Instead, the present finding supports the theory that all communication is interrelated.

101/...Adults'/...

Adults' mean factual and interpretative scores for listening were worse than their mean scores for reading. This would have been predicted by information theory which postulates that listening is more difficult than reading. Listeners obtained the lowest factual and second lowest interpretative scores. This accords with the general findings of other authors, such as Tinker and McCullough (1962), Carrol (1964), and Travers (197)), that adults of average or above average intelligence comprehend better by reading than by listening. There are several reasons for poor aural comprehension. Wilkinson (1970) suggested that most people tend to listen below their capacity and that comprehension of lectures, in particular, was very low. Comprehension may have suffered from the surroundings in which testing took place as the subjects were tested in a lecture-theatre during a period reserved for an afternoon tutorial. The present study might have been associated with the normal tutorial which is often no more than a monologue on the part of the tutor, rather than an interchange between him and the class. In addition to this, the purpose of the experiment had not been outlined to the subjects, and listening is often poorest when undirected. Alternatively, the passage may have been too long to sustain the subjects' interest, and they may not have been sufficiently motivated to listen carefully.

Adults' mean factual score for acting (6,4) was higher

102 /...than their/...

than their mean listening (5,8) and silent reading (6,33) scores, but lower than their mean score for oral reading (6,67). Their mean interpretative score for acting (5,27) was lower than any of their other scores. The degree of participation in the reading process which this condition offered may have made it easier to understand facts, but more difficult to interpret them. However, the subjects only played their roles twice in the present study and they may have required more time to organize their roles into the background of their cognitive expectations, and to develop insight into, and understanding of, their roles. Bowman (1949) suggests that this can only develop after an actor has taken a role a few times.

It was evident to an observer that many adults kept their roles as students and as actors separate. They remained themselves and did not identify with the character they were playing. The poor interpretative results may indicate that the actors did not locate their own character's position validly and attributed the wrong emotions to other actors. They were unable to identify the role they were to play, and to anticipate how their character was motivated, felt, or should behave. The role of 'student' may have conflicted with the role of 'actor' as the subjects tried to interpret their characters. Those subjects who took their roles as actors seriously may have identified with the character they were playing while acting. When they were tested,

103/...immediately/...

immediately afterwards, they resumed their roles as students, roles more compatible with answering a questionnaire. They may have experienced conflict in redefining the characters they had played in terms of their roles as students, and so they erred in the test. This concurs with Perls' (1971) contention that acting-out occurs only on the 'phony level', and does not lead to deeper understanding or to making the situation more meaningful to the actor.

Another explanation of the low scores is that subjects were performing more than one task, reading orally and silently, acting, interacting, moving and taking the role of a character which they had studied slightly may have interfered with interpretation. It was apparent that actors found difficulty in expressing themselves with gestures while they were talking. They either read their words aloud, and then silently read the stage directions and carried them out, or they read the stage directions silently and carried them out before reading aloud. Woodworth and Scholosberg (1954), Travers (1970), and Neisser (1970) have all shown that two competing tasks cannot be carried out simultaneously. If many activities are to be performed at once, an indication should be made to the subject as to where to direct his attention. Actors were given no such indication, besides the general instructions before the experiment began. They may not have known whether to concentrate on acting, listening, oral reading or

104/...comprehension/...

comprehension. Acting may involve something like 'perceptual blocking' (as discussed by Travers), and, instead of information being duplicated, too much input may block the system. Other competing tasks, such as the subject's having to know his place on the stage, which props he handled, and his relation to the other characters on-stage, may have distracted interpretation even more though these factors appeared to facilitate factual comprehension.

The high scores obtained by adults who read silently and orally may have predicted high acting scores (because actors read), but actors also depend on listening, and adults' listening scores were low. By concentrating on reading, which is easier for them, adult actors may not have been listening to the other characters who were taking part, except, (but not necessarily) for cues. Although adults reported that they enjoyed acting, they may have found the situation unreal. This, and the simplicity of the passage might have encouraged them not to concentrate and to regard the acting as child's play.

Several general points emerge from the discussion. These are summarised in relation to the theories underlying the present study as follows: (1) the relationship between age and comprehension; (2) the distinction between factual and interpretative comprehension; (3) the psycholinguistic theory that all communication is related; (4) the contribution of intonation and metalinguistics; (5) the importance of listening and (6)

105 /... the importance/...

the importance of acting.

1. The overall finding of a statistically significant difference between children and adults supports Smith's (1970, 1972) distinction between mediated and immediate comprehension. The difference also fits the theory that adults' linguistic experience and their automatic usage of the rules of language helps their semantic understanding. Children lacked these advantages and their comprehension was not as fluent.

2. It was found in the present study that factual and interpretative comprehension are complementary processes. Partial support exists for Dewey's (1931) findings that students were significantly better at noting facts than at making inferences. However, following several presentations in the present study, there was no, or very little, difference between factual and interpretative comprehension (no difference between factual and interpretative comprehension for silent reading within each age group; differences of not greater than 1,734 for children's scores and no greater than 1,133 for adults' scores, as shown in tables 6 and 7, pp. 71 and 72 respectively), and, therefore, there is also partial support for Vernon's (1962) finding that factual and interpretative comprehension do not differ. It is contended in the present study that interpretation cannot be made unless the facts, details, sequence of events, and the logical order of

106/...the passage/...

the passage are understood. The improvement of factual, and especially of interpretative comprehension with age, calls for an attempt to teach subjects to comprehend, beginning by concentrating on the facts as a source for making interpretations.

3. The present findings, from children and adults, support the psycholinguistic contention that all communication is interrelated. Most closely related were each group's scores for silent and oral reading. Acting and listening mean scores were also similar to reading scores for adults' factual and interpretative comprehension, and for children's interpretative comprehension (though not for their factual comprehension scores which fell in two distinct groups, silent and oral reading in one, and acting and listening in the other). The relatively high scores of children for the listening presentation indicated the extent to which reading is related to language. The linguistic experience of these young children had mainly been aural, and, as a result, they scored highest for listening. Their acting scores were also high because this presentation combined listening with reading, so that listening could compensate for what they lost through reading.

Children scored highest in the two conditions where intonation was employed. The experimenter incorporated intonation into her speech, when reading to the listeners, and the acting situation lent itself to the use of intonation. The children were not requested to use

107/...intonation/...

intonation in oral reading (neither were they prevented from so doing), and they did not appear to do so of their own accord. This omission in oral reading suggests a similar omission in silent reading because intonation is assumed to carry over from the one to the other.

4. Adults scored highest when they did not rely on listening for intonation cues. It may be that with age, the function of intonation changes as fluent readers may use it more frequently themselves in silent reading, but adult listeners do not rely as much as children on the meanings implied by the intonation patterns of others. This view is deduced from the theory that intonation patterns are learnt originally through speech and oral reading, and that they are carried over into silent reading, and that this assists comprehension. Metalinguistics may also be of more use to younger than to older subjects as subjects with more reading experience do not depend as much on paralinguistic and kinesic cues.

5. A comparison of children's and adults' listening scores with their scores for any other presentation appears to indicate that listening remains at a constant level. (Other presentations show a more marked increase with age in the mean number of correct scores, for example, factual comprehension of children who listened = 6,07, and of adults = 5,8; factual comprehension of children who read silently = 4,4, and of adults = 6,33).

108/...Listening/...

Listening capacity does not necessarily decrease with age, as the adults' factual scores might suggest, but aural comprehension seems to fall into disuse, being supplanted by more frequent reading. That this happens is not as strange as it first appears although so much time is spent listening - listening to others, listening to the radio, television or movies - but very little of this listening may be designated as "auding", the type of listening required for proper aural comprehension. This type of comprehension is the goal of reading, and the more we rely on reading for comprehending "important" issues, the more our ability to listen in the same manner, decreases. Like reading, listening must be taught and practised if aural comprehension is to be maintained and improved.

6. Whether acting should be adopted as a method of improving comprehension, or not, should be considered. Acting was the only presentation to encourage the subjects to supplement verbal communication with non-verbal communication. Argyle (1972) has shown that the non-verbal component of the message may carry more meaning and may even swamp the verbal component. He has described the function of non-verbal communication as being to elaborate and modify utterances.

The rules governing role-playing were discussed in chap, 3. Argyle has similarly suggested that rules govern any episode in behaviour and are reflected in the

non-verbal communication engaged in by the actors. Correct application of these rules adds meaning to the situation. The low scores obtained by adults in the present study suggest that they may have ignored the rules while acting, possibly because the situation did not strike them as being authentic. Children, being more accustomed to play and make-believe, were able to benefit from the rules which they could apply spontaneously. Adult actors may have ignored the specific non-verbal cues which synchronise behaviour, e.g. gestures, direction of gaze, pitch, change in intonation patterns, etc., because they devoted themselves to reading the script, rather than to watching the other participants as well. Children, on the other hand, were more receptive to such information because they relied more on watching and listening than on the printed text. They may have been attending more carefully to changes in pitch and intonation, and it was noted that they used gesture more freely and adults did. According to Kendon (1972) gesture completes meaning, and Abercombie (1968) wrote that 'We speak with our vocal organs, but we converse with our whole body.'

It was noted above that actors have to carry out several tasks during the same period. Factual scores, which were relatively high, were not adversely affected by this. However, this condition appeared to have an inhibitory effect on interpretation. Acting affords opportunities for practice in oral reading which need

110/...not then/...

not then be taught separately, and it allows subjects an in-depth appreciation of other situations and characters, provided that there is no role conflict. The acting situation sets reading in a broader and richer context which must ultimately benefit the reader. If children were encouraged to act more, they would be able to express themselves more easily by kinesics and gestures, to identify with their own characters, and to learn more from the other characters. Ideally, this should make for better factual and interpretative comprehension. However, for adults, the conclusion must be that this method is too time-consuming in the long run for it to have real advantages over reading.

Finally, in concluding this chapter, some reasons should be given for the choice of statistics. The data for the present study satisfied the assumptions for analysis of variances, as presented by McCall (1970) and Winer (1970). The two age groups were randomly selected (from first year university students and from standard I school children). In order to prevent variability of one group being correlated with the variability of the other groups, subjects were randomly assigned to each of the experimental conditions. The number of cases for each presentation was equal, there was more than one observation per call, and the factors in the design were fixed, not random.

According to Winer (1970), the primary purpose of a

111/...repeated/...

repeated measures design is the control that it provides over individual differences between experimental units. The design suited the present study in terms of economy of subjects as it was not necessary to test two groups of subjects who had previously been matched - the same subjects could be tested for both levels of the repeated factor.

The intricate nature of interactions deserves elaboration (one significant interaction was found in the present study - presentation x comprehension). If an interaction is found to be not significant, there is a broader base for generalizing about main effects as these have then been tested in conjunction with all the levels of the other factor (Edwards, 1962). McCall (1970) offers another perspective to the concept of significant interactions:

> ...an interaction may be thought of as occuring when a specific combination of levels of all factors generates a result that would not be predicted on the basis of knowledge of the effects of each factor separately...Thus one way to conceive a statistical interaction is that it occurs when the result of the joint influence of the two variables is not what one would have predicted on the basis of knowing the separate effects of each variable (p.250).

This explains two findings of the present study. Firstly, how a significant interaction could occur with only one significant main effect involved, and, secondly, how a statistically significant interaction casts a different complexion on the factors examined. When a significant interaction is found, most authors agree that the only

112/...accurate/...

accurate statement which can be made is that one of the factors depends on another factor, or on a particular level of another factor. This 'dependence' has been presented as the crux of interactions by McGuigan (1968) who wrote that '..."it depends" embodies the basic notion of interaction' (p. 249).

Interactions are never easy to explain and there are doubts about how to do this. Winer (1970) comments on interpreting interactions as follows:

> From many points of view interaction is a measure of the nonadditivity of the main effects. To some extent the existence or nonexistence of interaction depends on the scale of measurement used (p. 148).

Hays (1963) has also discussed additivity. In a similar vein to McCall, he stated that 'when there is no interaction, effects are said to be additive, since the effects of a combination is the sum of the effects of the treatments involved.' (p. 389). Although agreeing that interaction may shed light on the relevance of the different variables in the search for predictive functional relationships, Hays noted, as Winer did, the uncertainty which surrounds the concept and the importance of the scale of measurement taken:

> To a very large extent, the presence or absence of interaction in an experiment is governed by the scale of measurement used for the dependent variable. Thus, in terms of the original scale of measurement interaction may be present, but if, for example, the values are transformed into their respective logarithms, interaction effects may vanish. It is clear that in many circumstances evidence for interaction reflects

113 /...not so much/...

> not so much a state of nature as our own inability to find the proper measurement scales for the phenomena we study (Hays, 1963, p. 392).

In conclusion, the following statement by Hays appears to summarise the predictive value of interactions:

> Significant interaction effects usually reflect a situation very like this: overall estimates of differences due to one factor are fine as predictors of average differences over all possible levels of the factor, but it will not necessarily be true that these are good estimates of the differences to be expected when information about the category on the other factor is given. Significant interaction serves as a warning: treatment differences do exist, but to specify exactly how the treatments differ, and especially to make good individual predictions, one must look within levels of the other factor. The presence of interaction effects is a signal that in any predictive use of the experimental results, effects attributed to particular treatments representing one factor are best qualified by specifying the level of the other factor. This is extremely important if one is going to try to use estimated effects in forecasting the result of applying a treatment to an individual: when interaction effects are present, the best forecast can be made only if the individual's status on both factors is known (Hays, 1963, p. 391, his italics).

C H A P T E R V I I

7 SUMMARY, CONCLUSIONS AND PROJECTIONS

7.1 Summary

Reading and comprehension of meaning have been discussed as complementary processes for at least 400 years; listening has been studied for a shorter period; and knowledge of acting extended as far as role theory, but not to studies of comprehension.

Previous studies varied in the method of presenting the passage. Several investigators, in comparing silent reading and oral reading, found that silent reading had advantages in speed. In addition, although oral reading was more often taught to beginners, it was not necessarily the simpler method. The idea emerged that silent and oral reading may be used for different purposes. Reading and listening were also compared and found to be related to the age and intelligence of the subjects. The theory that all methods of communication are related, nullified the differences between methods of presentation..

115/...As regards/...

As regards age, it was evident from the literature that adults would be expected to score higher than children because of their experience and their linguistic knowledge.

As regards comprehension, some authors argued that factual and interpretative comprehension involve different processes, and interpretation was considered to be a more highly developed ability. Other authors contended that there are no differences between the two.

The present study comprised 120 randomly selected subjects. Half were adults, and half were children. Within each age group, fifteen subjects read the set passage silently, fifteen read it orally, fifteen listened to it being read by a skilled reader, and fifteen enacted it. All subjects answered a questionnaire, based on the passage, consisting of factual and interpretative questions. The data were analyzed by a 2 x 4 x 2 analysis of variance which showed that there was a significant age difference between the two groups. Adults scored higher than children in most conditions. The two types of comprehension differed significantly from each other and factual comprehension was more often better than interpretation, although for most presentations the difference was slight, and for some it did not exist, the significant effect being additive. Presentation alone was not found to be statistically significant, but the significant interaction between comprehension

116/...and presentation/...

and presentation suggested that the type of comprehension depended on the presentation of the passage. The first and second parts of the hypothesis, that the number of correct answers obtained by subjects would differ with respect to the kind of question asked and with the age of the subjects, were accepted, but the third part which postulated that the number of correct answers obtained by subjects would differ with respect to the presentation of the passage was rejected, except in so far as comprehension depended on presentation.

7.2 Conclusions

It is hoped that the present study will do more than add to the many isolated findings which exist in this area, and that it will support some of the theories which have been formulated. A brief resumé of these theories, and an attempt to show how the present findings relate to them, follows.

The present study is indebted to Farnham (1881) who first propounded the view, later adopted by the psycholinguists, that speech assists reading. The present finding is that children's auditory comprehension was better than their reading comprehension, and the reason may be that most of their linguistic experience had been auditory or vocal, and not visual. When the child learns to read, he applies to reading the rules of language which he has mastered in speech. It was found in the present study that children's reading comprehension was

117/...not as accurate/...

not as accurate as their listening comprehension; that children are able to comprehend at all by reading may be explained by analysis-by-synthesis which proposes that the same rules for generating speech allow the child to reconstruct what others are saying while he listens to them. This theory has been extended to cover thought and might be applied to reading as the reader gradually learns to apply the linguistic rules visually. According to Neisser (1967): 'Reading is externally guided thinking' (p. 130).

With age, and practice, the application of the linguistic rules to reading becomes automatic and the distinction which Smith (1971) drew between mediated and immediate comprehension, and which the present study upheld, disappears. Adults' reading scores were higher than children's which indicated that the adults were more adept at handling material presented visually. The difference between the two age groups decreased when the passage was presented aurally. The children's factual score for listening was higher than the score obtained by adult listeners for factual or interpretative comprehension, and this accentuates how well children comprehended aurally. They are accustomed to listening to details, directions, and instructions, and seem to rely on their ears more than adults do. The aural modality has little advantage for adults. Listening may be a more difficult process than reading, as the

118/...information/...

information theorists have suggested. However, the high scores of the children dispute this, suggesting, rather, that once reading has been mastered, listening falls into disuse. A comparison between the adults' and children's factual scores suggests that comprehension actually deteriorates. (The interpretative scores do not show this deterioration, possibly because children's interpretative comprehension was poor for all presentations). Because so much time is spent listening, aural comprehension should be improved. The present study is in agreement with Wilkinson and Stratta (1972) that the reasons for poor listening in adults should be investigated. Adults and children would benefit from being taught to rely more on their ears, and all obstacles which prevent them from doing so should be removed.

The present study included an intermediate condition involving both listening and reading. In order to respond meaningfully, actors while reading their parts are expected to listen to kinesic and metalinguistic cues given by other particpants. The factual scores of adult actors were similar to the adults' readers' scores, and hence higher than the listeners' scores. Actors may have comprehended more after acting than after listening because of the reading involved in the acting situation. The advantage worked in the opposite direction for children: they benefitted because they

119/...were able/...

were able to depend more on listening and not as much on reading while acting. An alternative explanation is that the actual acting situation led to an improvement. The props, other actors, and the metalinguistic aspects of the setting may have created reduncancy which facilitated comprehension.

Acting may not be the best method to use with adults. Their comprehension scores for this condition were not their highest, and, although adults may agree to act once in a while, they might not willingly take part more often. Acting is a time-consuming process and only a few actors may take part at any one time. Others may watch and listen, but the poor results of adult listeners do not hold out much hope for this method, unless listening can be improved. In short, for adults, this method appears to be a waste of time for no real gains. However, acting has more advantages for children. They were capable of acting a passage of which they had no previous experience, and their comprehension scores were average, or above. Their oral reading was more fluent in this condition than it was when they read orally without acting, and they enjoyed acting. These findings would tentatively suggest, pending further research, that acting should replace oral reading as a medium of instruction in oral reading. It would not be too difficult to adapt children's books in order to make dramatization a possibility.

120 /...In accord/...

In accord with Fairbanks(1937), Rogers (1967), Dearborn (1952) and Goodman (1968) is the present study's conclusion that silent and oral reading are similar processes. Furthermore, the adults' scores for all presentations were similar and this concurs with psycholinguistic findings. The equality appears to develop with age since the children's factual scores fell into two groups, reading in one, and acting and listening in the other. (This distinction did not apply to children's interpretative scores).

Considering the effect of presentation on comprehension the present study found that children's factual and interpretative scores were equal for silent reading, as were the adults' scores. In all other conditions, factual comprehension scores were higher than interpretative scores. Children's interpretative scores following oral reading were higher than their factual scores. This supports Stone's (1926) finding that oral reading could improve interpretation but not factual comprehension. Children's mean factual scores for listening and acting were higher than their interpretative scores.

As regards the type of comprehension, silent and oral readers' factual comprehension improved more with age than actors' and listeners' comprehension. Interpretation improves with age for all presentations, though only slightly for listening. Factual and interpretative

121/...comprehension/...

comprehension cannot be regarded as separate entities: the view was formed in the present study that they depend on each other and that poor factual comprehension precludes proper interpretation. For the reader, listener or actor to be able to form opinions, to gain impressions, to formulate attitudes, or to appreciate aesthetically, he must, as a prerequisite, be familiar with the facts.

7.2.i Implications for education

The findings of the present study may have practical implications for education. The expected difference between children's and adults' comprehension scores was confirmed. It may be inferred from this that different teaching methods should be used with students at different stages of developemnt which correspond to stages of comprehension. These should be defined and the changes which occur should be specified. For example, schoolteachers should take advantage of the ease with which children comprehend (especially factually) after listening, and should utilize this method to a larger extent. This is not to suggest that reading should be neglected. However, the present study shows that reading comprehension improved more with age than comprehension following any of the other presentations: it appears that reading is currently receiving enough attention, while listening is not. This is true for children as well as for adults. Although the findings

122/...did not show/...

did not show adults' listening scores to differ significantly from other scores, they did show that in comparison with children's scores, adults' listening had decreased. It is imperative that the reasons for this be found and that the obstacles be removed, not only for those who are now adults, but also for children and teenagers. The importance of auding cannot be stressed often enough. A few years ago the source of the difficulty might have been impossible to divine, but knowledge of non-verbal communication (intonation patterns, pitch, rate and pace) and of metalinguistics, has developed, and several (or all) of these factors may be related to auditory comprehension. These should be taught in the classroom as maximum benefit cannot be derived from them if they are left to develop by chance. In addition, they are not difficult to teach, and children enjoy experimenting with these metalinguistic features of language. This last point is partially substantiated by the subjects' reported enjoyment of acting. Characterization is one of the best methods of encouraging the use of intonation, changes of pitch, gesture, etc., and more attention should be paid to this method in the class-room.

From the present findings it is also suggested that before differences between the scores are regarded as resulting from types of comprehension alone, it should be noted that these scores were often similar within each age group. However, the tendency of factual scores to be

123/...higher than/...

higher than interpretative scores indicates that an attempt should be made in schools to relate the two, with factual comprehension serving as a basis for interpretation. Interpretations will be poor unless the facts are clearly understood. Children should be taught to read and listen in order to obtain facts and details, and then to apply these in interpretation. Concentration should be on the latter, expecially because it is more difficult to accomplish.

Not all material is suited for such trainin_, and passages must be selected with care. Those which contain purely factual material are not suitable, nor are passages which contain factual material which is too simple to interpret, but there are numerous passages in which factual and interpretative aspects are well balanced.

7.3 Projections

In the event of proceeding with research in this area, the present study would have to be repeated, with possible modifications, on a different and larger sample. If the findings are replicated, future studies could be planned to investigate some of these factors. The modifications which could be introduced imply criticism of the present study, although several of the points to be discussed were beyond the scope of the present study, and would have made the design too complicated.

124/...It is evident/...

It is evident that psycholinguistic theory is the most appealing in terms of logical possibilities and practical opportunities. Among the fields to be examined, using this theory as background, are: the distinction between mediated and immediate comprehension in relation to teaching reading and comprehension, and the stages at which oral and silent reading, and reading and listening, transmit the same amount of information.

Psycholinguistic aspects of listening and acting could be investigated together with metalinguistic topics. A detailed study of this was not possible in the context of the present study. Currently, social psychologists, extrapolating from linguistics, are attempting to find the deep and surface structures underlying non-verbal communication. These may be related to kinesics and paralanguage (Clark, 1974, personal communication).

Other aspects of the listening situation could be singled out and studied to note whether they could increase the effectiveness of comprehension. This may focus attention on those aspects of the listening situation which listeners ignore to the detriment of their comprehension, hereby casting some light on the reasons for poor listening scores. Such an investigation would be particularly worthwhile because of the importance of listening in daily social interactions.

The degree of interest which the passage holds for the

125/...reader/...

reader or listener should also be varied in different studies, and correlated with subjects' scores on interest inventories. A comparison could be made between directed and non-directed listening, and their effect on comprehension could be assessed. Use in the present study of an extract from Alice in Wonderland may not have been ideal as it is generally a well-known book, but possibly even more so to adults than to children.

The findings of the present study are that oral reading is not the best method for eliciting comprehension. Nevertheless, there is one aspect of the oral reading situation which may be investigated: reading aloud to an audience. In the present study the subjects were instructed to read aloud, but they were not told to read to the experimenter, even though she remained within listening distance. The results of oral readers' reading aloud to an audience would indicate whether functional oral reading (as in the acting presentation) may improve the reader's comprehension. The effect which the reader has on the listener's comprehension would also have to be measured; an unskilled reader may hamper listeners' comprehension.

Further studies of different types of passages selected from school textbooks may investigate children's comprehension during listening and acting. The feasibility of dramatizing the reading passage should be estimated. The results of such a study would reveal the

126/...effectiveness/...

effectiveness of these methods over a wide range of materials.

The components of factual and interpretative comprehension should be set out clearly. More attention could have been paid by the present study to ensuring that the different types of factual and interpretative comprehension were equally represented. Questions were randomly selected from categories such as noting the sequence of events, noting details, following instructions, using facts to reach conclusions (all factual abilities) and gaining a general impression, making or suspending judgement, sensing the author's attitude, and understanding the emotive and expressive aspects of the passage (all interpretative). These could have been presented in a more balanced ratio in the questionnaire. It may be worth investigating whether different abilities are involved in processing different types of material, for example, details, instructions, the sequence of events, etc., in the same way as the different sensory detectors analyze various stimuli. The relationship between factual and interpretative comprehension should be spelled out, and their mutual interdependence specified.

Finally, criticism may always be levelled at the sample selected. The children were from a rather exclusive school and all the students were from psychology I at the same university. These factors

127/...may have/...

may have biased the results. In any future studies, a wider sample should be used, possibly comprising adults of different occupations and children from different schools.

A P P E N D I X A

PASSAGE USED IN THE PRESENT STUDY

The KING OF HEARTS is seated on his throne in the centre of the courtroom, towards the back. He wears a wig under his crown. The MARCH HARE stands on his left, holding a trumpet in one hand and a scroll in the other. In the middle of the courtroom, in front of the KING OF HEARTS, is a table with a dish of tarts on it. They looked so good that it made ALICE, who was sitting on the right hand side of the KING, quite hungry to look at them. The COOK sits next to ALICE. To the right of the COOK is a door, leading into the court-room.

ALICE: (looking about). I wonder when they will get the trial done. I wish they'd be quick and hand round the refreshments!

ALICE realises that there seems to be little chance of this, so she looks at everything about her to pass the time. ALICE had never been in a court of justice before, but she had read about them in books and she was quite pleased to find that she knew the names of nearly everything there. She knew that everyone was waiting for the trial to begin. The accused, that is, the person who was believed to have done something wrong, was to be tried to see if he was guilty or not guilty. Witnesses would then tell whether they thought the accused was guilty and in so doing they would give their evidence. The witnesses would be cross-examined or questioned by the judge to see what they krew. Finally the judge would give his decision, or verdict, as to whether the accused was guilty or not guilty.

ALICE: The King is judge because he is wearing a wig.

MARCH HARE: (loudly). Silence in the court!

KING: (to the MARCH HARE). Read the accusation.

MARCH HARE: (blowing three blasts on the trumpet first and then reading from the parchment scroll which he unrolls. Parchment is a type of paper made out of animal skin).

The Queen of Hearts, she made some tarts,
All on a summer's day.
The Knave of Hearts, he stole those tarts
And took them right away.

KING: Consider your verdict.

129/...MARCH/...

MARCH HARE: (interrupting quickly). Not yet, not yet! There's a great deal to come before that!

KING: Call the first witness.

MARCH HARE: (blowing three times on the trumpet). First witness!

The MAD HATTER enters at the door and walks till he stands facing the KING, between ALICE and the tray of tarts. He carries a teacup in one hand and a piece of bread-and-butter in the other.

MAD HATTER: (bowing to the KING). I beg your pardon, your Majesty, for bringing these in, but I hadn't quite finished my tea when I was sent for.

KING: You ought to have finished. When did you begin?

MAD HATTER: Fourteenth of March, I think it was.

KING: Take off your hat.

MAD HATTER: It isn't mine.

KING: (exclaiming). Stolen!

MAD HATTER: (exclaiming). I keep them to sell, I've none of my own. I'm a hatter.

The MAD HATTER keeps shifting from one foot to the other . He is anxious.

KING: Give your evidence and don't be nervous or I'll have your head cut off on the spot.

This did not seem to encourage the witness at all and in his confusion he bit a large piece of his teacup instead of the bread-and-butter. Just at this moment ALICE is aware of a very curious feeling which puzzles her a good deal until she makes out what it is: she is beginning to grow larger again, and she thinks, at first, that she will get up and leave the courtroom; but on second thoughts she decides to remain where she is as long as there is room for her. As ALICE continues to grow, the COOK becomes more and more squashed. Finally she moves away to sit next to the MARCH HARE.

COOK: (speaking to ALICE as she crosses behind the table on which the tarts are placed). I wish you wouldn't squeeze so. I can hardly breathe.

MEANWHILE, the KING is still questioning the MAD HATTER.

KING: Give your evidence, or I'll have you executed. Your head will be cut off. Whether you're nervous or not.

130/...MAD HATTER/...

MAD HATTER: I'm a poor man, your Majesty, and I hadn't begun my tea, more than a week or so ago, and what with the bread and butter getting so thin the TWINKLING of the tea...

KING: The twinkling of what?

MAD HATTER: It began with the tea.

KING: Of course twinkling begins with a T. Do you take me for a fool? Go on.

MAD HATTER: I'm very poor, and most things twinkled after that, only the March Hare said...

MARCH HARE: (interrupting in a great hurry). I did not...

MAD HATTER: You did!

MARCH HARE: I deny it!

KING: He denies it. Leave that part out.

MAD HATTER: After that, I cut some more bread and butter.

KING: But what else did the March Hare say?

MAD HATTER: That I can't remember.

KING: You must remember, or I'll have you executed. Off with his head.

MAD HATTER: (dropping his teacup and bread-and-butter and falling onto his knees).

I'm a poor man, your Majesty...

KING: You're a very poor speaker. If that's all you know about it, you may step down.

MAD HATTER: I can't go no lower. I'm on the floor as it is.

KING: Then you may sit down.

MAD HATTER: I'd rather finish my tea.

KING: You may go.

The MAD HATTER leaves the court without even waiting to put his shoes on.

KING: Call the next witness.

MARCH HARE: Second witness!

131/...The second/...

The second witness is the COOK and as she rises everyone begins to sneeze. She carries a pepper-box in her hands.

KING: Give your evidence.

COOK: (waving her pepper-box around). Shan't!

The KING is worried and he looks at the MARCH HARE.

MARCH HARE: (in a low voice). Your Majesty must cross examine this witness.

KING: (He feels rather upset and he frowns at the COOK till his eyes are nearly out of sight. He folds his arms and speaks in a deep voice)

What are tarts made of?

COOK: Pepper, mostly.

KING: Cook, you may go. Call the next witness.

ALICE watches the MARCH HARE as he fumbles over the list. She is very curious to see what the next witness will be like.

ALICE: They haven't got much evidence yet.

MARCH HARE: (reading at the top of his shrill voice). Alice!

ALICE, quite forgetting in the flurry of the moment how large she had grown in the last few minutes, knocks over most of the courtroom as she crosses to stand in front of the KING.

KING: What do you know of this business.

ALICE: Nothing.

KING: (persisting). Nothing whatever?

ALICE: Nothing whatever.

KING: That's very important.

MARCH HARE: (interrupting to correct the KING in a respectful tone, but smiling and making faces at him as he speaks).

Unimportant, your Majesty means, of course.

KING: (hastily). Unimportant, of course, I meant. (Then he speaks softly to himself, trying to work out which word fits better).

132/...important/...

Important ... unimportant ... important unimportant.

(Suddenly the KING takes up a note-book and reads):

Silence! rule forty-two: all persons more than a mile high to leave the court.

Everybody looks at ALICE.

ALICE: I'm not a mile high.

KING: You are. Nearly two miles high.

ALICE: Well, I shan't go, at any rate. Besides, that's not a regular rule: You invented it just now.

KING: It's the oldest rule in the book.

ALICE: Then it ought to be number one.

The KING turns pale and shuts his note-book hastily.

133/...Appendix B/...

A P P E N D I X B

PASSAGE USED IN THE PILOT STUDY

The KING OF HEARTS is seated on his throne, in the centre of the courtroom. He wears a wig under his crown. The MARCH HARE stands on his left, holding a trumpet in one hand and a scroll in the other. In the middle of the courtroom, in front of the KING OF HEARTS, is a table with a dish of tarts on it. They looked so good that it made ALICE, who was sitting on the right hand side of the KING, quite hungry to look at them. The COOK sits next to ALICE.

ALICE: (looking about). I wonder when they will get the trial done; I wish they'd be quick and hand round the refreshments!

ALICE realises that there seems to be little chance of this, so she looks at everything about her to pass the time. ALICE had never been in a court of justice before, but she had read about them in books and she was quite pleased to find that she knew the names of nearly everything there.

ALICE: The KING is judge because he is wearing a wig.

MARCH HARE: (loudly). Silence in the court!

KING: (to the MARCH HARE). Read the accusation.

MARCH HARE: (blowing three blasts on the trumpet first and then reading from the parchment scroll which he unrolls).

The Queen of Hearts, she made some tarts,
All on a summer's day.
The Knave of Hearts, he stole those tarts,
And took them right away.

KING: Consider your verdict.

MARCH HARE: (interrupting quickly). Not yet, not yet! There's a great deal to come before that!

KING: Call the first witness.

MARCH HARE: (blowing three times on his trumpet). First witness.

134/...The MAD HATTER/...

The MAD HATTER enters from behind ALICE and walks till he stands in front of the KING, between ALICE and the tray of tarts. He comes in carrying a teacup in one hand and a piece of bread-and-butter in the other.

MAD HATTER: (bowing to the KING). I beg your pardon, your Majesty, for bringing these in; but I hadn't quite finished my tea when I was sent for.

KING: You ought to have finished. When did you begin?

MAD HATTER: Fourteenth of March, I think it was.

KING: Take off your hat.

MAD HATTER: It isn't mine.

KING: (exclaiming). Stolen!

MAD HATTER: (exclaiming). I keep them to sell; I've none of my own. I'm a hatter.

The MAD HATTER keeps shifting from one foot to the other.

KING: Give your evidence and don't be nervous or I'll have you executed on the spot.

This did not seem to encourage the witness at all and in his confusion he bit a large piece of his teacup instead of the bread-and-butter.

Just at this moment ALICE feels a very curious sensation which puzzles her a good deal until she makes out what it is: she is beginning to grow larger again, and she thinks at first she will get up and leave the courtroom; but on second thoughts she decides to remain where she is as long as there is room for her. As ALICE continues to grow the COOK becomes more and more squashed. Finally she moves away to sit next to the MARCH HARE.

COOK: I wish you wouldn't squeeze so. I can hardly breathe.

Meanwhile the KING is still busy with the MAD HATTER.

KING: Give your evidence, or I'll have you executed, whether you're nervous or not.

MAD HATTER: I'm a poor man, your Majesty, and I hadn't begun my tea, more than a week or so ago, and what with the bread and butter getting so thin, and the twinkling of the tea...

KING: The twinkling of what?

135/...MAD HATTER/...

MAD HATTER: It began with the tea.

KING: Of course twinkling begins with a T. Do you take me for a dunce? Go on.

MAD HATTER: I'm very poor, and most things twinkled after that, only the MARCH HARE said...

MARCH HARE: (interrupting in a great hurry). I did not ...

MAD HATTER: You did!

MARCH HARE: I deny it!

KING: He denies it. Leave out that part.

MAD HATTER: After that, I cut some more bread and butter.

KING: But what else did the March Hare say?

MAD HATTER: That I can't remember.

KING: You must remember, or I'll have you executed.

MAD HATTER: (dropping his teacup and bread-and-butter and falling onto his knees).

I'm a poor man, your Majesty...

KING: You're a very poor speaker. If that's all you now about it, you may stand down.

MAD HATTER: I can't go no lower. I'm on the floor as it is.

KING: Then you may sit down.

MAD HATTER: I'd rather finish my tea.

KING: You may go.

The MAD HATTER leaves the court without even waiting to put his shoes on.

KING: Call the next witness.

MARCH HARE: Second witness!

The second witness is the COOK and as she rises everyone begins to sneeze. She carries a pepper-box in her hands.

KING: Give your evidence.

COOK: (waving her pepper-box around). Shan't.

136/... The KING/...

The KING looks anxiously at the MARCH HARE.

MARCH HARE: (in a low voice). Your Majesty must cross-examine this witness.

KING: (feeling rather upset and frowning at the COOK till his eyes were nearly out of sight, he folds his arms and speaks in a deep voice).

What are tarts made of?

COOK: Pepper, mostly.

KING: Cook, you may go. Call the next witness.

ALICE watched the MARCH HARE as he fumbled over the list. She was feeling very curious to see what the next witness would be like.

ALICE: They haven't got much evidence yet.

MARCH HARE: (reading at the top of his shrill voice). Alice!

ALICE, quite forgetting in the flurry of the moment how large she had grown in the last few minutes, knocks over most of the courtroom as she crosses to stand in front of the KING.

KING: What do you know of this business?

ALICE: Nothing.

KING: (persisting). Nothing whatever?

ALICE: Nothing whatever.

KING: That's very important.

MARCH HARE: (interrupting to correct the KING in a respectful tone, but smiling and making faces at him as he spoke).

Unimportant, your Majesty means, of course.

KING: (Hastily). Unimportant, of course, I meant.

(Then he speaks softly as if to himself, trying to work out which word fits better).

Important - unimportant - important - unimportant.

(Suddenly the KING takes up a note-book and reads).

Silence! Rule forty-two: All persons more

137/...than a/...

than a mile high to leave the court.

EVERYBODY looks at Alice.

ALICE: I'm not a mile high.

KING: You are. Nearly two miles high.

ALICE: Well, I shan't go, at any rate. Besides, that's not a regular rule: You invented it just now.

KING: It's the oldest rule in the book.

ALICE: Then it ought to be number one.

The KING turns pale and shuts his note-book hastily.

138/...Appendix C/...

A P P E N D I X C

QUESTIONNAIRE USED IN THE PRESENT STUDY

Please answer the following questions. Write your answers on the dotted line next to the question.

HOW OLD ARE YOU? .....YEARS and.....MONTHS

WHAT IS YOUR SEX?.....

CONDITION .....e.g...S.A,..O.A,..L..or..E.....

Please answer the following questions by writing the answer on the dotted line where such a line is provided. Where there is no dotted line you must ring the correct answer.

Here are a few examples:

HOW DOES ALICE FEEL BEFORE THE TRIAL?

(bored; tired; excited; sleepy; cross)

The correct answer is 'bored' so your answer should look like this:

HOW DOES ALICE FEEL BEFORE THE TRIAL?

((bored;) tired; excited; sleepy; cross)

Here is the next example:

WHAT TWO THINGS DOES THE MARCH HARE CARRY?

.....

This time you have to fill the answer in on the dotted line. The correct answer is "a trumpet and a scroll". Your answer should look like this:

WHAT TWO THINGS DOES THE MARCH HARE CARRY?

He carries a trumpet and a scroll.
.....

139/...Here is/...

Here is another example:

HOW DID THE KING FEEL WHEN THE COOK REFUSED TO GIVE EVIDENCE?

(cross; angry; anxious; didn't mind)

The correct answer is "anxious" and you must ring that word. Please do so now.

Here is the last example:

WHAT MAKES ALICE FEEL HUNGRY?

.....

Again, you have to fill in the answer on the dotted line. The correct answer is "A dish of tarts". Fill that in on the dotted line now.

Do you understand what you have to do?... Are there any questions?... If not, please turn over the page and answer the following questions.

140/... 1. WHO WAS/...

1. WHO WAS THE FIRST WITNESS?

   The Mad Hatter.
   .....

2. HOW DOES THE FIRST WITNESS FEEL ABOUT THE DATE ON WHICH HE BEGAN HIS TEA?

   (sure; not sure;

3. WHAT DID THE SECOND WITNESS CARR.?

   The second witness carried a pepperpot.
   .....

4. HOW DID THE MAD HATTER FEEL WHEN THE KING SAID THAT HE WOULD CUT HIS HEAD OFF?

   (panicky; brave; horrified; pleased; frightened)

5. WHERE DOES THE KING SIT?

   He sat on the throne, next to Alice and the March
   .....
   Hare, behind the tarts, to the centre of the court,
   .....
   towards the back.
   .....

6. HOW DID ALICE FEEL WHEN SHE REALISED THAT SHE KNEW THE NAMES OF NEARLY EVERYTHING IN COURT?

   (satisfied; pleased; dissatisfied; excited;

   displeased)

7. HOW DID ALICE KNOW WHAT A COURT OF JUSTICE WAS?

   She had read about it in a book.
   .....

8. WHAT DID THE MAD HATTER FEEL WHEN THE KING SAID THAT HE HAD STOLEN SOMETHING?

   (that it is not so; denies it; admits that it is so;

   doesn't care; becomes angry)

9. WHAT DID THE MARCH HARE DO BEFORE READING FROM HIS SCROLL?

   He blew three blasts on the trumpet.
   .....

10. WHEN THE MARCH HARE CORRECTS THE KING, HE (THE MARCH HARE) IS

    (careful; vague; uncertain; cautious; unafraid)

141/...11. WHAT/...

11. WHAT DID THE MAD HATTER CARRY?

A teacup and bread-and-butter and his shoes.

12. HOW DID THE KING FEEL WHEN HE CLOSED HIS NOTE BOOK QUICKLY?

(upset; troubled; embarrassed; faint; ill)

13. GIVE THE EXACT DAY AND MONTH THE MAD HATTER BEGAN DRINKING HIS TEA

14th March.

14. WHEN THE KING OPENED THE TRIAL DID YOU FEEL THAT HE WANTED TO

(do it thoroughly; take as long as was needed; leave it alone; finish it quickly)

15. WHAT WAS WRONG WITH THE HAT THAT THE MAD HATTER WAS WEARING, ACCORDING TO THE KING?

It was stolen.

16. HOW DID THE KING FEEL WHEN HE ASKED THE COOK WHAT TARTS ARE MADE OF?

(angry; impatient; upset; irritated; annoyed)

17. WHERE DID THE MAD HATTER STAND?

He stood between Alice and the tarts, facing the King.

18. THE COOK MOVED AWAY BECAUSE SHE

(was tired of sitting in one place; wanted to stretch her legs; disliked Alice; was angry with Alice)

19. WHY WOULDN'T THE MAD HATTER TAKE OFF HIS HAT?

Because it wasn't his/he was keeping it to sell/ he was a hatter.

20. WHEN ALICE BEGAN TO GROW SHE WAS

(puzzled; dazed; confused; happy; pleased)

142/...Appendix D/...

11. WHAT DID THE MAD HATTER CARRY?

A teacup and bread-and-butter and his shoes.

12. HOW DID THE KING FEEL WHEN HE CLOSED HIS NOTE BOOK QUICKLY?

(upset; troubled; embarrassed; faint; ill)

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142/...Appendix D/...

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King.

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(was tired of sitting in one place; wanted to stretch her legs; disliked Alice; was angry with Alice)

19. WHY WOULDN'T THE MAD HATTER TAKE OFF HIS HAT?

Because it wasn't his/he was keeping it to sell/

he was a hatter.

20. WHEN ALICE BEGAN TO GROW SHE WAS

(puzzled; dazed; confused; happy; pleased)

142/...Appendix D/...

A P P E N D I X D

QUESTIONNAIRE USED IN THE PILOT STUDY

NAME ..... AGE .....

1. How does Alice feel before the trial? (Bored, tired, excited, sleepy, cross).

   .....

2. How did Alice feel when she realised that she knew the names of nearly everything in court? (Excited, pleased, cross, hungry).

   .....

3. The March Hare is very (mild, business-like, rude, stupid).

   .....

4. The Mad Hatter has been disturbed. He feels (that he is late, satisfied, rushed, angry at being disturbed).

   .....

5. Is the Mad Hatter sure or not sure of the date on which he began his tea?

   .....

6. What does the Mad Hatter feel when the King accuses him of stealing? (Doesn't care, admits that it is so, becomes angry, denies it).

   .....

7. When Alice began to grow, she was (amazed, puzzled, shocked, not surprised, sad, happy).

   .....

8. What did the March Hare do when the Mad Hatter said that he had said something? (Denied it, admitted it, repeated what he had said before, refused to repeat what he had said previously.

   .....

143/...9. How/...

9. How did the Mad Hatter feel when the King said he would cut his head off? (angry, pleased, worried, frightened).

.....

10. How did the King feel when the Cook refused to give evidence? (cross, angry, anxious, didn't mind).

.....

11. How did Alice feel when she was called to give evidence? (embarrassed, in a flurry, calm, shy, nervous).

.....

12. How did the King feel when he asked the Cook what tarts are made of? (sad, upset, happy, angry).

.....

13. Who do you feel knew more about the trial, the King or the March Hare?

.....

14. When the King was thinking whether what Alice had said was important he felt (sure, uncertain, amazed, surprised).

.....

15. What did the King feel when he closed his note-book quickly? (frightened, angry, faint, ill, embarrassed).

.....

16. When the King opens the trial, does he want to (do it thoroughly, finish it quickly, take as long as it needs)?

.....

17. When the March Hare corrects the King, is he (nervous, scared, unafraid, pleased with himself, cautious).

.....

18. The Cook moved away because she was (tired of sitting in one place, wanted to stretch her legs, was angry with Alice, disliked Alice.

.....

144/...19. While/...

19. While the King is questioning the March Hare about the tea he (the King) feels (insulted, angry, pleased, thirsty).

.....

20. When the March Hare can't remember something, the King (pleads with him to try and remember, threatens him, jokes with him).

.....

145/...1. Where does/...

1. Where does the King of Spades sit? .....
2. Where does the King of Hearts sit? .....
3. What two things does the March Hare carry. .....
4. What makes Alice feel hungry? .....
5. How did Alice know what a court of justice was? .....
6. Why did the King wear a wig? .....
7. Who was accused of doing something wrong? .....
8. What had this person done wrong? .....
9. Who was the first witness? .....
10. What does the March Hare do before reading from his scroll? .....
11. On which side of the King does Alice sit? .....
12. How did the March Hare call the witnesses into the court? .....
13. Who does Alice sit next to? .....
14. What does the Mad Hatter carry? .....
15. When did the Mad Hatter begin drinking tea? .....
16. What was wrong with the hat that the Mad Hatter was wearing, according to to the King? .....
17. When did the Cook move away from Alice? .....
18. What did the Mad Hatter leave behind when he left the court-room? .....
19. Who was the second witness? .....
20. What did the second witness carry? .....
21. Why did Alice knock half the court-room down? .....

146/...22. Why/...

22. Why did Alice think that the King had made up the rule about all persons over a mile long having to leave the court? .....

23. Where did the Mad Hatter stand? .....

24. Who is cross-examined? .....

25. Who gives evidence? .....

26. Why won't the Mad Hatter take his hat off? .....

27. Does the Cook give evidence? .....

28. What is the number of the oldest rule in the book? .....

147/...Appendix E/...

22. Why did Alice think that the King had made up the rule about all persons over a mile long having to leave the court? .....

23. Where did the Mad Hatter stand? .....

24. Who is cross-examined? .....

25. Who gives evidence? .....

26. Why won't the Mad Hatter take his hat off? .....

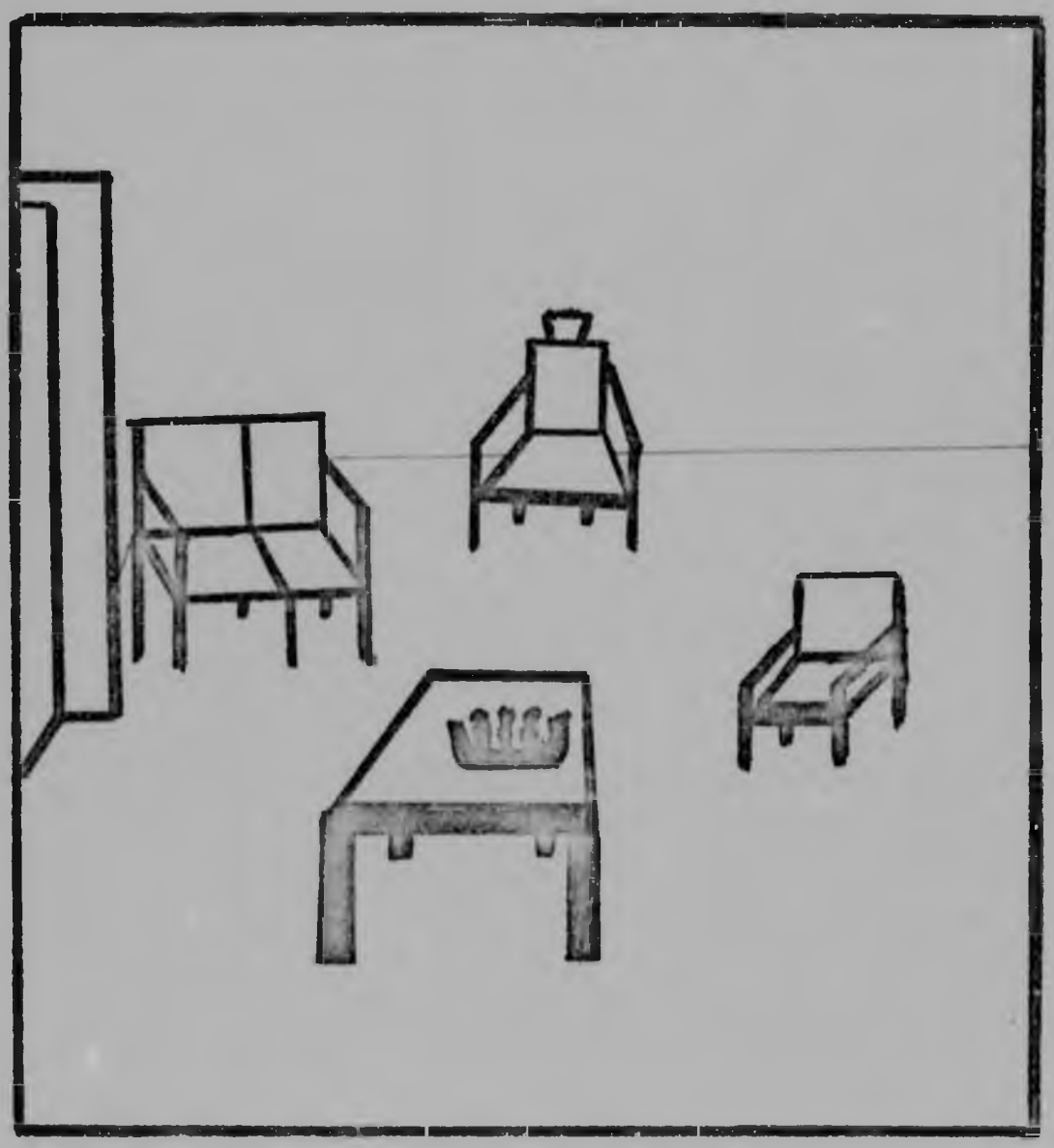
27. Does the Cook give evidence? .....

28. What is the number of the oldest rule in the book? .....

147/...Appendix E/...

A P P E N D I X E

DIAGRAMMATIC REPRESENTATION OF THE STAGE AS SET FOR ACTORS



148/...Appendix F/...

A P P E N D I X F

RAW FACTUAL AND INTERPRETATIVE SCORES OBTAINED BY SUBJECTS IN THE FOUR CONDITIONS

	C O N D I T I O N S															
	SR				OR				L				A			
	f		i		f		i		f		i		f		i	
	x	x^2	x	x^2	x	x^2	x	x^2	x	x^2	x	x^2	x	x^2	x	x^2
a_1 children	6	36	3	9	6	36	5	25	4	16	2	4	5	25	5	25
	7	49	5	25	4	16	5	25	8	64	6	36	5	25	6	36
	6	36	4	16	4	16	6	36	6	36	3	9	8	64	4	16
	1	1	1	1	8	64	4	16	6	36	3	9	6	36	5	25
	7	49	4	16	9	81	7	49	6	36	4	16	7	49	3	9
	4	16	3	9	2	4	4	16	5	25	4	16	9	81	8	64
	1	1	4	16	1	1	3	9	7	49	6	36	6	36	2	4
	1	1	5	25	3	9	2	4	9	81	3	9	5	25	2	4
	2	4	2	4	4	16	3	9	2	4	4	16	5	25	5	25
	3	9	2	4	3	9	5	25	7	49	3	9	7	49	4	16
	5	25	6	36	5	25	4	16	8	64	5	25	6	36	5	25
	6	36	5	25	3	9	7	49	5	25	5	25	3	9	5	25
	6	36	8	64	4	16	8	64	6	36	6	36	6	36	4	16
	5	25	6	36	4	16	5	25	6	36	6	36	4	16	5	25
	6	36	8	64	3	9	4	16	6	36	5	25	6	36	4	16
	66	360	66	350	63	327	72	384	91	593	65	307	88	548	67	331
a_2 adults	9	81	7	49	9	81	8	64	6	36	7	49	3	9	5	25
	8	64	5	25	9	81	6	36	4	16	6	36	6	36	4	16
	7	49	6	36	6	36	7	49	8	64	2	4	8	64	2	4
	6	36	7	49	4	16	4	16	1	1	3	9	4	16	7	49
	6	36	6	36	8	64	6	36	8	64	6	36	6	36	4	16
	5	25	5	25	4	16	5	25	6	36	6	36	5	25	4	16
	8	64	8	64	7	49	4	16	7	49	8	64	9	81	7	49
	9	81	10	100	7	49	8	64	8	64	5	25	8	64	6	36
	5	25	7	49	8	64	8	64	6	36	7	49	6	16	5	25
	6	36	6	36	8	64	8	64	6	36	7	49	8	64	7	49
	5	25	6	36	7	49	5	25	6	36	7	49	7	49	3	9
	3	9	5	25	4	16	2	4	4	16	2	4	9	81	5	25
	7	49	5	25	8	64	5	25	5	25	4	16	8	64	6	36
	7	49	6	36	5	25	8	64	4	16	7	49	7	49	7	49
	4	16	6	36	6	36	6	36	8	64	8	64	4	16	7	49
	95	645	95	627	100	710	90	588	87	559	85	539	96	670	79	453

Legend: SR = silent reading
OR = oral reading
L = listening
A = acting

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